PRELIMINARY ASSESSMENT FOR FLEURIEU PENINSULA MARINE PARK LOCAL ADVISORY GROUP TO ASSIST WITH MEETING ON THE 5th of MAY 2011

Rapid Assessment on Comprehensive, Adequate and Representative (CAR) Principles for the Encounter Marine Park (Marine Park 15) (Fleurieu coast) suggested zoning options

Overview

DENR has undertaken a rapid assessment of the CAR principles for the possible sanctuary zone options for the Encounter Marine Park. Possible zones were suggested at the Marine Park Local Advisory Group Meeting held on 15 February 2011and from workshops and discussions following the meeting.

Community feedback and MPLAG advice has resulted in sanctuary zones suggested at 14 locations within the marine park, with alternative zones suggested at eight of the locations (Zones A, C, D, E, G, I, N and P).

Using combinations of alternate suggested zones (A2, A4, C1, C2, C3, D1, D2, E1, E2, G2, I1, I3, N2, N4, P3) with the suggested zones (B2, J2, K1, L1, M1, O2), four zoning options for the marine park were developed (see Figures 1-4). There are numerous options that could be developed. DENR has chosen four alternative combinations as examples of possible zoning options for the Fleurieu coast portion of the Marine Park.

This rapid assessment¹ 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.

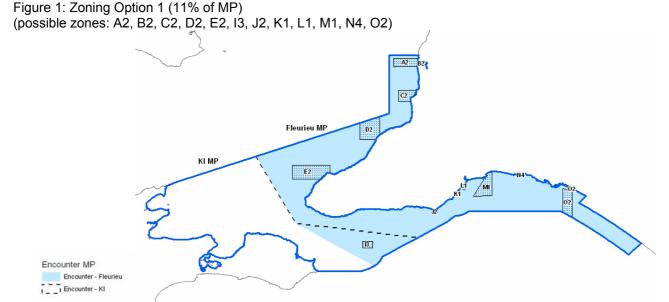
Adequate: To be adequate, the marine parks system should provide for the maintenance of the ecological viability and integrity of populations, species and communities

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.

This assessment has been carried out over the Fleurieu coast portion of the Marine Park to advise the Fleurieu MPLAG. A separate assessment has been carried out for the Kangaroo Island portion. The Pages Islands are considered in both assessments as both MPLAGs have provided advice on possible zones for this area.

Possible zoning options for marine park 15 (Fleurieu coast side)



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.

Figure 2: Zoning Option 2 (21% of MP)

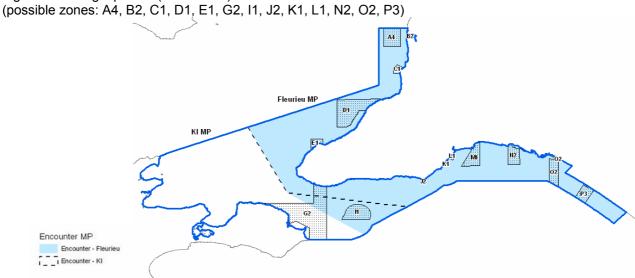


Figure 3: Zoning Option 3 (12% of MP) (possible zones: A2, B2, C3, D2, E2, I3, J2, K1, L1, M1, N2, P3)

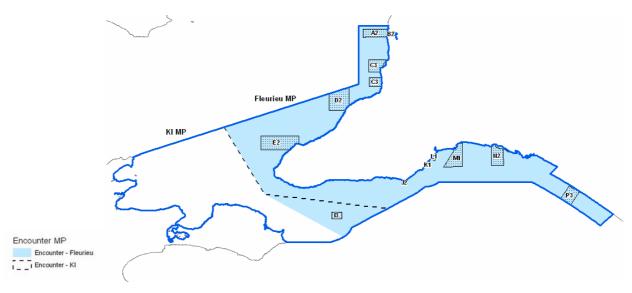
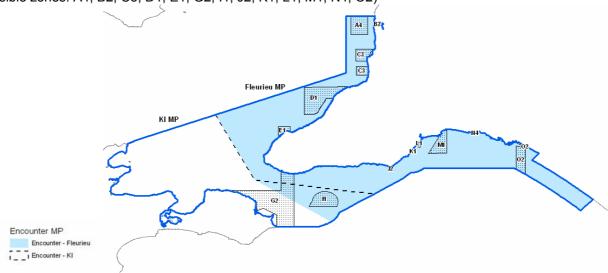


Figure 4: Zoning Option 4 (21% of MP) (possible zones: A4, B2, C3, D1, E1, G2, I1, J2, K1, L1, M1, N4, O2)



Note: finer scale maps of the smaller zones (B2, J2, K1, L1, N4 and 02) can be viewed in Appendix D

How to use this document

The rapid assessment shows the range of environmental values/features that are included in MPLAG zoning options and those 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.

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

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

In addition, options 2 and 4 also include:

✓ Pebble cobble beach

All four zoning options do not include the following shoreline types and seafloor (benthic habitats):

- × Invertebrate communities
- Mixed beach
- Deep sea sponge habitat (note: if the deep sea sponges are represented off KI, for example, in the deep trench adjacent Dudley Peninsula, this habitat type will be represented).

Representativeness

Each option was assessed against the proportion of environmental values² 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 four 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:

- A more detailed assessment of environmental values and the percentage included in each zoning option 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.

² In this assessment, an environmental value includes features which are ecologically important, underwater habitats and shoreline habitats.

Table 1. Environmental values represented within the possible zoning options as a proportion of their availability within the Fleurieu coast portion of the park.

- ✓✓✓ Environmental values that are represented at a level ≥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
Australian Sealions (breeding)	///	///	///	///
Australian Sealions (haulout)	×	×	×	×
Coastal Wader Bird Sites	///	V V V	///	///
Cosema Endangered Macroalgae	///	///	///	///
Emergent Land	×	×	×	×
Estuary	✓	✓	✓	√ √
Offshore Islands	√ √	√ √	√√	√ √
Surveyed Reef Fish Sites	///	///	///	///
Sea Bird Sites	///	√ √	///	///
Deep Sea Sponges	×	×	×	×
Invertebrate Community (0 to -10m)	×	×	×	×
Invertebrate Community (-10 to -30m)	×	×	*	×
Invertebrate Community (-30 to -50m)	×	×	*	×
Macroalgae (0 to -10m)	✓	✓	✓	✓
Macroalgae (-10 to -30m)	✓	×	✓	×
Rocky Reef (0 to -10m)	√√	√√	√√	√√
Rocky Reef (-10 to -30m)	///	✓	///	///
Seagrass (0 to -10m)	✓	√ √	√√	///
Seagrass (-10 to -30m)	///	√ √	///	///
Soft-bottom Habitat (0 to -10m)	√ √	√ √	///	///
Soft-bottom Habitat (-10 to -30m)	√ √	///	√ √	///
Soft-bottom Habitat (-30 to -50m)	×	×	×	×
Unmapped (0 to -10m)	✓	√√	√√	√√
Unmapped (-10 to -30m)	√√	√√	√√	√√
Unmapped (-30 to -50m)	✓	✓	✓	✓
Unmapped (>-50m)	×	×	×	×
Bedrock Platform (Exposed)	×	×	×	×
Bedrock Platform (Moderate)	√ √	V V V	✓ ✓	///
Bedrock Platform (Sheltered)	×	×	×	×
Boulder Beach (Exposed)	×	×	*	×
Boulder Beach (Moderate)	///	///	///	///
Boulder Beach (Sheltered)	×	×	×	×
Cliff (Exposed)	√ √	√ √	√√	√ √
Cliff (Moderate)	✓	///	✓	///
Cliff (Sheltered)	×	×	×	×
Coarse Sand Beach (Moderate)	✓	✓	✓	✓
Coarse Sand Beach (Sheltered)	///	×	///	///
Fine-medium Sand Beach (Exposed)	✓	√ √	√ √	✓
Fine-medium Sand Beach (Moderate)	✓	✓	√ √	√ √
Fine-medium Sand Beach (Sheltered)	×	×	*	×
Mixed Beach (Moderate)	×	×	*	×
Mixed Beach (Sheltered)	×	×	*	×
Pebble Cobble Beach (Moderate)	×	///	*	///
Pebble Cobble 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. And then the total area of each of the four options was 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 (lengths rounded to the nearest whole number).

	From the coast to	Coastline along shore	Size of
Zone	offshore (or length) (km)	(or width) (km)	zone (km²)
A2	7	3	22
A4	5	7	36
B2	1	1	<1
C1	2	3	6
C2	5	4	18
C3 (pt A)	5	5	19
C3 (pt B)	4	3	12
D1	11	4	77
	(north bnd)	(coastal strip)	
D2	6	7	43
E1	2	4	9
E2	11	5	54
G2	21	12	161
I1	6	8	39
13	2	3	7
J2	1	1	2
K1	1	1	<1
L1	1	1	2
M1	8	4	29
N2	7	4	24
N4	1	1	
O2	10	3	<1
P3	6	4	20

Note: size is not necessarily length x width, it will vary because of the shape of the zones and because the numbers have been rounded to the nearest whole number.

Areas of alternative Options 1-4

Four alternative zoning options were developed using different combinations of the individual zones suggested at each of the 14 locations.

A comparison of the total area (km²) 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.

Suggested zoning option	Total area (km²) of sanctuary zones in the Fleurieu portion of the Encounter Marine Park	% of sanctuary zones located in the Fleurieu portion of the Encounter Marine Park
1	205	11
2	401	21
3	234	12
4	413	21

Comparing the four zoning options

- Option 2 and 4 both include 21% of sanctuary zones within the Fleurieu portion of the Encounter marine park. Option 3 includes 12% and Option 1 includes 11%.
- Option 4 includes 15 environmental values with ≥20% representation, with a total of 27 environmental values included out of a possible 44.
- Option 1, 2 and 3 all include 26 environmental values out of a possible 44.
- Option 3 includes 10 environmental values with ≥20% representation.
- Option 2 has a larger number of environmental values with 10-19% representation.
- Option 2 and 4 include 6% and 17% more soft bottom habitat (-10 to -30m), 20% and 25% more bedrock platform (moderate), 6% more boulder beach (moderate), 21% more cliff (moderate) and 100% more pebble cobble beach (moderate).
- Option 3 includes 2% more rocky reef (-10 to -30m) and 19% more seagrass (-10 to -30m) compared to options 2 and 4.
- Option 1 includes 9 environmental values with ≥20% representation, however it includes a larger number of environmental values with <10% representation.
- Options 2 and 4 have higher percent representation of both benthic and shoreline habitats.

Appendix A.

Table 3: The percentage of each environmental value included in zoning Options 1- 4 (% rounded to the nearest whole number)

Environmental Values	r) Option 1 Total in all zones (%)	Option 2 Total in all zones (%)	Option 3 Total in all zones (%)	Option 4 Total in all zones (%)
Ecological Features	%	%	%	%
Australian Sealions (breeding)	50	50	50	50
Australian Sealions (haulout)	0	0	0	0
Coastal Wader Bird Sites	24	42	50	23
Cosema Endangered Macroalgae	28	24	28	24
Emergent Land	0	0	0	0
Estuary	5	5	5	10
Offshore Islands	13	13	13	13
Surveyed Reef Fish Sites	45	36	45	42
Sea Bird Sites	22	17	22	22
Habitat	%	%	%	%
Deep Sea Sponges	0	0	0	0
Invertebrate Community (0 to -10m)	0	0	0	0
Invertebrate Community (-10 to -30m)	0	0	0	0
Invertebrate Community (-30 to -50m)	0	0	0	0
Macroalgae (0 to -10m)	3	6	3	6
Macroalgae (-10 to -30m)	7	0	7	0
Rocky Reef (0 to -10m)	14	10	17	19
Rocky Reef (-10 to -30m)	40	6	41	39
·	6	19	12	26
Seagrass (10 to -10m)	49	10	49	30
Seagrass (-10 to -30m)			22	
Soft-bottom Habitat (0 to -10m)	17	17		25
Soft-bottom Habitat (-10 to -30m)	14	23	17	34
Unmapped (0 to -10m)	9	16	10	12
Unmapped (-10 to -30m)	11	19	14	18
Unmapped (-30 to -50m)	7	5	7	5
Unmapped (>-50m)	0	0	0	0
Total area of seafloor habitats	10	14	12	15
Shoreline Habitats	%	%	%	%
Bedrock Platform (Exposed)	0	0	0	0
Bedrock Platform (Moderate)	17	37	17	42
Bedrock Platform (Sheltered)	0	0	0	0
Boulder Beach (Exposed)	0	0	0	0
Boulder Beach (Moderate)	25	31	25	31
Boulder Beach (Sheltered)	0	0	0	0
Cliff (Exposed)	15	15	15	15
Cliff (Moderate)	7	29	7	29
Cliff (Sheltered)	0	0	0	0
Coarse Sand Beach (Moderate)	6	4	4	2
Coarse Sand Beach (Sheltered)	36	0	36	36
Fine-medium Sand Beach (Exposed)	6	15	10	6
Fine-medium Sand Beach (Moderate)	8	6	16	16
Fine-medium Sand Beach (Sheltered)	0	0	0	0
Mixed Beach (Moderate)	0	0	0	0
Mixed Beach (Sheltered)	0	0	0	0
Pebble Cobble Beach (Moderate)	0	100	0	100
Pebble Cobble Beach (Sheltered)	0	6	0	6
Total	9	15	12	16

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

Appendix B. Environmental values represented and percentage included in each suggested zone. Values have been rounded to the nearest whole number.

																							Total in Fleurieu Portion of Encounter Marine Park
Ecological Importance	Units	A2	A4	B2	C1	C2	C3	D1	D2	E1	E2	G2	I1	13	J2	K1	L1	M1	N2	N4	02	P3	(count)
Australian Sealions (breeding)	Count												1	1									2
Australian Sealions (haulout)	Count																						1
Coastal Wader Bird Sites	Count	20	0	123	44	179	178	1	1	1	<1	<1	13	2	4	39	8	41	644	22	63	<1	2588
Cosema Endangered Macroalgae	Count	1			5	5	5			1	1	1											37
Emergent Land	Count																						2
Estuary	Count											1					1						24
Offshore Islands	Count							_		- 10	_		1	1									11
Surveyed Reef Fish Sites	Count	10	1		3	3	3	7	3	10	7	16	1	1	1		2	2					105
Sea Bird Sites Estuaries	Count	4		<1			<1			<1		<1	3	3			1	1 <1					34 45
Underwater Habitats	. 2	A2	A4	B2	C1	C2	СЗ	D1	D2	E1	E2	G2	11	13	J2	K 1	L1	M1	N2	N4	02	P3	Fleurieu Portion of Encounter Marine Park (km2)
Deep Sea Sponges	km ²											59											93
Dense Seagrass Patches (0 to -10m)	km ²																						7
Rocky Reef (0 to -10m)	km ²	<1			1	2	3	2	1	1	1	4			<1	<1	1	2					68
Rocky Reef (-10 to -30m)	km ²	<1			2	2	2											9					28
Invertebrate Community (0 to -10m)	km ²																						<1
Invertebrate Community (-10 to -30m)	km ²																						2
Invertebrate Community (-30 to -50m)	km ²																						1
Macroalgae (0 to -10m)	km ²	<1								<1	1	1											18
Macroalgae (-10 to -30m)	km ²	<1																					1
Seagrass (0 to -10m)	km ²	1				<1	5	12	<1	4	3	1				<1	1	<1					264
Seagrass (-10 to -30m)	km ²	2			<1	2	2	1															51

Soft-bottom Habitat (0 to -10m)

291

Soft-bottom Habitat (-10m to -30m)	km ²	1			1	1	2	6	<1									2					50
Unmapped Habitat (0 to -10m)	km ²						<1	3	4	1	8	29	1	1	<1				3	<1	4	3	245
Unmapped Habitat (-10 to -30m)	km ²	17	36		2	10	11	22	22		17	52	38	7	<1			12	16		12	15	1,378
Unmapped Habitat (-30 to -50m)	km ²					2	2	20	9		20	14						1			2	1	571
Unmapped Habitat (>-50m)	km ²																						<1
Total	km ²	22	36	<1	6	18	31	77	43	9	54	161	39	7	2	<1	2	29	20	<1	18	20	3,070

Shoreline Habitats		A2	A4	B2	C1	C2	C3	D1	D2	E1	E2	G2	I1	13	J2	K 1	L1	M1	N2	N4	02	Р3	Total in Fleurieu Portion of Encounter Marine Park (km)
Bedrock Platform (Exposed)	km																						12
Bedrock Platform (Moderate)	km							7	2									1					20
Bedrock Platform (Sheltered)	km																						2
Boulder Beach (Exposed)	km																						1
Boulder Beach (Moderate)	km									3	2												9
Boulder Beach (Sheltered)	km																						2
Cliff (Exposed)	km														2								20
Cliff (Moderate)	km									2	2	18											49
Cliff (Sheltered)	km																						17
Coarse Sand Beach (Exposed)	km																						2
Coarse Sand Beach (Moderate)	km	<1			<1	<1	<1																12
Coarse Sand Beach (Sheltered)	km															1	2						51
Fine-medium Sand Beach (Exposed)	km														<1				4	<1	3	2	61
Fine-medium Sand Beach (Moderate)	km				2	2	5		<1									1					50
Fine-medium Sand Beach (Sheltered)	km																						7
Mixed Beach (Moderate)	km																						1
Mixed Beach (Sheltered)	km																						13
Mudflats and Sandflats (Sheltered)	km																						7
Pebble Cobble Beach (Moderate)	km									1													1
Pebble Cobble Beach (Sheltered)	km									<1													2
Total	km	<1	<1	<1	3	3	6	7	2	6	4	18	<1	<1	2	1	2	2	4	<1	3	2	377

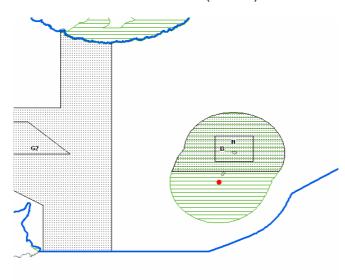
Appendix C. Location of the environmental values <10% represented.

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

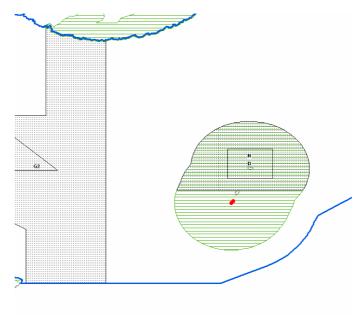
Note: Maps are best viewed in colour.



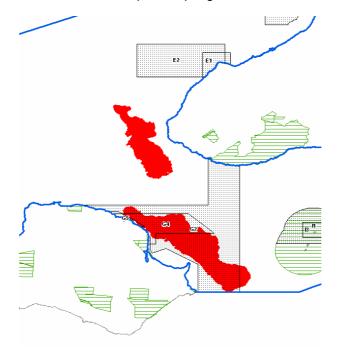
Australian Sealion (haulout)



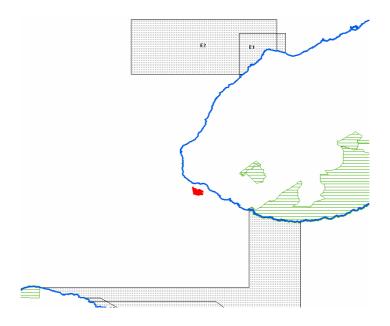
Emergent land



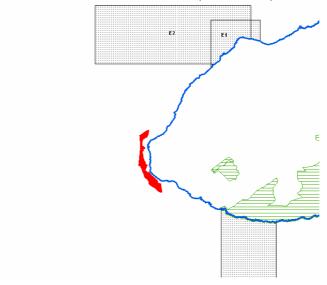
Deep Sea Sponges



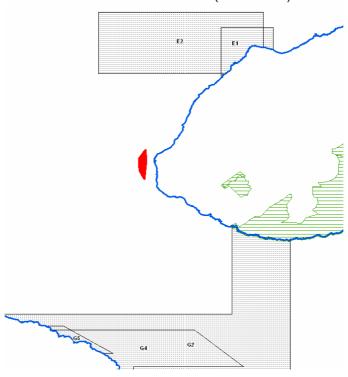
Invertebrate Communities (0 to -10m)



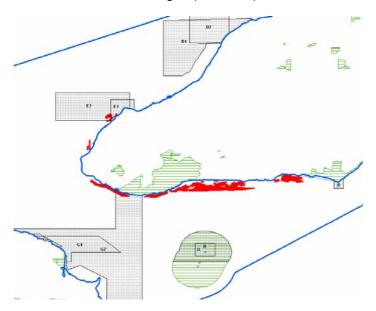
Invertebrate Communities (-10 to -30m)



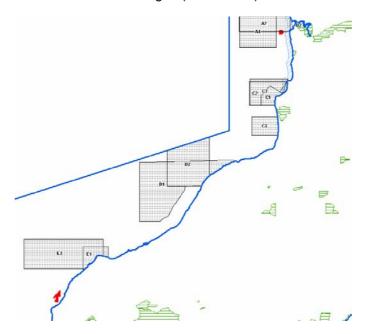
Invertebrate Communities (-30 to -50m)



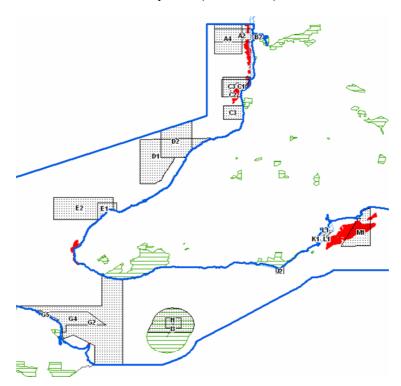
Macroalgae (0 to -10m)



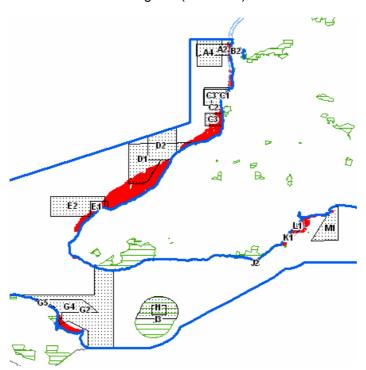
Macroalgae (-10 to -30m)



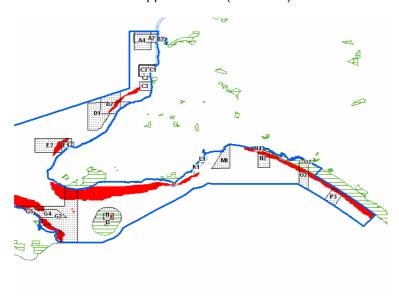
Rocky Reef (-10 to -30m)



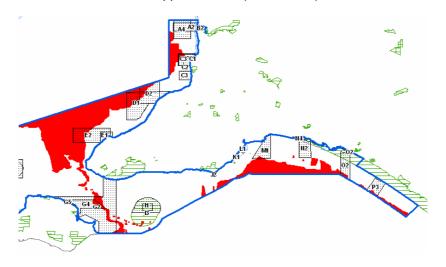
Seagrass (0 to -10m)



Unmapped Habitat (0 to -10m)



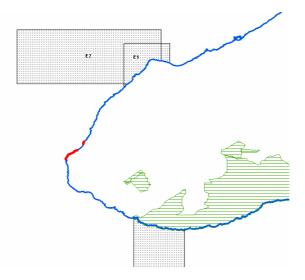
Unmapped Habitat (-30 to -50m)



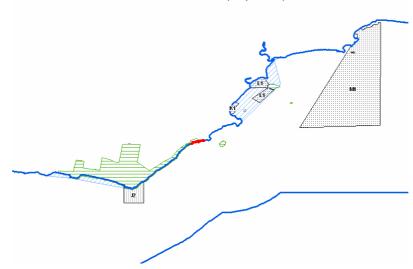
Bedrock Platform (Exposed)



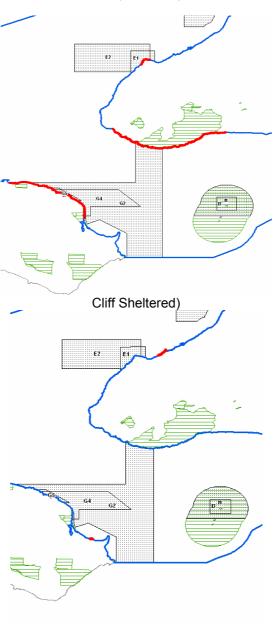
Bedrock Platform (Sheltered)



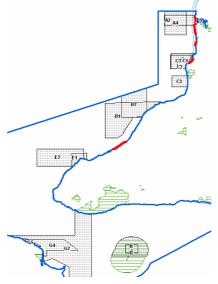
Boulder Beach (Exposed)



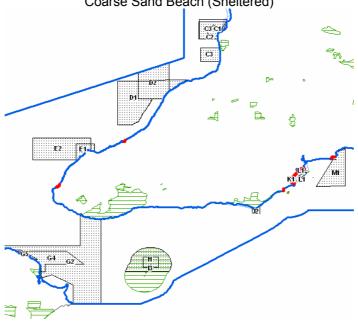
Cliff (Moderate)



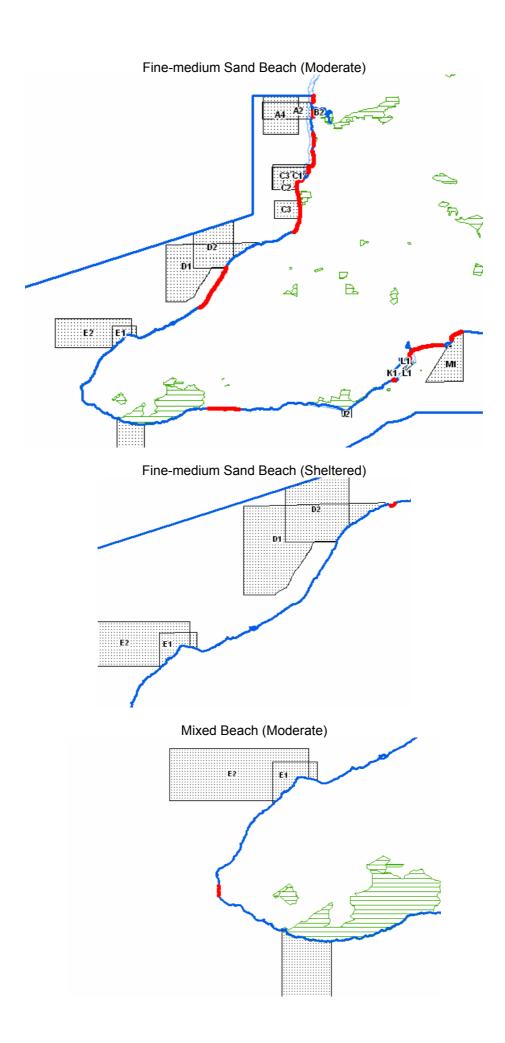
Coarse Sand Beach (Moderate)

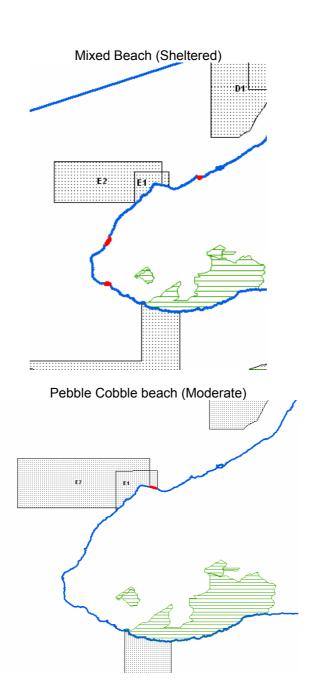


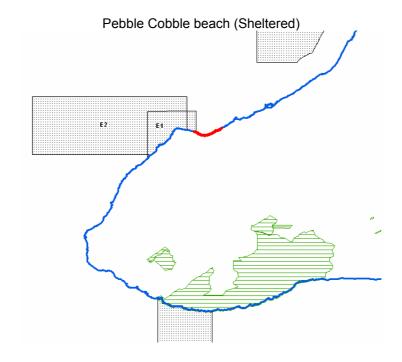
Coarse Sand Beach (Sheltered)











Mapping information:

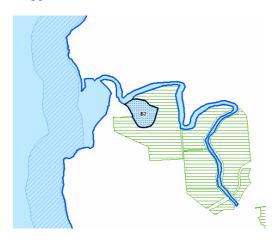
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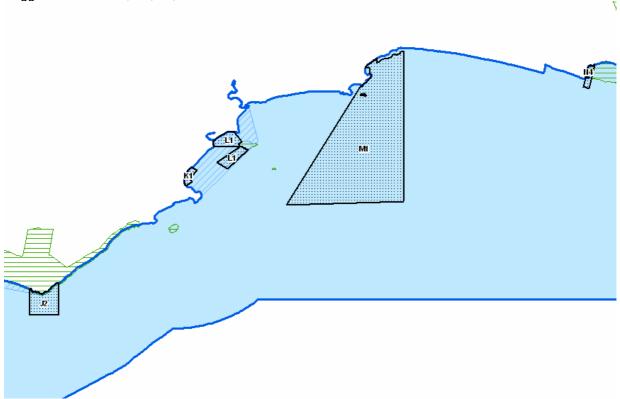
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Appendix D. Additional maps for small zones within Encounter Fleurieu component

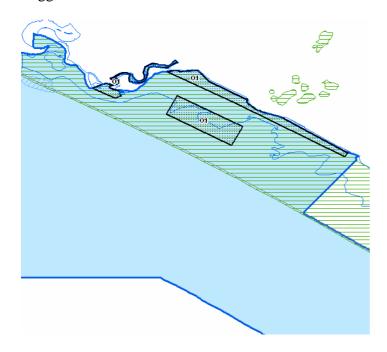
Suggested Zone B2



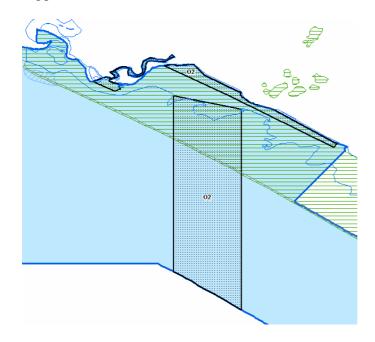
Suggested Zones J2, K1, L1, M1 and N4



Suggested Zones for O1



Suggested Zones for 02



Mapping information:

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