

# PRELIMINARY ASSESSMENT FOR KANGAROO ISLAND MARINE PARK LOCAL ADVISORY GROUP TO ASSIST WITH THE MEETING ON THE 16<sup>TH</sup> MAY 2011

## Rapid Assessment on Comprehensive, Adequate and Representative (CAR) Principles for the Southern Kangaroo Island Marine Park (Marine Park 17) suggested zoning options

### Overview

DENR has undertaken a rapid assessment of the CAR principles for the possible sanctuary zone options for the Southern Kangaroo Island Marine Park suggested at the Marine Park Local Advisory Group meeting held on 17<sup>th</sup> February 2011.

Community feedback and MPLAG advice has resulted in seven sanctuary zoning options with zones being suggested at five locations within the marine park.

Using combinations of alternative suggested zones (A (1,2,3), B (1,3,4,5), C (1,2,3), D (2,3) and E (1,2)), seven zoning options for the marine park were developed (Figures 1,2,3,4,5,6 and 7).

This rapid assessment<sup>1</sup> helps to determine if the zoning option meets 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.

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### 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.**

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<sup>1</sup> 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.

**Possible zoning options for marine park 17 using combinations of the 7 suggested zones**

Figure 1: Zoning Option 1 (8% of MP)  
(possible zones: B4, C3, E2)

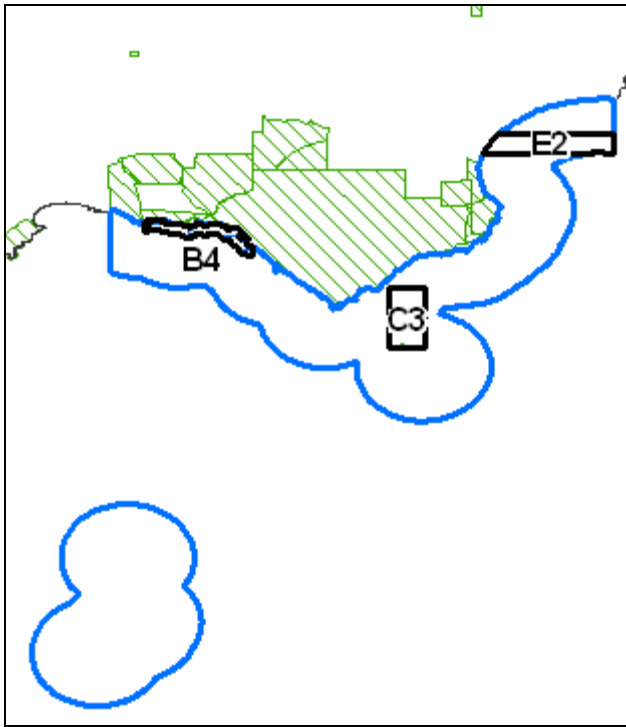


Figure 2: Zoning Option 2 (29% of MP)  
(possible zones: A3, B1, C2, D3, E1)

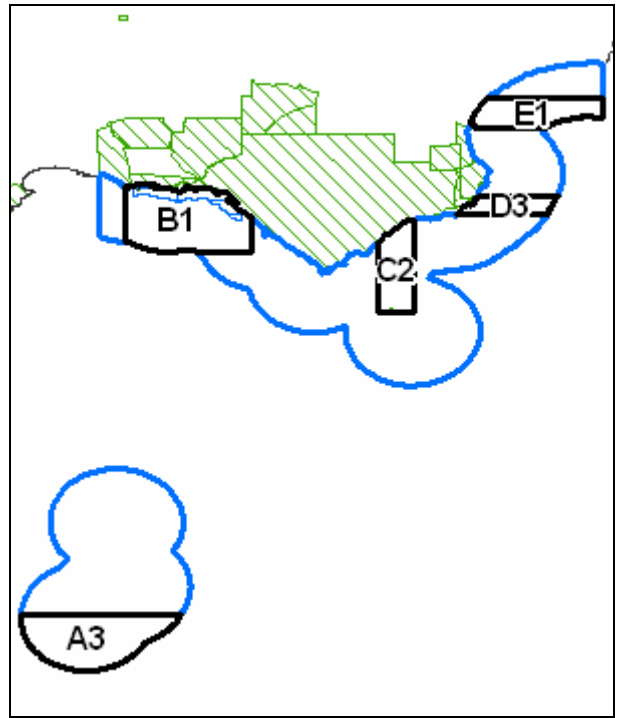


Figure 3: Zoning Option 3 (37% of MP)  
(possible zones: A1, B3, C1, D2, E1)

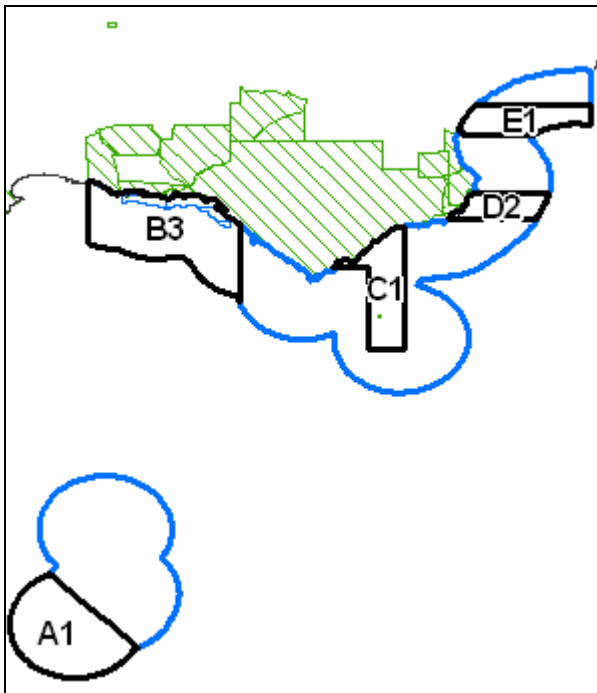


Figure 4: Zoning Option 4 (26% of MP)  
(possible zones: A3, B1, C2, E1)

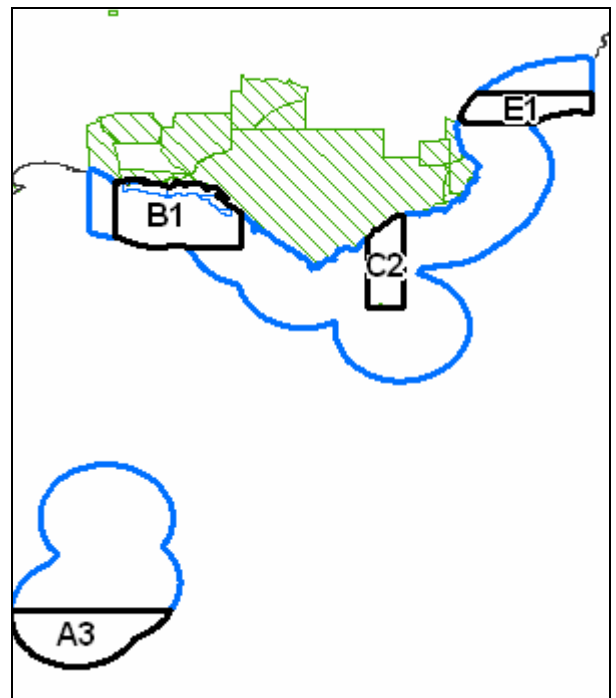


Figure 5: Zoning Option 5 (34% of MP)  
(possible zones: A1, B3, C1, E1)

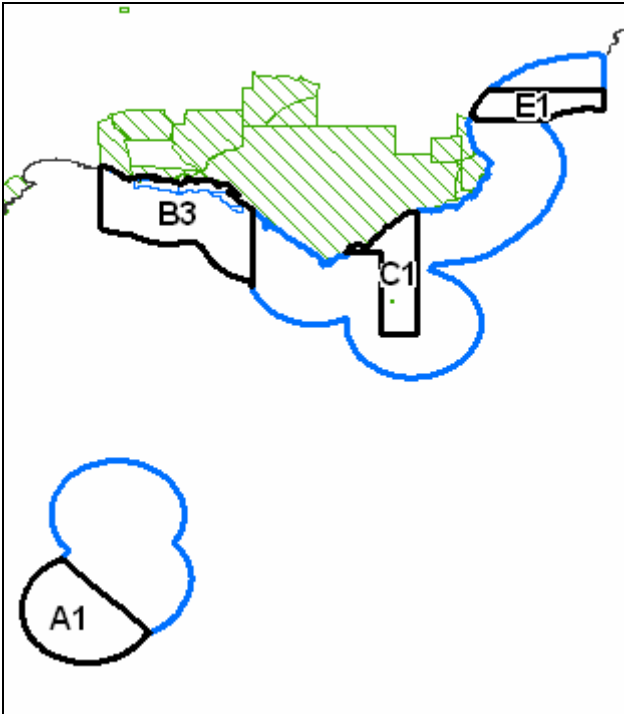


Figure 6: Zoning Option 6 (25% of MP)  
(possible zones: A3, B5, C2, D3, E1)

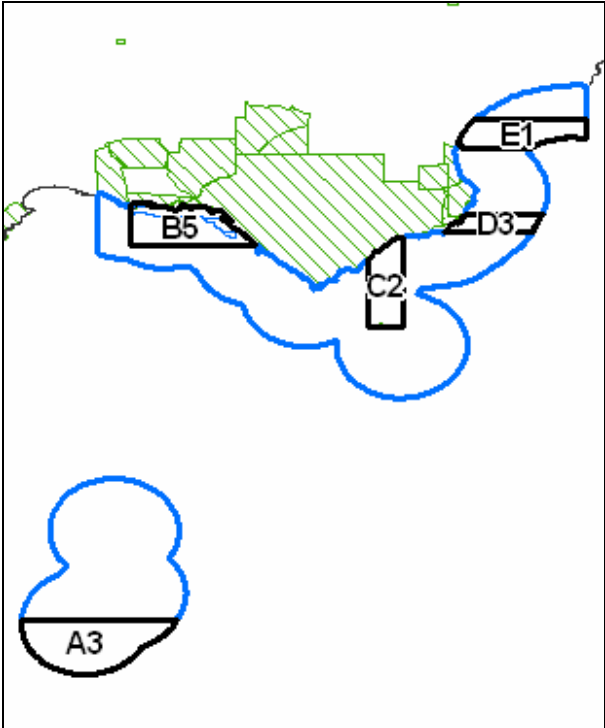
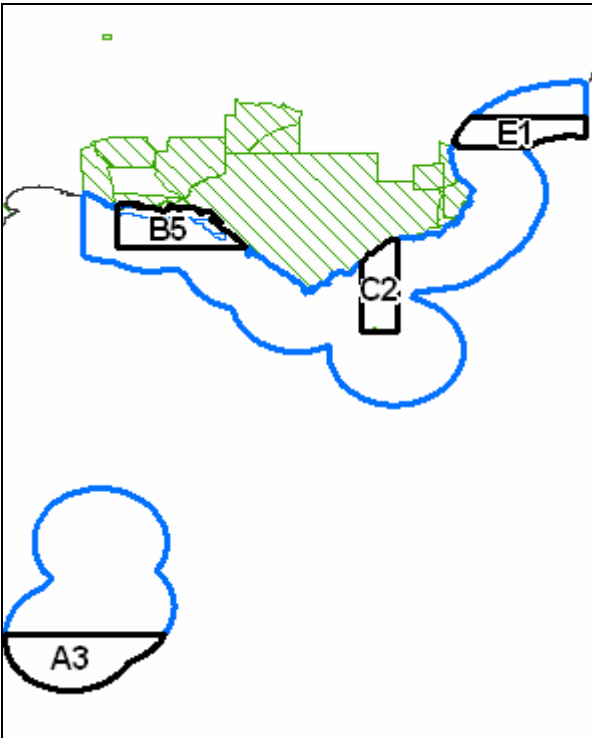


Figure 7: Zoning Option 7 (22% of MP)  
(possible zones: A3, B5, C2, E1)



## **Comprehensiveness**

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

All 7 zoning options include the following shoreline and seafloor (benthic) habitats:

- ✓ Rocky reef
- ✓ Seagrass
- ✓ Soft bottom habitat
- ✓ Unmapped
- ✓ Bedrock platform
- ✓ Cliff
- ✓ Coarse sand beach
- ✓ Fine-medium sand beach

In addition, Options 2, 6, and 7 include:

- ✓ Boulder beach;

In addition, Options 3 and 5 include:

- ✓ Mixed beach

Options 1,3,4,5 do not include the following shoreline habitat type:

- × Boulder beach

And,

Options 1,2,4,6 and 7 do not include the following shoreline habitat type:

- × Mixed beach

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## **Representativeness**

*Each option was assessed against the proportion of environmental values<sup>2</sup> 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%. A comparison of the environmental values represented as a proportion of their availability within the park for each option can be seen in Table 1.*

### **Note:**

- Environmental values included within each suggested individual zone can be viewed in Table 4 Appendix A.
- A more detailed assessment of environmental values and the percentage included in each zoning option can be viewed in Table 5 Appendix B.
- The locations of environmental values that are not included or are under represented are shown in Table 6 Appendix C.

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<sup>2</sup> In this assessment an environmental value include seafloor habitats and shoreline habitats and ecologically important features available within the outer boundary.

**Table 1.** 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  $\geq 20\%$
- ✓✓ Environmental values that are represented between 10-19%
- ✓ Environmental values that are represented at a level  $< 10\%$
- × Environmental values that are not represented (0%)

Environmental Values	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7
Australian Sealions (breeding)	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Coastal Waders	✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Cosema Endangered Macroalgae	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓
New Zealand Fur Seals (breeding)	×	×	✓✓✓	×	✓✓✓	×	×
Offshore Islands	×	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Surveyed Reef Fish Sites	×	×	×	×	×	×	×
Sea Bird Sites	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Reef (0 to -10m)	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Reef (-10 to -30m)	✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Reef (-30 to -50m)	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Seagrass (0 to -10m)	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Soft bottom habitat (0 to -10m)	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Soft bottom habitat (-10m to -30m)	✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Soft bottom habitat (-30m to -50m)	×	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓
Unmapped (0 to -10m)	✓	✓✓✓	✓✓✓	✓	✓✓	✓✓✓	✓✓✓
Unmapped (-10 to -30m)	✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Unmapped (-30 to -50m)	✓	✓✓✓	✓✓✓	✓✓	✓✓✓	✓✓	✓✓
Unmapped (>-50m)	×	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Bedrock Platform (Exposed)	✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Boulder Beach (Exposed)	×	✓✓✓	×	×	×	✓✓✓	✓✓✓
Cliff (Exposed)	✓	✓	✓✓	✓	✓✓	✓	✓
Coarse Sand Beach (Sheltered)	✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Fine-medium Sand Beach (Exposed)	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓
Fine-medium Sand Beach (Sheltered)	×	×	×	×	×	×	×
Mixed Beach (Sheltered)	×	×	✓✓✓	×	✓✓✓	×	×

### **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 2. The total area of each of the seven options was then calculated, as shown in Table 3.

**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 2.** Approximate length, width and size of each suggested zone

<b>Zone</b>	<b>From the coast to offshore (or length) (km)</b>	<b>Coastline along shore (or width) (km)</b>	<b>Size of zone (km<sup>2</sup>)</b>
A1	11	7.5	72
A3	13.5	6	56
B1	6	11	65
B3	10	13	91
B4	1	9	11
B5	4	11	38
C1	13	7	40
C2	10	3	27
C3	6	3	20
D2	7.5	3.5	19
D3	7.5	2	15
E1	11	3	29
E2	11	2.5	22

**NOTE:**

- In both of the suggested zones for E, 'along shore' value relates to the length, and 'from the coast to offshore' is width.
- Area is not necessarily length by width, it will vary because of the actual shape of the zones and because most of the numbers have been rounded to the nearest whole number.

### **Areas of alternative Options 1-7**

Seven alternative zoning options were developed using different combinations of the individual zones suggested at each of the five locations.

A comparison of the total area (km<sup>2</sup>) of each of the zoning options and the percentage sanctuary zones in each option can be seen in Table 3.

**Table 3.** Comparison of the total area and percentage of sanctuary zones in each zoning option.

<b>Suggested zoning option</b>	<b>Total area of sanctuary zones (km<sup>2</sup>)</b>	<b>% of sanctuary zones located in the marine park</b>
1	52	8
2	193	29
3	251	37
4	178	26
5	232	34
6	165	25
7	151	22

## Comparing the seven zoning options

- Options 3, 37% (251 km<sup>2</sup>); and Option 5, 34% (232 km<sup>2</sup>) include the largest percentages of sanctuary zones within the park, varying within 3% of each other.
- Option 2, 29% (193 km<sup>2</sup>); Option 4, 26% (178 km<sup>2</sup>); Option 6, 25% (165 km<sup>2</sup>); and, Option 7, 22% (151 km<sup>2</sup>), vary within 7% from highest to lowest percentage as sanctuary zone options.
- Option 1, 8% (52 km<sup>2</sup>) is the smallest of the sanctuary zone options within the park.
- All options include similar number of underwater habitats with environmental values  $\geq 20\%$  represented, with the exception of Option 1 which includes 4, compared to 8-10 present in each of the other options.
- All options have a similar seagrass (0 to -10m) value of 31%, except of Option 1, with a value of 16%.
- All options have soft bottom habitat (-10 to -30m) present (between 12-14%), except Option 1 where it is not represented.
- All options include similar number of shoreline habitats with  $\geq 20\%$  representation, with the exception of Option 1 which doesn't have any shoreline habitats with  $\geq 20\%$  representation, compared to 2-3 present in each of the other options.
- All options include 100% of Australian sea lion (breeding) sites, except for Option 1 (50%).
- All options represent a similar percentage of coastal wader's sites, except for Option 1, which includes 13%, compared to between 37-55% in each of the other options.
- All options represent a similar percentage of COSEMA endangered macroalgae sites, except for Option 1 which includes 25%, compared to 75% in each of the other options.
- Option 3 and Option 5 are the only options to include New Zealand fur seal (breeding) sites.
- All options represent all or half of the offshore islands present in this park, except for Option 1, which doesn't include any offshore island.

## Appendix A.

**Table 4: The percentage of each environmental value included in zoning Option 1- 7  
(% rounded to the nearest whole number)**

	Option 1 Total in all Zones (%)	Option 2 Total in all Zones (%)	Option 3 Total in all Zones (%)	Option 4 Total in all Zones (%)	Option 5 Total in all Zones (%)	Option 6 Total in all Zones (%)	Option 7 Total in all Zones (%)
<b>Ecological Importance</b>							
Australian Sealions (breeding)	50	100	100	100	100	100	100
Coastal Waders	13	45	55	37	37	45	45
Cosema Endangered Macroalgae	25	75	75	75	75	75	75
New Zealand Fur Seals (breeding)	0	0	100	0	100	0	0
Offshore Islands	0	50	100	50	100	50	50
Surveyed Reef Fish Sites	0	0	0	0	0	0	0
Sea Bird Sites	38	50	50	50	50	50	50

	Option 1 Total in all Zones (%)	Option 2 Total in all Zones (%)	Option 3 Total in all Zones (%)	Option 4 Total in all Zones (%)	Option 5 Total in all Zones (%)	Option 6 Total in all Zones (%)	Option 7 Total in all Zones (%)
<b>Underwater Habitats</b>							
Reef (0 to -10m)	21	47	57	42	50	45	45
Reef (-10 to -30m)	12	52	59	51	59	41	41
Reef (-30 to -50m)	36	83	90	83	90	43	43
Seagrass (0 to -10m)	16	31	31	31	31	31	31
Seagrass (-10 to -30m)	0	0	0	0	0	0	0
Soft bottom habitat (0 to -10m)	21	30	40	28	36	31	31
Soft bottom habitat (-10m to -30m)	17	26	29	26	29	27	27
Soft bottom habitat (-30m to -50m)	0	12	14	12	14	12	12
Unmapped (0 to -10m)	1	25	41	3	18	25	25
Unmapped (-10 to -30m)	9	32	41	23	28	27	27
Unmapped (-30 to -50m)	9	21	36	16	31	14	14
Unmapped (>-50m)	0	21	26	21	26	21	21
<b>Total</b>	<b>5</b>	<b>12</b>	<b>18</b>	<b>10</b>	<b>15</b>	<b>9</b>	<b>9</b>

	Option 1 Total in all Zones (%)	Option 2 Total in all Zones (%)	Option 3 Total in all Zones (%)	Option 4 Total in all Zones (%)	Option 5 Total in all Zones (%)	Option 6 Total in all Zones (%)	Option 7 Total in all Zones (%)
<b>Shoreline Habitats</b>							
Bedrock Platform (Exposed)	10	46	60	44	60	48	48
Boulder Beach (Exposed)	0	22	0	0	0	22	22
Cliff (Exposed)	7	9	15	9	15	9	9
Coarse Sand Beach (Sheltered)	17	39	33	33	33	39	39
Fine-medium Sand Beach (Exposed)	10	18	19	18	19	18	18
Fine-medium Sand Beach (Sheltered)	0	0	0	0	0	0	0
Mixed Beach (Sheltered)	0	0	99	0	99	0	0
<b>Total</b>	<b>10</b>	<b>30</b>	<b>37</b>	<b>29</b>	<b>37</b>	<b>32</b>	<b>32</b>

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



## Appendix B.

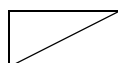
**Table 5: Environmental values represented and percentage included in each suggested zone.**

	A1	A3	B1	B3	B4	B5	C1	C2	C3	D2	D3	E1	E2	Total in Marine Park (count)
<b>Ecological Importance</b>														
Australian Sealions (breeding)			1	1	1	1	1	1						2
Coastal Waders			8	8	8	8				11	5	14		60
Cosema Endangered Macroalgae			1	1	1	1						2		4
New Zealand Fur Seals (breeding)							1							1
Offshore Islands			1	1		1	1							2
Reef Fish														2
Sea Bird Sites			4	4	3	4								8

	A1	A3	B1	B3	B4	B5	C1	C2	C3	D2	D3	E1	E2	Total in Marine Park (km <sup>2</sup> )
<b>Underwater Habitats</b>														
Reef (0 to -10m)			12	14	7	11	7	5	<1	4	2	3	3	49
Reef (-10 to -30m)			29	34	1	21	1	1	<1	<1	<1	11	8	79
Reef (-30 to -50m)			6	7		0						5	5	13
Seagrass (0 to -10m)												4	2	13
Seagrass (-10 to -30m)														0
Soft bottom habitat (0 to -10m)			4	5	3	4	1	<1		1	<1	<1	<1	17
Soft bottom habitat (-10m to -30m)			1	1	<1	1						4	3	19
Soft bottom habitat (-30m to -50m)				<1								<1		2
Unmapped (0 to -10m)	<1	<1					<1	<1	<1	<1	<1			2
Unmapped (-10 to -30m)	1	<1	2	2		1	5	4	3	4	3			29
Unmapped (-30 to -50m)	3	1	12	27		<1	26	17	17	10	8	<1	<1	184
Unmapped (>-50m)	68	55												265
<b>Total</b>	<b>72</b>	<b>56</b>	<b>19</b>	<b>36</b>	<b>3</b>	<b>5</b>	<b>31</b>	<b>21</b>	<b>19</b>	<b>15</b>	<b>11</b>	<b>8</b>	<b>5</b>	<b>530</b>

	A1	A3	B1	B3	B4	B5	C1	C2	C3	D2	D3	E1	E2	Total in Marine Park (km)
<b>Shoreline Habitats</b>														
Bedrock Platform (Exposed)			6	7	3	6	8	5		1	1			24
Boulder Beach (Exposed)										<1	<1			0
Cliff (Exposed)			<1	1	<1	<1								4
Coarse Sand Beach (Sheltered)			2	2	1	2				<1				5
Fine-medium Sand Beach (Exposed)			4	4	2	4						3	2	23
Fine-medium Sand Beach (Sheltered)										1				1
Mixed Beach (Sheltered)							<1							0
<b>Total</b>			<b>12</b>	<b>14</b>	<b>6</b>	<b>12</b>	<b>8</b>	<b>5</b>		<b>2</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>57</b>

Note: numbers have been rounded to the nearest whole number



These were not included in the stats as these working zones will allow fishing from shore access points yet to be determined.

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

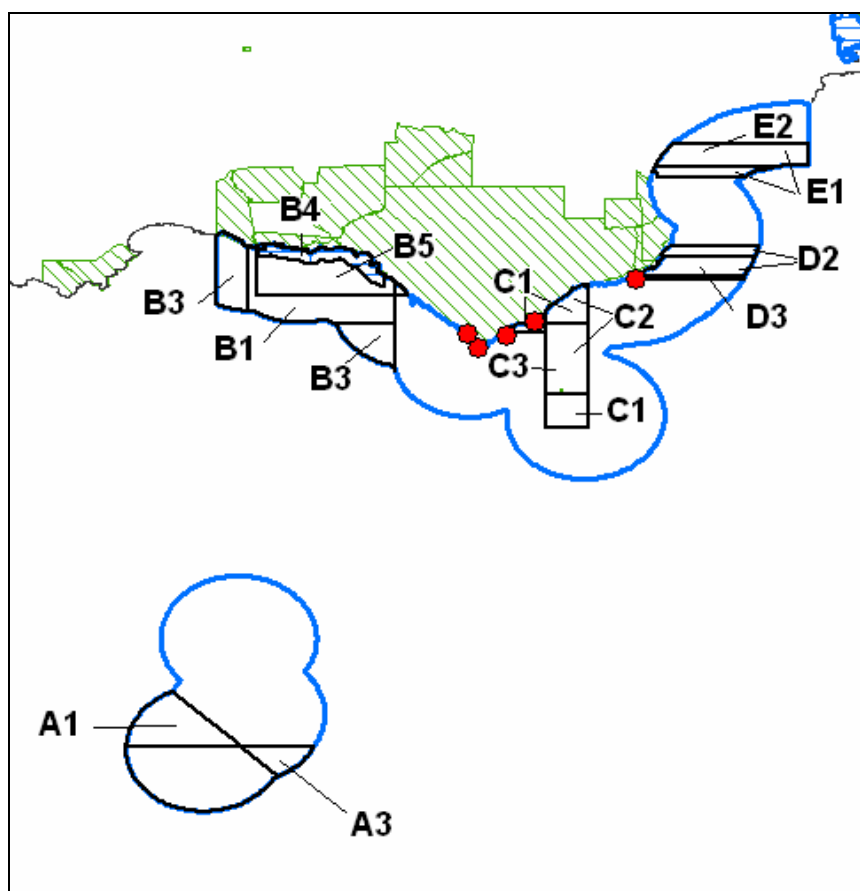
Environmental values that have <10% representation are shown in red, identifying where they could be represented within the marine park.

Note: maps are best viewed in colour.

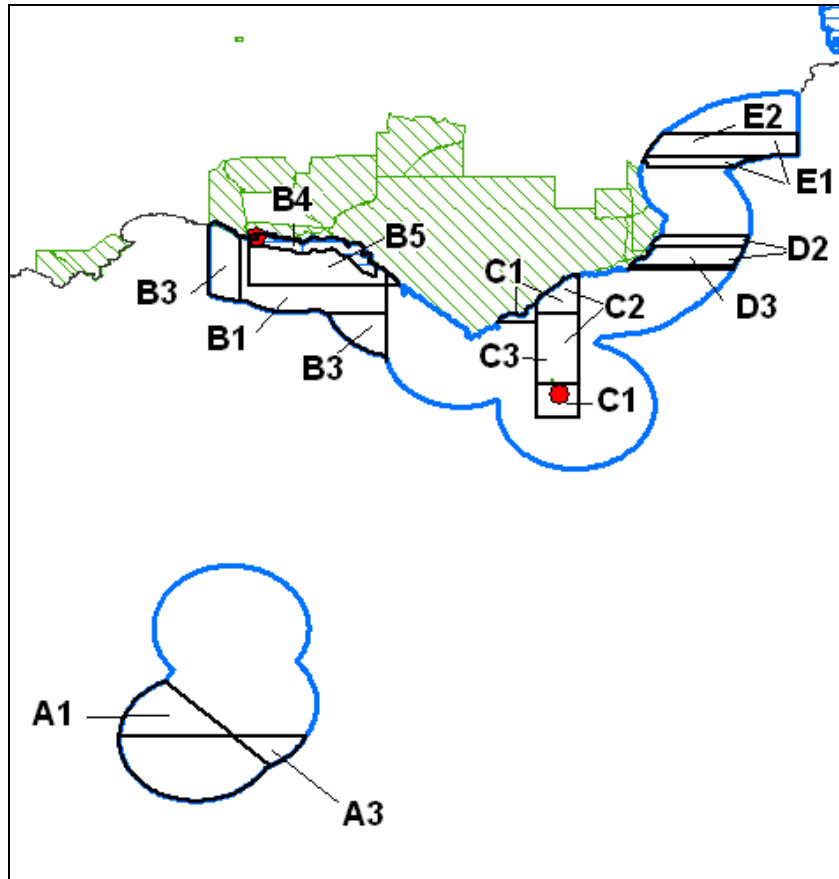
**Legend**

-  Environmental Values
-  Marine Park
-  LAG Advice
-  Netting Closures
-  Parks and Reserves
-  Coastline

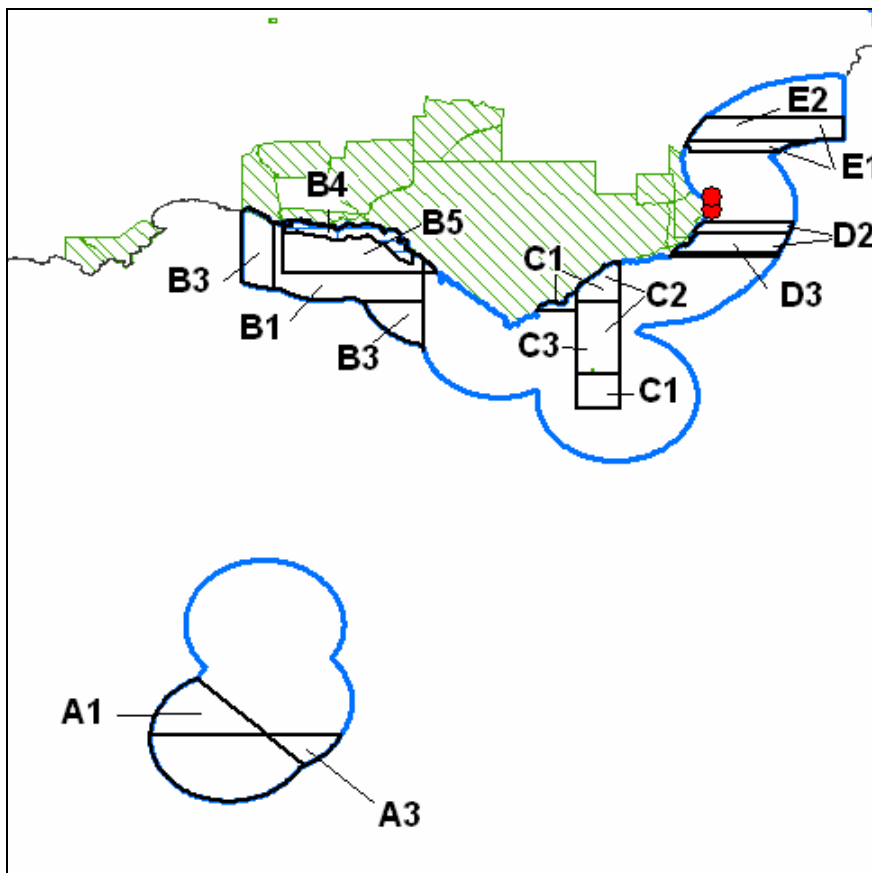
*New Zealand Fur Seals (breeding)*



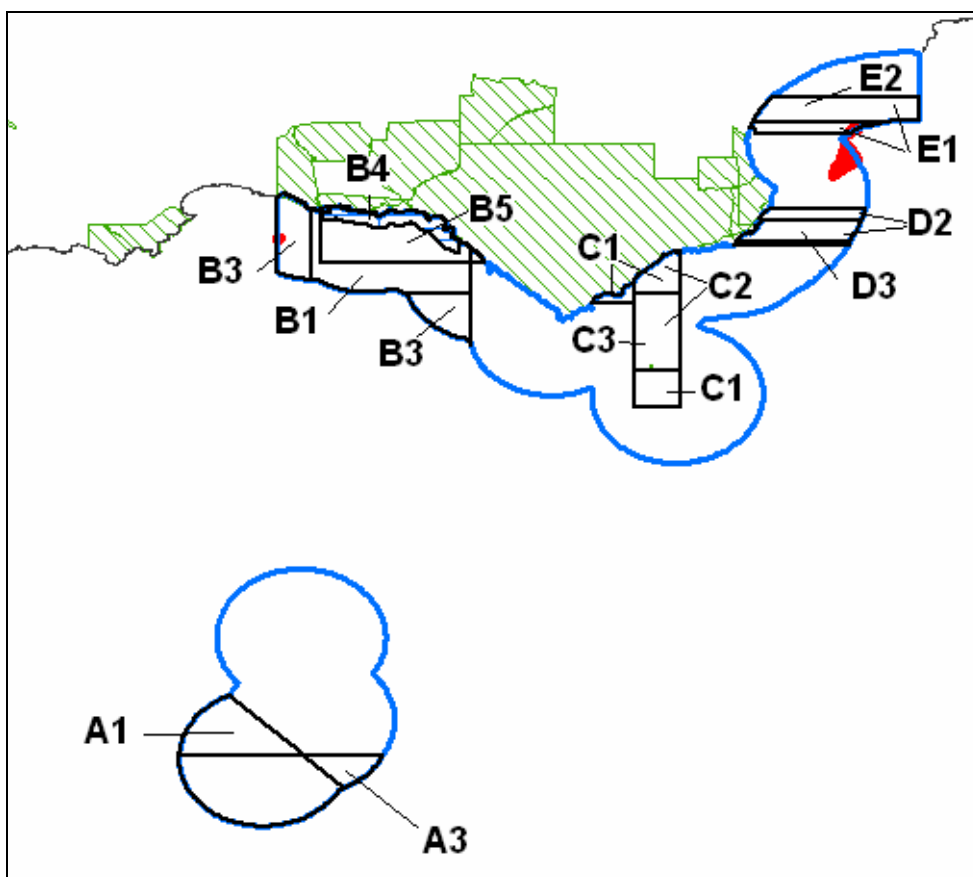
Offshore Islands



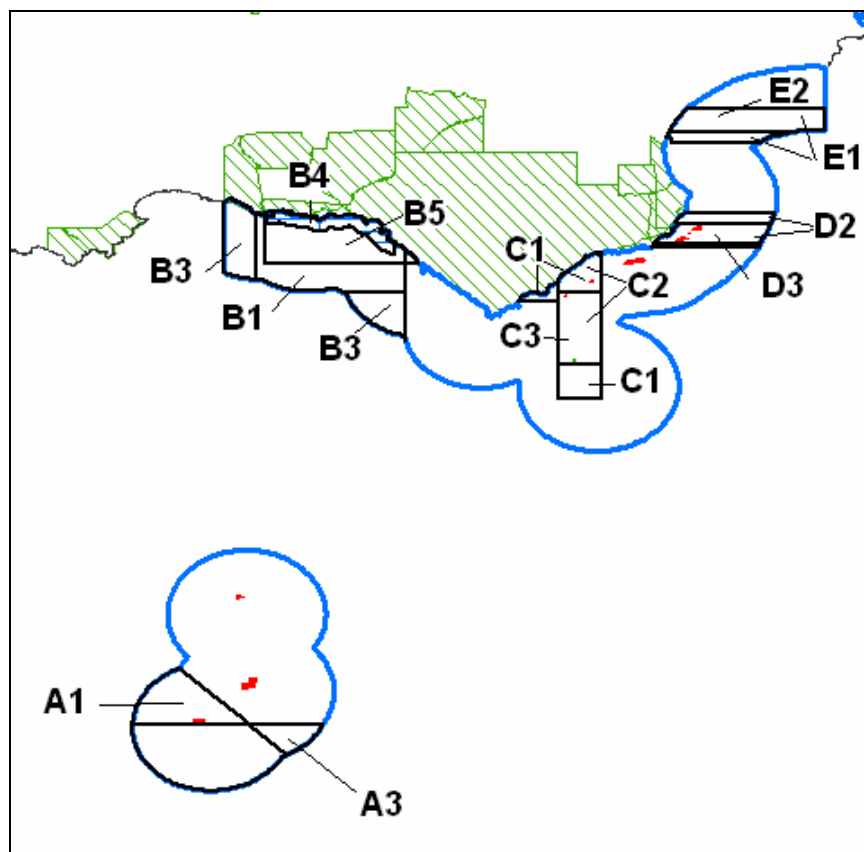
Surveyed Reef Fish Sites



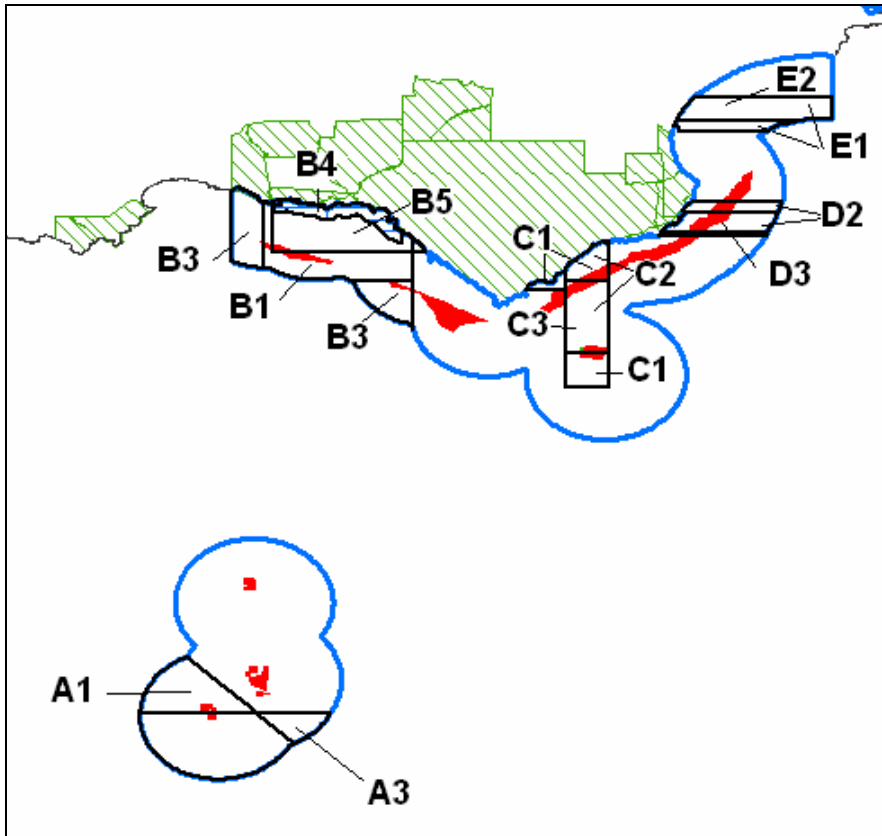
Soft bottom habitat (-30 to -50m)



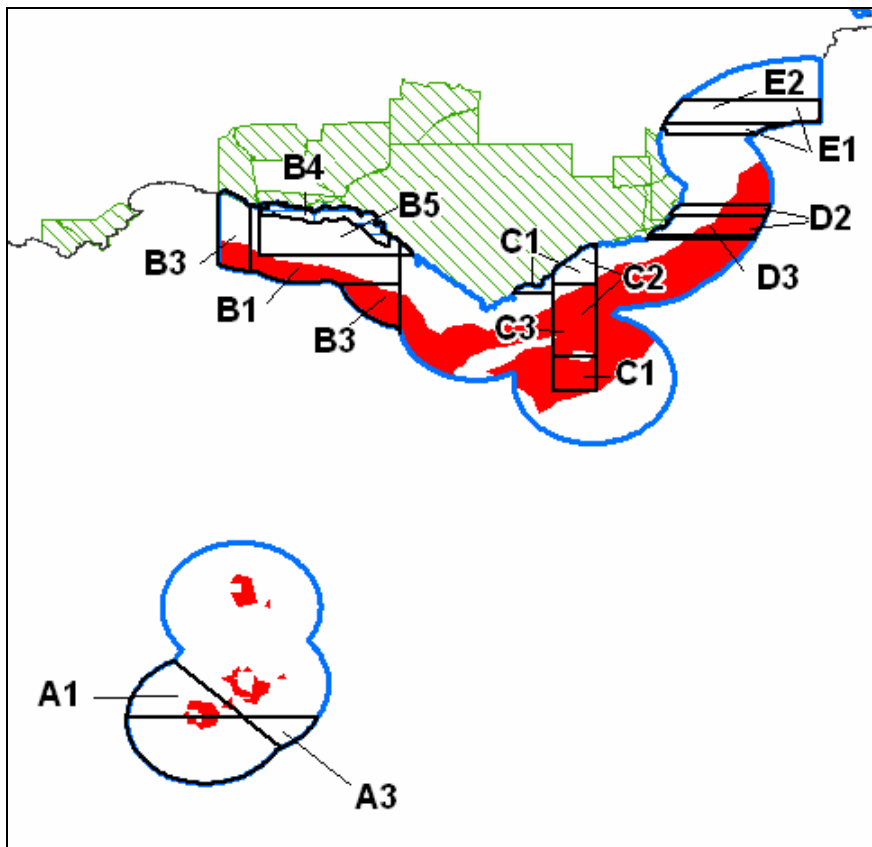
Unmapped (0 to -10m)



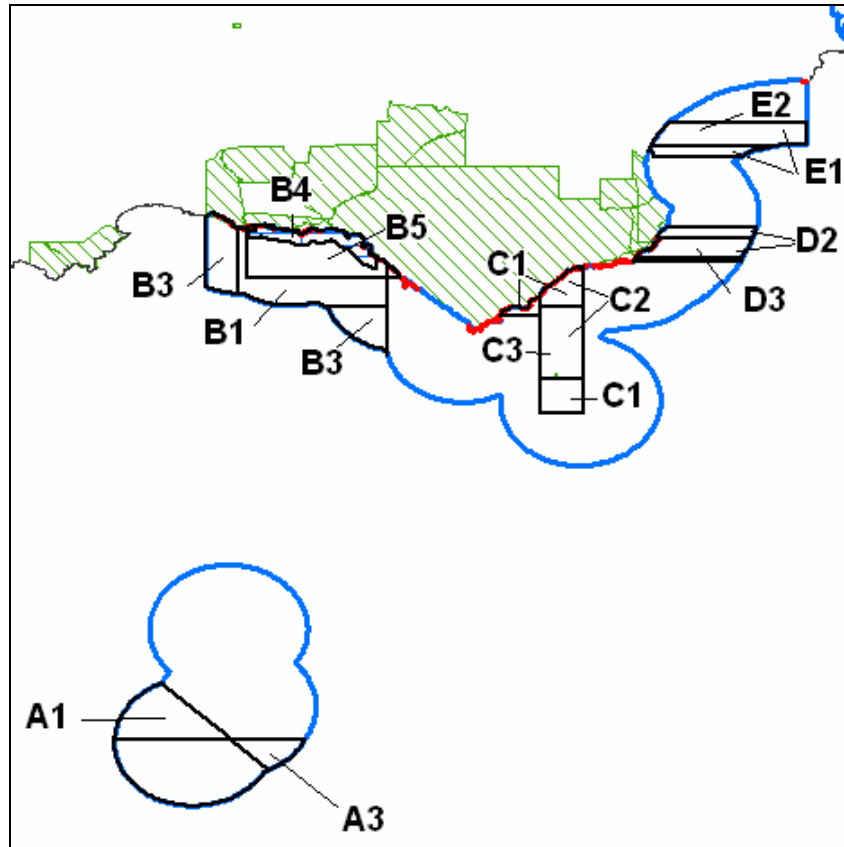
Unmapped (-10 to -30m)



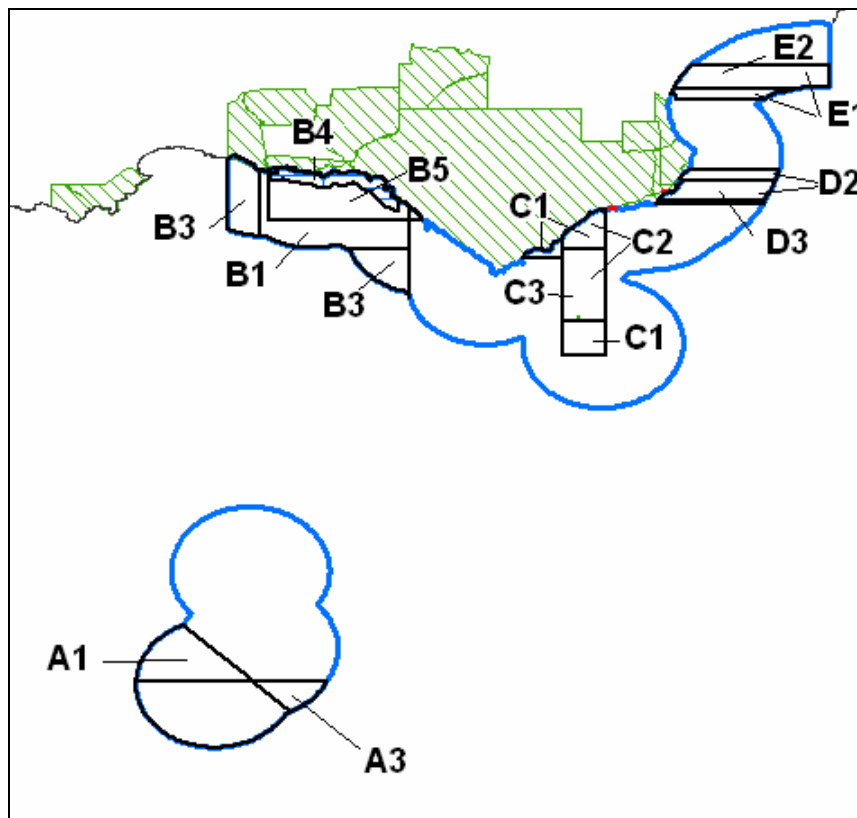
Unmapped (-30 to -50m)



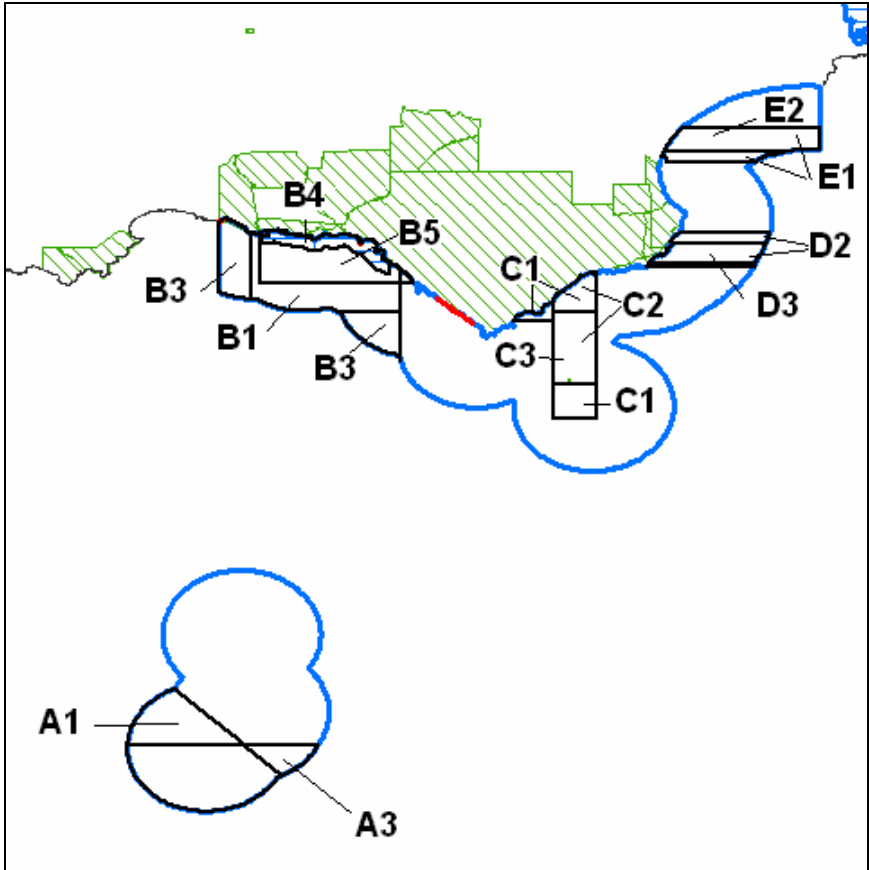
*Bedrock Platform (Exposed)*



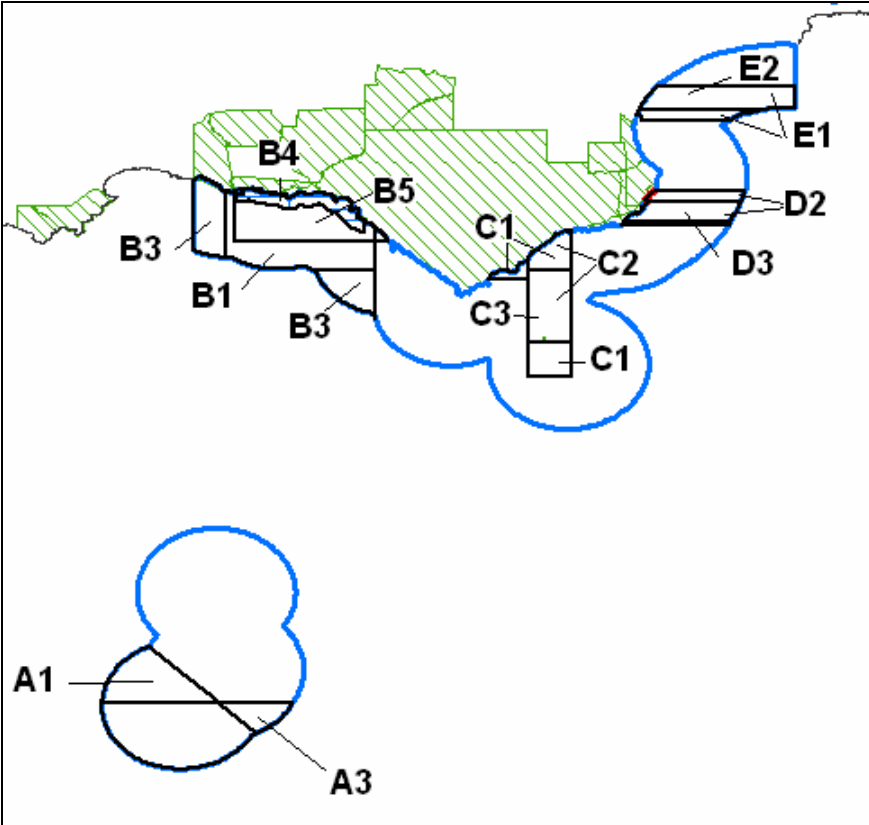
*Boulder Beach (Exposed)*



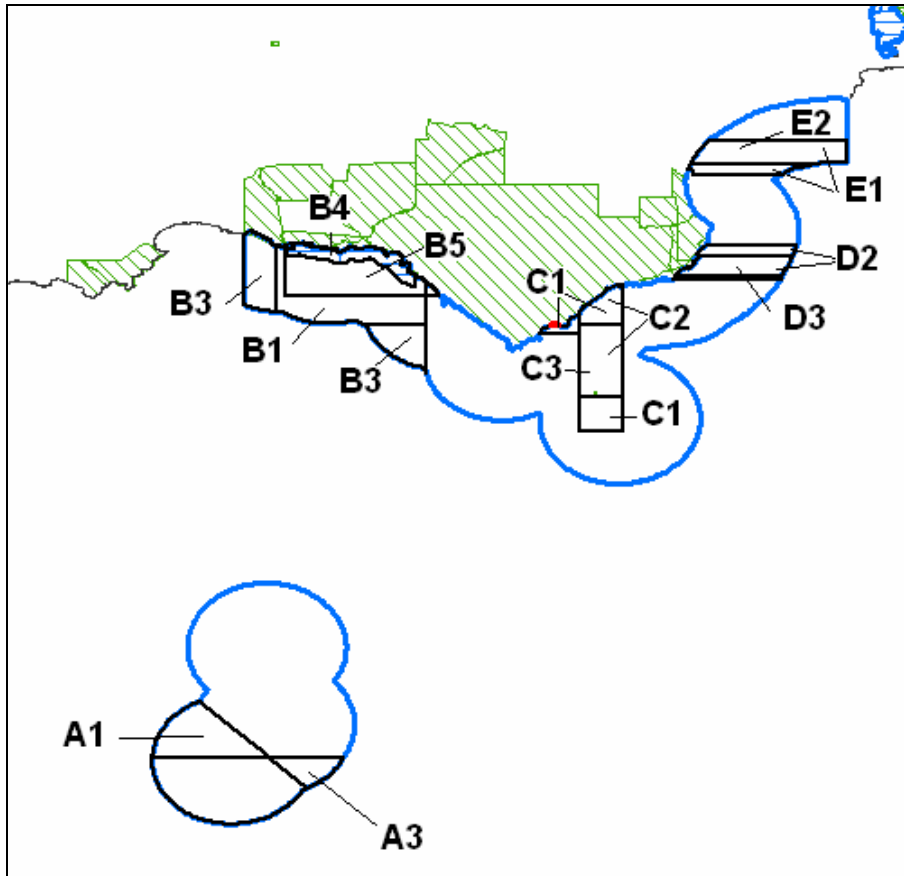
Cliff (Exposed)



Fine-medium sand beach (sheltered)



Mixed Beach (Sheltered)



*Mapping information:*

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