

# PRELIMINARY ASSESSMENT FOR UPPER SOUTH EAST MARINE PARK LOCAL ADVISORY GROUP TO ASSIST WITH THE MEETING ON THE 3<sup>rd</sup> MAY 2011

## Rapid Assessment on Comprehensive, Adequate and Representative (CAR) Principles for the Upper South East (Marine Park 18) suggested zoning options

### Overview

DENR has undertaken a rapid assessment of the CAR principles for the possible sanctuary zone options for the Upper South East Marine Park suggested at the Marine Park Local Advisory Group meeting held on 22<sup>nd</sup> February 2011 and through discussions and additional workshops following the meeting.

Community feedback and MPLAG advice has resulted in sanctuary zones suggested at six locations within the marine park, with alternative zones suggested at two of the locations (Zones C and E).

Using combinations of alternative suggested zones (C2, C3, E1, E3, E6, E7) with the suggested zones (A1, B1, D1, F2), eight zoning options for the marine park were developed (see Figures 1-8). There are numerous options that could be developed, DENR has chosen 8 alternative combinations as examples of possible zoning options.

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 18 using combinations of the 7 suggested zones**

Figure 1: Zoning Option 1 (16% of MP)  
(possible zones: A1, B1, C2, D1, E7, F2)

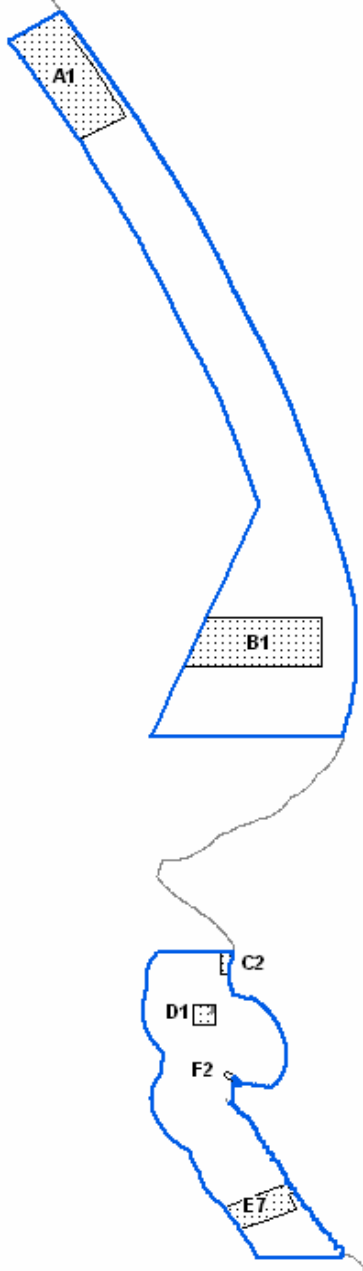


Figure 2: Zoning Option 2 (17% of MP)  
(possible zones: A1, B1, C3, D1, E7, F2)

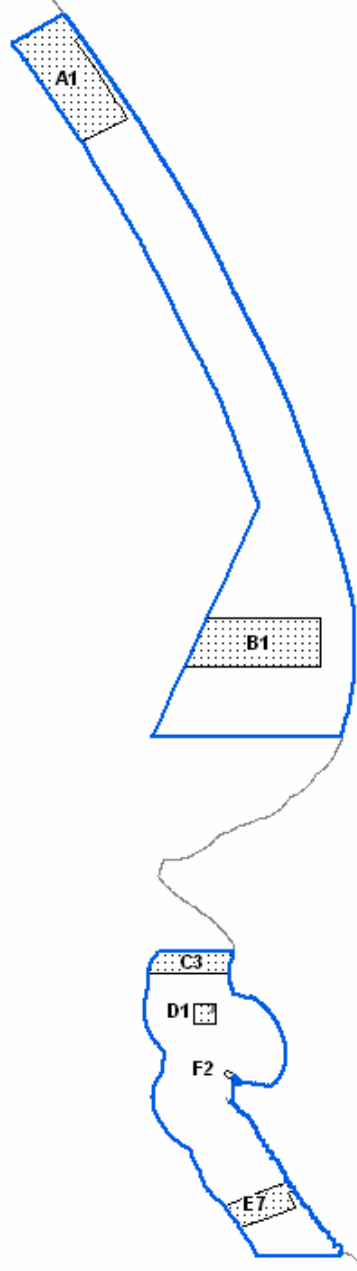


Figure 3: Zoning Option 3 (16% of MP)  
(possible zones: A1, B1, C2, D1, E1, F2)

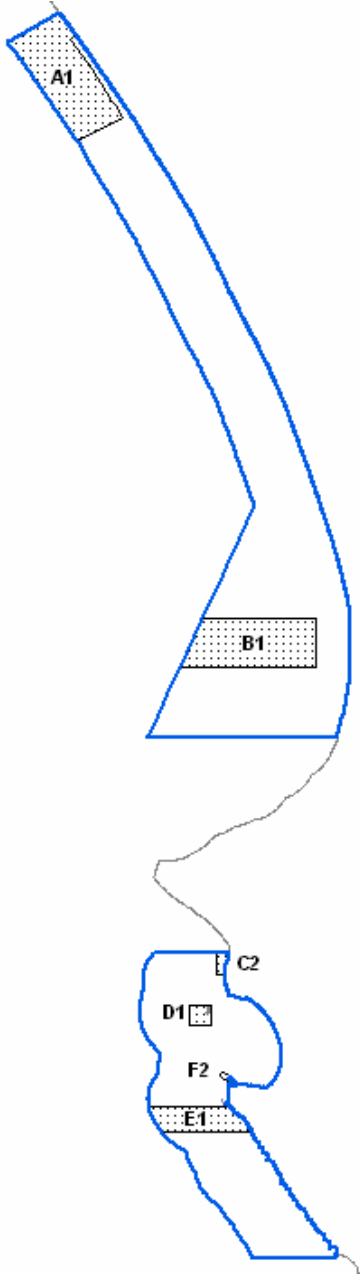


Figure 4: Zoning Option 4 (18% of MP)  
(possible zones: A1, B1, C3, D1, E1, F2)

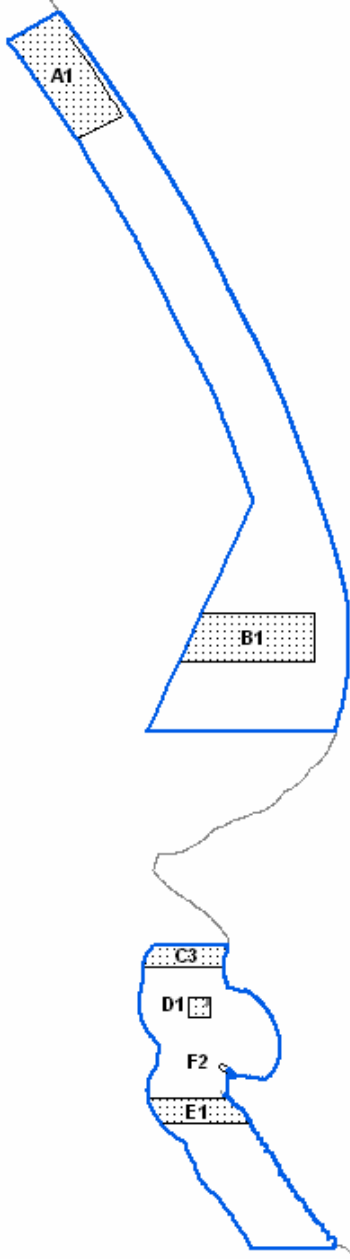


Figure 5: Zoning Option 5 (15% of MP)  
(possible zones: A1, B1, C2, D1, E3, F2)

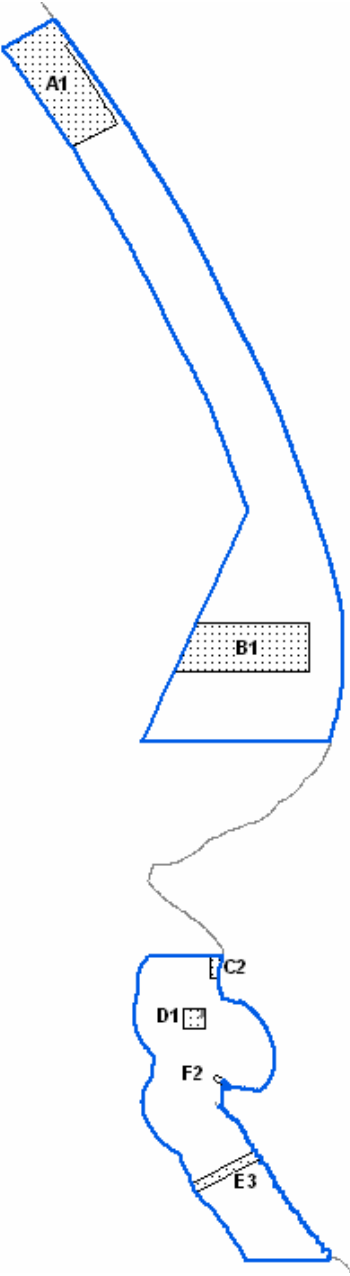


Figure 6: Zoning Option 6 (16% of MP)  
(possible zones: A1, B1, C3, D1, E3, F2)

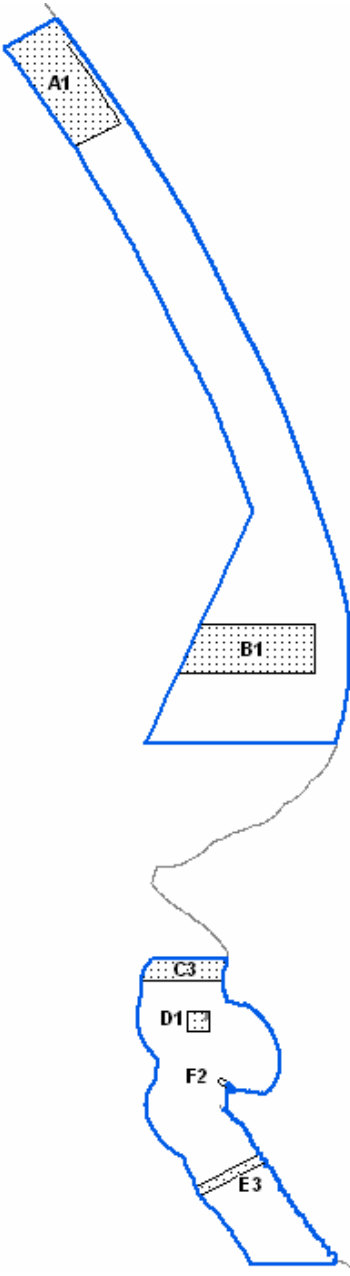


Figure 7: Zoning Option 7 (15% of MP)  
(possible zones: A1, B1, C2, D1, E6, F2)

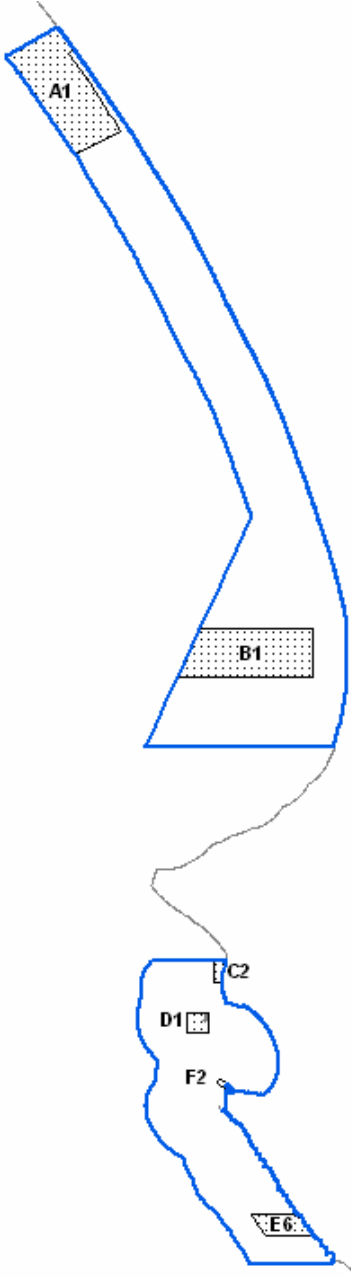
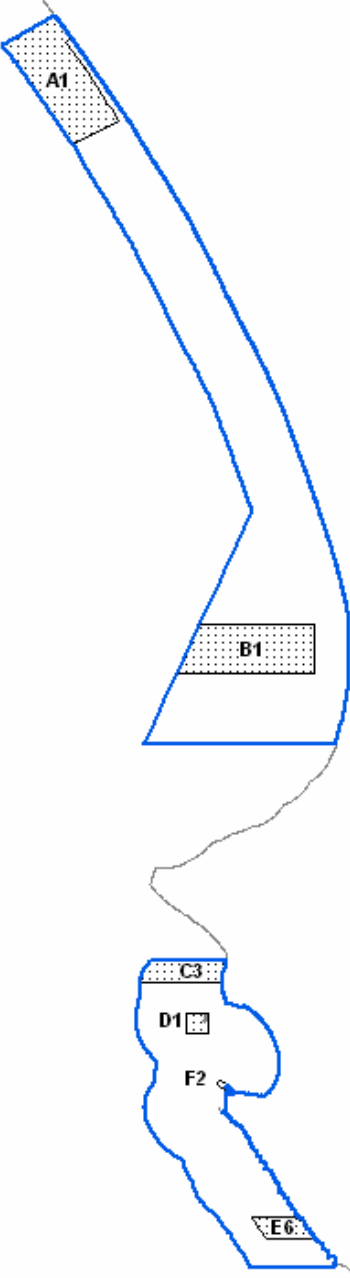


Figure 8: Zoning Option 8 (17% of MP)  
(possible zones: A1, B1, C3, D1, E6, F2)



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### **Comprehensiveness**

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

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

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

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

- ✗ Mixed beach

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### **Representativeness**

*Each option was assessed against the proportion of environmental values<sup>1</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:**

- 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 represented <10% are shown in Appendix C.

**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 ≥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 | Option 8 |
|------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| Australian Sealions (haulout)      | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      |
| Offshore Islands                   | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      |
| Sea Bird Sites                     | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      |
| Cliff (Exposed)                    | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      |
| Macroalgae (-10 to -30m)           | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      |
| Soft-bottom Habitat (-10m to -30m) | ✓✓       | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓       | ✓✓✓      | ✓✓       | ✓✓✓      |
| Rocky Reef (-10 to -30m)           | ✓✓✓      | ✓✓✓      | ✓✓       | ✓✓✓      | ✓✓       | ✓✓✓      | ✓✓✓      | ✓✓✓      |
| Rocky Reef (0 to -10m)             | ✓✓       | ✓✓✓      | ✓✓       | ✓✓✓      | ✓✓       | ✓✓✓      | ✓✓       | ✓✓✓      |
| Coarse Sand Beach (Sheltered)      | ✓✓       | ✓✓       | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓       | ✓✓       |
| Unmapped Habitat (-10 to -30m)     | ✓✓       | ✓✓       | ✓✓✓      | ✓✓✓      | ✓✓       | ✓✓       | ✓✓       | ✓✓       |
| Unmapped Habitat (0 to -10m)       | ✓✓       | ✓✓       | ✓✓       | ✓✓       | ✓✓       | ✓✓       | ✓✓       | ✓✓       |
| Soft-bottom Habitat (0 to -10m)    | ✓✓       | ✓✓       | ✓✓       | ✓✓       | ✓✓       | ✓✓       | ✓✓       | ✓✓       |
| Seagrass (0 to -10m)               | ✓✓       | ✓✓       | ✓✓       | ✓✓       | ✓✓       | ✓✓       | ✓✓       | ✓✓       |
| Coastal Wader Bird Sites           | ✓✓       | ✓✓       | ✓✓       | ✓✓       | ✓        | ✓        | ×        | ✓        |
| Unmapped Habitat (-30 to -50m)     | ✓        | ✓        | ✓✓       | ✓✓       | ×        | ×        | ×        | ×        |
| Cliff (Sheltered)                  | ✓✓       | ✓✓       | ×        | ×        | ×        | ×        | ×        | ×        |
| Cliff (Moderate)                   | ×        | ×        | ×        | ×        | ✓        | ✓        | ×        | ×        |
| Fine-medium Sand Beach (Exposed)   | ✓        | ✓        | ✓        | ✓        | ✓        | ✓        | ✓        | ✓        |
| Seagrass (-10 to -30m)             | ✓        | ✓        | ✓        | ✓        | ✓        | ✓        | ✓        | ✓        |
| Fine-medium Sand Beach (Sheltered) | ✓        | ✓        | ×        | ×        | ✓        | ✓        | ×        | ×        |
| Fine-medium Sand Beach (Moderate)  | ×        | ×        | ✓        | ✓        | ×        | ×        | ×        | ×        |
| COSEMA Endangered Macroalgae       | ×        | ×        | ×        | ×        | ×        | ×        | ×        | ×        |
| Emergent Land                      | ×        | ×        | ×        | ×        | ×        | ×        | ×        | ×        |
| Estuaries                          | ×        | ×        | ×        | ×        | ×        | ×        | ×        | ×        |
| Macroalgae (0 to -10m)             | ×        | ×        | ×        | ×        | ×        | ×        | ×        | ×        |
| 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 1. The total area of each of the eight 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 (length) (km)</b> | <b>Coastline along shore (width) (km)</b> | <b>Size of zone (km<sup>2</sup>)</b> |
|-------------|---|---|--------------------------------------|
| A1          | 6 (part A)<br>5 (part B)                        | 13  | 63                                   |
| B1          | 11  | 5   | 58                                   |
| C2          | 1   | 2   | 2                                    |
| C3          | 7   | 2   | 16                                   |
| D1          | 2   | 2   | 4                                    |
| E1          | 8   | 3   | 21                                   |
| E3          | 7   | 1   | 7                                    |
| E6          | 4   | 2   | 9                                    |
| E7          | 6 (part A)<br>5 (part B)                        | 3   | 16                                   |
| F2          | 1   | 1   | 1                                    |

**Note:**

- Zone A1 and E7 have two coasts to offshore lengths.

### **Areas of alternative Options 1-8**

Eight alternative zoning options were developed using different combinations of the individual zones suggested at each of the six 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 2.

**Table 3.** Comparison of the total area and percentage of sanctuary zones in each zoning option (areas rounded to the nearest whole number)

| <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                              | 144   | 16   |
| 2                              | 158   | 17   |
| 3                              | 148   | 16   |
| 4                              | 162   | 18   |
| 5                              | 135   | 15   |
| 6                              | 149   | 16   |
| 7                              | 137   | 15   |
| 8                              | 151   | 17   |



### **Comparing the eight zoning options**

- Option 4 includes 18% (162 km<sup>2</sup>) of sanctuary zones within the park. Option 2 and 8 both include 17%, Option 1, 3 and 6 all include 16%, Option 5 includes 15% and Option 7 is the smallest with 9% of sanctuary zones within the park.
- All options are very similar with the exception of Option 7, which includes 12 environmental values compared to 16-19 environmental values included in each of the other options.
- Option 4 includes a larger number of environmental values with  $\geq 20\%$  representation.
- Option 4 includes 1% more rocky reef (0 to -10m) and 5% more soft bottom habitat (-10 to -30m).
- Option 7 includes 16 environmental values compared to 18-19 for the other seven options.

Appendix A.

**Table 3:** The percentage of each environmental value included in zoning Option 1- 8 (% rounded to the nearest whole number)

| Environmental Values          | Option 1<br>Total in<br>all zones<br>(%) | Option 2<br>Total in<br>all zones<br>(%) | Option 3<br>Total in<br>all zones<br>(%) | Option 4<br>Total in<br>all zones<br>(%) | Option 5<br>Total in<br>all zones<br>(%) | Option 6<br>Total in<br>all zones<br>(%) | Option 7<br>(fixed)<br>Total in<br>all zones<br>(%) | Option 8<br>Total in<br>all zones<br>(%) |
|-------------------------------|--|--|--|--|--|--|---|--|
| <b>Ecological Importance</b>  |  |  |  |  |  |  |   |  |
| Australian Sealions (haulout) | 100                                      | 100                                      | 100                                      | 100                                      | 100                                      | 100                                      | 100   | 100                                      |
| Coastal Wader Bird Sites      | 10                                       | 10                                       | 11                                       | 11                                       | 9  | 9  | 9   | 9  |
| COSEMA Endangered Macroalgae  | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0  |
| Emergent Land                 | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0  |
| Offshore Islands              | 80                                       | 80                                       | 80                                       | 80                                       | 80                                       | 80                                       | 80  | 80                                       |
| Sea Bird Sites                | 86                                       | 86                                       | 86                                       | 86                                       | 86                                       | 86                                       | 86  | 86                                       |
| Estuaries                     | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0  |

| Underwater Habitats                |           |           |           |           |           |           |           |           |
|------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Macroalgae (0 to -10m)             | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         |
| Macroalgae (-10 to -30m)           | 24        | 25        | 24        | 25        | 24        | 25        | 24        | 25        |
| Rocky Reef (0 to -10m)             | 13        | 21        | 14        | 22        | 13        | 21        | 13        | 21        |
| Rocky Reef (-10 to -30m)           | 22        | 28        | 19        | 25        | 18        | 24        | 22        | 28        |
| Seagrass (0 to -10m)               | 11        | 11        | 11        | 11        | 11        | 11        | 11        | 11        |
| Seagrass (-10 to -30m)             | 3         | 3         | 3         | 3         | 3         | 3         | 3         | 3         |
| Soft-bottom Habitat (0 to -10m)    | 13        | 13        | 14        | 14        | 13        | 13        | 13        | 13        |
| Soft-bottom Habitat (-10m to -30m) | 16        | 21        | 27        | 32        | 15        | 20        | 15        | 20        |
| Unmapped Habitat (0 to -10m)       | 10        | 10        | 10        | 10        | 10        | 10        | 10        | 10        |
| Unmapped Habitat (-10 to -30m)     | 19        | 19        | 21        | 21        | 19        | 19        | 17        | 17        |
| Unmapped Habitat (-30 to -50m)     | 8         | 8         | 10        | 10        | 0         | 0         | 0         | 0         |
| <b>Total</b>                       | <b>16</b> | <b>17</b> | <b>16</b> | <b>18</b> | <b>15</b> | <b>16</b> | <b>15</b> | <b>17</b> |

| Shoreline Habitats                 |          |          |          |          |          |          |          |          |
|------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| Cliff (Exposed)                    | 36       | 36       | 36       | 36       | 36       | 36       | 36       | 36       |
| Cliff (Moderate)                   | 0        | 0        | 0        | 0        | 15       | 15       | 0        | 0        |
| Cliff (Sheltered)                  | 12       | 12       | 0        | 0        | 0        | 0        | 0        | 0        |
| Coarse Sand Beach (Sheltered)      | 19       | 19       | 24       | 24       | 23       | 23       | 17       | 17       |
| Fine-medium Sand Beach (Exposed)   | 4        | 4        | 7        | 7        | 4        | 4        | 4        | 4        |
| Fine-medium Sand Beach (Moderate)  | 0        | 0        | 2        | 2        | 0        | 0        | 0        | 0        |
| Fine-medium Sand Beach (Sheltered) | 6        | 6        | 0        | 0        | 8        | 8        | 0        | 0        |
| Mixed Beach (Sheltered)            | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| <b>Total</b>                       | <b>6</b> | <b>6</b> | <b>8</b> | <b>8</b> | <b>6</b> | <b>6</b> | <b>5</b> | <b>5</b> |

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

Appendix B.

**Table 4.** Area of environmental values represented in each suggested zone.

| <b>Ecological Importance</b>  | <b>Units</b> | <b>A1</b> | <b>B1</b> | <b>C2</b> | <b>C3</b> | <b>D1</b> | <b>E1</b> | <b>E3</b> | <b>E6</b> | <b>E7</b> | <b>F2</b> | <b>Total in Marine Park (count)</b> |
|-------------------------------|--------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------------------------------------|
| Australian Sealions (haulout) | Count        |           |           |           |           | 1         |           |           |           |           |           | 1                                   |
| Coastal Wader Bird Sites      | Count        |           |           | 13        | 13        | 3         | 3         |           |           | 1         |           | 174                                 |
| Cosema Endangered Macroalgae  | Count        |           |           |           |           |           |           |           |           |           |           | 5                                   |
| Emergent Land                 | Count        |           |           |           |           |           |           |           |           |           |           | 2                                   |
| Offshore Islands              | Count        |           |           |           |           | 4         |           |           |           |           |           | 5                                   |
| Sea Bird Sites                | Count        |           |           |           |           | 6         |           |           |           |           |           | 7                                   |
| Estuaries                     | Count        |           |           |           |           |           |           |           |           |           |           | <1                                  |

| <b>Underwater Habitats</b>         |                 | <b>A1</b> | <b>B1</b> | <b>C2</b> | <b>C3</b> | <b>D1</b> | <b>E1</b> | <b>E3</b> | <b>E6</b> | <b>E7</b> | <b>F2</b>    | <b>Total in Marine Park (km2)</b> |
|------------------------------------|-----------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--------------|-----------------------------------|
| Macroalgae (0 to -10m)             | km <sup>2</sup> |           |           |           |           |           |           |           |           |           |              | 1                                 |
| Macroalgae (-10 to -30m)           | km <sup>2</sup> |           | 1         |           | <1        |           |           |           |           |           |              | 5                                 |
| Rocky Reef (0 to -10m)             | km <sup>2</sup> |           | 3         | 2         | 6         | 2         | 1         | 1         | <1        | <1        | <1           | 60                                |
| Rocky Reef (-10 to -30m)           | km <sup>2</sup> |           | 23        |           | 9         | 2         | 3         | 2         | 8         | 7         | <1           | 148                               |
| Seagrass (0 to -10m)               | km <sup>2</sup> |           | 11        |           |           | <1        |           |           |           |           |              | 95                                |
| Seagrass (-10 to -30m)             | km <sup>2</sup> |           | <1        |           |           |           |           |           |           |           |              | 7                                 |
| Soft Bottom Habitat (0 to -10m)    | km <sup>2</sup> | 19        | 1         | <1        | 1         | <1        | 2         | <1        | <1        | <1        |              | 154                               |
| Soft Bottom Habitat (-10m to -30m) | km <sup>2</sup> |           | 1         |           | <1        |           | 1         | <1        | <1        | <1        |              | 5                                 |
| Unmapped (0 to -10m)               | km <sup>2</sup> | 12        |           |           |           |           |           |           |           |           |              | 117                               |
| Unmapped (-10 to -30m)             | km <sup>2</sup> | 32        | 18        |           |           |           | 12        | 4         | 1         | 6         |              | 292                               |
| Unmapped (-30 to -50m)             | km <sup>2</sup> |           |           |           |           |           | 2         | <1        |           | 2         |              | 22                                |
| <b>Total</b>                       | km <sup>2</sup> | <b>63</b> | <b>58</b> | <b>2</b>  | <b>16</b> | <b>4</b>  | <b>21</b> | <b>7</b>  | <b>8</b>  | <b>15</b> | <b>&lt;1</b> | <b>906</b>                        |

| <b>Shoreline Habitats</b>          |    | <b>A1</b> | <b>B1</b> | <b>C2</b> | <b>C3</b> | <b>D1</b> | <b>E1</b> | <b>E3</b> | <b>E6</b> | <b>E7</b> | <b>F2</b> | <b>Total in Marine Park (km)</b> |
|------------------------------------|----|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------------------------------|
| Cliff (Exposed)                    | km |           |           |           |           |           |           |           |           |           | 1         | 4                                |
| Cliff (Moderate)                   | km |           |           |           |           |           |           | <1        |           |           |           | 1                                |
| Cliff (Sheltered)                  | km |           |           |           |           |           |           |           |           | 1         | <1        | 5                                |
| Coarse Sand Beach (Sheltered)      | km |           |           | 3         | 3         |           | 1         | 1         |           | <1        |           | 15                               |
| Fine-medium Sand Beach (Exposed)   | km | 3         |           |           |           |           | 2         |           |           |           |           | 72                               |
| Fine-medium Sand Beach (Moderate)  | km |           |           |           |           |           | 1         |           |           |           |           | 32                               |
| Fine-medium Sand Beach (Sheltered) | km |           |           |           |           |           |           | <1        |           | <1        |           | 6                                |
| Mixed Beach (Sheltered)            | km |           |           |           |           |           |           |           |           |           |           | 1                                |
| <b>Total</b>                       | km | <b>3</b>  | <b>0</b>  | <b>3</b>  | <b>3</b>  | <b>0</b>  | <b>4</b>  | <b>1</b>  | <b>0</b>  | <b>1</b>  | <b>1</b>  | <b>135</b>                       |

Note: numbers have been rounded to the nearest whole number

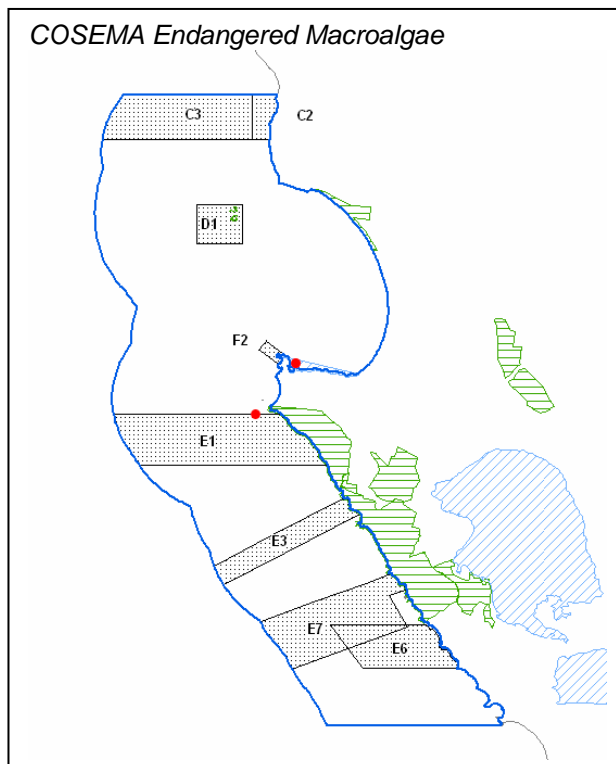
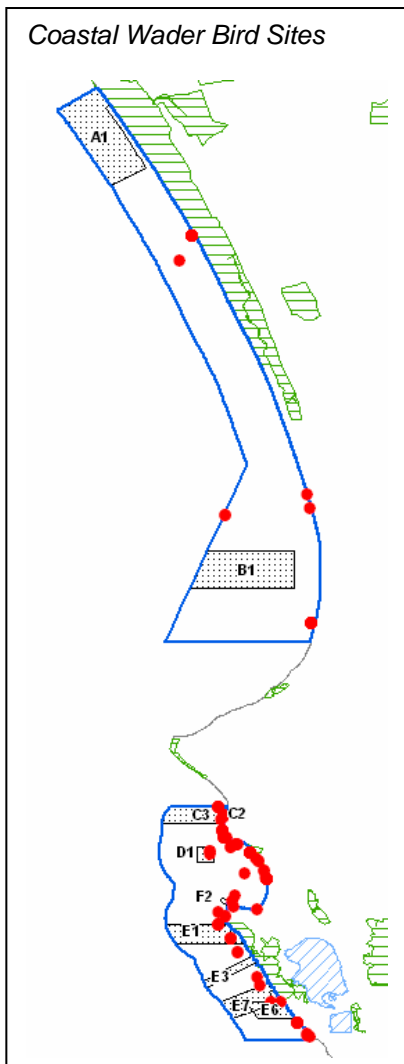
**Appendix C.** Location of the environmental values <10% represented.

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

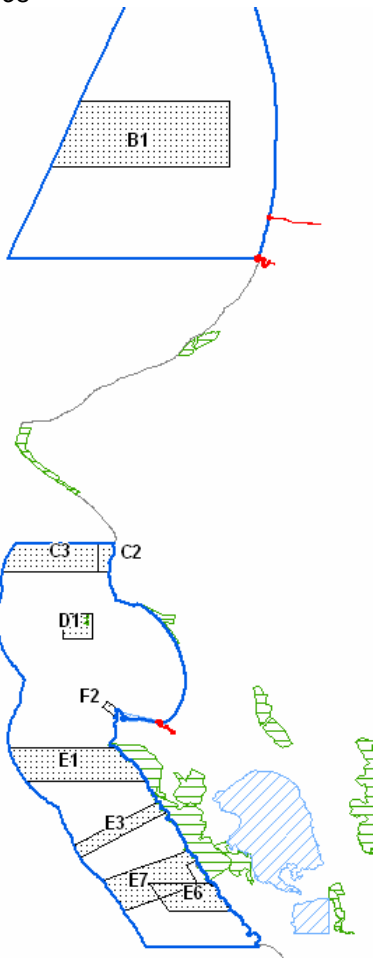
Note: maps are best viewed in colour.

**Legend**

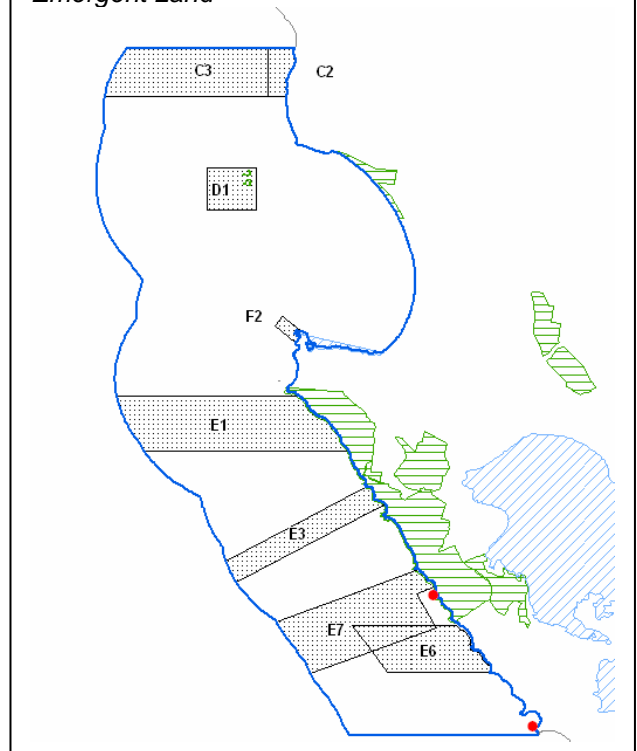
- Environmental Values
- Marine Park
- LAG Advice
- Netting Closures
- Parks and Reserves
- Coastline



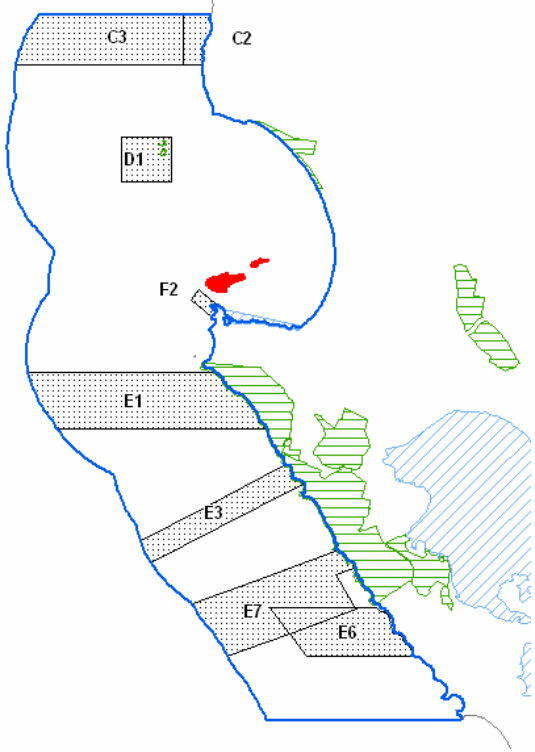
Estuaries

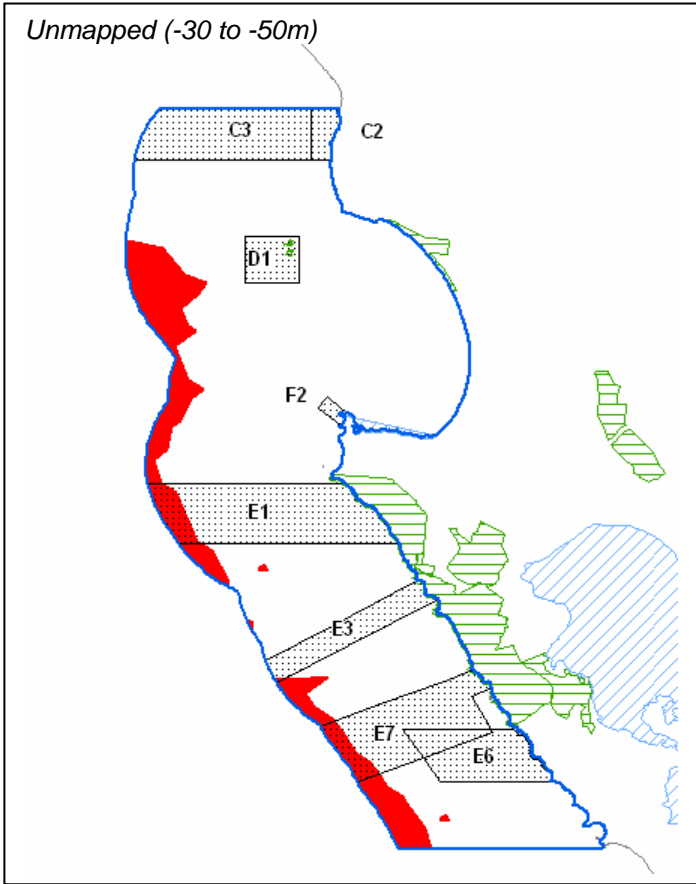
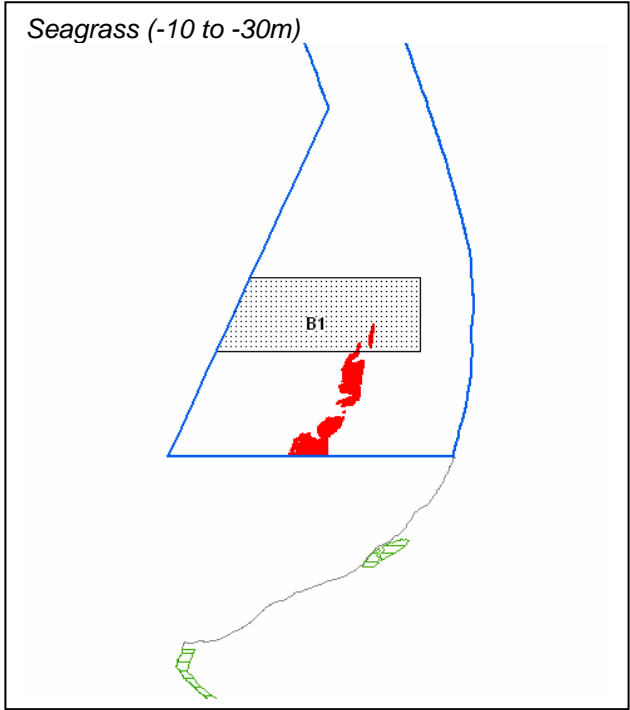


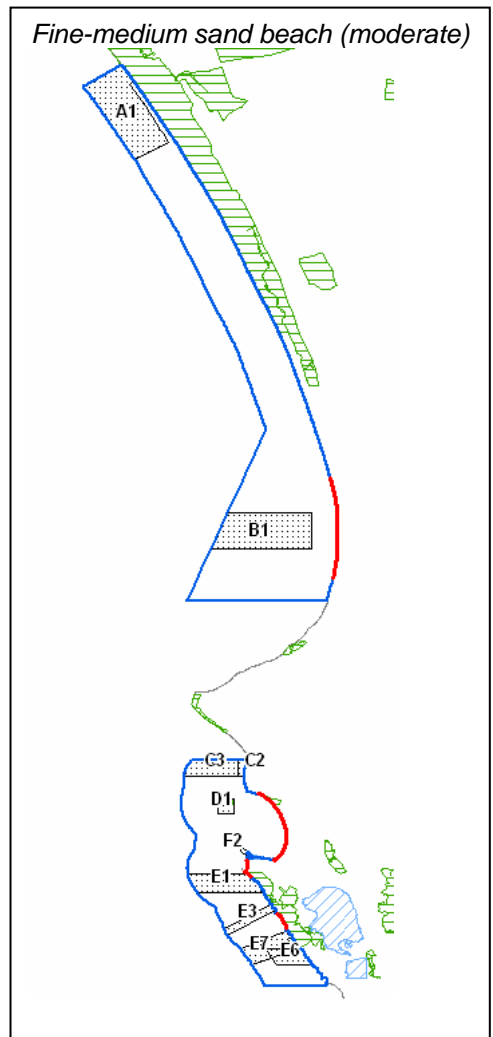
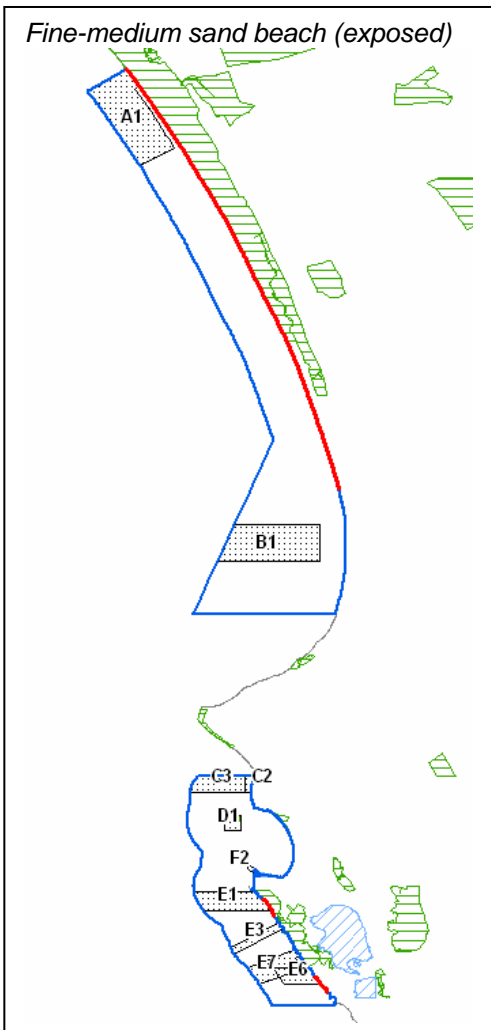
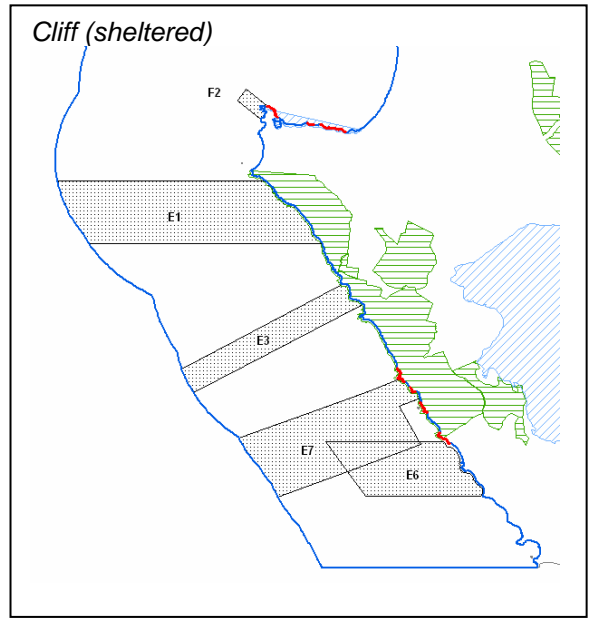
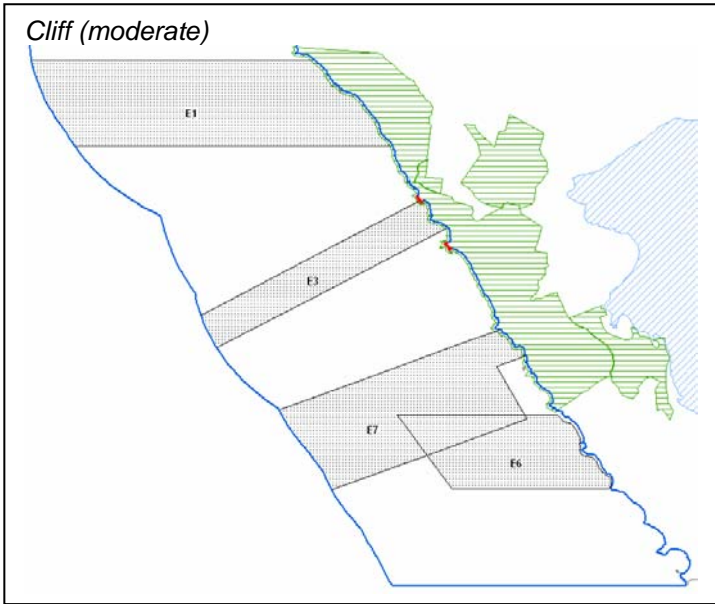
Emergent Land



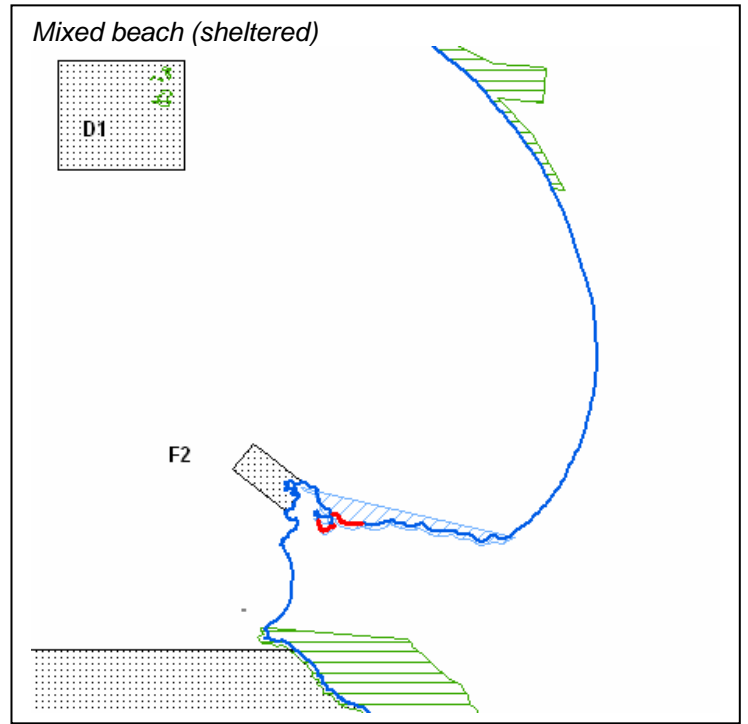
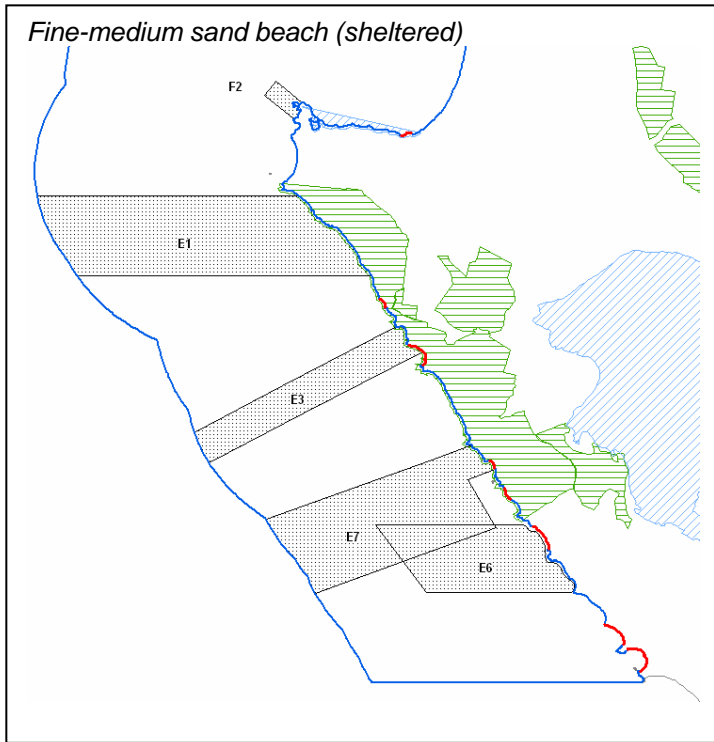
Macroalgae (0 to -10m)











*Mapping information:*

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