Patterns in Oyster Shell Biomass in Suwannee Sound

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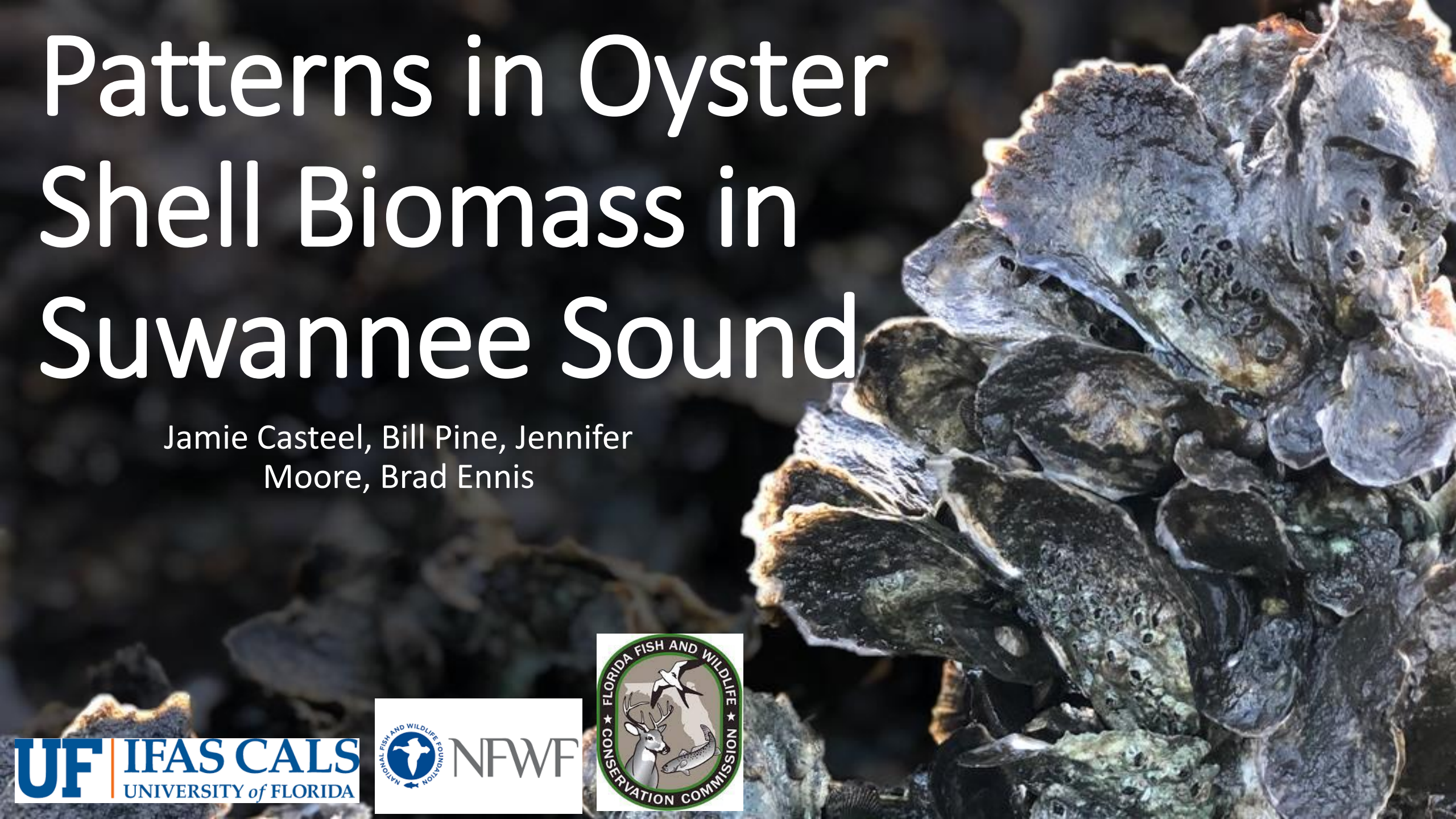

Key research need

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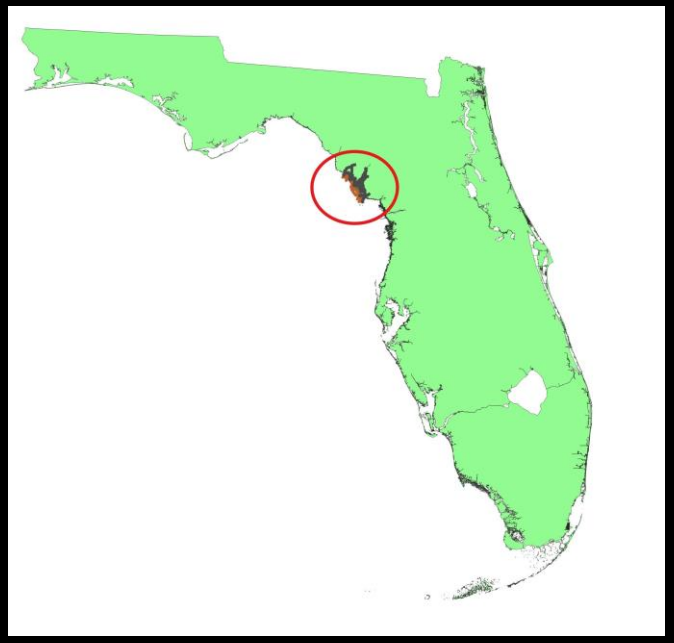
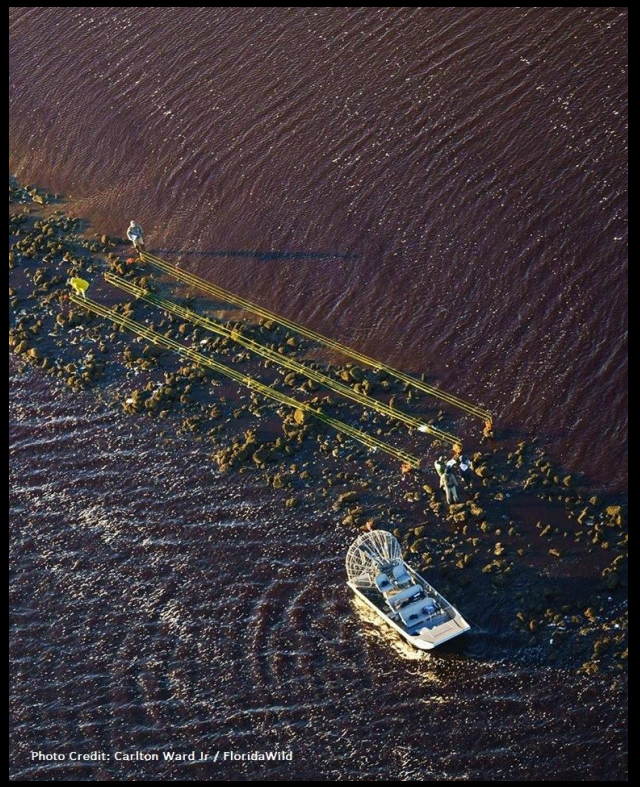
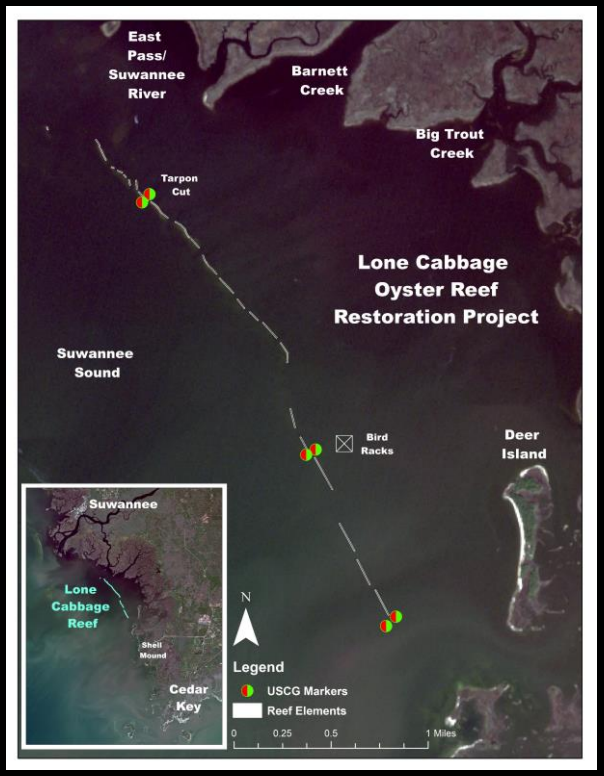
- Common restoration need to add cultch
- Restoration efforts in Apalachicola, Pensacola, St. Andrews, and Suwannee Sound
- Assume cultch biomass and oyster populations health are related
- Limited information on these relationships for wild oyster populations

Study Area

- Suwannee Sound, FL
- Lone Cabbage Reef
- One of the largest oyster restoration projects in Florida
- ~5 km in length ~12,233 m^3 of material
- Since 2015 Suwannee Sound had the largest number of trips in Florida
- Intertidal reefs

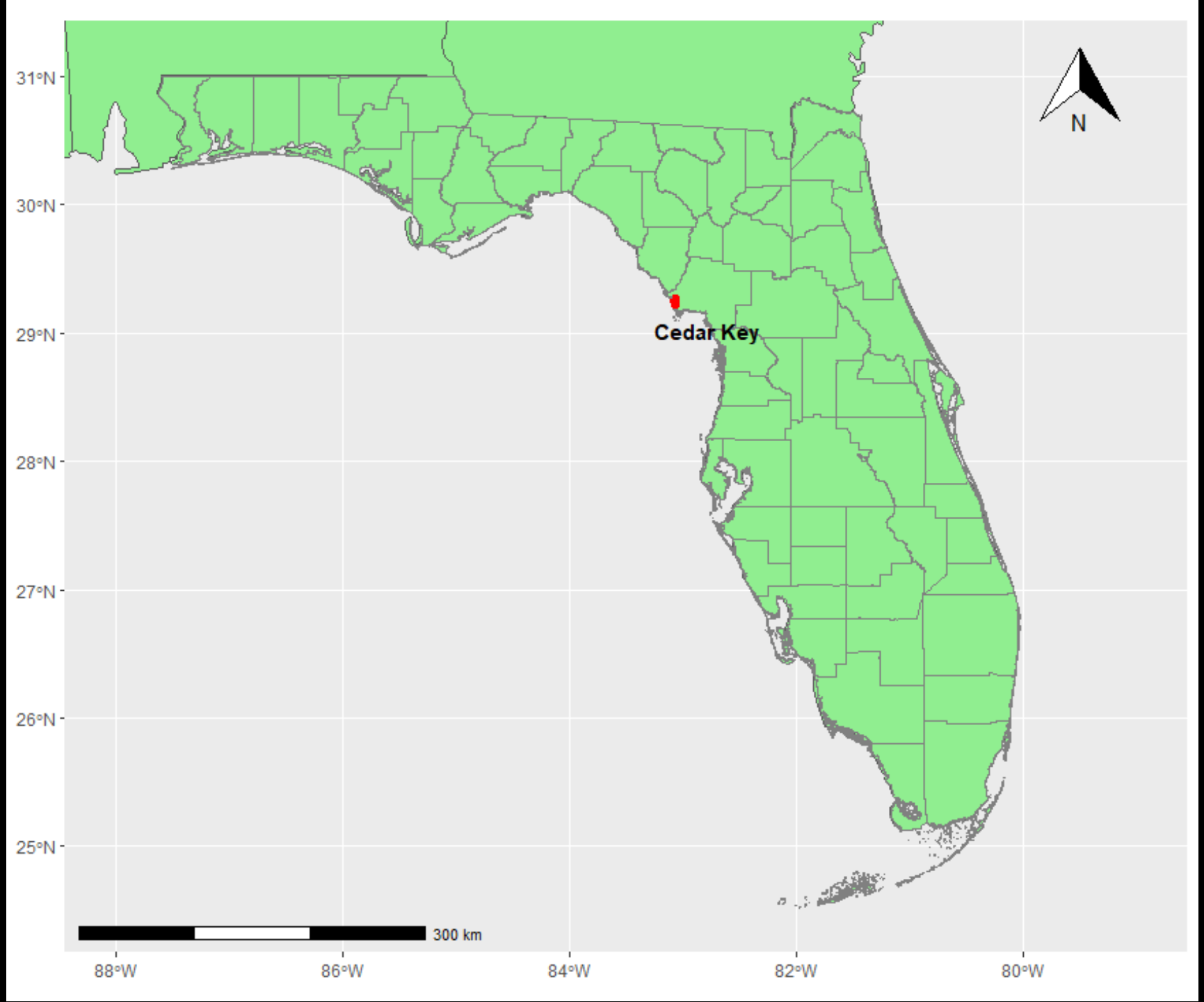


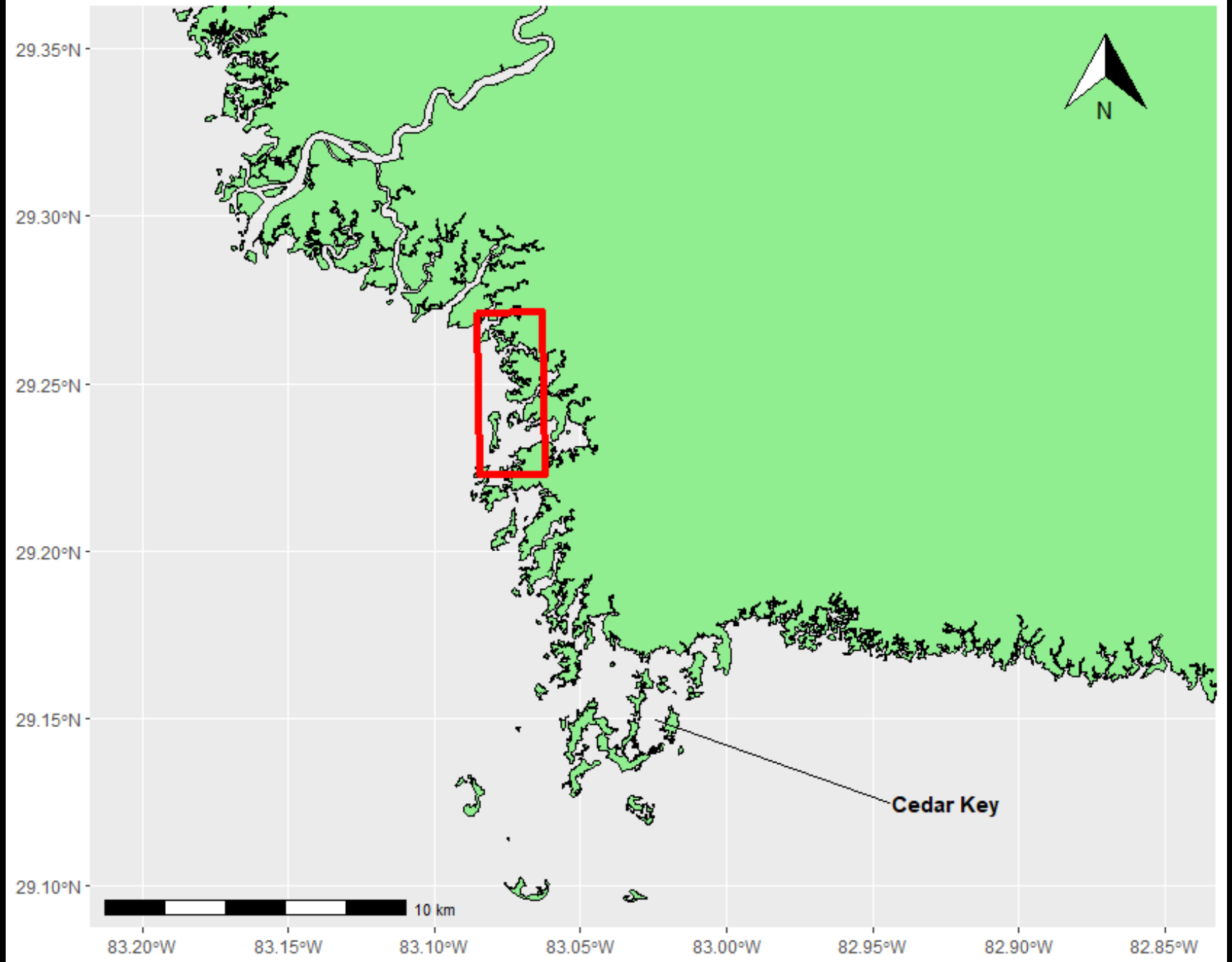


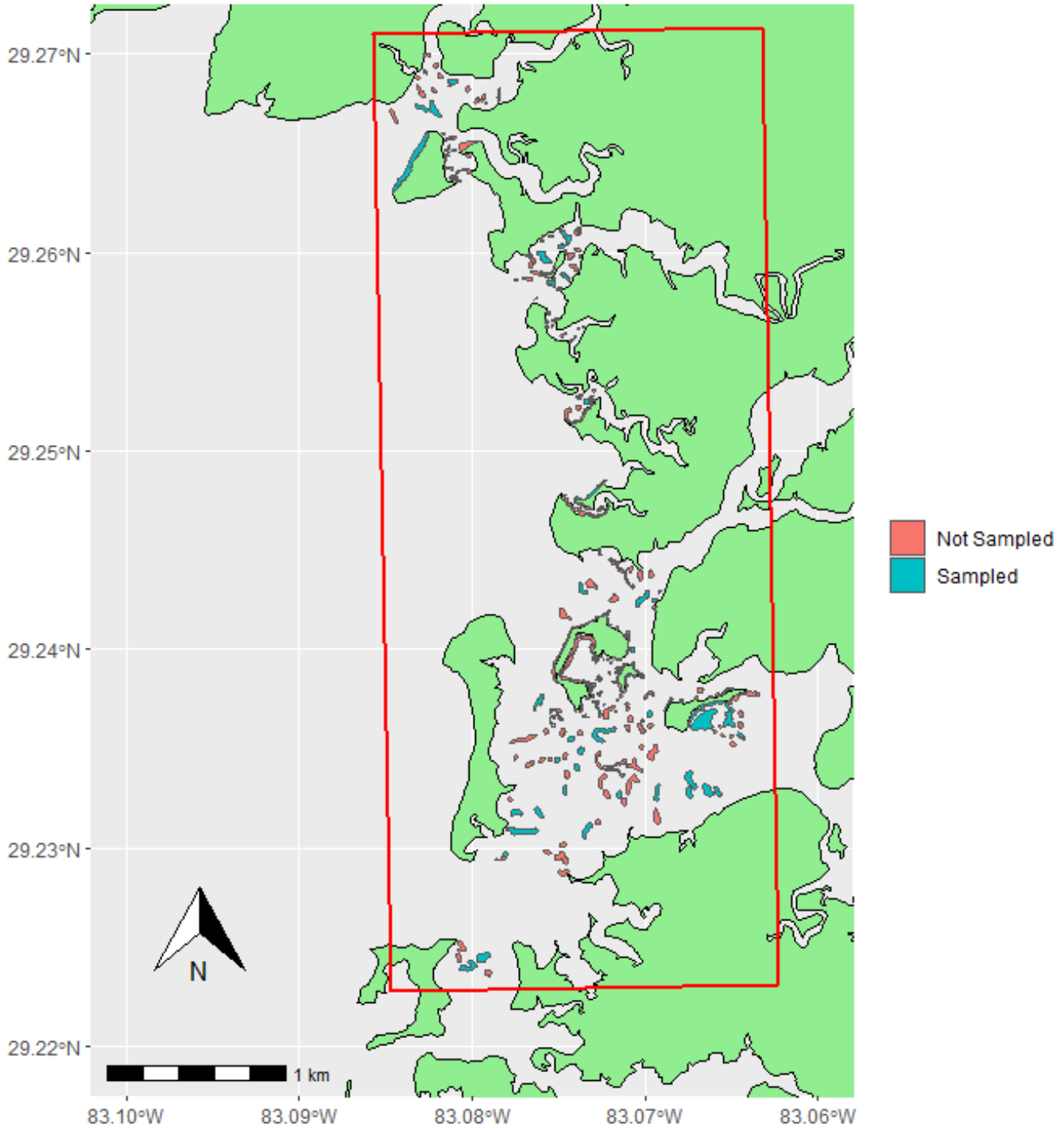


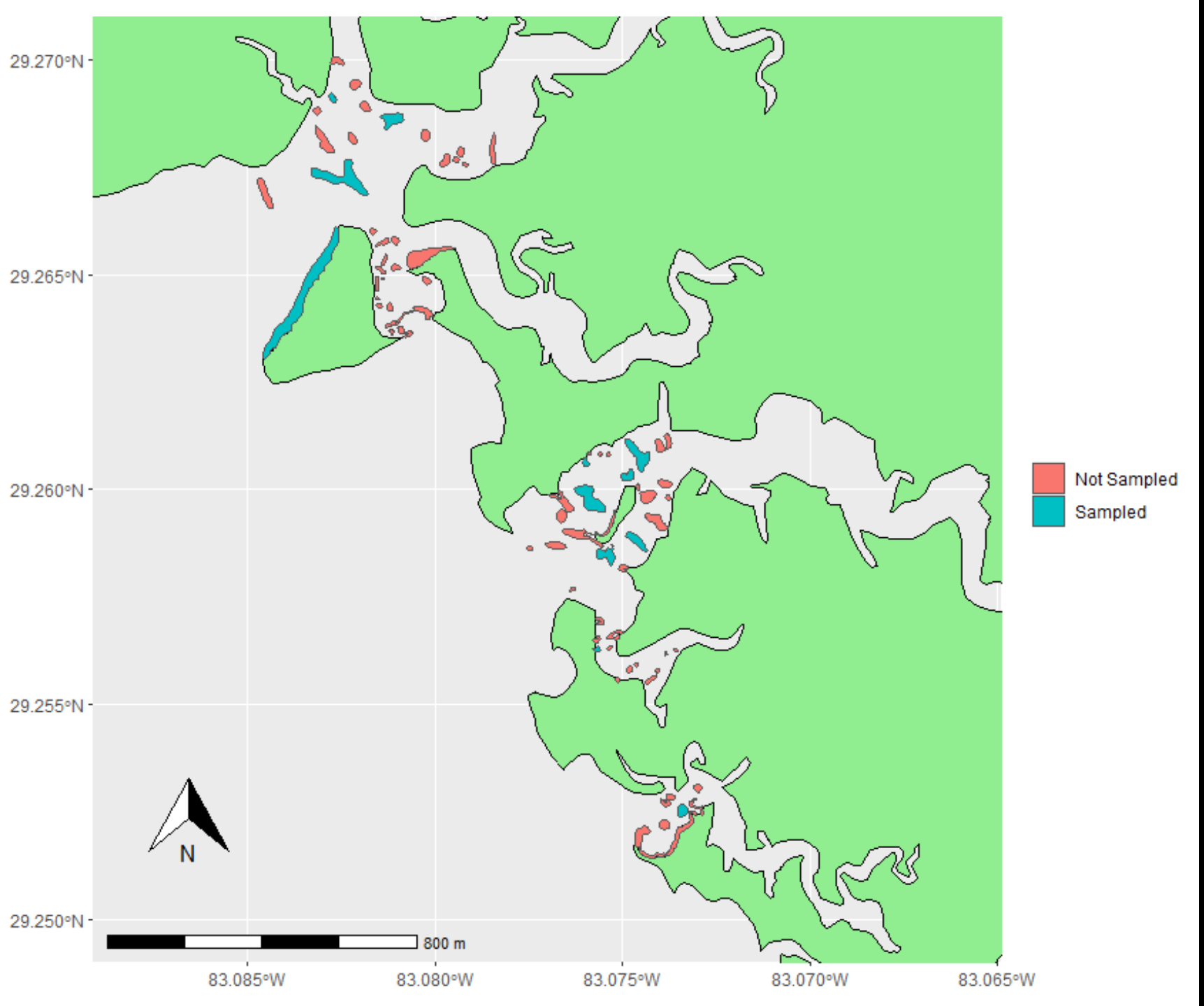
Is there sufficient oyster shell biomass?

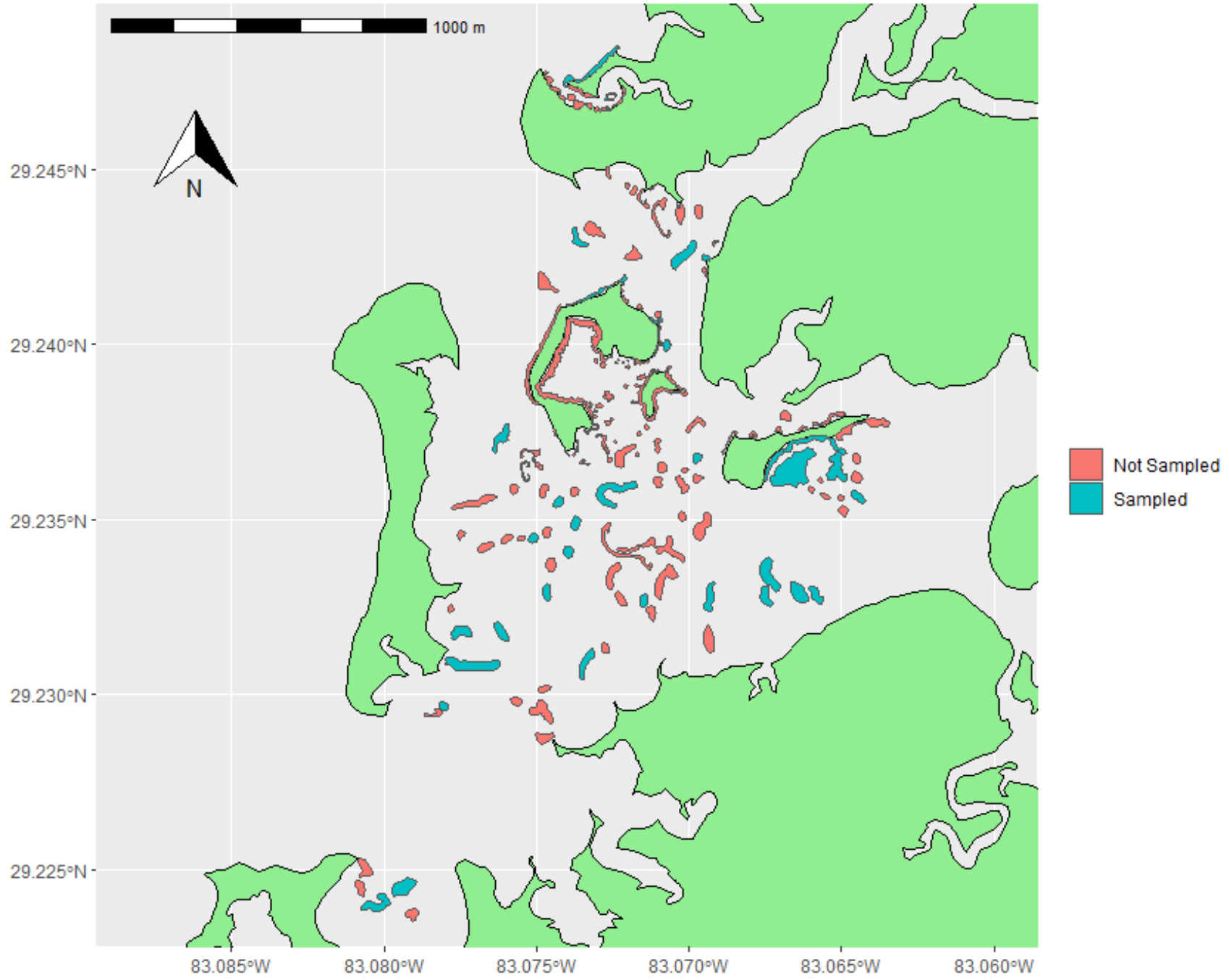
- Relationships between live oyster density and shell biomass
  - Intertidal reefs Areas open and closed to harvest
  - Potentially have high density of small size oysters
  - Common reef type in Suwannee Sound
  - Adjacent to subtidal bars that do support harvest
- Methods
  - Live density from ongoing line-transect monitoring
  - Grub box for shell biomass estimation – standard area of excavation

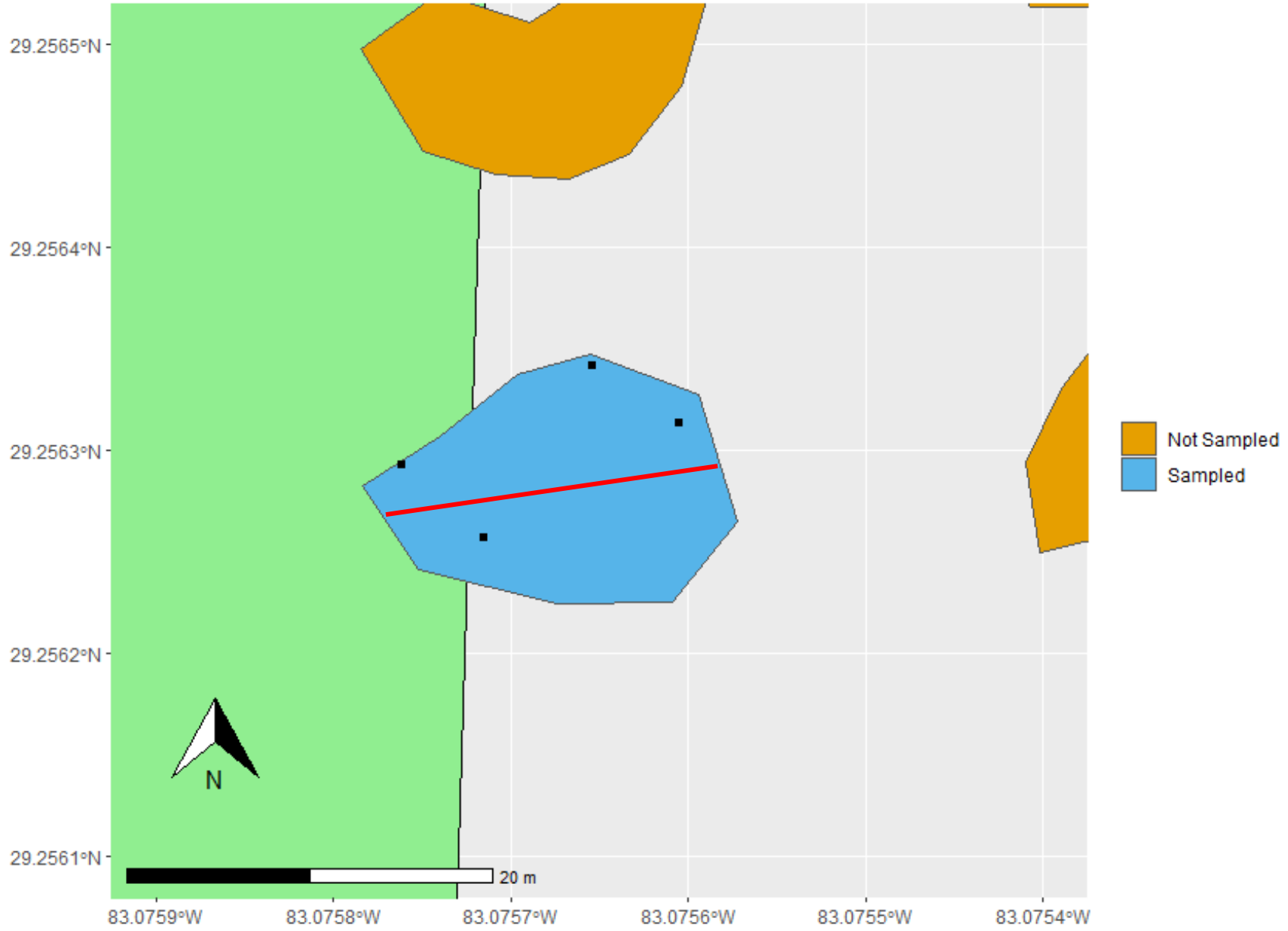

31°N
30°N
29°N
28°N
27°N
26°N
25°N
88°W
86°W
84°W
82°W
80°W
Cedar Key
N
300 km


29.35°N
29.30°N
29.25°N
29.20°N
29.15°N
29.10°N
N
Cedar Key
10 km
83.20°W
83.15°W
83.10°W
83.05°W
83.00°W
82.95°W
82.90°W
82.85°W


29.27°N
29.26°N
29.25°N
29.24°N
29.23°N
29.22°N
83.10°W
83.09°W
83.08°W
83.07°W
83.06°W
N
1 km
Not Sampled
Sampled


29.270°N
29.265°N
29.260°N
29.255°N
29.250°N
83.085°W
83.080°W
83.075°W
83.070°W
83.065°W
N
800 m
Not Sampled
Sampled

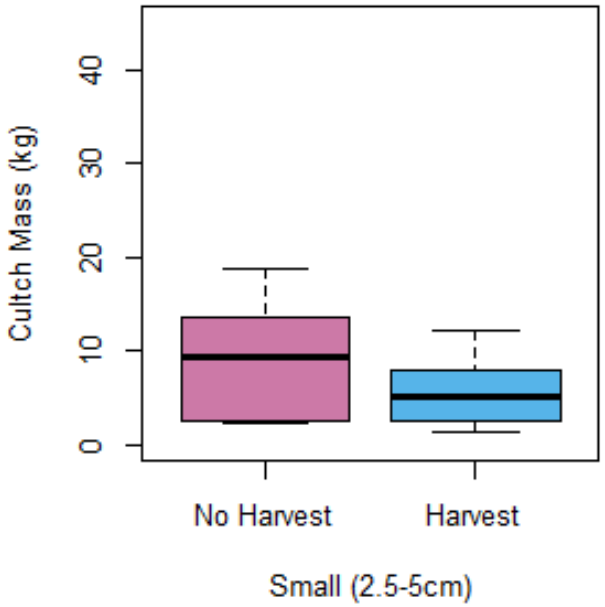

1000 m
N
29.245°N
29.240°N
29.235°N
29.230°N
29.225°N
83.085°W
83.080°W
83.075°W
83.070°W
83.065°W
83.060°W
Not Sampled
Sampled

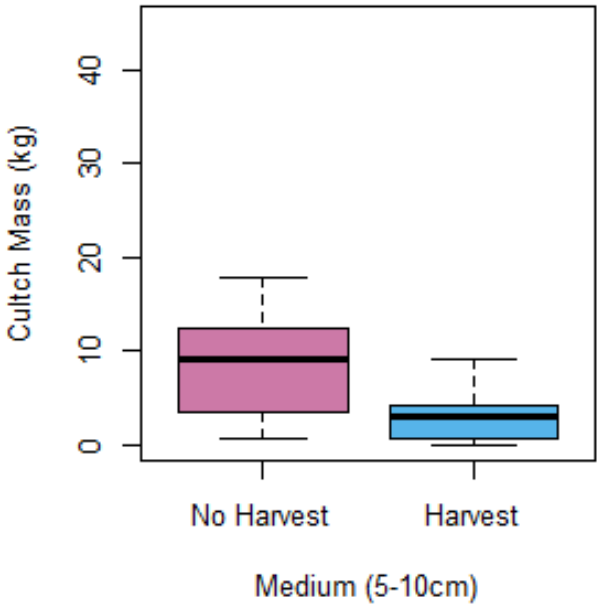

29.2565°N
29.2564°N
29.2563°N
29.2562°N
29.2561°N
83.0759°W
83.0758°W
83.0757°W
83.0756°W
83.0755°W
83.0754°W
N
20 m
Not Sampled
Sampled

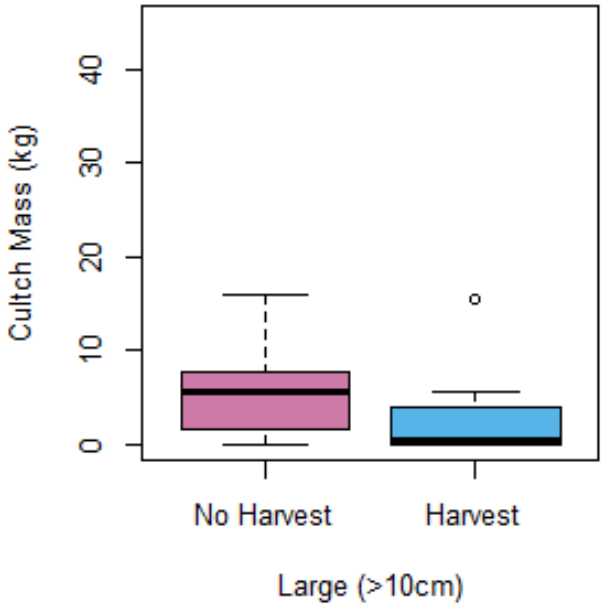
Analyses

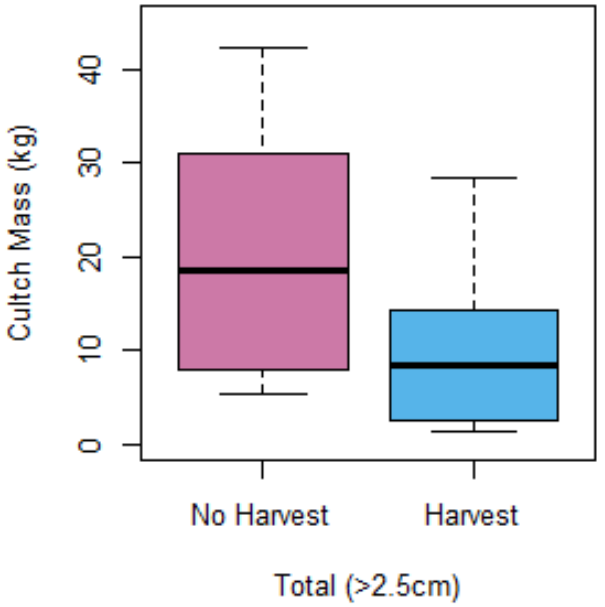
- Stock-Recruitment Models
- Relationships between shell biomass and oyster density
- Stock-recruitment relationship for oysters
  - Beverton-Holt curve

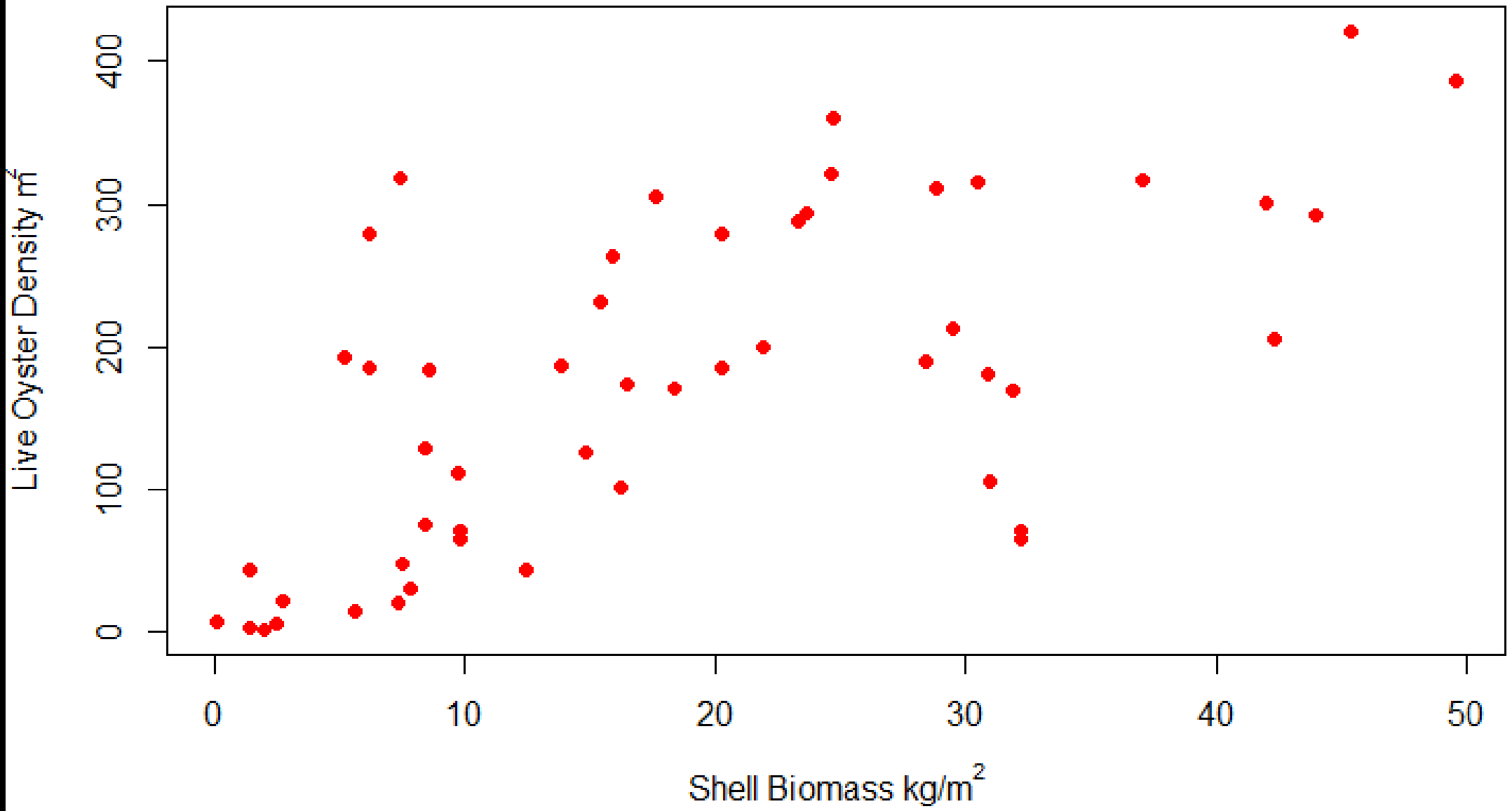
Results

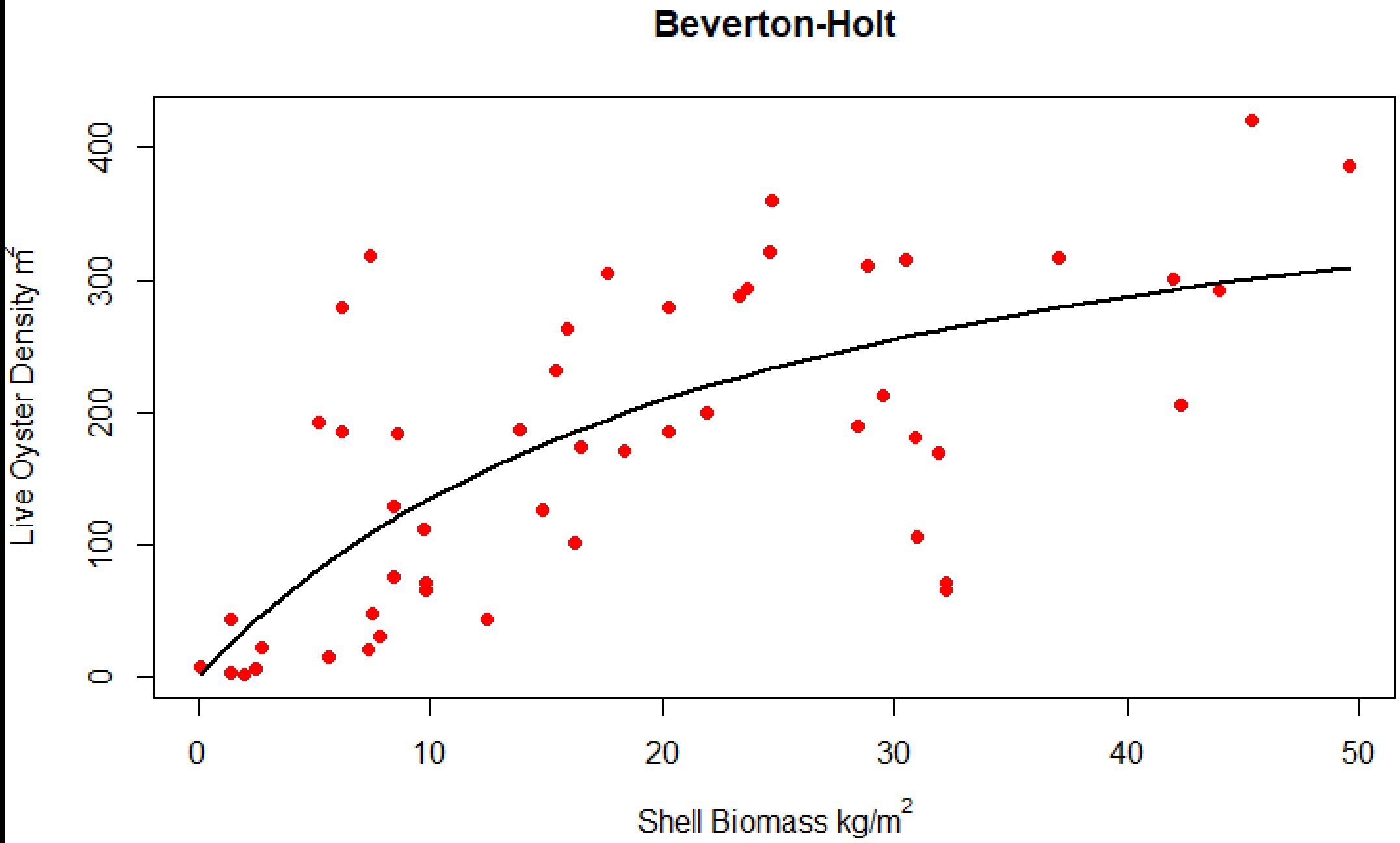

Cultch Mass (kg)
0
10
20
30
40
No Harvest
Harvest
Small (2.5-5cm)

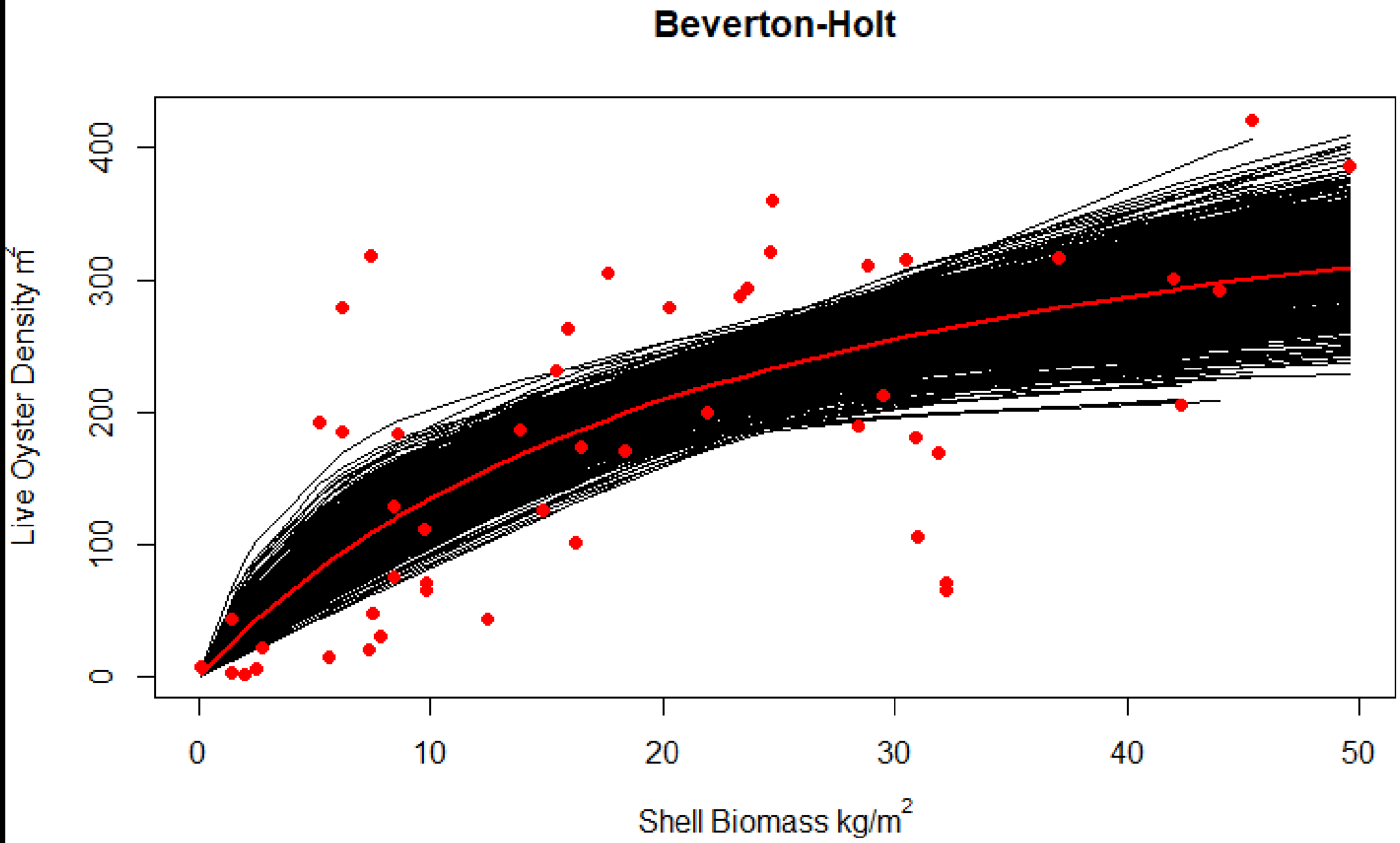

Cultch Mass (kg)
0
10
20
30
40
No Harvest
Harvest
Medium (5-10cm)


Cultch Mass (kg)
0
10
20
30
40
No Harvest
Harvest
Large (>10cm)


Cultch Mass (kg)
0
10
20
30
40
No Harvest
Harvest
Total (>2.5cm)


Live Oyster Density m²
0
100
200
300
400
0
10
20
30
40
50
Shell Biomass kg/m²


Beverton-Holt
Live Oyster Density m²
0
100
200
300
400
0
10
20
30
40
50
Shell Biomass kg/m²


Beverton-Holt
Live Oyster Density m²
0
100
200
300
400
0
10
20
30
40
50
Shell Biomass kg/m²

Key Results

- Positive relationships
- Possible inflection points
- Inform management and restoration

Conclusions

- Management focused on removals of live oysters
- Restoration focused on replacing cultch material
- Better manage live oysters to create cultch
- Inform management and restoration

Acknowledgements

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