2. Seagrass Restoration Trade-offs Paper - Using PrioritizR for identifying potential areas for conservation and restoration to optimize multiple ecosystem service outcomes

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Contents

Paper Resources

Click **here** to see the latest meeting notes in the Google Doc.

Click **here** to see a tutorial on PrioritizR

Click **here** to see a tutorial about calibrating tradeoffs in PrioritizR

To Do List: - Run the set of PrioritizR configs we discussed at last meeting. i.e., run for 1 ES, 2 ES, 3 ES,. . . up to 5 to see how much area it takes to select for 5% of each of the ES considered.

Setup (i.e., loading data, setting targets etc).

Functionalizing a prioritization for 1 ES from Confirmed Beds

```
##   absolute_held summary   n total_amount                    feature
## 1     10.881945 overall  41     214.6776    NursHab_EV_Raw_Confirmed
## 2    672.472287 overall 161   13384.9536 BlueCarbon_EV_Raw_Confirmed
## 3      6.682237 overall  28     131.6349        Rec_EV_Raw_Confirmed
## 4    785.555802 overall 184   15658.4625   Exposure_EV_Raw_Confirmed
## 5    134.498116 overall 145    2676.6991      BioDiv_EV_Raw_Confirmed
```

Functionalizing a prioritization for 2 ES from Confirmed Beds

```
##    no_ES                     feature Order solution_area relative_held
## 1      2     NursHab_EV_Raw_Confirmed 1 2           162    0.05042655
## 2      2 BlueCarbon_EV_Raw_Confirmed 1 2           162    0.05055297
## 3      2     NursHab_EV_Raw_Confirmed 1 3            49    0.05101165
## 4      2         Rec_EV_Raw_Confirmed 1 3            49    0.05088522
## 5      2     NursHab_EV_Raw_Confirmed 1 4           184    0.07842457
## 6      2    Exposure_EV_Raw_Confirmed 1 4           184    0.05016813
## 7      2     NursHab_EV_Raw_Confirmed 1 5           147    0.05058348
## 8      2      BioDiv_EV_Raw_Confirmed 1 5           147    0.05044738
## 9      2 BlueCarbon_EV_Raw_Confirmed 2 3           162    0.05052843
## 10     2         Rec_EV_Raw_Confirmed 2 3           162    0.05206384
## 11     2 BlueCarbon_EV_Raw_Confirmed 2 4           192    0.05029716
## 12     2    Exposure_EV_Raw_Confirmed 2 4           192    0.05024813
## 13     2 BlueCarbon_EV_Raw_Confirmed 2 5           165    0.05029726
## 14     2      BioDiv_EV_Raw_Confirmed 2 5           165    0.05031616
## 15     2         Rec_EV_Raw_Confirmed 3 4           188    0.05016905
## 16     2    Exposure_EV_Raw_Confirmed 3 4           188    0.05017739
## 17     2         Rec_EV_Raw_Confirmed 3 5           148    0.05095827
## 18     2      BioDiv_EV_Raw_Confirmed 3 5           148    0.05042345
## 19     2    Exposure_EV_Raw_Confirmed 4 5           187    0.05026908
## 20     2      BioDiv_EV_Raw_Confirmed 4 5           187    0.05028963
```

Functionalizing a prioritization for 3 ES from Confirmed Beds

```
##    no_ES                     feature  Order solution_area relative_held
## 1      3     NursHab_EV_Raw_Confirmed 1 2 3           163    0.05074573
## 2      3 BlueCarbon_EV_Raw_Confirmed 1 2 3           163    0.05065927
## 3      3         Rec_EV_Raw_Confirmed 1 2 3           163    0.05190787
## 4      3     NursHab_EV_Raw_Confirmed 1 2 4           192    0.05857147
## 5      3 BlueCarbon_EV_Raw_Confirmed 1 2 4           192    0.05029716
## 6      3    Exposure_EV_Raw_Confirmed 1 2 4           192    0.05024813
## 7      3     NursHab_EV_Raw_Confirmed 1 2 5           165    0.05278452
## 8      3 BlueCarbon_EV_Raw_Confirmed 1 2 5           165    0.05029726
## 9      3      BioDiv_EV_Raw_Confirmed 1 2 5           165    0.05031616
## 10     3     NursHab_EV_Raw_Confirmed 1 3 4           188    0.08256601
## 11     3         Rec_EV_Raw_Confirmed 1 3 4           188    0.05016905
## 12     3    Exposure_EV_Raw_Confirmed 1 3 4           188    0.05017739
## 13     3     NursHab_EV_Raw_Confirmed 1 3 5           148    0.05065968
## 14     3         Rec_EV_Raw_Confirmed 1 3 5           148    0.05041510
## 15     3      BioDiv_EV_Raw_Confirmed 1 3 5           148    0.05038118
```

```
## 16       3    NursHab_EV_Raw_Confirmed 1 4 5          187   0.07844691
## 17       3    Exposure_EV_Raw_Confirmed 1 4 5         187   0.05026908
## 18       3     BioDiv_EV_Raw_Confirmed 1 4 5          187   0.05028963
## 19       3 BlueCarbon_EV_Raw_Confirmed 2 3 4          194   0.05014198
## 20       3        Rec_EV_Raw_Confirmed 2 3 4          194   0.05036528
## 21       3   Exposure_EV_Raw_Confirmed 2 3 4          194   0.05021619
## 22       3 BlueCarbon_EV_Raw_Confirmed 2 3 5          166   0.05044138
## 23       3        Rec_EV_Raw_Confirmed 2 3 5          166   0.05141653
## 24       3     BioDiv_EV_Raw_Confirmed 2 3 5          166   0.05047331
## 25       3 BlueCarbon_EV_Raw_Confirmed 2 4 5          192   0.05020840
## 26       3   Exposure_EV_Raw_Confirmed 2 4 5          192   0.05018812
## 27       3     BioDiv_EV_Raw_Confirmed 2 4 5          192   0.05023427
## 28       3        Rec_EV_Raw_Confirmed 3 4 5          191   0.05067055
## 29       3   Exposure_EV_Raw_Confirmed 3 4 5          191   0.05027660
## 30       3     BioDiv_EV_Raw_Confirmed 3 4 5          191   0.05030375
```

Functionalizing a prioritization for 4 ES from Confirmed Beds

```
##     no_ES                       feature   Order solution_area relative_held
## 1       4    NursHab_EV_Raw_Confirmed 1 2 3 4          194   0.06564523
## 2       4 BlueCarbon_EV_Raw_Confirmed 1 2 3 4          194   0.05014198
## 3       4        Rec_EV_Raw_Confirmed 1 2 3 4          194   0.05036528
## 4       4   Exposure_EV_Raw_Confirmed 1 2 3 4          194   0.05021619
## 5       4    NursHab_EV_Raw_Confirmed 1 2 3 5          166   0.06141540
## 6       4 BlueCarbon_EV_Raw_Confirmed 1 2 3 5          166   0.05044138
## 7       4        Rec_EV_Raw_Confirmed 1 2 3 5          166   0.05141653
## 8       4     BioDiv_EV_Raw_Confirmed 1 2 3 5          166   0.05047331
## 9       4    NursHab_EV_Raw_Confirmed 1 2 4 5          192   0.06589930
## 10      4 BlueCarbon_EV_Raw_Confirmed 1 2 4 5          192   0.05020840
## 11      4   Exposure_EV_Raw_Confirmed 1 2 4 5          192   0.05018812
## 12      4     BioDiv_EV_Raw_Confirmed 1 2 4 5          192   0.05023427
## 13      4    NursHab_EV_Raw_Confirmed 1 3 4 5          191   0.08183486
## 14      4        Rec_EV_Raw_Confirmed 1 3 4 5          191   0.05067055
## 15      4   Exposure_EV_Raw_Confirmed 1 3 4 5          191   0.05027660
## 16      4     BioDiv_EV_Raw_Confirmed 1 3 4 5          191   0.05030375
## 17      4 BlueCarbon_EV_Raw_Confirmed 2 3 4 5          196   0.05062805
## 18      4        Rec_EV_Raw_Confirmed 2 3 4 5          196   0.05154196
## 19      4   Exposure_EV_Raw_Confirmed 2 3 4 5          196   0.05055248
## 20      4     BioDiv_EV_Raw_Confirmed 2 3 4 5          196   0.05054859
```

Functionalizing a prioritization for 5 ES from Confirmed Beds

```
##   no_ES                         feature   Order solution_area relative_held
## 1     5    NursHab_EV_Raw_Confirmed 1 2 3 4 5        196   0.07636112
## 2     5 BlueCarbon_EV_Raw_Confirmed 1 2 3 4 5        196   0.05062805
## 3     5        Rec_EV_Raw_Confirmed 1 2 3 4 5        196   0.05154196
## 4     5   Exposure_EV_Raw_Confirmed 1 2 3 4 5        196   0.05055248
## 5     5     BioDiv_EV_Raw_Confirmed 1 2 3 4 5        196   0.05054859
```

Plotting out the number of services vs solution area