PRELIMINARY ASSESSMENT FOR NUYTS ARCHIPELAGO MARINE PARK LOCAL ADVISORY GROUP TO ASSIST WITH MEETING ON 2 MAY 2011

Rapid Assessment on Comprehensive, Adequate and Representative (CAR) Principles for the Nuyts Archipelago Marine Park (Marine Park 2) suggested zoning options

Overview

DENR has undertaken a rapid assessment of the CAR principles for the possible sanctuary zone option for the Nuyts Archipelago Marine Park provided by the community on 1 April 2011.

Community feedback and MPLAG advice has resulted in one sanctuary zoning option with zones being suggested at 12 locations within the marine park (see Figure 1).

This rapid assessment[1] helps to measure the zoning option against the core biophysical principles of:

Comprehensive: To be comprehensive, examples of all ecosystems and habitats within the marine park should be included within sanctuary zones.

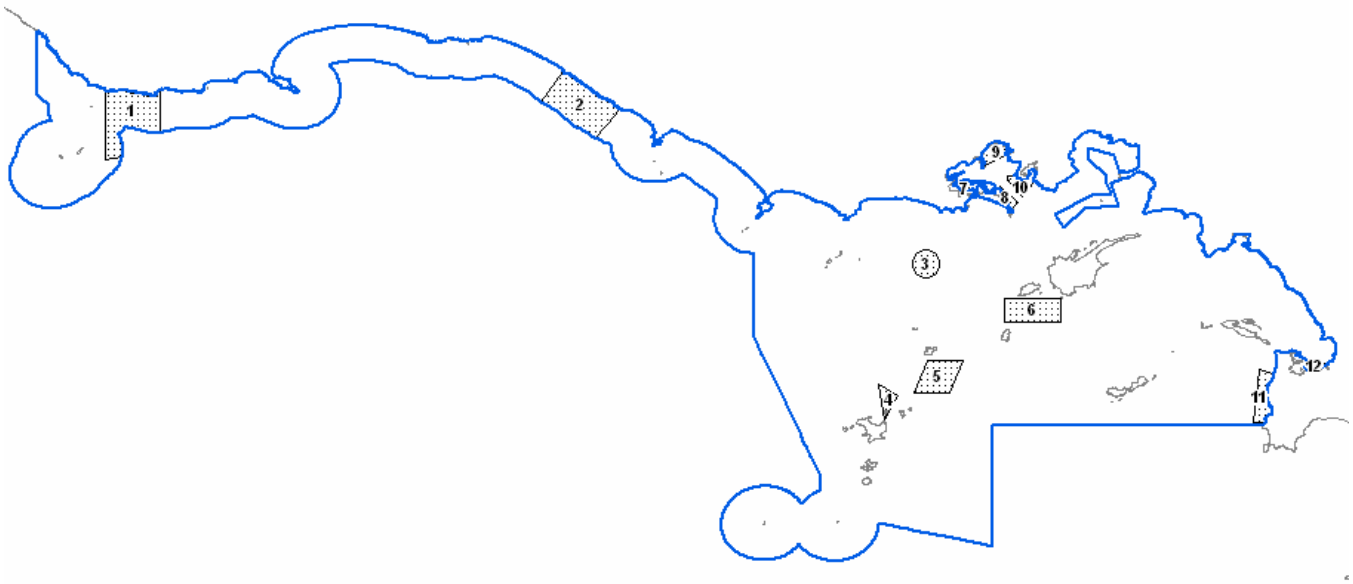
Adequate: To be adequate, the marine parks system should provide for the maintenance of the ecological viability and integrity of populations, species and communities.

Representative: To be representative, the system of sanctuary zones should reflect the biodiversity and variability naturally present in the marine park.

MPLAGs should seek to apply the full suite of 14 design principles in any further zoning advice generated.

Possible zoning options for marine park 2

Figure 1: Zoning Option 1 (5% of MP)
(possible zones: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12)



[1] GIS processing formed the basis of the rapid assessments. A number of data layers captured at various scales were used in the analysis, these include layers such as: state and national benthic mapping; coastal shoreline types; and sea lion haul out and breeding locations. Procedures such as intersections, unions, frequency analysis as well as manual measurements were used in this assessment. All information is subject to the scale and accuracy of the data used.

How to use this document

The rapid assessment shows the range of environmental values/features that are included in MPLAG zoning options and that are omitted. It also shows those features that are well represented and those that are under-represented. **For each under-represented feature, the maps in Appendix C show alternative locations where the feature is mapped.**

The rapid assessment also provides a measure of each suggested sanctuary zone to assist consideration of the adequacy of those zones. **Note: It is better to have fewer, larger sanctuary zones than many smaller ones**.

Comprehensiveness

Each option was assessed for the inclusion of examples of shoreline types and benthic habitats in the suggested sanctuary zones.

The zoning option includes the following shoreline and seafloor (benthic) habitats:

- ✓ Macroalgae
- ✓ Rocky reef
- ✓ Seagrass
- ✓ Soft-bottom habitat
- ✓ Unmapped habitat
- ✓ Bedrock platform
- ✓ Cliff
- ✓ Coarse sand beach
- ✓ Fine-medium sand beach
- ✓ Mangrove
- ✓ Saltmarsh
- ✓ Sand dunes

The zoning option does not include the following shoreline and seafloor (benthic) habitats:

- Nil

Representativeness

Each option was assessed against the proportion of environmental values[2] represented in the suggested sanctuary zones. To consider the full diversity and variability of the coastal and marine features, this assessment included benthic habitat types at different depths, shoreline types at different exposures and a range of other ecologically important features. Each zoning option was assessed for the proportion (as a %) of environmental values represented in the suggested sanctuary zones. Proportions were broken into 4 categories: ≥20%, between 10% and 19%, <10% and 0%.

Environmental values represented within the possible zoning options as a proportion of their availability within the park

Environmental values that are represented at a level ≥20%:

- ✓ Bedrock platform (sheltered)
- ✓ Fine-medium sand beach (sheltered)
- ✓ Sand dunes (sheltered)

[2] In this assessment an environmental value include seafloor habitats and shoreline habitats and ecologically important features available within the outer boundary.

Environmental values that are represented between 10-19%:

- ✓ Australian sea lions (haulout)
- ✓ Coastal wader bird sites
- ✓ Rocky reef (-30 to -50m)
- ✓ Unmapped (-30 to -50m)
- ✓ Cliff (exposed)
- ✓ Mangrove (sheltered)
- ✓ Saltmarsh (sheltered)

Environmental values that are represented at a level <10%:

- ✓ Australian sea lions (breeding)
- ✓ Emergent land
- ✓ Offshore islands
- ✓ Sea bird sites
- ✓ Estuary
- ✓ Macroalgae (0 to -10m)
- ✓ Reef (0 to -10m, -10 to -30m)
- ✓ Seagrass (0 to -10m)
- ✓ Soft-bottom habitat (0 to -10m, -10 to -30m)
- ✓ Unmapped habitat (0 to -10m, -10 to -30m, >-50m)
- ✓ Cliff (sheltered)
- ✓ Coarse sand beach (sheltered)
- ✓ Fine-medium sand beach (exposed)

Environmental values that are not represented (0%):

- × Cosema endangered macroalgae
- × Surveyed reef fish sites
- × Macroalgae (-10 to -30m)
- × Rocky reef (>-50m)
- × Seagrass (-10m to -30m)
- × Soft-bottom habitat (-30 to -50m)
- × Bedrock Platform (exposed and moderate)
- × Cliff (moderate)
- × Coarse sand beach (exposed and moderate)
- × Fine-medium sand beach (moderate)

Note:

- A more detailed assessment of environmental values and the percentage included in Zoning Option 1 can be viewed in Appendix A.
- Environmental values included within each suggested individual zone can be viewed in Appendix B.
- The locations of environmental values that are not included or are under represented are shown in Appendix C.

Adequacy

Each of the suggested zones was measured for their approximate lengths (from coast to offshore or longitudinal lengths) and widths (coastline or latitudinal lengths), these are shown in Table 1. The total area of each of the four options was then calculated, as shown in Table 2.

Note: The guideline is that a zone should include whole habitats or areas with minimum linear dimensions of 7-10 km (or 5km where State waters are limited to 3 nautical miles). Smaller dimensions are likely to have a value but not for all organisms.

Table 1. Approximate length, width and size of each suggested zone.

Zone	From the coast to offshore (length) (km)	Coastline along shore (width) (km)	Size of zone (km^2)
1	11 (west boundary) 6 (east boundary)	7	54
2	6	10	54
3	4	4	14
4	4	2	7
5	5	5	25
6	4	7	27
7	1	1	1
8	1	3	3
9	3	3	8
10	2	3	7
11	2	8	14
12	2	3	3

Note:

- Zone 1 had two coasts to offshore lengths.

Area of Zoning Option

One zoning option was developed with zones suggested at 12 locations.

The total area (km^2) and the percentage sanctuary zones for the option can be seen in Table 2.

Table 2. Total area and percentage of sanctuary zones in the zoning option (rounded to the nearest whole number).

Suggested zoning option	Total area of sanctuary zones (km^2)	% of sanctuary zones located in the marine park
1	217	5

Appendix A

Table 3. The percentage of each environmental value included in zoning Option 1.

Environmental values	Option 1 Total in all Zones (%)
Ecological Importance	%
Australian Sealions (breeding)	9
Australian Sealions (haulout)	13
Coastal Wader Bird Sites	15
Cosema Endangered Macroalgae	0
Emergent Land	4
Offshore Islands	9
Surveyed Reef Fish Sites	0
Sea Bird Sites	5
Estuaries	9
Underwater Habitats	%
Macroalgae (0 to -10m)	<1
Macroalgae (-10 to -30m)	0
Rocky Reef (0 to -10m)	5
Rocky Reef (-10 to -30m)	7
Rocky Reef (-30 to -50m)	11
Rocky Reef (>-50m)	0
Seagrass (0 to -10m)	4
Seagrass (-10 to -30m)	0
Soft-bottom Habitat (0 to -10m)	9
Soft-bottom Habitat(-10m to -30m)	7
Soft-bottom Habitat (-30m to -50m)	0
Unmapped Habitat (0 to -10m)	4
Unmapped Habitat (-10 to -30m)	5
Unmapped Habitat(-30 to -50m)	10
Unmapped Habitat (>-50m)	<1
Total	**5**
Shore Habitats	%
Bedrock Platform (Exposed)	0
Bedrock Platform (Moderate)	0
Bedrock Platform (Sheltered)	27
Cliff (Exposed)	11
Cliff (Moderate)	0
Cliff (Sheltered)	1
Coarse Sand Beach (Exposed)	0
Coarse Sand Beach (Moderate)	0
Coarse Sand Beach (Sheltered)	5
Fine-medium Sand Beach (Exposed)	6
Fine-medium Sand Beach (Moderate)	0
Fine-medium Sand Beach (Sheltered)	53
Mangrove (Sheltered)	10
Saltmarsh (Sheltered)	16
Sand Dunes (Sheltered)	20
Total	**8**

Environmental values represented
Represented ≥20%
Represented between 10-19%
Represented <10%
Not Represented 0%

Note: Areas rounded to the nearest whole number

Appendix B

Table 4. Environmental values represented in each suggested zone.

Ecological Importance	**Units**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Total in Marine Park (count)**
Australian Sealions (breeding)	Count			1										11
Australian Sealions (haulout)	Count				2									16
Coastal Wader Bird Sites	Count	5		5	2		2		33	23	12			537
Cosema Endangered Macroalgae	Count													21
Emergent Land	Count	1												25
Estuary	Count													2
Offshore Islands	Count			1	2									34
Reef Fish	Count													27
Sea Bird Sites	Count				1									21

Underwater Habitats		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Total in Marine Park (km2)**
Macroalgae (0 to -10m)	Km^2								<1					28
Macroalgae (-10 to -30m)	Km^2													5
Reef (0 to -10m)	Km^2	4	2		<1					<1		1		140
Reef (-10 to -30m)	Km^2	2	<1		<1		7							136
Reef (-30 to -50m)	Km^2				<1		3							31
Reef (>-50m)	Km^2													1
Seagrass (0 to -10m)	Km^2							1	1	5	3	7	2	500
Seagrass (-10 to -30m)	Km^2													12
Soft bottom habitat (0 to -10m)	Km^2	1	1						2	2	4	2	1	144
Soft bottom habitat (-10m to -30m)	Km^2		<1											4
Soft bottom habitat (-30m to -50m)	Km^2													<1
Unmapped (0 to -10m)	Km^2	1	2	1	<1			<1	<1	<1	<1		<1	167
Unmapped (-10 to -30m)	Km^2	8	15	<1	1		5					4		625
Unmapped (-30 to -50m)	Km^2	37	33	13	5	25	11							1,320
Unmapped (>-50m)	Km^2	1	<1		<1									819
Total	Km^2	**54**	**53**	**14**	**5**	**25**	**27**	**1**	**3**	**8**	**7**	**14**	**3**	**3,932**

Shore Habitats		1	2	3	4	5	6	7	8	9	10	11	12	Total in Marine Park (km)
Bedrock Platform (Exposed)	km													24
Bedrock Platform (Moderate)	km													5
Bedrock Platform (Sheltered)	km												3	9
Cliff (Exposed)	km		6											55
Cliff (Moderate)	km													9
Cliff (Sheltered)	km									<1				36
Coarse Sand Beach (Exposed)	km													31
Coarse Sand Beach (Moderate)	km													12
Coarse Sand Beach (Sheltered)	km								<1	1	1		<1	52
Fine-medium Sand Beach (Exposed)	km		6											97
Fine-medium Sand Beach (Moderate)	km													<1
Fine-medium Sand Beach (Sheltered)	km									1				1
Mangrove (Sheltered)	km							4	3	6	3		4	213
Saltmarsh (Sheltered)	km								<1	3	1			24
Sand Dunes (Sheltered)	km										1			6
Total	km	**0**	**11**	**0**	**0**	**0**	**0**	**4**	**3**	**11**	**7**	**0**	**7**	**574**

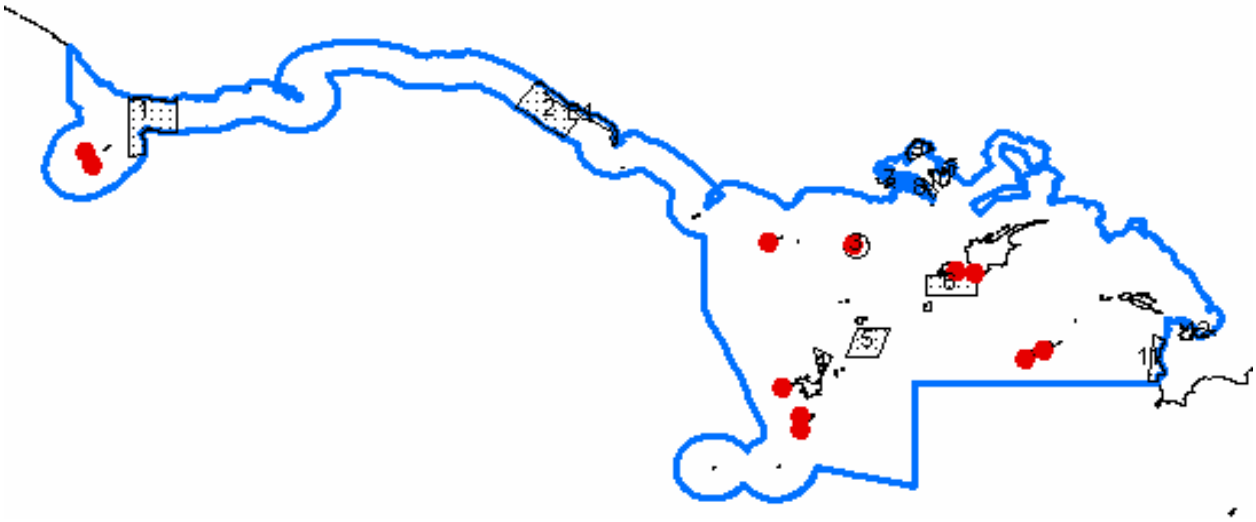
Note: Areas rounded to the nearest whole number

Appendix C. Location of the environmental values <10% represented.

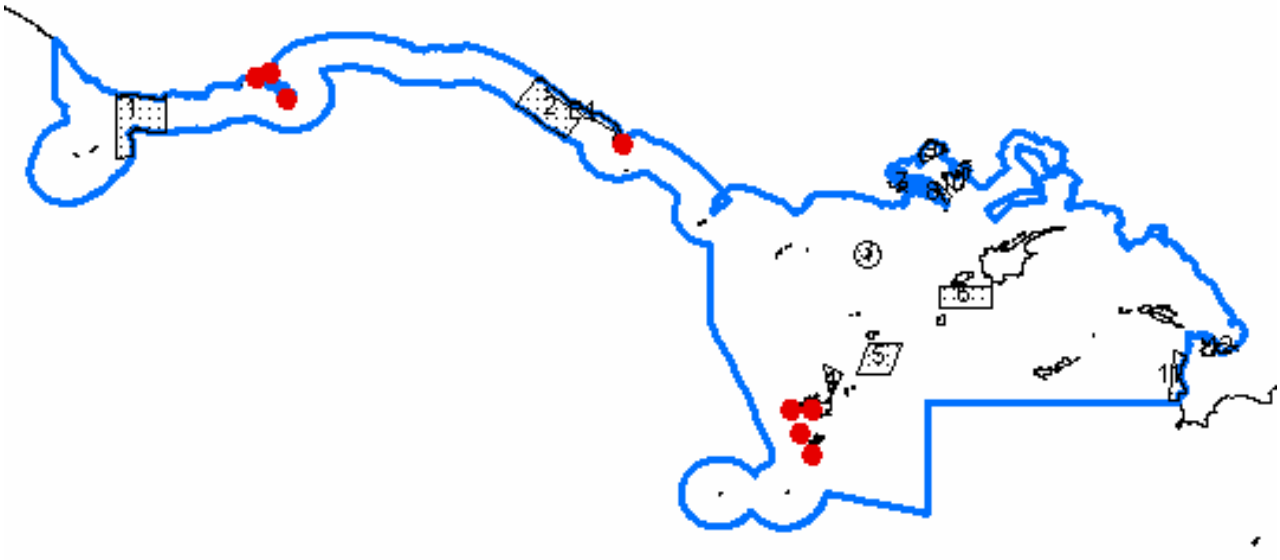
Environmental values that have <10% representation are shown in red, identifying where they could be represented within the marine park.

Note: maps are best viewed in colour.

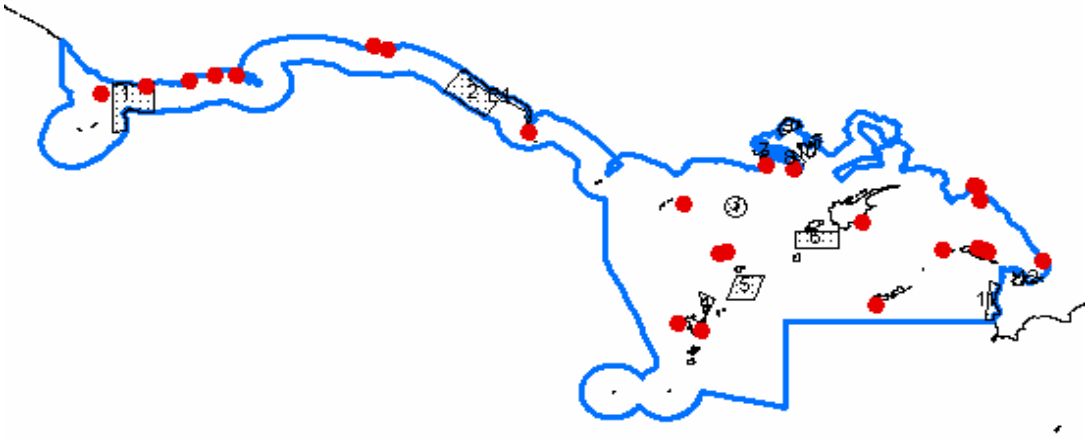
Australian sea lions (breeding)



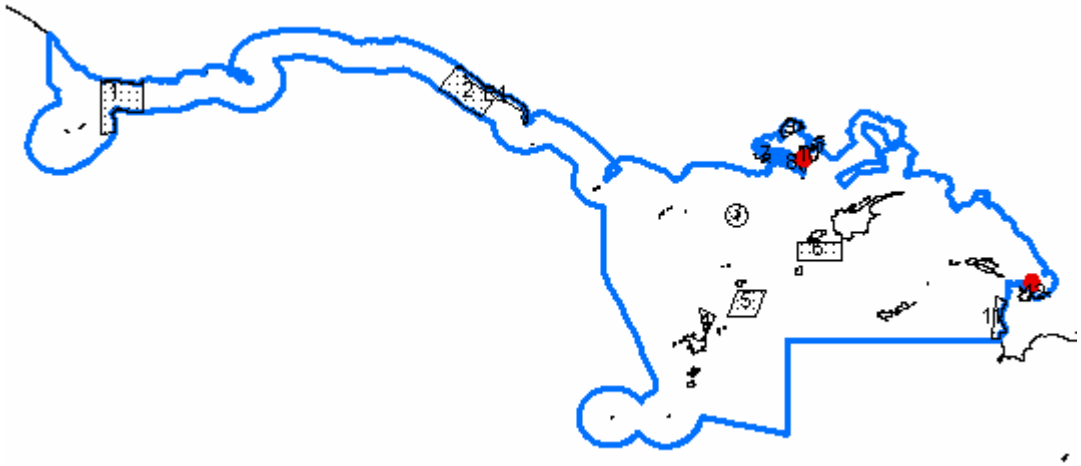
COSEMA (endangered macroalgae)



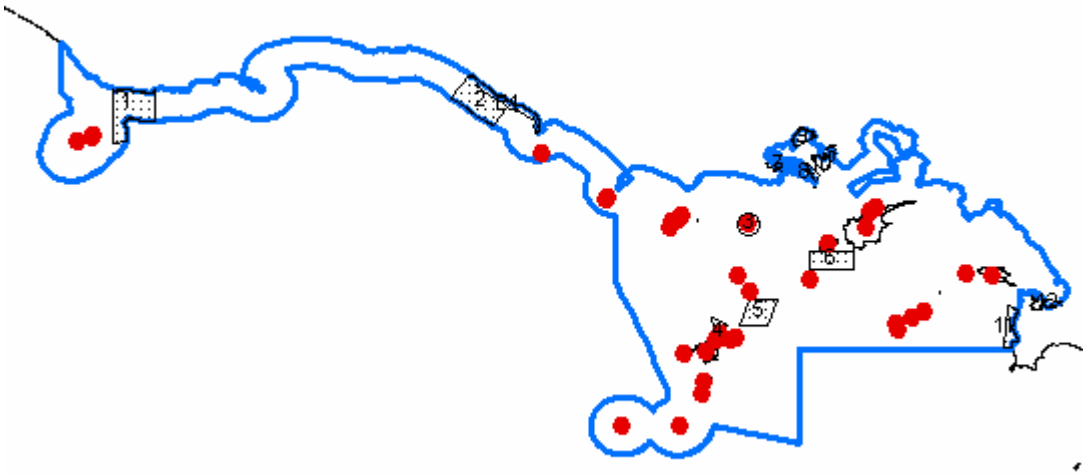
Emergent land



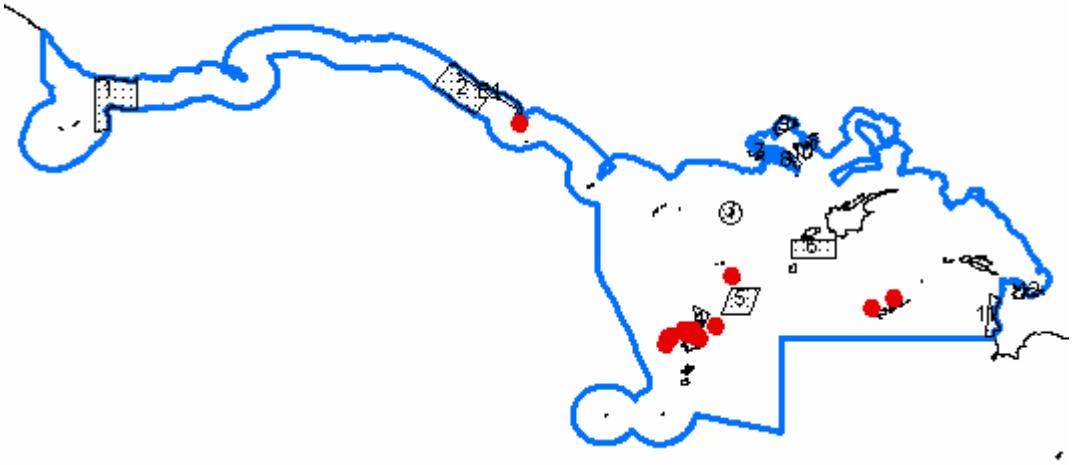
Estuaries



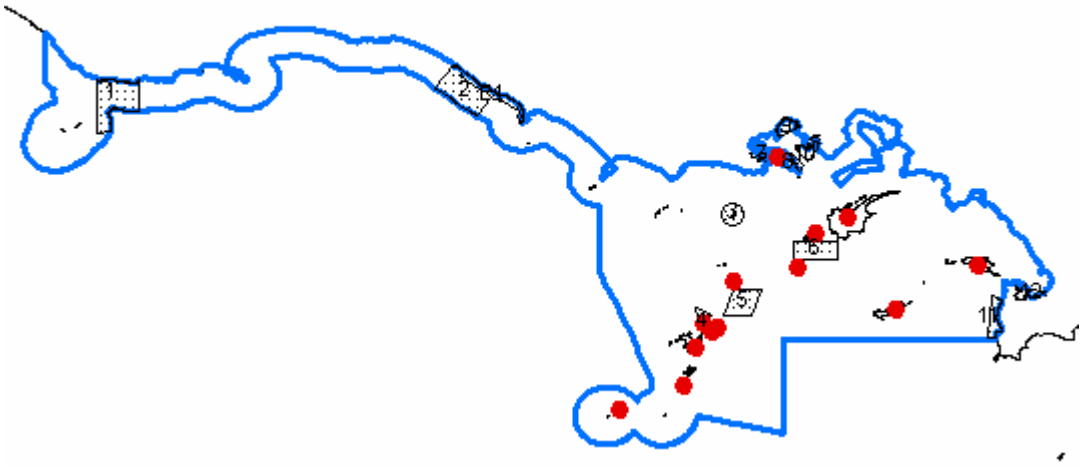
Offshore islands



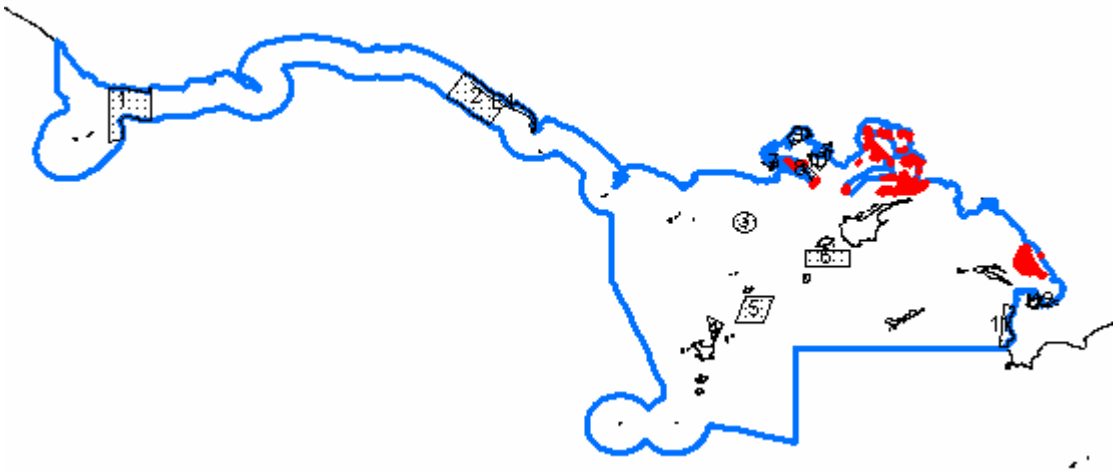
Reef fish



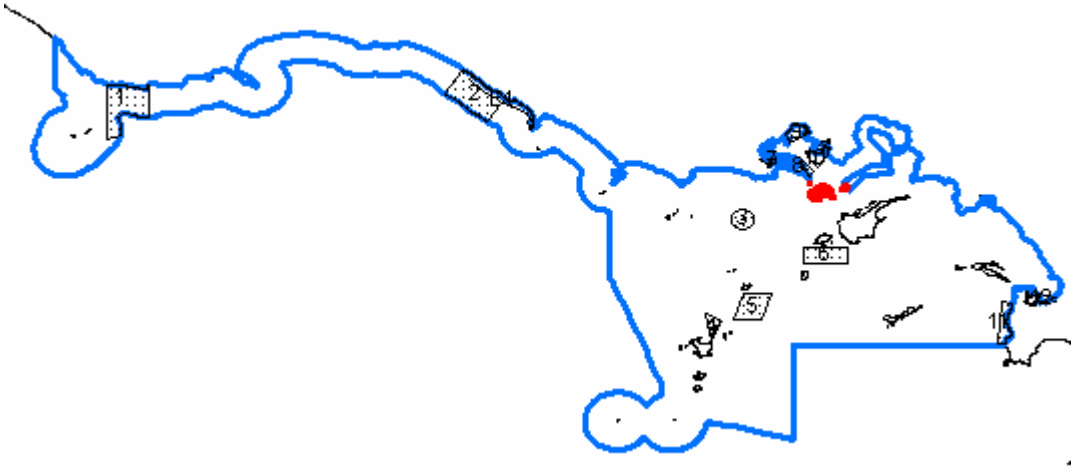
Seabird sites



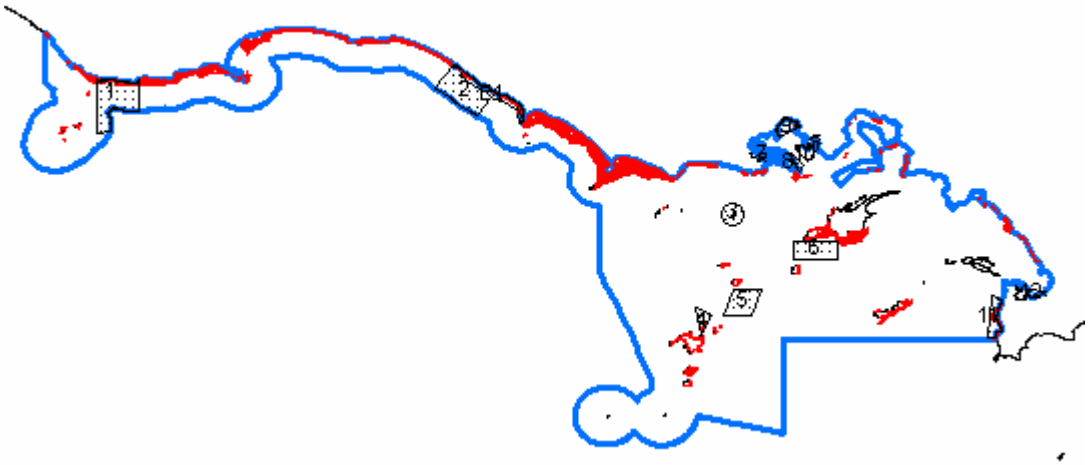
Macroalgae (0 to -10m)



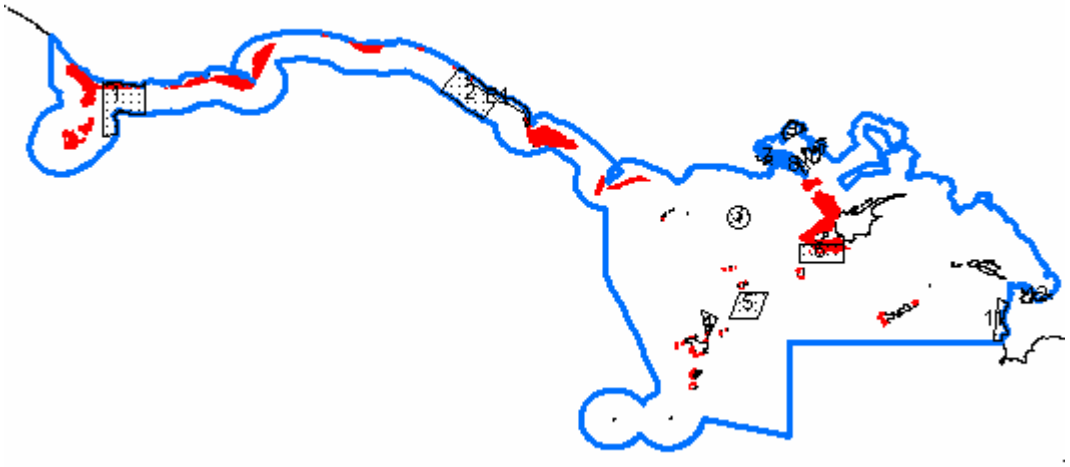
Macroalgae (-10 to -30m)



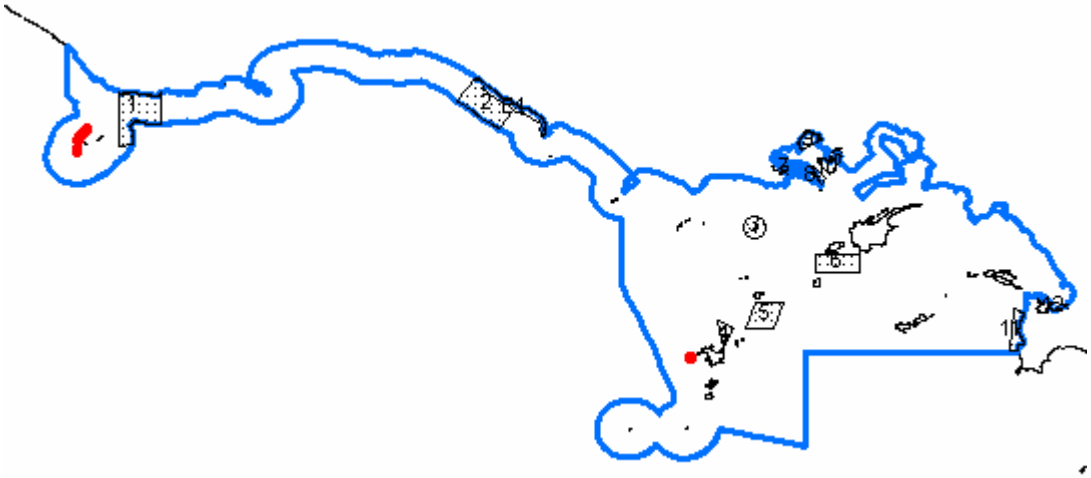
Rocky reef (0 to -10m)



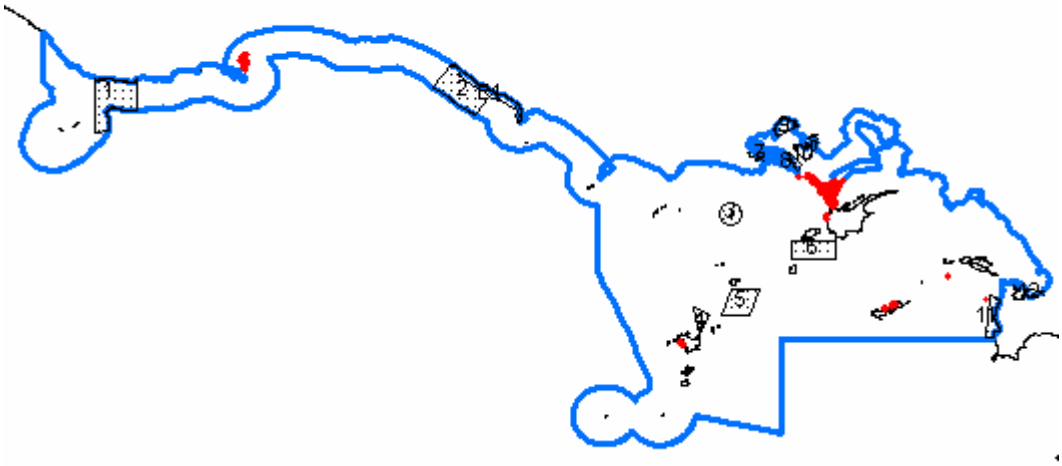
Rocky reef (-10 to -30m)



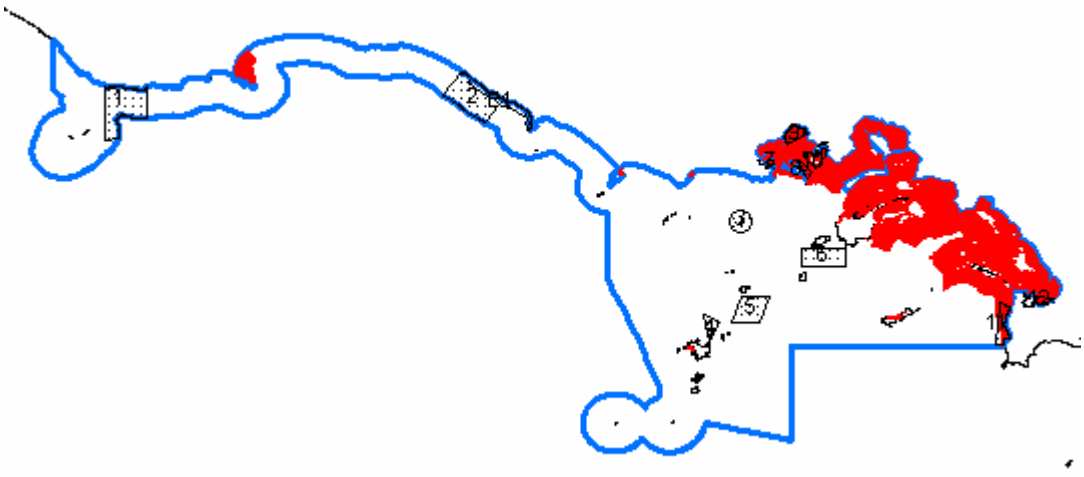
Rocky reef (>-50m)



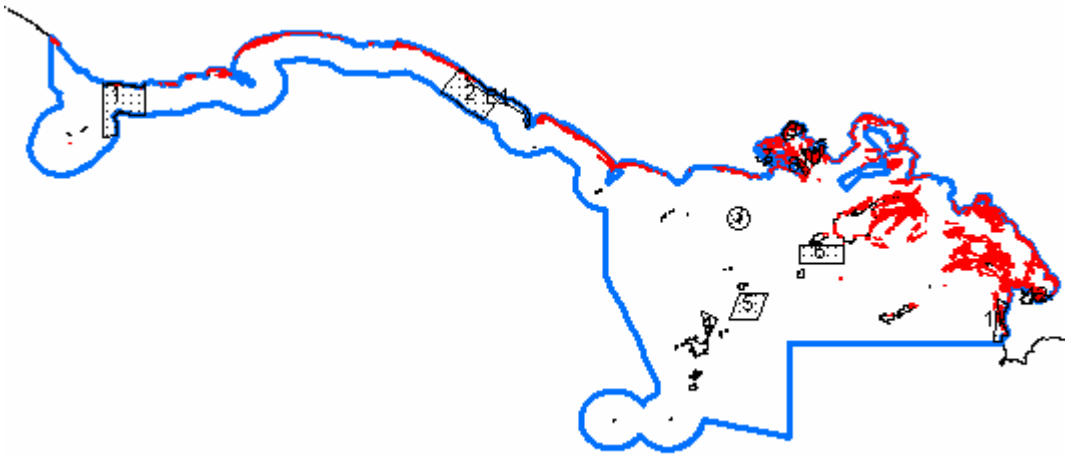
Seagrass (0 to -30m)



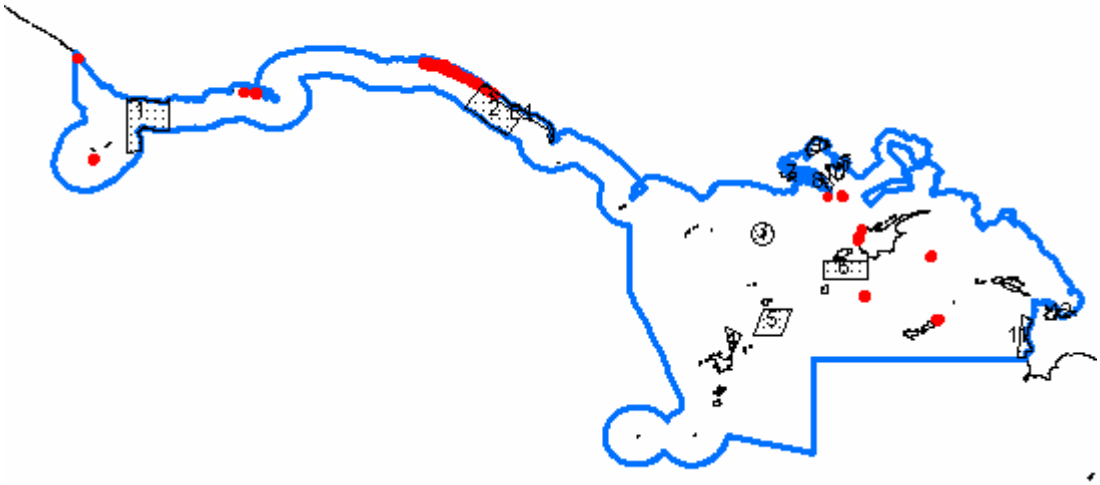
Seagrass (0 to -10m)



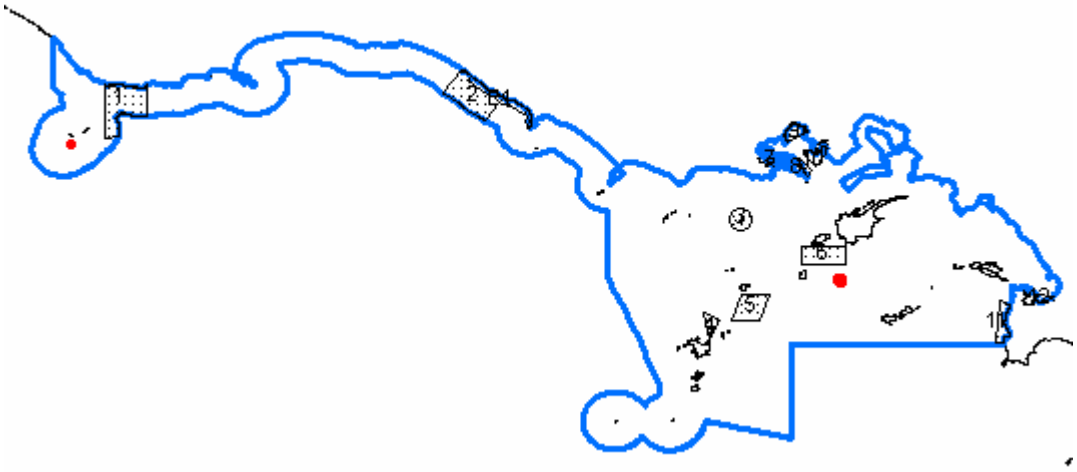
Soft-bottom habitat (0 to -10m)



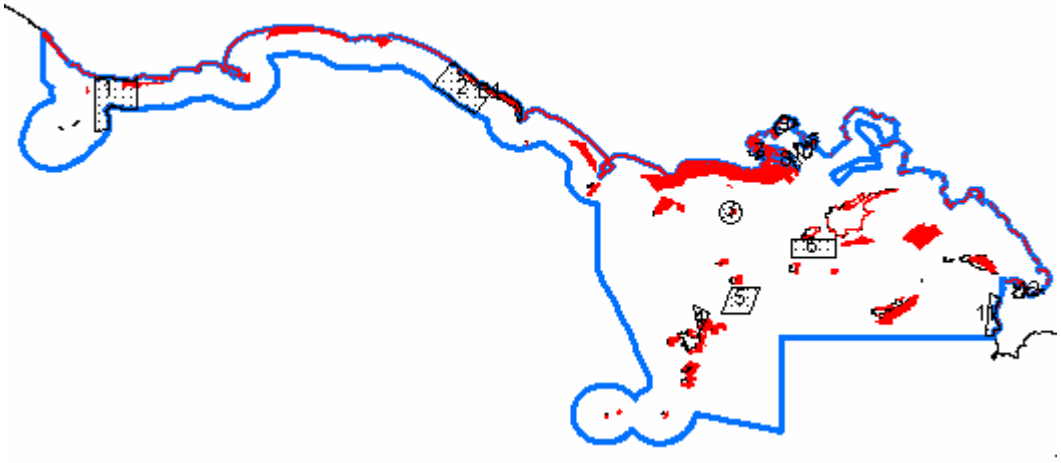
Soft-bottom habitat (-10 to -30m)



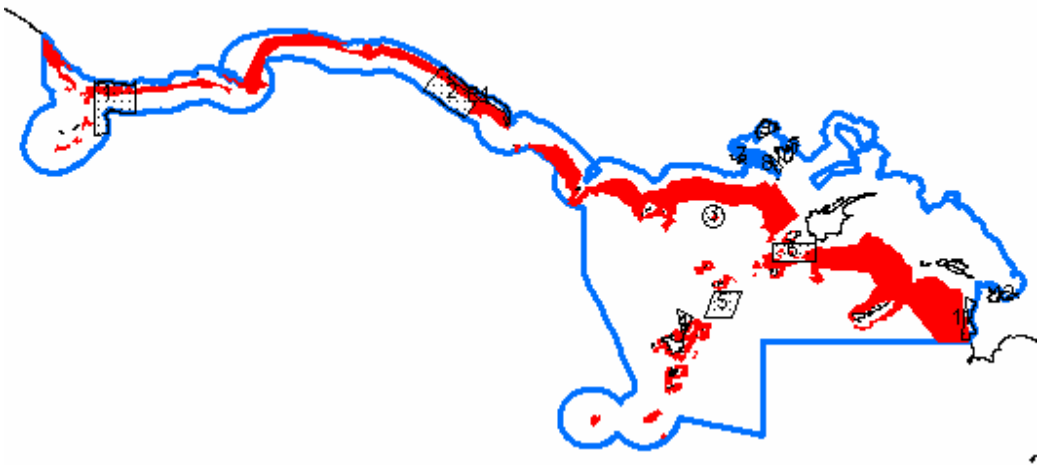
Soft-bottom habitat (-30 to -50m)



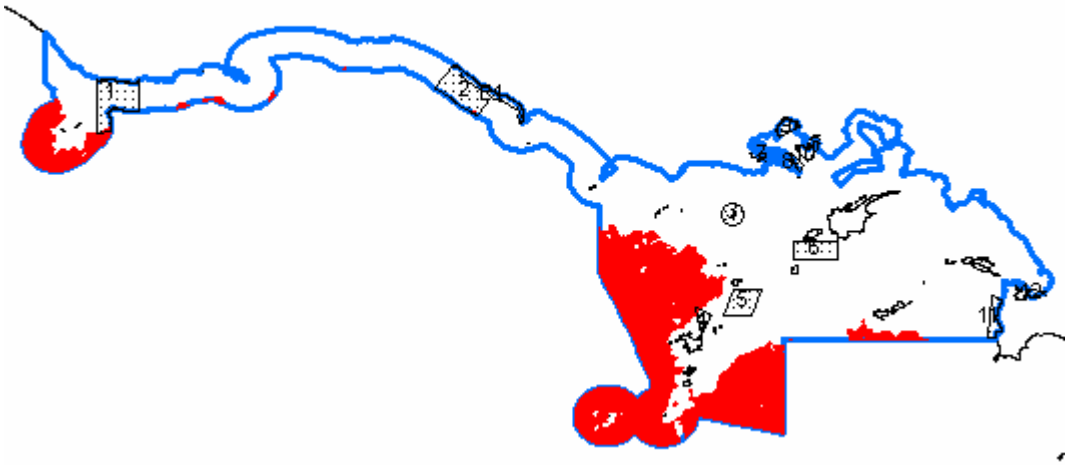
Unmapped habitat (0 to -10m)



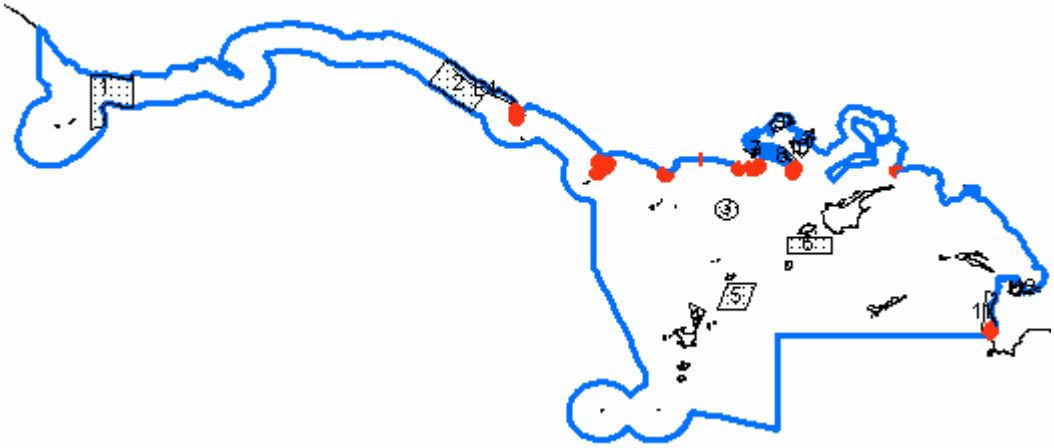
Unmapped habitat (-10 to -30m)



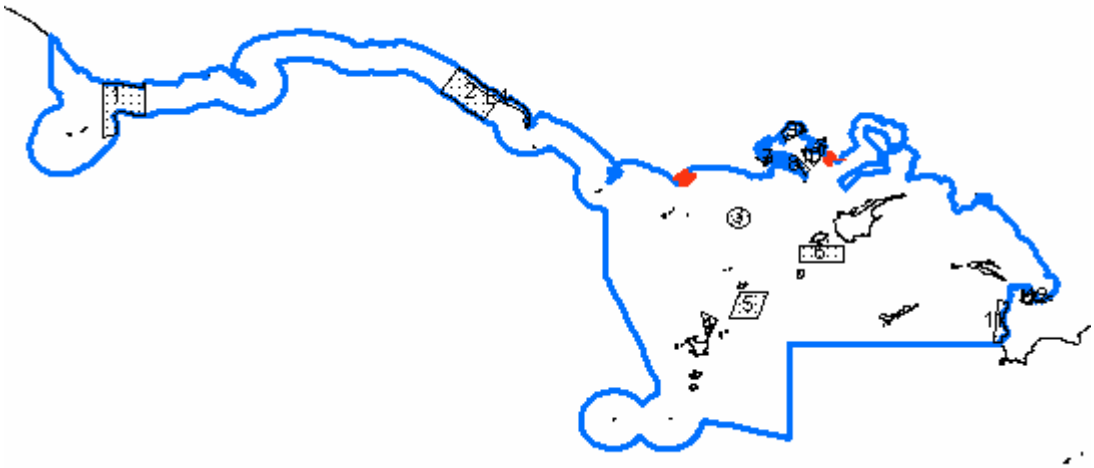
Unmapped habitat (>-50m)



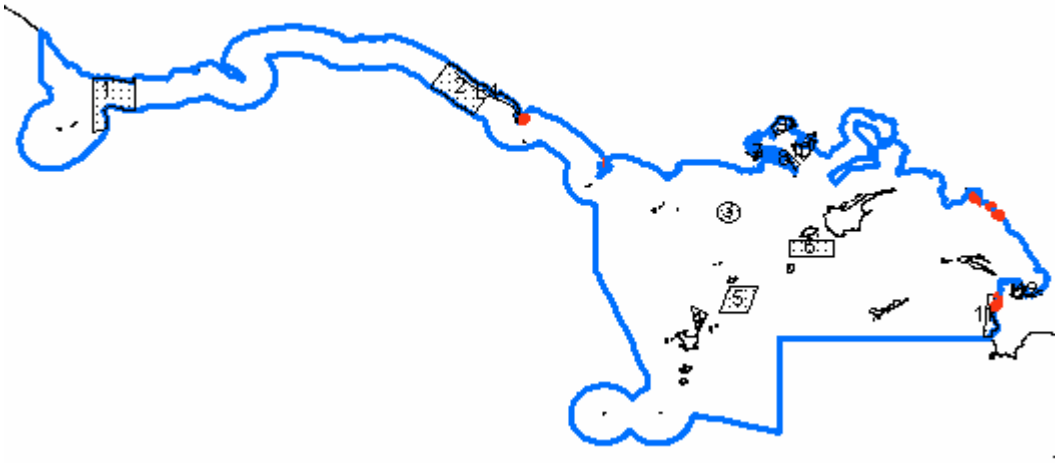
Bedrock platform (exposed)



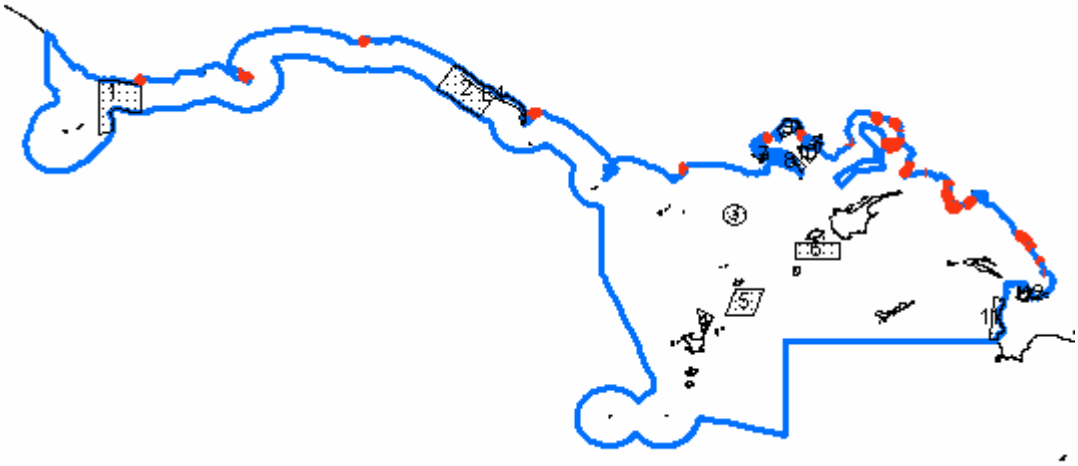
Bedrock platform (moderate)



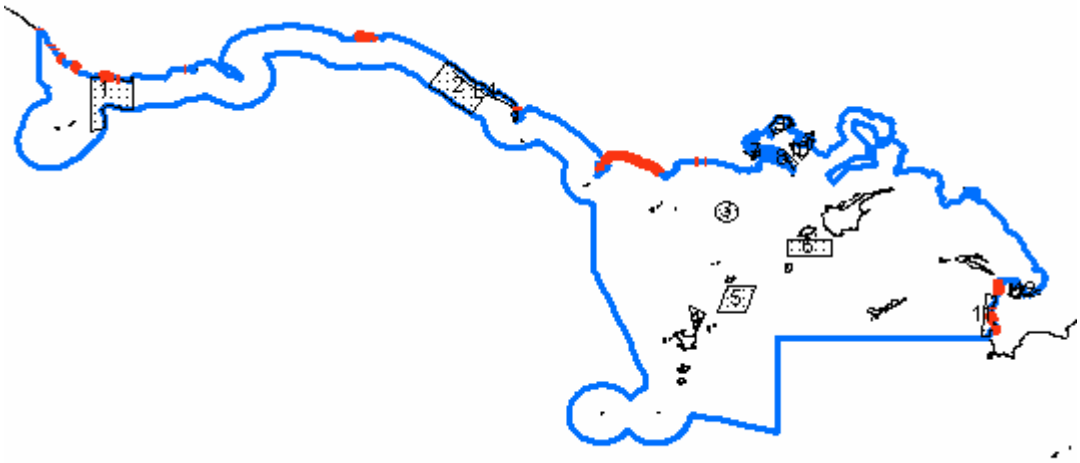
Cliff (moderate)



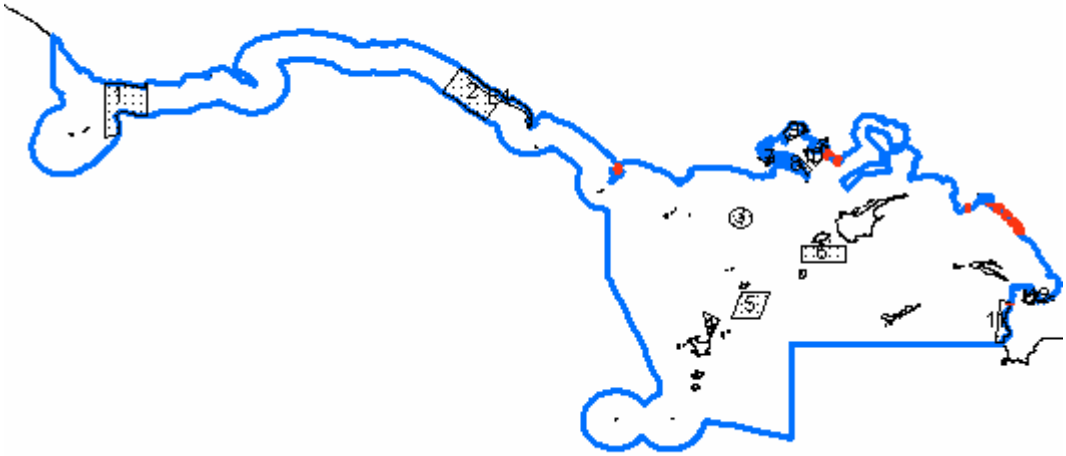
Cliff (sheltered)



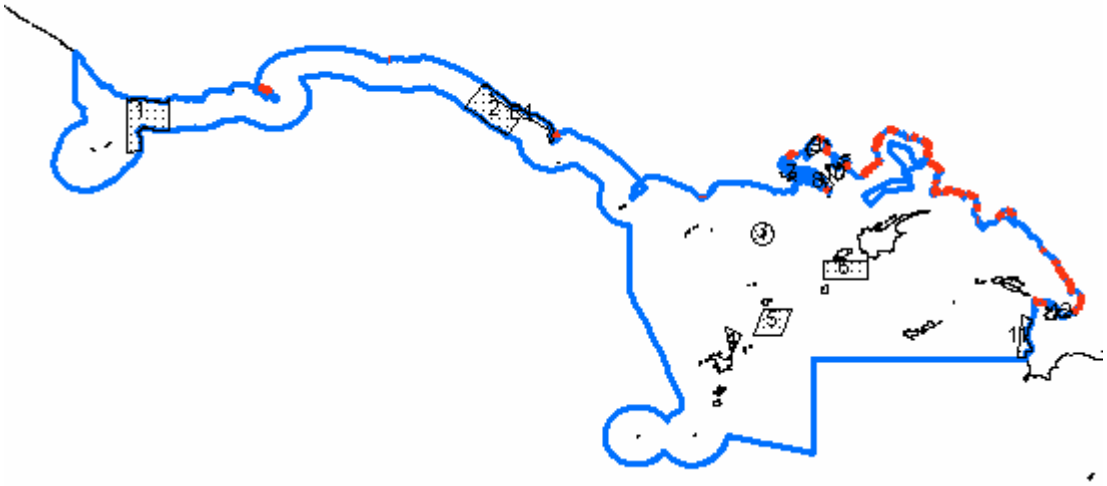
Coarse sand beach (exposed)



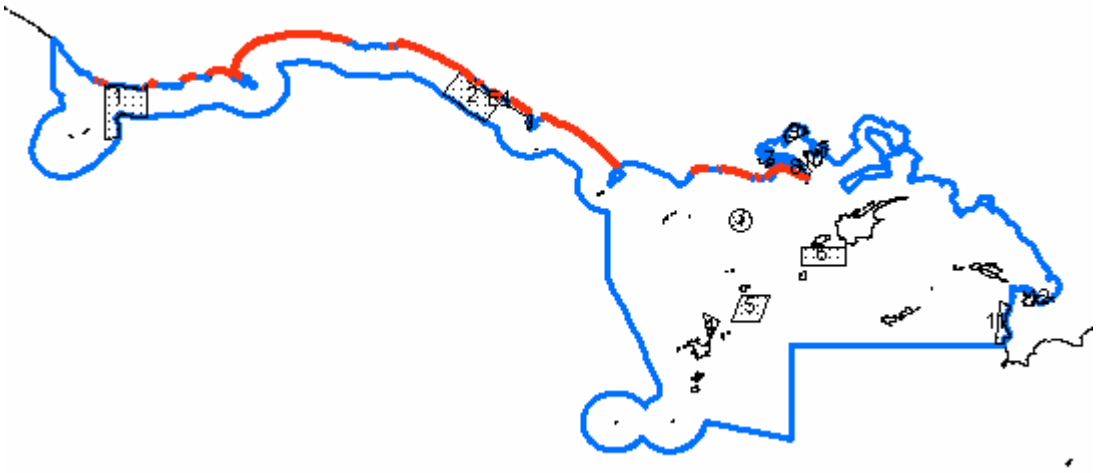
Coarse sand beach (moderate)



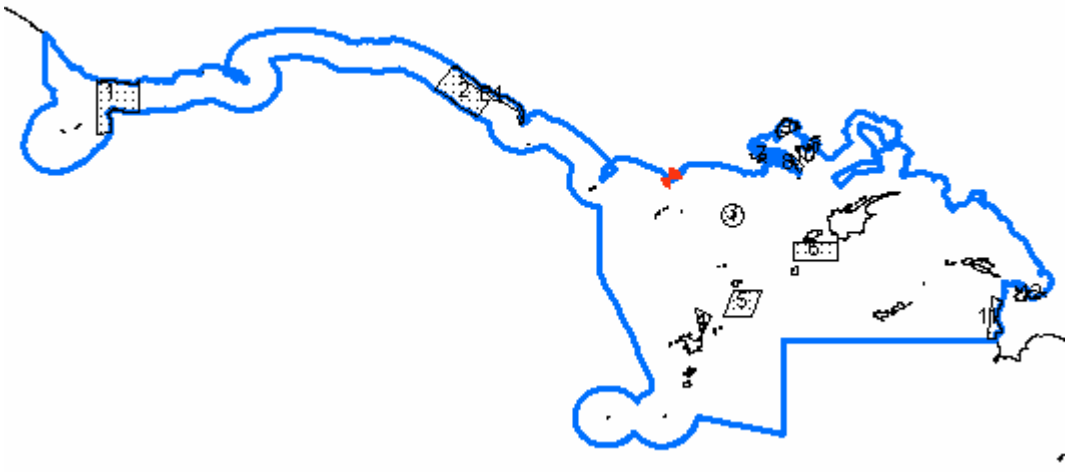
Coarse sand beach (sheltered)



Fine-medium sand beach (exposed)



Fine-medium sand beach (moderate)



Mapping information: