

## PRELIMINARY FEEDBACK 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 Spencer Gulf (Marine Park 12) (Kangaroo Island coast) suggested zoning options

#### Overview

DENR has undertaken a rapid assessment of the CAR principles for the possible sanctuary zone options for the Southern Spencer Gulf 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 sanctuary zones suggested at two locations within the marine park, with alternative zones suggested at both of the locations (Zones G and I).

Using combinations of alternate suggested zones (G1b, G2, G3a, G3c, I2, I3, and I4), 8 zoning options for the marine park were developed (See Figures 1-8).

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.

This assessment has been carried out over the Kangaroo Island coast portion of the Marine Park to advise the Kangaroo Island MPLAG. A separate assessment has been carried out for the Yorke Peninsula portion.

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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 12 using combinations of the 7 suggested zones

Figure 1: Zoning Option 1 (17% of MP)  
(possible zones: G2, I4)

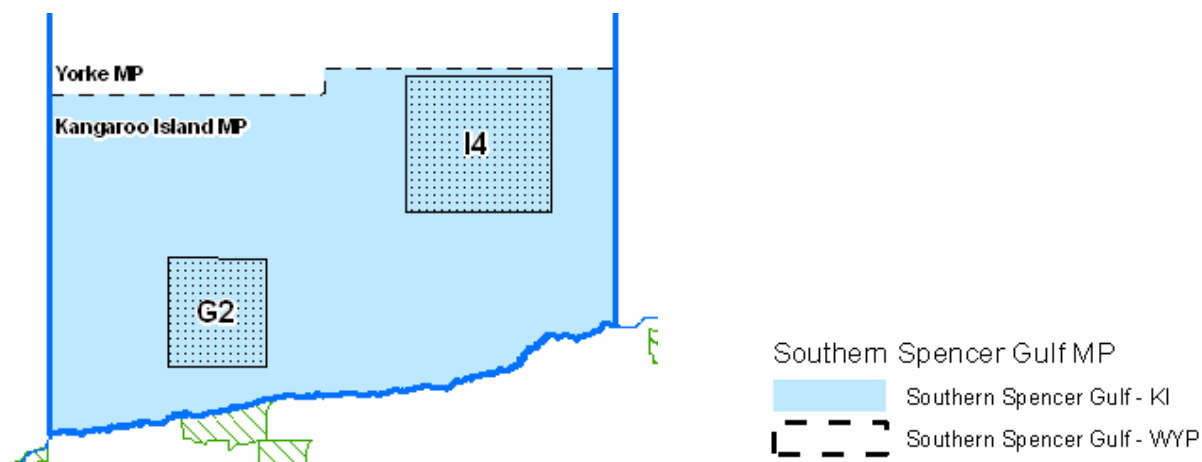


Figure 2: Zoning Option 2 (7% of MP)  
(possible zones: G2, I2)

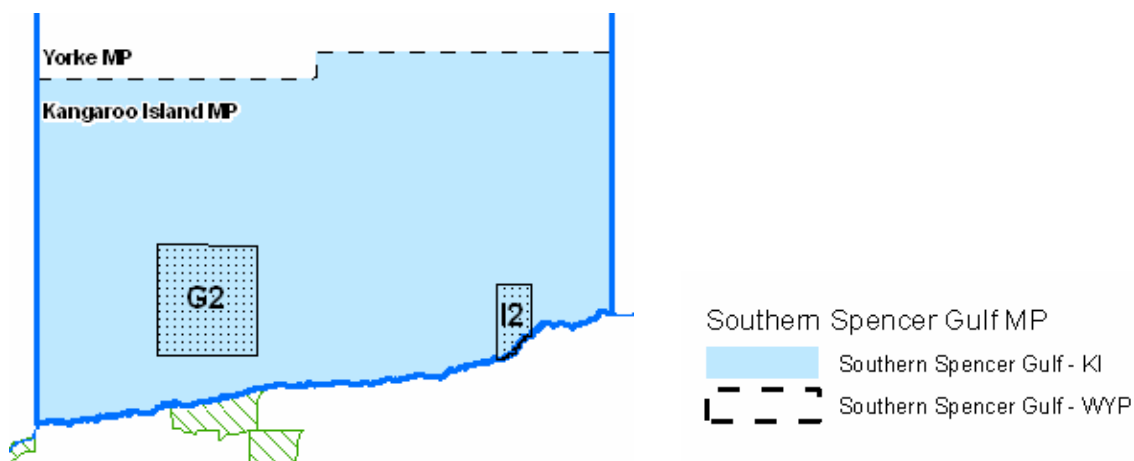


Figure 3: Zoning Option 3 (11% of MP)  
(possible zone: I3)

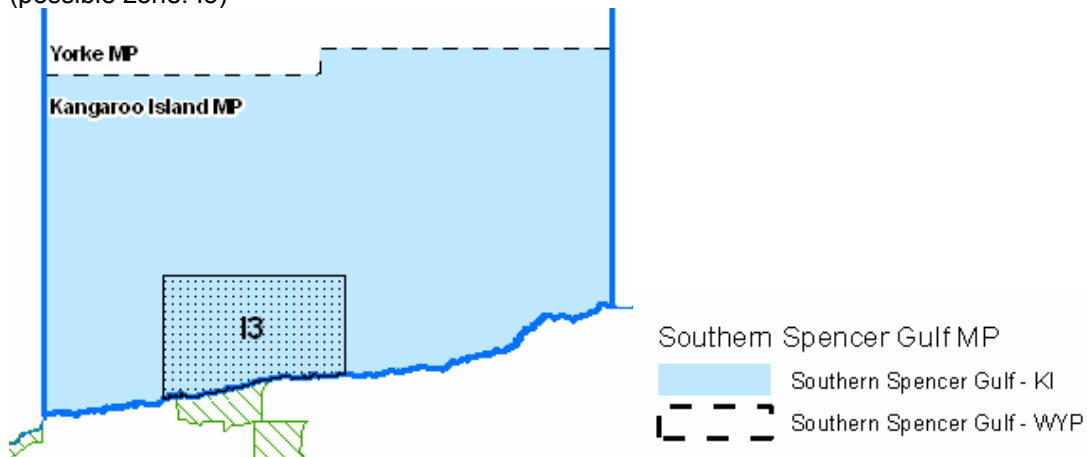


Figure 4: Zoning Option 4 (14% of MP)  
(possible zones: G3a, I4)

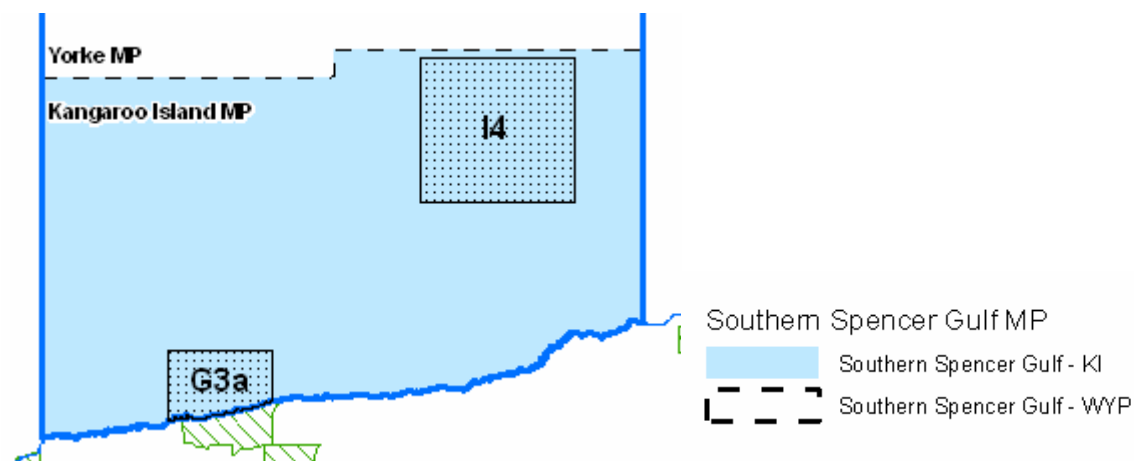


Figure 5: Zoning Option 5 (5% of MP)  
(possible zones: G3a, I2)

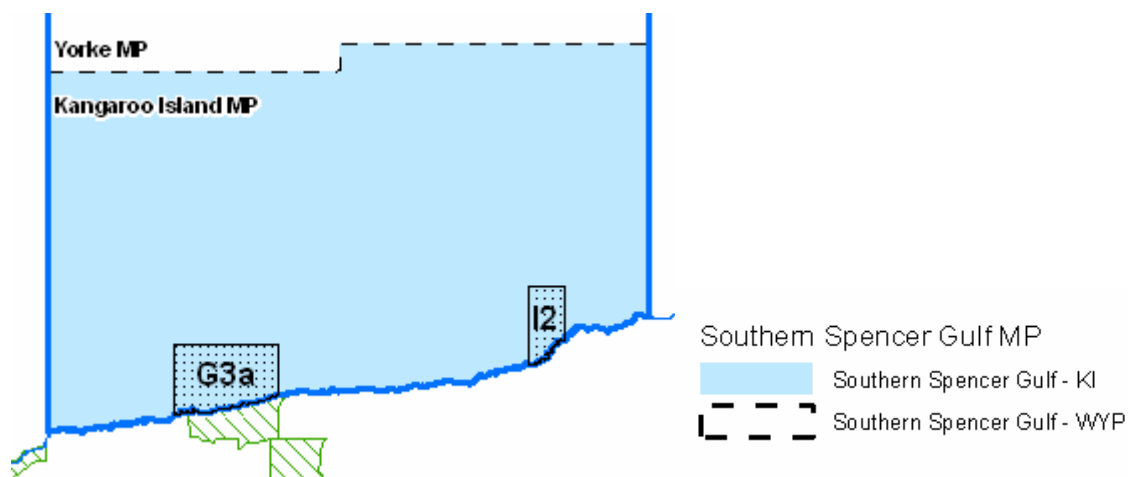


Figure 6: Zoning Option 6 (4% of MP)  
(possible zones: G3a, G3c)

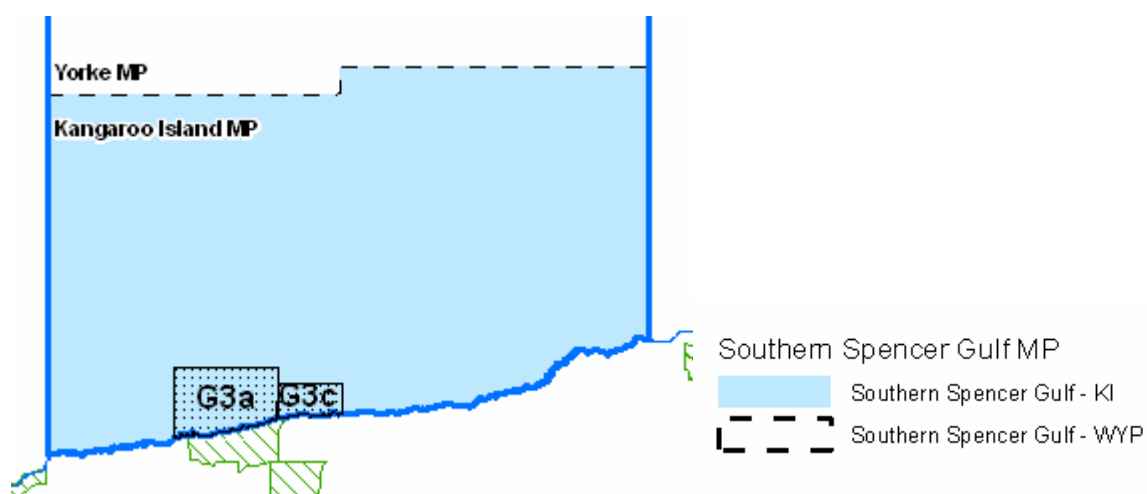


Figure 7: Zoning Option 7 (10% of MP)  
(possible zones: G1, I2)

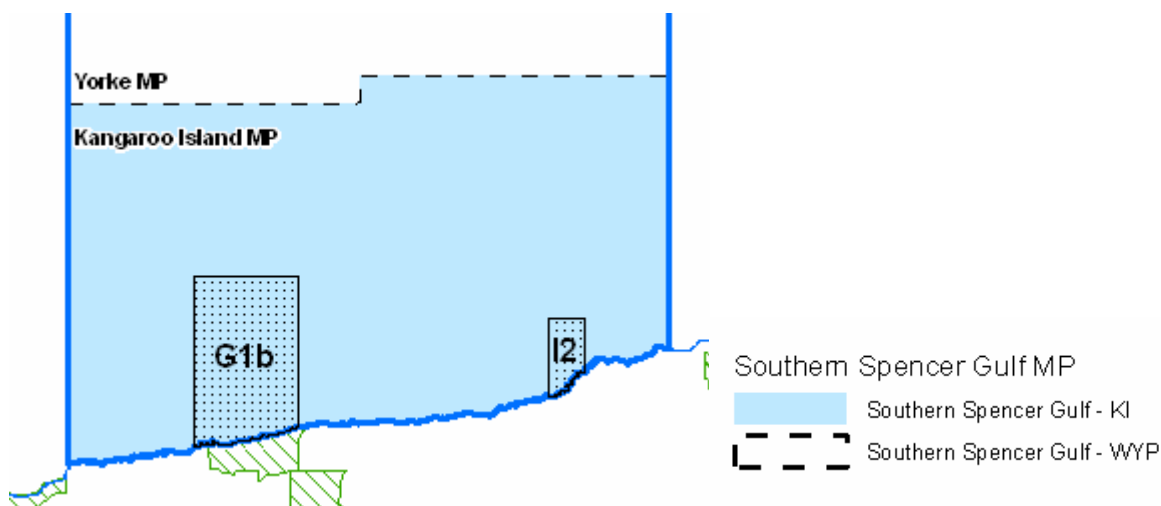
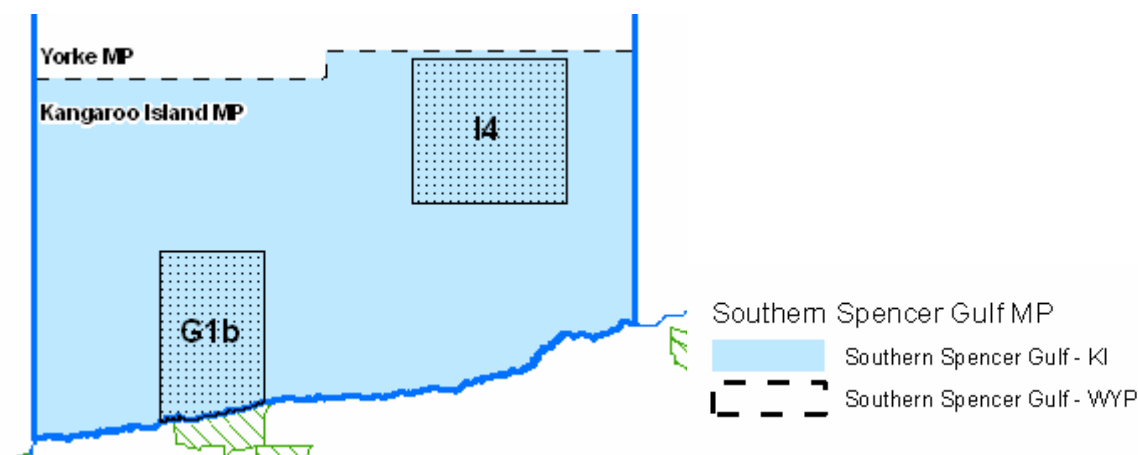


Figure 8: Zoning Option 8 (20% of MP)  
(possible zones: G1, I4)



### Comprehensiveness

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

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

- ✓ Unmapped

In addition, options 2, 3, 4, 5, 6, 7 and 8 include:

- ✓ Rocky reef
- ✓ Bedrock platform
- ✓ Soft bottom habitat
- ✓ Boulder beach

And, options 2, 5 and 7 include:

- ✓ Seagrass
- ✓ Fine-medium sand beach

Zoning option 1 does not include the following shoreline types and seafloor (benthic) habitats:

- ✗ Rocky reef
- ✗ Bedrock platform
- ✗ Soft bottom habitat
- ✗ Boulder Beach

## 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:  $\geq 20\%$ , 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  $\geq 20\%$   
 ✓✓ 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 | Option 8 |
|------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| Coastal Wader Birds                | ✕        | ✓✓✓      | ✓✓✓      | ✕        | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✕        |
| Estuaries                          | ✕        | ✓✓       | ✓✓✓      | ✓✓       | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓       |
| Reef Fish                          | ✕        | ✓        | ✓✓✓      | ✓✓       | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓       |
| Rocky Reef (0 to -10m)             | ✕        | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      |
| Seagrass (0 to -10m)               | ✕        | ✓✓✓      | ✕        | ✕        | ✓✓✓      | ✕        | ✓✓✓      | ✕        |
| Soft-bottom Habitat (0 to -10m)    | ✕        | ✓        | ✓✓✓      | ✓✓       | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓       |
| Soft-bottom Habitat (-10 to -30m)  | ✕        | ✓✓       | ✓        | ✓        | ✓✓       | ✓        | ✓✓       | ✓        |
| Unmapped (0 to -10m)               | ✕        | ✕        | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      |
| Unmapped (-10 to -30m)             | ✓        | ✓✓       | ✓✓✓      | ✓✓       | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓       |
| Unmapped (-30 to -50m)             | ✓✓✓      | ✓        | ✓✓       | ✓✓✓      | ✓        | ✓        | ✓        | ✓✓✓      |
| Unmapped (>-50m)                   | ✓        | ✓        | ✓        | ✕        | ✕        | ✕        | ✓        | ✓        |
| Bedrock Platform (Moderate)        | ✕        | ✓        | ✓✓✓      | ✓✓       | ✓✓       | ✓✓       | ✓✓       | ✓✓       |
| Boulder Beach (Moderate)           | ✕        | ✓✓✓      | ✓        | ✓        | ✓✓✓      | ✓        | ✓✓✓      | ✓        |
| Boulder Beach (Sheltered)          | ✕        | ✕        | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      | ✓✓✓      |
| Coarse Sand Beach (Sheltered)      | ✕        | ✕        | ✓✓       | ✕        | ✕        | ✓✓       | ✕        | ✕        |
| Fine-medium Sand Beach (Sheltered) | ✕        | ✓✓✓      | ✕        | ✕        | ✓✓✓      | ✕        | ✓✓✓      | ✕        |
| Fine-medium Sand Beach (Exposed)   | ✕        | ✕        | ✕        | ✕        | ✕        | ✕        | ✕        | ✕        |

### **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 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 (values rounded to the nearest whole number)

| <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> |
|-------------|--|--|--------------------------------------|
| G1b         | 12   | 7  | 78                                   |
| G2          | 9  | 7  | 55                                   |
| G3a         | 5  | 7  | 105                                  |
| G3c         | 2.5  | 4  | 10                                   |
| I2          | 5  | 3  | 11                                   |
| I3          | 8  | 12   | 103                                  |
| I4          | 11   | 9  | 103                                  |

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

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

Eight alternative zoning options were developed using different combinations of the individual zones suggested at each of the two 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 (areas rounded to the nearest whole number)

| <b>Suggested zoning option</b> | <b>Total area (km<sup>2</sup>) of sanctuary zones in the Kangaroo Island portion of the Southern Spencer Gulf Marine Park</b> | <b>% of sanctuary zones located in the Kangaroo Island portion of the Southern Spencer Gulf Marine Park</b> |
|--------------------------------|---|---|
| 1                              | 159   | 17  |
| 2                              | 67  | 7   |
| 3                              | 103   | 11  |
| 4                              | 134   | 14  |
| 5                              | 42  | 5   |
| 6                              | 40  | 4   |
| 7                              | 89  | 10  |
| 8                              | 182   | 20  |

## Comparing the eight zoning options

- Option 8 includes 20% (182 km<sup>2</sup>) of sanctuary zones within the KI portion of the park, option 1 includes 17%, option 4 includes 14%, options 3 and 7 are similar with 11% and 10%, respectively. Option 2 includes 7% of sanctuary zones within the KI portion of the park, options 5 & 6 are the smaller options which include 5% and 4%, respectively.
- Option 8 includes the highest percent representation of benthic habitats at 20%, followed by option 1 which includes 17%.
- Options 3, 5 and 7 all include the highest percent representation of shoreline habitats, they include 21%.
- Option 3 includes 13% more unmapped (0 to -10m) habitat compared to option 6, 26% more compared to options 4, 5, 7 and 8 and 83% more compared to option 1.
- Option 3 includes 4% more soft bottom habitat (0 to -10m) compared to option 6, 8% more compared to options 5 and 7, 14% more compared to options 4 and 8, 26% more compared to option 2 and 32% more compared to option 1.
- Options 3, 5, 6 and 7 include higher representation of the ecologically important environmental values, all have ≥20% representation within sanctuary zones.
- Option 5 and 7 include 11 environmental values with ≥20% representation, option 3 includes 9 and option 6 includes 8.
- Options 3, 5 and 7 all include 14 of the 17 environmental values found within the KI portion of the park.
- Option 1 only includes 3 of the 17 environmental values found within the park, all which are benthic habitats.
- Option 1 does not include ecologically important environmental values nor does it include shoreline habitats.
- Options 4 and 8 are very similar, they include the same environmental values with the same percent representation however option 8 includes unmapped (>50m) whereas option 4 does not.
- Options 2, 5 and 7 are the only options which include seagrass and fine-medium sand beach.
- Option 3 and 6 are the only options which include coarse sand beach.

## Appendix A.

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

|                              | Option 1<br>Total in<br>all<br>Zones<br>(%) | Option 2<br>Total in<br>all<br>Zones<br>(%) | Option 3<br>Total in<br>all<br>Zones<br>(%) | Option 4<br>Total in<br>all<br>Zones<br>(%) | Option 5<br>Total in<br>all<br>Zones<br>(%) | Option 6<br>Total in<br>all<br>Zones<br>(%) | Option 7<br>Total in<br>all<br>Zones<br>(%) | Option 8<br>Total in<br>all<br>Zones<br>(%) |
|------------------------------|---|---|---|---|---|---|---|---|
| <b>Ecological Importance</b> |   |   |   |   |   |   |   |   |
| Coastal Wader Birds          | 0   | 60  | 20  | 0   | 60  | 20  | 60  | 0   |
| Estuaries                    | 0   | 14  | 43  | 14  | 29  | 43  | 29  | 14  |
| Surveyed Reef Fish Sites     | 0   | 9   | 32  | 18  | 27  | 27  | 27  | 18  |

|                                   | Option1<br>Total in<br>all<br>Zones<br>(%) | Option2<br>Total in<br>all<br>Zones<br>(%) | Option3<br>Total in<br>all<br>Zones<br>(%) | Option4<br>Total in<br>all<br>Zones<br>(%) | Option5<br>Total in<br>all<br>Zones<br>(%) | Option6<br>Total in<br>all<br>Zones<br>(%) | Option7<br>Total in<br>all<br>Zones<br>(%) | Option8<br>Total in<br>all<br>Zones<br>(%) |
|-----------------------------------|--|--|--|--|--|--|--|--|
| <b>Underwater Habitats</b>        |  |  |  |  |  |  |  |  |
| Rocky Reef (0 to -10m)            | 0  | 20   | 35   | 21   | 41   | 32   | 41   | 21   |
| Seagrass (0 to -10m)              | 0  | 61   | 0  | 0  | 61   | 0  | 61   | 0  |
| Soft-bottom Habitat (0 to -10m)   | 0  | 6  | 32   | 18   | 24   | 28   | 24   | 18   |
| Soft-bottom Habitat (-10 to -30m) | 0  | 15   | 1  | 1  | 15   | 1  | 15   | 1  |
| Unmapped (0 to -10m)              | 0  | 0  | 83   | 57   | 57   | 70   | 57   | 57   |
| Unmapped (-10 to -30m)            | 3  | 11   | 34   | 18   | 26   | 24   | 26   | 18   |
| Unmapped (-30 to -50m)            | 26   | 6  | 10   | 21   | 1  | 1  | 7  | 26   |
| Unmapped (>-50m)                  | 8  | 8  | 3  | 0  | 0  | 0  | 8  | 8  |
| <b>Total</b>                      | <b>17</b>                                  | <b>7</b>                                   | <b>11</b>                                  | <b>14</b>                                  | <b>5</b>                                   | <b>4</b>                                   | <b>10</b>                                  | <b>20</b>                                  |

|                                    | Option1<br>Total in<br>all<br>Zones<br>(%) | Option2<br>Total in<br>all<br>Zones<br>(%) | Option3<br>Total in<br>all<br>Zones<br>(%) | Option4<br>Total in<br>all<br>Zones<br>(%) | Option5<br>Total in<br>all<br>Zones<br>(%) | Option6<br>Total in<br>all<br>Zones<br>(%) | Option7<br>Total in<br>all<br>Zones<br>(%) | Option8<br>Total in<br>all<br>Zones<br>(%) |
|------------------------------------|--|--|--|--|--|--|--|--|
| <b>Shoreline Habitats</b>          |  |  |  |  |  |  |  |  |
| Bedrock Platform (Moderate)        | 0  | 6  | 22   | 12   | 18   | 19   | 18   | 12   |
| Boulder Beach (Moderate)           | 0  | 79   | 9  | 9  | 89   | 9  | 89   | 9  |
| Boulder Beach (Sheltered)          | 0  | 0  | 54   | 54   | 54   | 70   | 54   | 54   |
| Coarse Sand Beach (Sheltered)      | 0  | 0  | 10   | 0  | 0  | 10   | 0  | 0  |
| Fine-medium Sand Beach (Sheltered) | 0  | 100  | 0  | 0  | 100  | 0  | 100  | 0  |
| Fine-medium Sand Beach (Exposed)   | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| <b>Total</b>                       | <b>0</b>                                   | <b>9</b>                                   | <b>21</b>                                  | <b>11</b>                                  | <b>21</b>                                  | <b>19</b>                                  | <b>21</b>                                  | <b>11</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.

| Ecological Importance    | Units | G1b | G2 | G3a | G3c | I2 | I3 | I4 | Total in Marine Park - KI side (count) |
|--------------------------|-------|-----|----|-----|-----|----|----|----|--|
| Coastal Wader Birds      | Count |     |    |     | 1   | 3  | 1  |    | 5                                      |
| Estuaries                | Count | 1   |    | 1   | 2   | 1  | 3  |    | 7                                      |
| Surveyed Reef Fish Sites | Count | 4   |    | 4   | 2   | 2  | 7  |    | 22                                     |

| Underwater Habitats               |                 | G1b       | G2        | G3a       | G3c       | I2        | I3         | I4         | Total in Marine Park - KI side (km <sup>2</sup> ) |
|-----------------------------------|-----------------|-----------|-----------|-----------|-----------|-----------|------------|------------|---|
| Rocky Reef (0 to -10m)            | km <sup>2</sup> | 1         |           | 1         | <1        | 1         | 1          |            | 3   |
| Seagrass (0 to -10m)              | km <sup>2</sup> |           |           |           |           | <1        |            |            | <1  |
| Soft-bottom Habitat (0 to -10m)   | km <sup>2</sup> | 8         |           | 8         | 5         | 3         | 14         |            | 44  |
| Soft-bottom Habitat (-10 to -30m) | km <sup>2</sup> | <1        |           | <1        | <1        | 2         | <1         |            | 14  |
| Unmapped (0 to -10m)              | km <sup>2</sup> | 1         |           | 1         | <1        |           | 2          |            | 3   |
| Unmapped (-10 to -30m)            | km <sup>2</sup> | 12        | 2         | 12        | 4         | 5         | 24         |            | 70  |
| Unmapped (-30 to -50m)            | km <sup>2</sup> | 36        | 33        | 8         |           | <1        | 52         | 103        | 532   |
| Unmapped (>-50m)                  | km <sup>2</sup> | 20        | 20        |           |           |           | 9          |            | 257   |
| <b>Total</b>                      | km <sup>2</sup> | <b>78</b> | <b>55</b> | <b>30</b> | <b>10</b> | <b>11</b> | <b>103</b> | <b>103</b> | <b>924</b>  |

| Shoreline Habitats                 |    | G1b      | G2 | G3a      | G3c      | I2       | I3        | I4 | Total in Marine Park - KI side (km) |
|------------------------------------|----|----------|----|----------|----------|----------|-----------|----|-------------------------------------|
| Bedrock Platform (Moderate)        | km | 6        |    | 6        | 4        | 3        | 10        |    | 48                                  |
| Boulder Beach (Moderate)           | km | <1       |    | <1       |          | 1        | <1        |    | 2                                   |
| Boulder Beach (Sheltered)          | km | <1       |    | <1       | <1       |          | <1        |    | <1                                  |
| Coarse Sand Beach (Sheltered)      | km |          |    |          | <1       |          | <1        |    | <1                                  |
| Fine-medium Sand Beach (Sheltered) | km |          |    |          |          | <1       |           |    | <1                                  |
| Fine-medium Sand Beach (Exposed)   | km |          |    |          |          |          |           |    | 1                                   |
| <b>Total</b>                       | km | <b>6</b> |    | <b>6</b> | <b>4</b> | <b>5</b> | <b>11</b> |    | <b>50</b>                           |

Note: numbers have been rounded to the nearest whole number

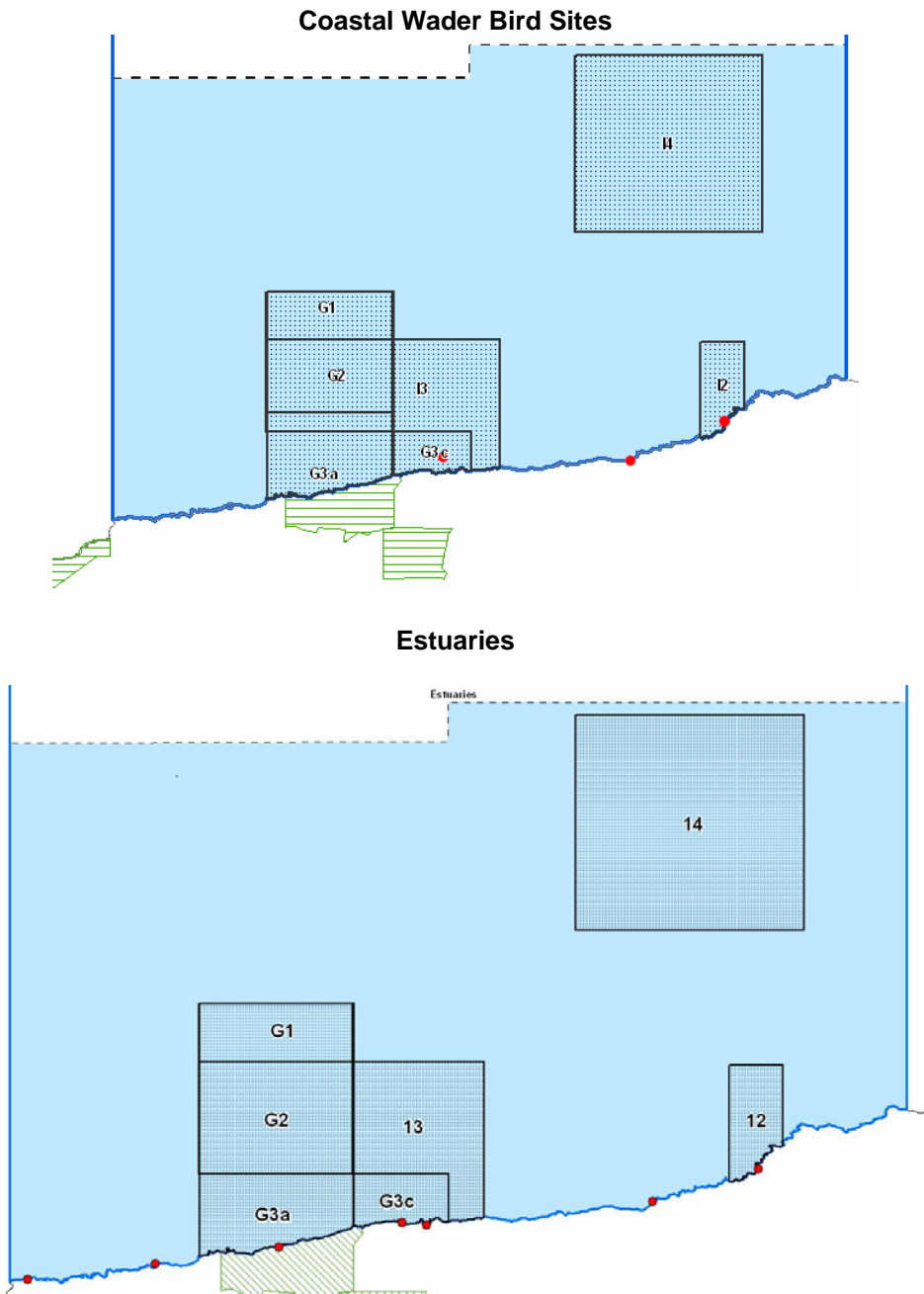
**Appendix C.** Location of the environmental values <10% represented.

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

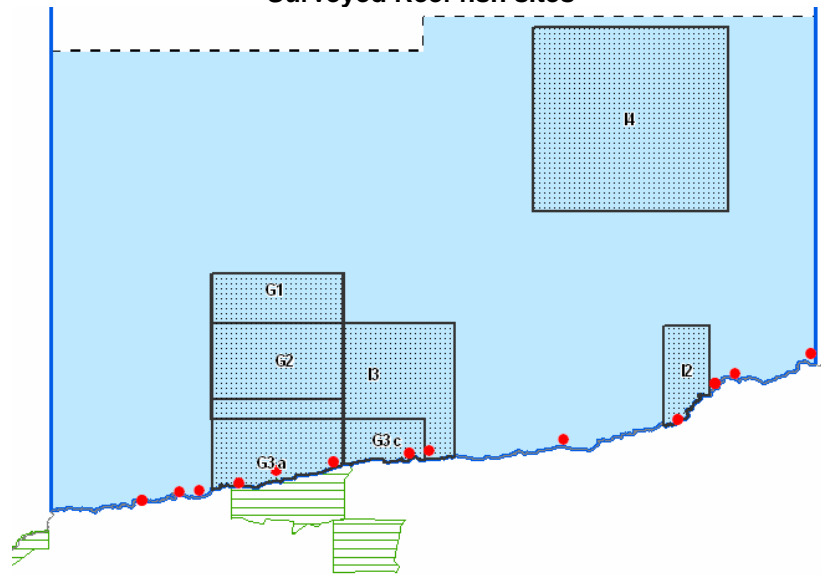
Note: Maps are best viewed in colour.

**Legend**

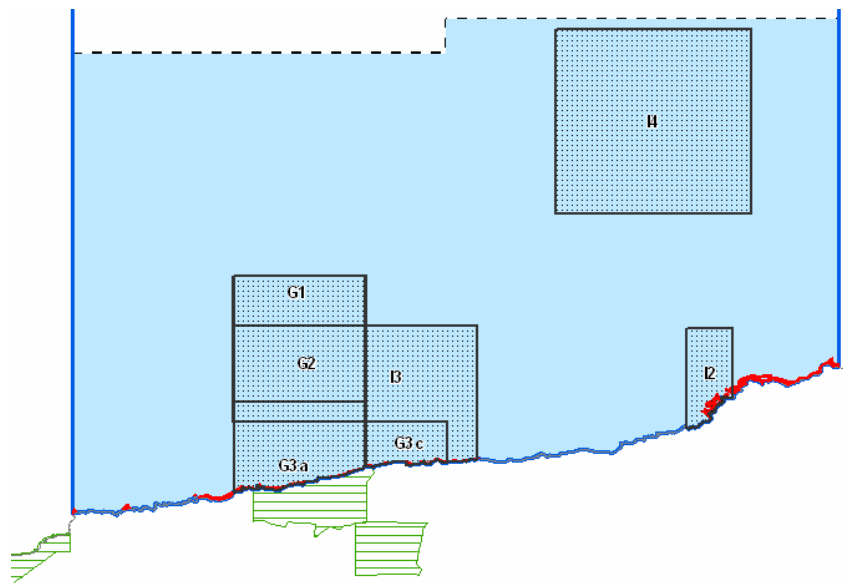
- Environmental Values
- Marine Park
- LAG Advice
- Netting Closures
- Parks and Reserves
- Coastline



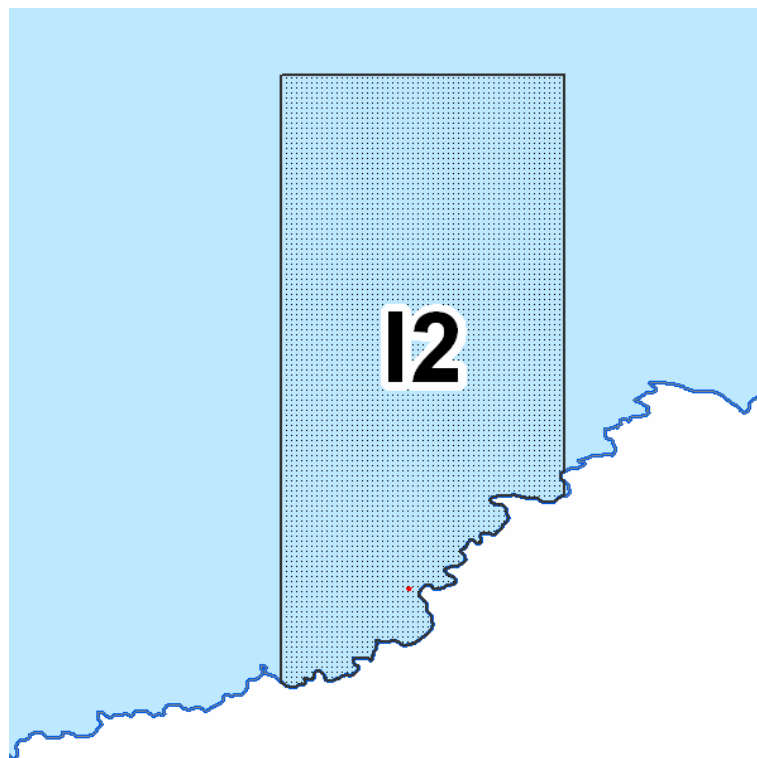
**Surveyed Reef fish sites**



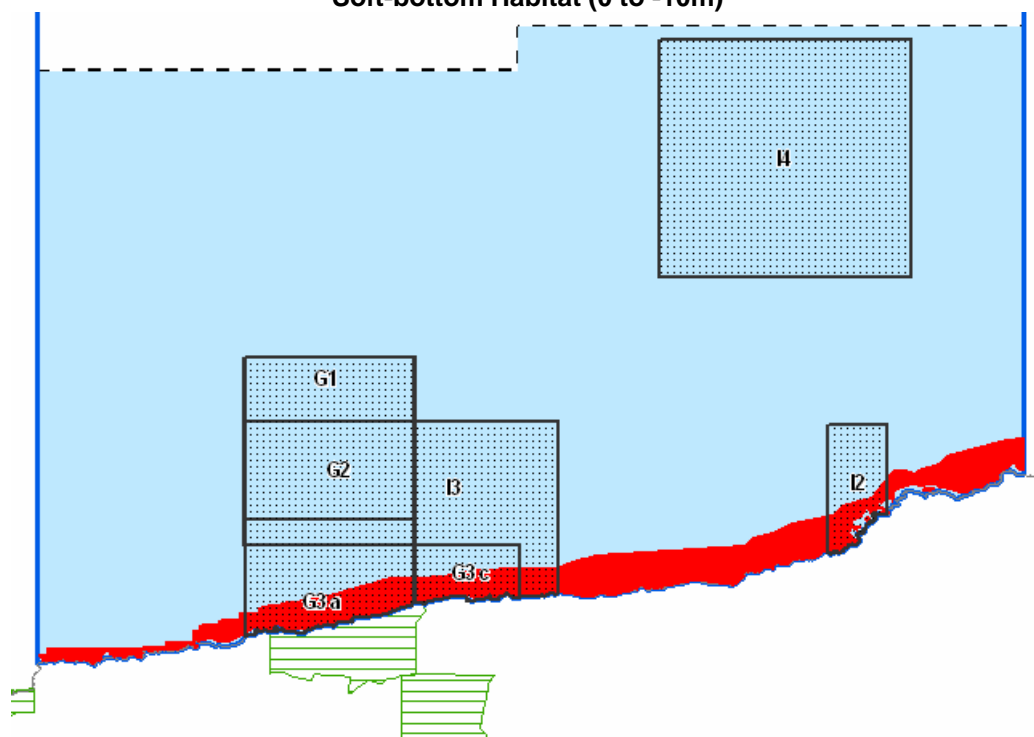
**Rocky reef (0 to -10m)**



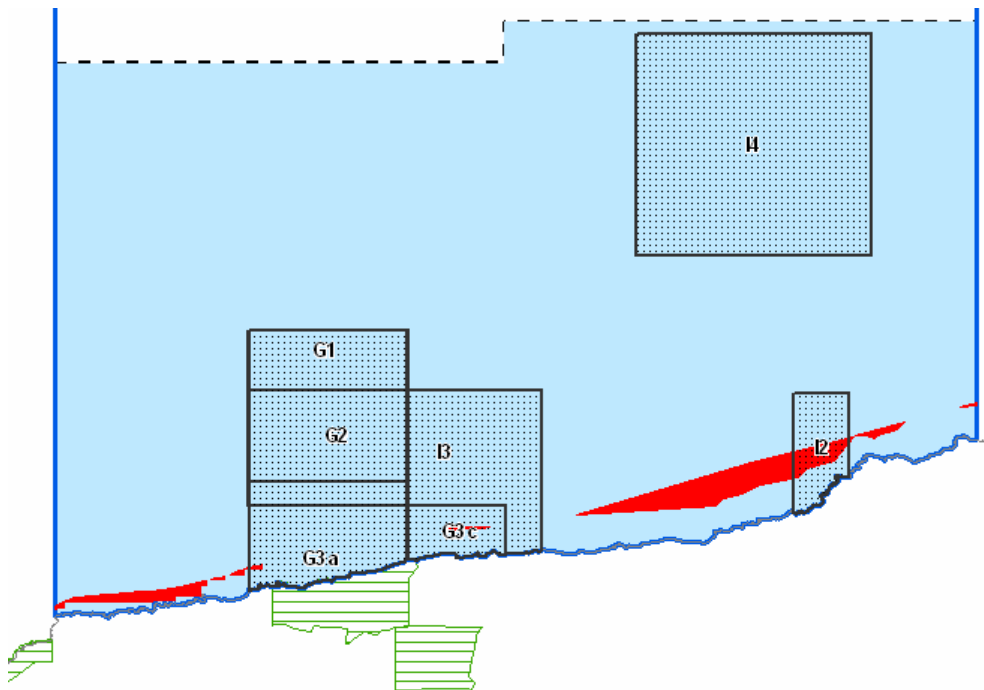
Seagrass (0 to -10m)



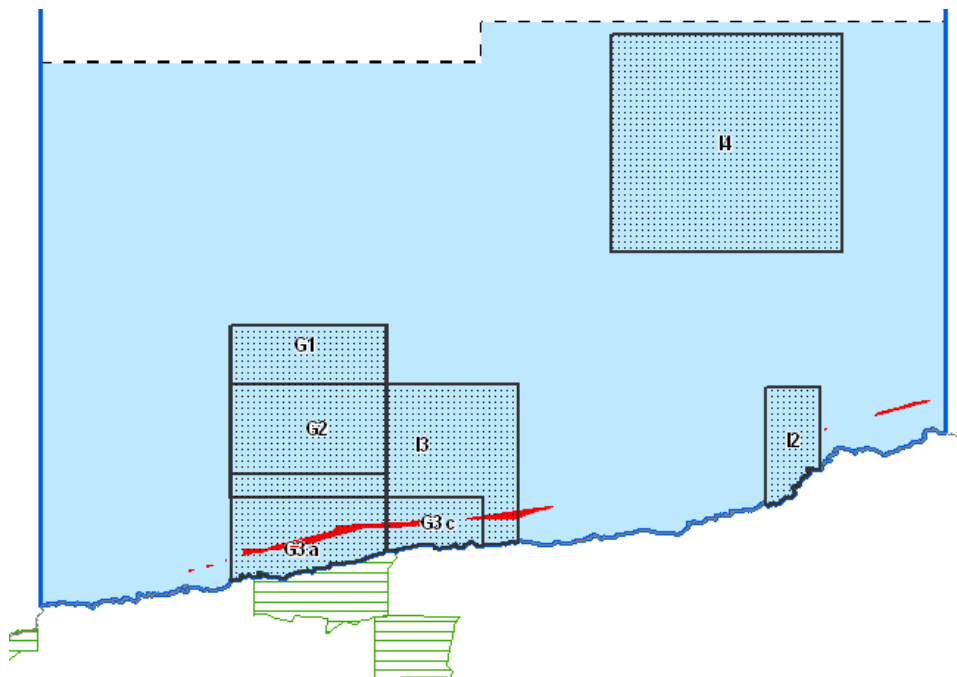
Soft-bottom Habitat (0 to -10m)



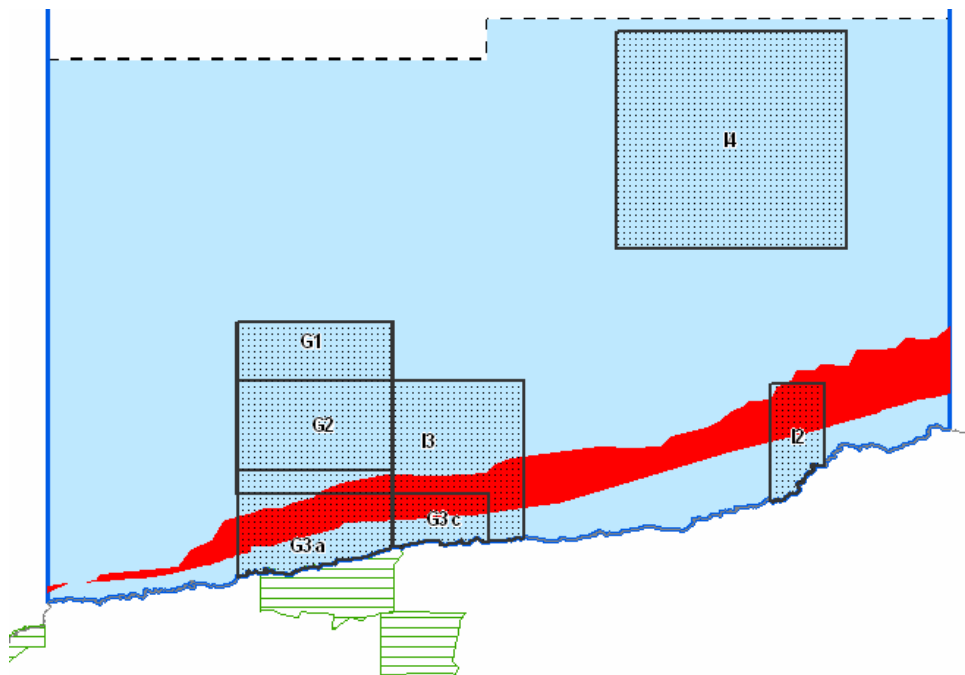
### Soft-bottom Habitat (-10 to -30m)



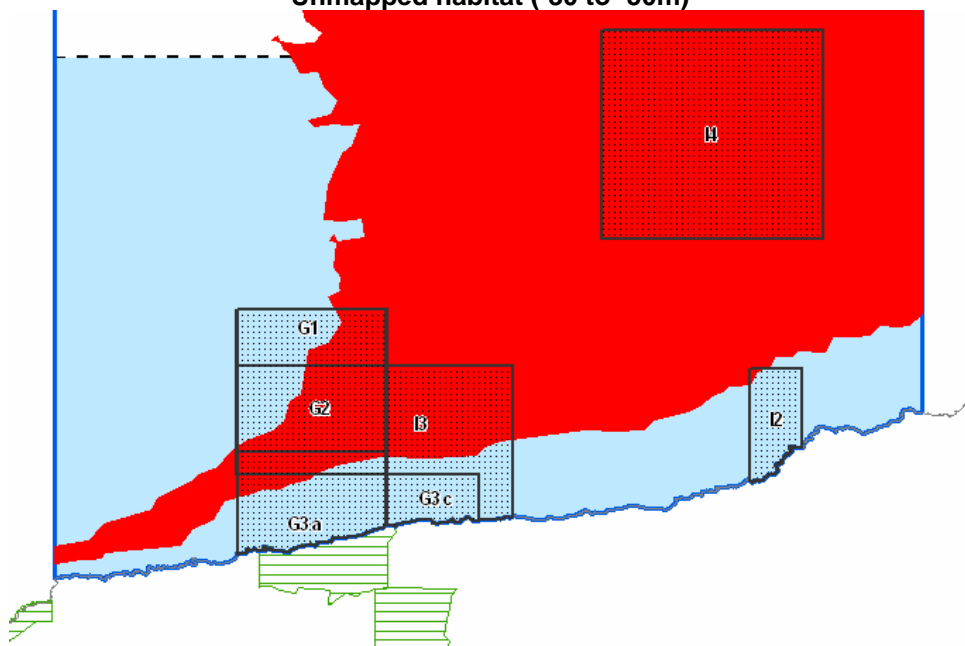
### Unmapped habitat (0 to -10m)



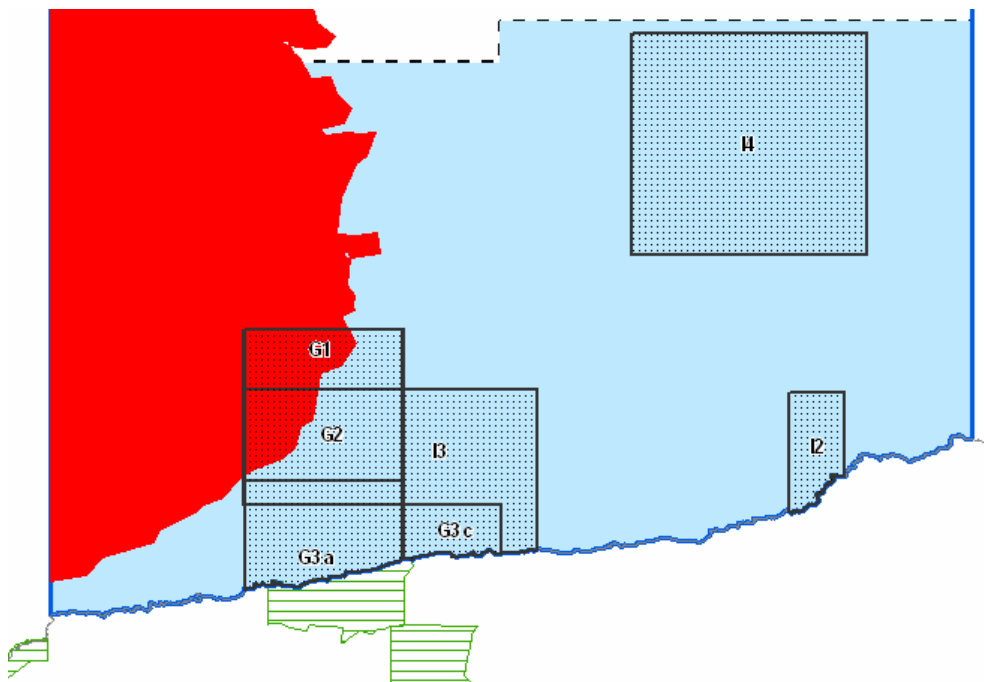
**Unmapped habitat (-10 to -30m)**



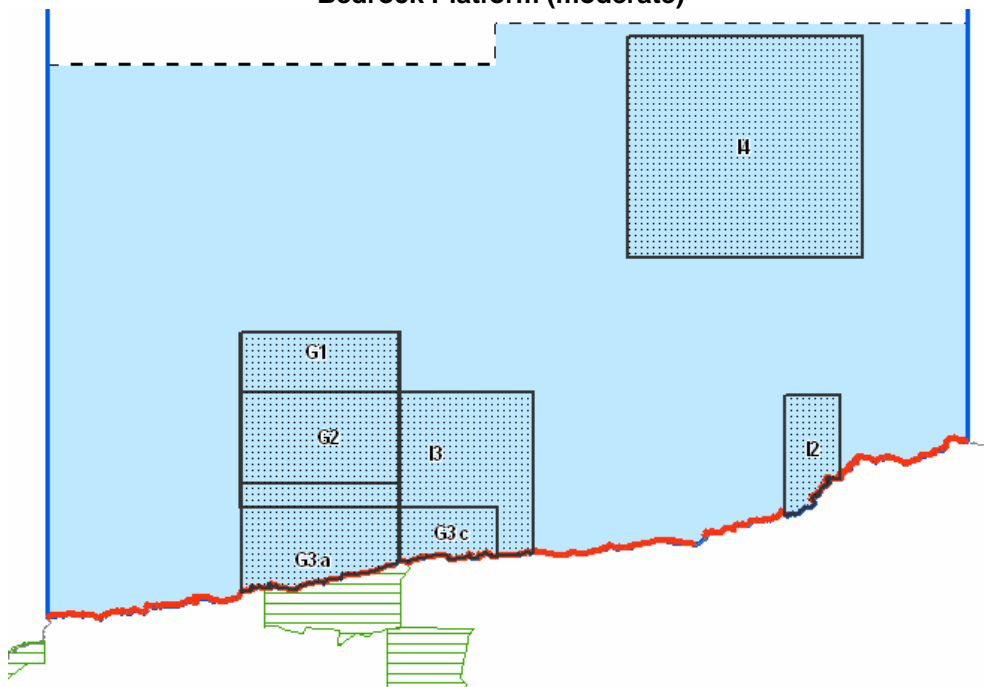
**Unmapped habitat (-30 to -50m)**



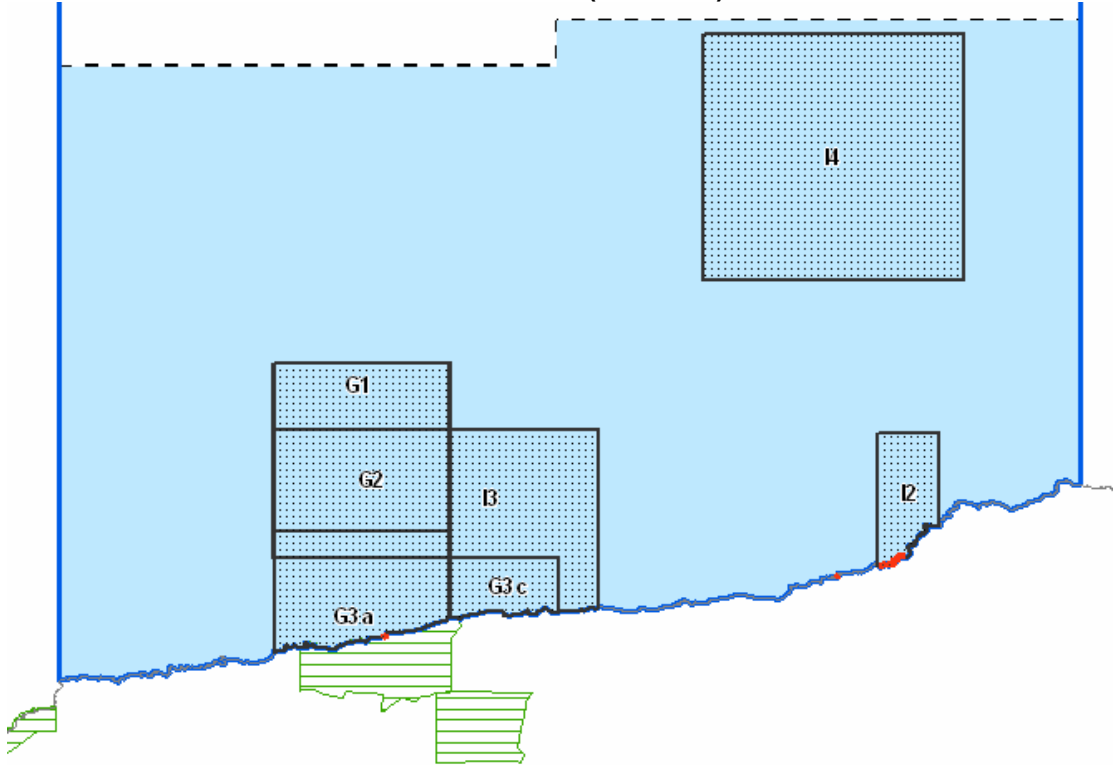
Unmapped habitat (>-50m)



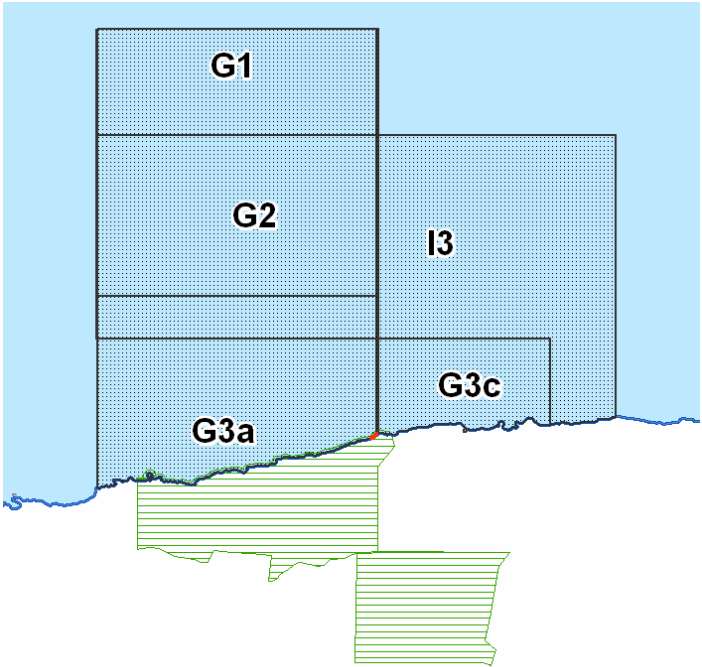
Bedrock Platform (moderate)



Boulder beach (moderate)

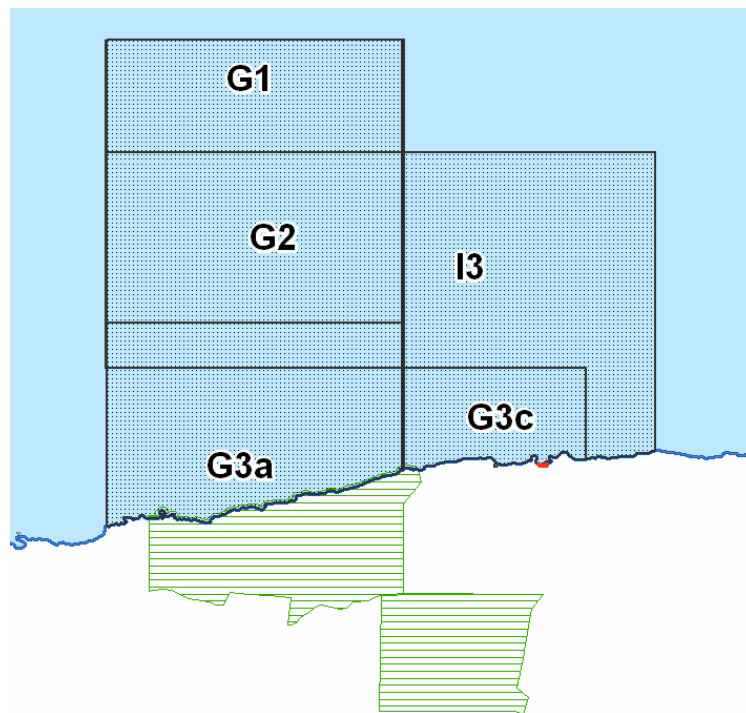


Boulder beach (sheltered)

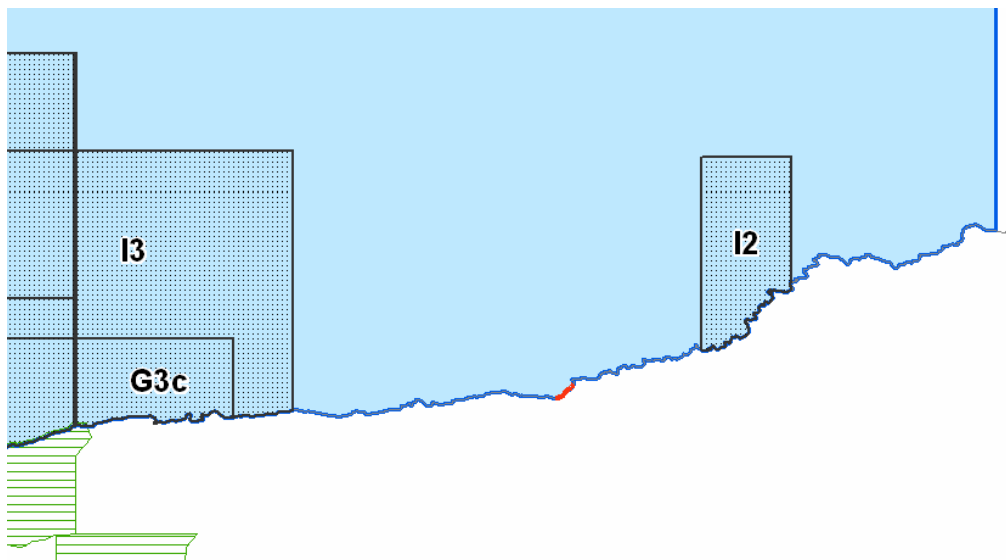




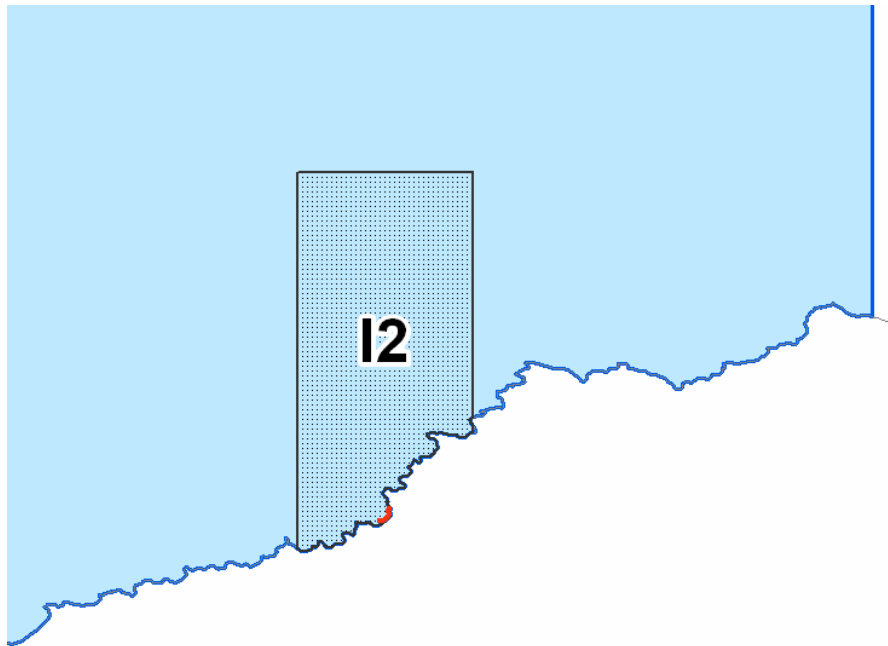
**Coarse sand beach (sheltered)**



**Fine-medium sand beach (exposed)**



**Fine-medium sand beach (exposed)**



*Mapping information:*

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