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The Intended and Unintended Effects of Fishing on Deep Sea Fish

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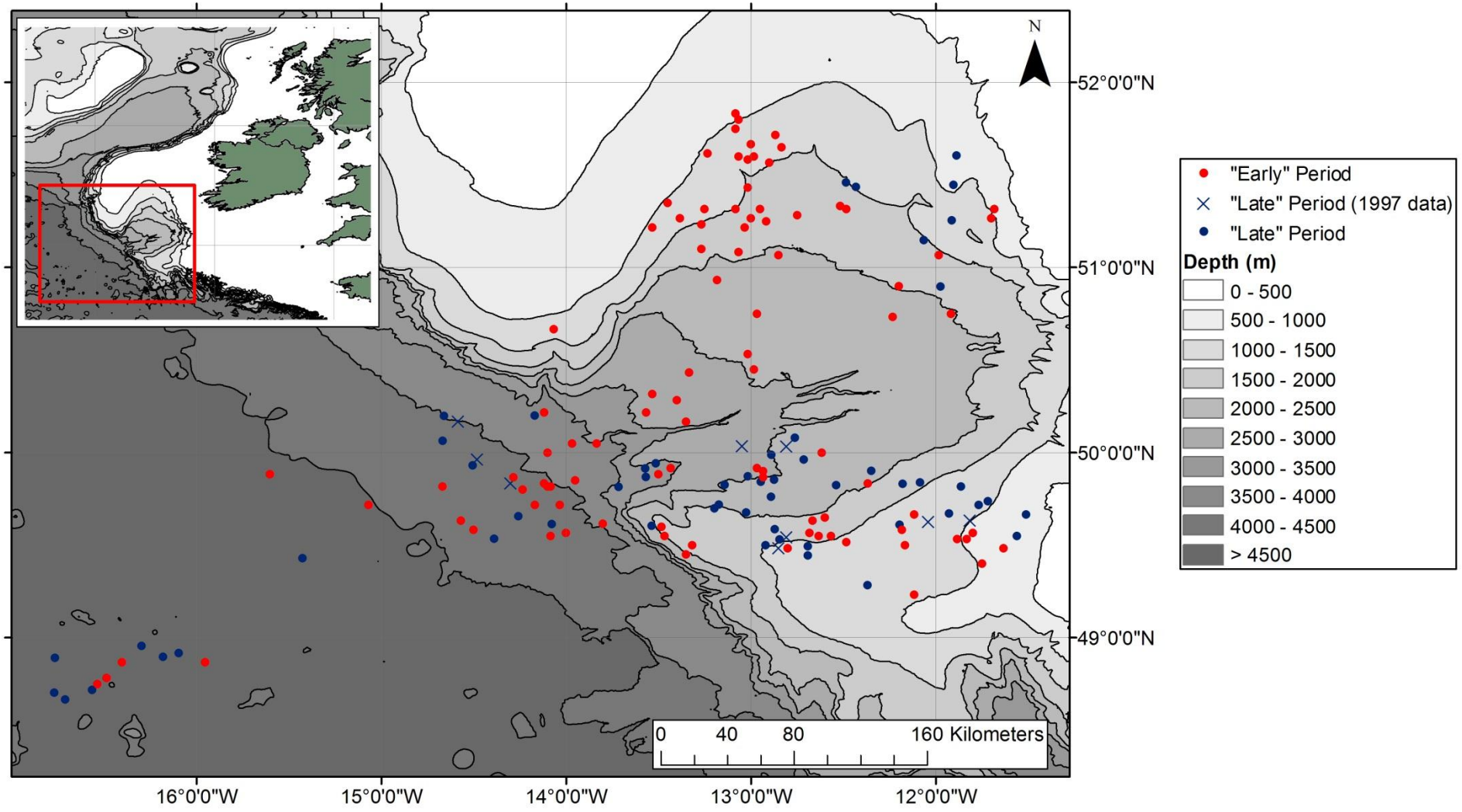
Deep sea fish

- Diverse
- Sometimes extremely long lived
- Very low survival if brought to surface
- Difficult and expensive to study
- Very few long term, fishery-independent surveys
- Less well understood than shallow species

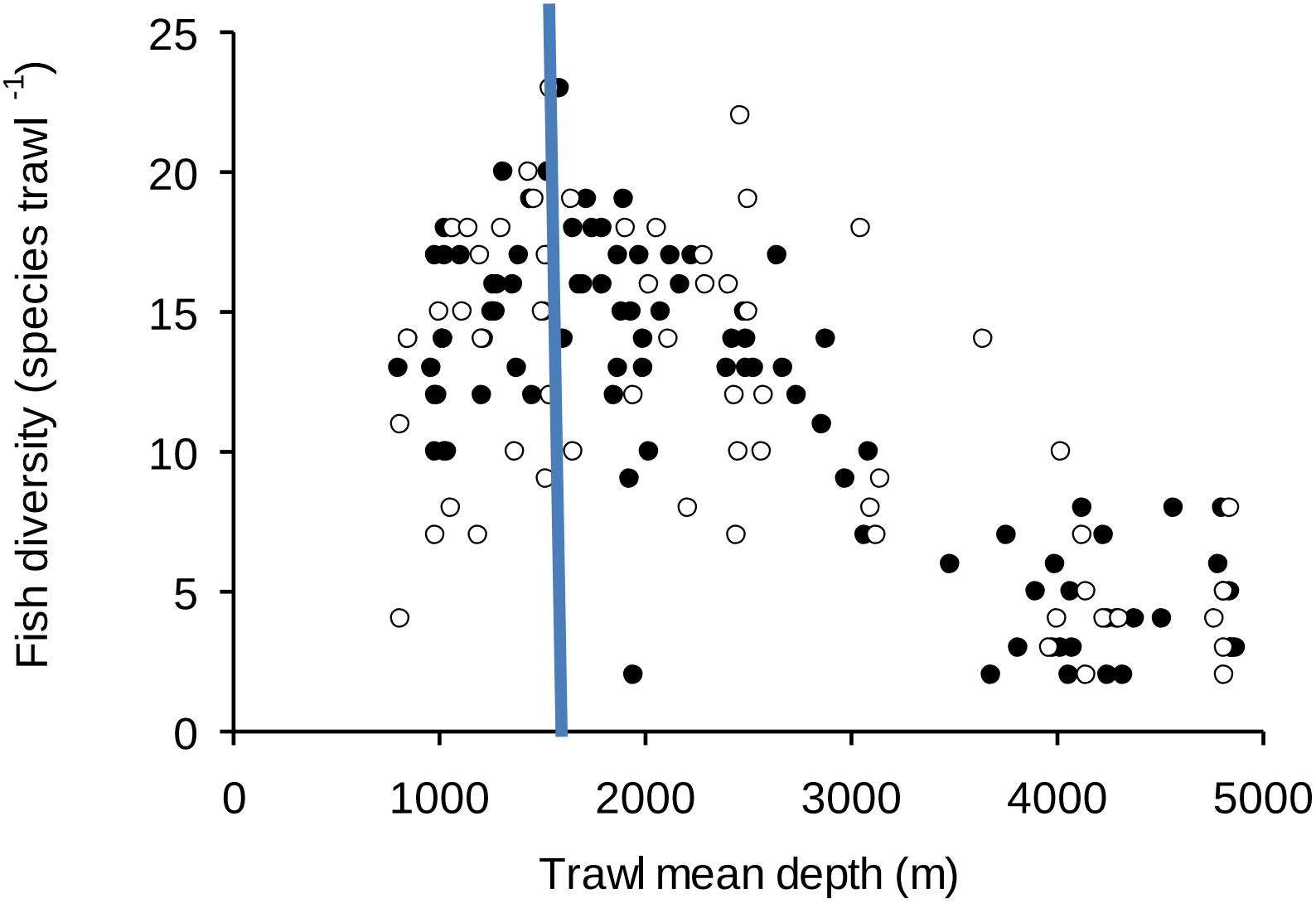
Case study


N
52°0'0"N
51°0'0"N
50°0'0"N
49°0'0"N
16°0'0"W
15°0'0"W
14°0'0"W
13°0'0"W
12°0'0"W
0 40 80 160 Kilometers
"Early" Period
"Late" Period (1997 data)
"Late" Period
Depth (m)
0 - 500
500 - 1000
1000 - 1500
1500 - 2000
2000 - 2500
2500 - 3000
3000 - 3500
3500 - 4000
4000 - 4500
> 4500

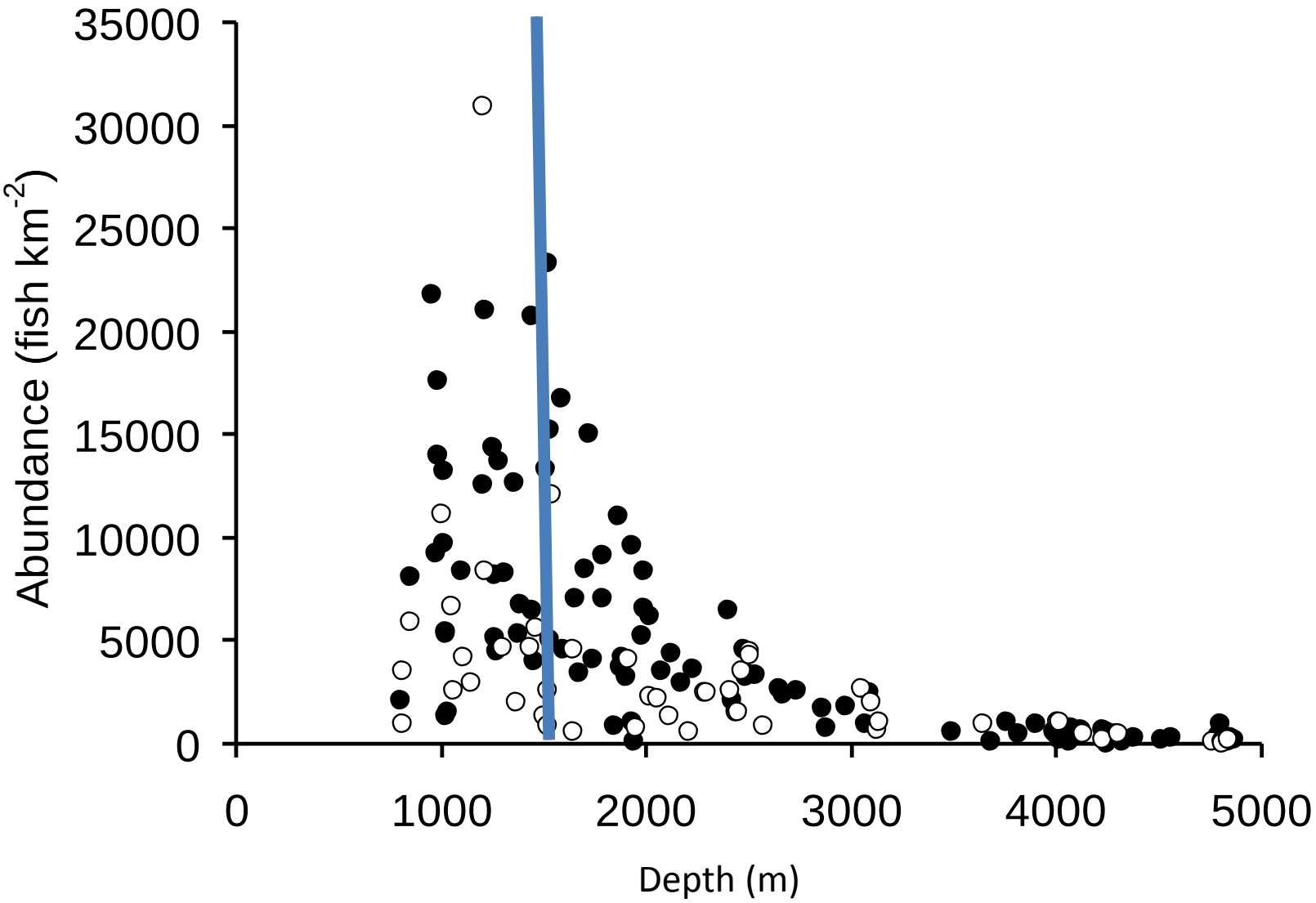
Trawling


EXHAUST
VENT

Species richness



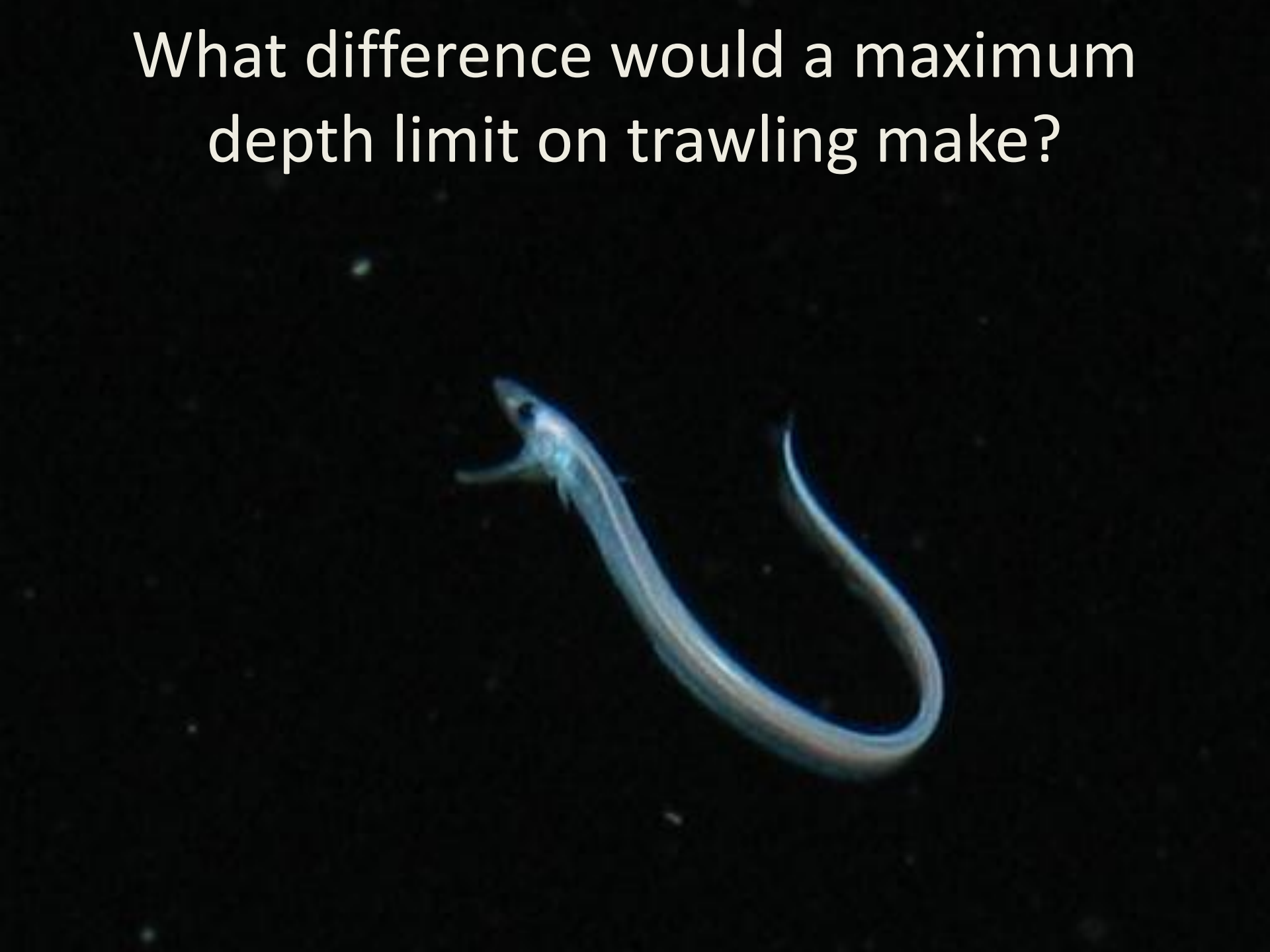
Abundance


35000
30000
25000
20000
15000
10000
5000
0
Abundance (fish km-2)
0
1000
2000
3000
4000
5000
Depth (m)

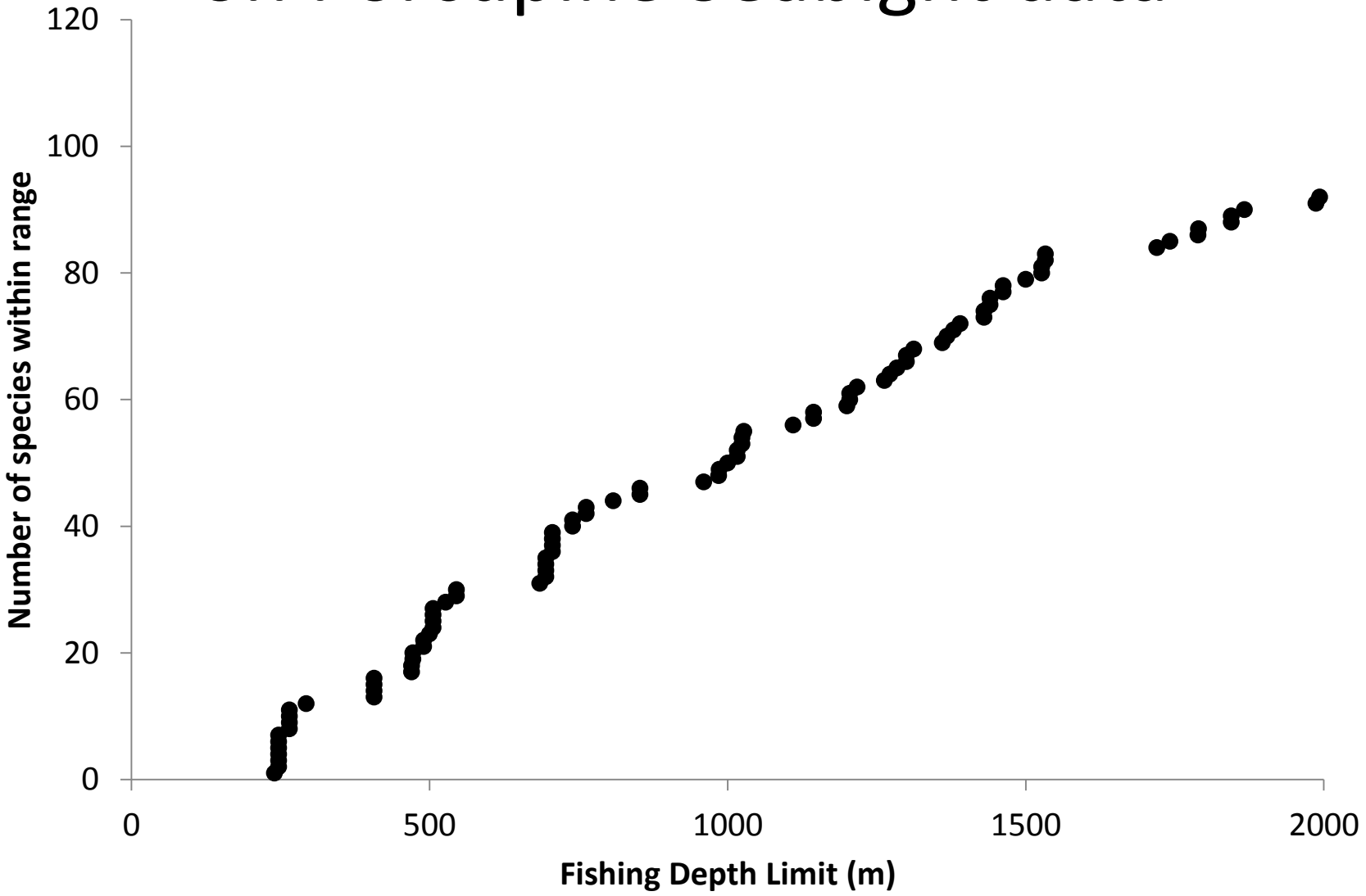
What we found

- Declines occur in the majority of species, regardless of whether they are targets of the fishery
- Any fish whose range falls <1500 m can be affected
- Removal at <1500 m reduces their abundance across their whole range
- As a result the fishery impact extends to c2500 m
- No change in species/trawl but significant change in assemblage structure (relative proportions of species)

What difference would a maximum depth limit on trawling make?



Fish species exposed to fishing based on Porcupine Seabight data



Conclusions

- The study of deep sea environments is difficult and expensive
- Fishing **adversely affects deep water fish** assemblages
  - Abundances of individual **non-target species**
  - Overall **structure** of the fish assemblage
- Unless provably the result of sustainable use such large changes will not be compatible with our **legal obligations** under the Marine Strategy Framework Directive
- Limiting maximum trawling depth to 600 m would take **50 fish species** out of the reach of trawling. **A conservation gain of this size would be enormously expensive in other ecosystems**

Thank you

- NERC
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