

SUSTAINABLE
SEAS

Ko ngā moana
whakauka

Mapping Ecosystem Services and Assessing Impacts

Drew Lohrer and Mike Townsend, et al.

Biogenic Habitat Structure — Provision of Refuge Habitat for Juvenile Fish and Invertebrates



Vertical 3-D relief

- Hiding places
- Settlement sites
- Increased populations of **scallops, snapper**

Disturbance

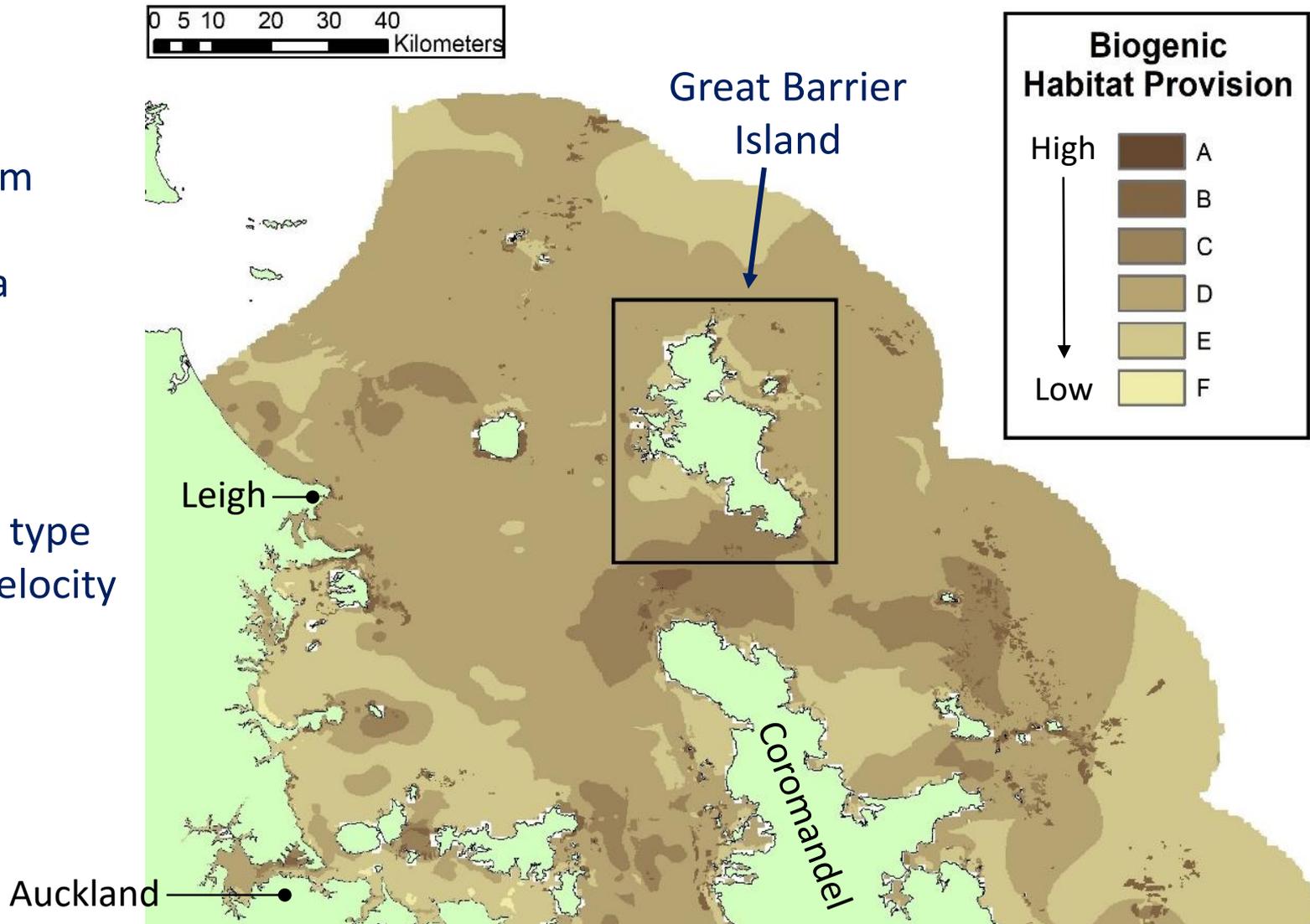
- Bottom trawling
- Sediment Loading
- etc.

Biogenic Habitat Provision (Refuge Habitat ES) predicted using an Ecosystem Principles Approach

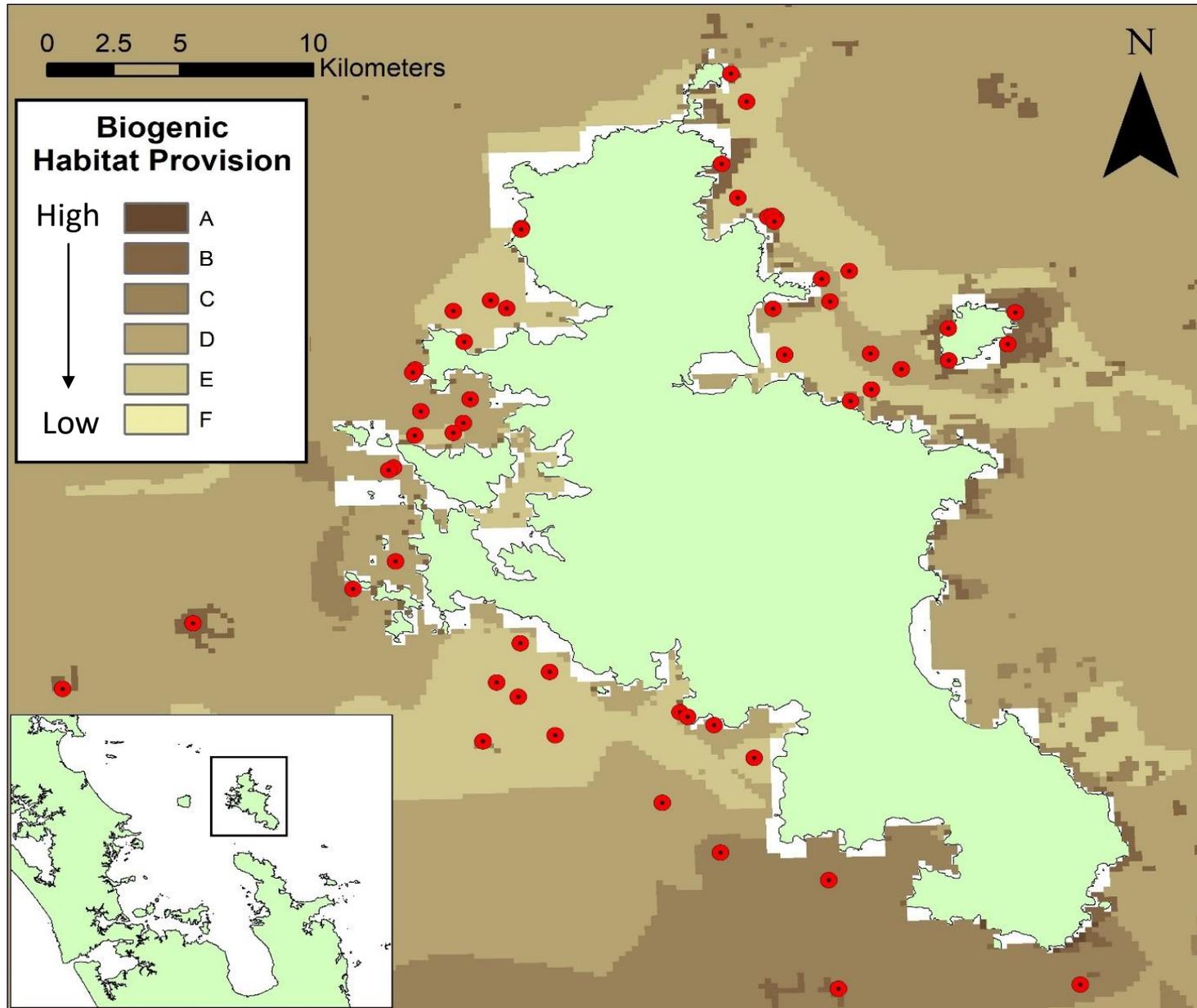
Resolution
200 m x 200 m

Mapped area
14,000 km²

- Depth
- Substrate type
- Current velocity
- Turbidity

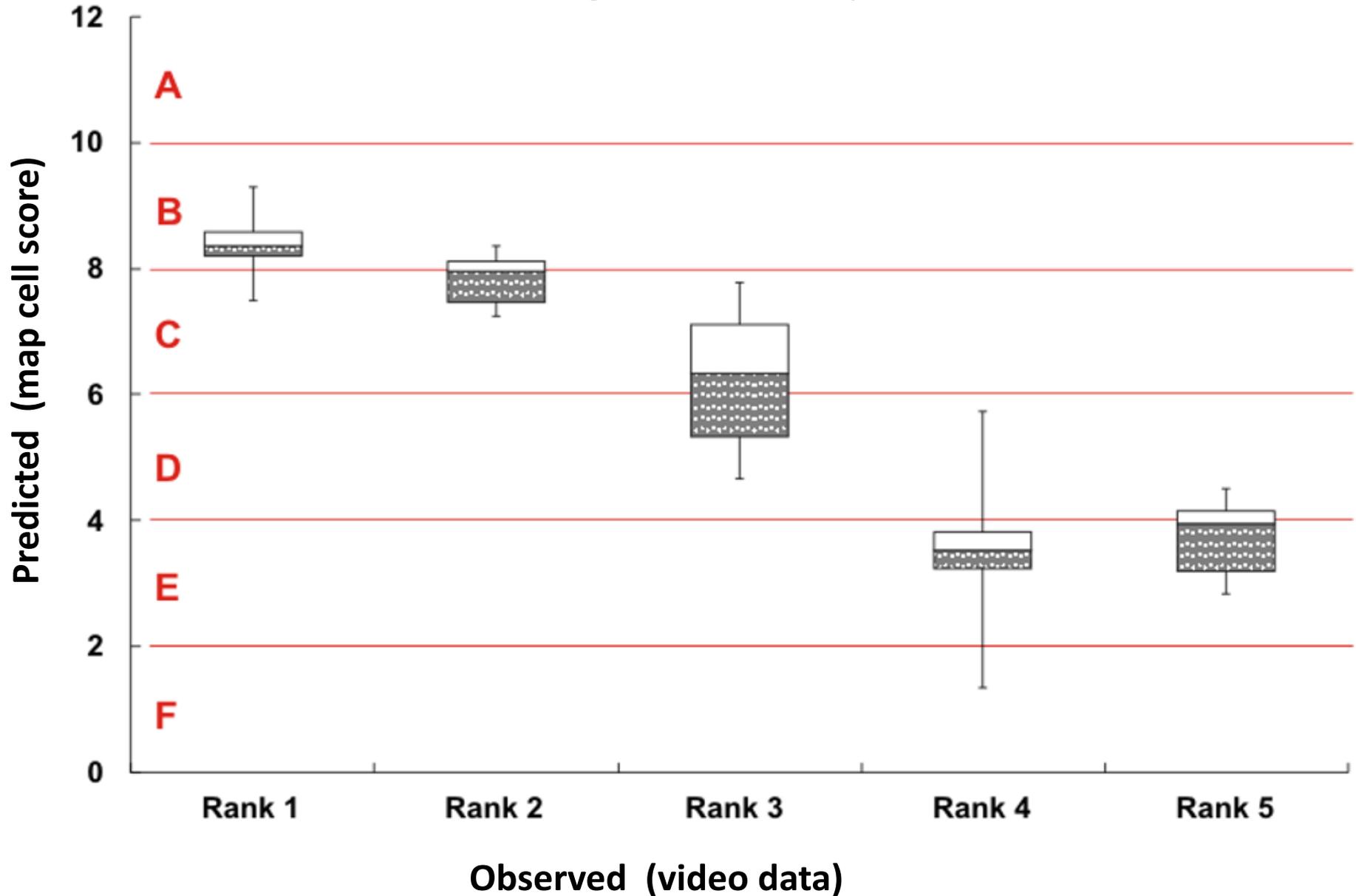


Map Validation — Great Barrier Island (low disturbance)



Empirical observations \approx Mapped predictions

- Method of Refuge Habitat ES prediction robust



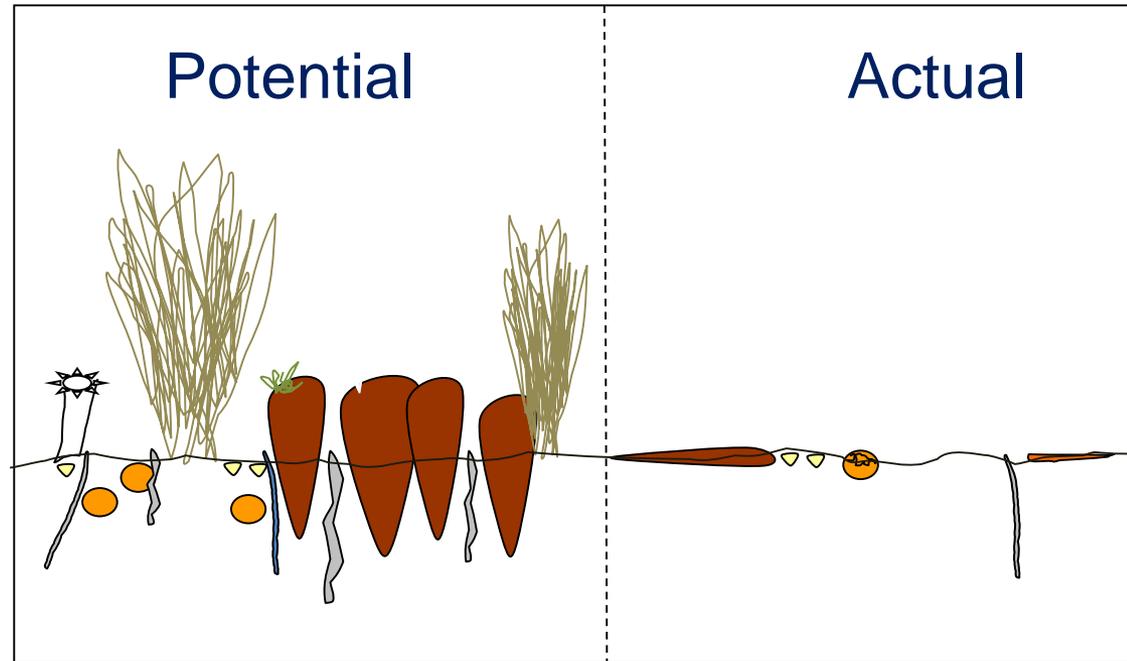
Why observations and predictions differ

- The area studied is not free from disturbance
e.g., bottom trawling, sediment loading, etc.

Maps show 'potential' whereas video observations are 'actual'



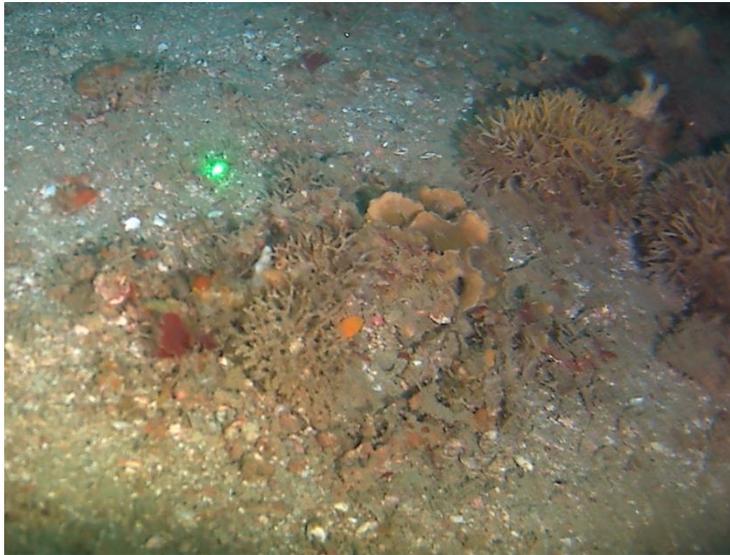
The way it once was...
(*without disturbance*)



One reason why observations and predictions differ

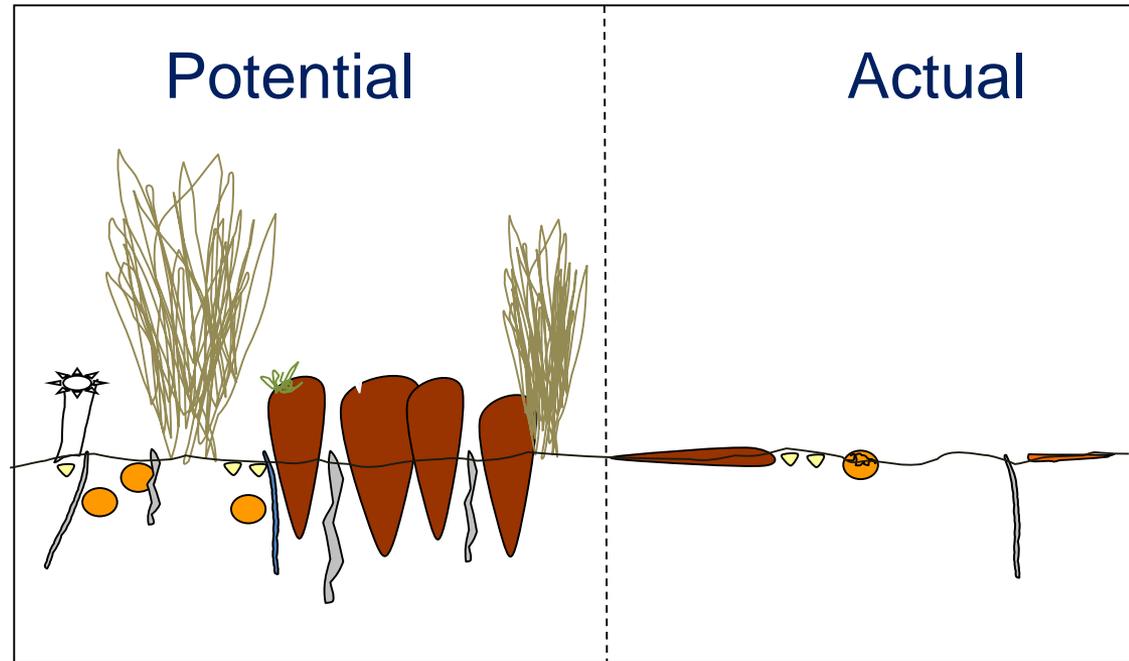
- The area studied is not free from disturbance
e.g., bottom trawling, sediment loading, etc.

Maps show ‘potential’ whereas video observations are ‘actual’



The way it could be again...

(with recovery)



Acknowledgments

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- Simon Thrush, Carolyn Lundquist, Judi Hewitt, Megan Carbines, Malene Felsing, Sanjay Wadhwa
- MEPS (2011) 434: 291
- Auckland Council TR (2012)
- Ecosystem Services (2014) 8: 44
- Frontiers in Marine Science (In review)



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