

Investigating the environmental and procedural effects of *Ecklonia radiata* seeded on “Green Gravel” in North-Eastern New Zealand



Presented by Ella Lis

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An underwater photograph showing a school of blue fish swimming through a dense forest of brown kelp. The scene is dimly lit, with light filtering through the water. The fish are of various sizes and are swimming in different directions. The kelp has long, narrow, brown leaves that create a textured background.

We are losing
important kelp habitats
at an alarming rate!

The primary causes:

- Overharvesting keystone species
 - Pollution
- Coastal development
- A changing climate



Influence
water flow
and
sediment
settlement

Nursery
and
feeding
grounds

3D
structure
and
shelter

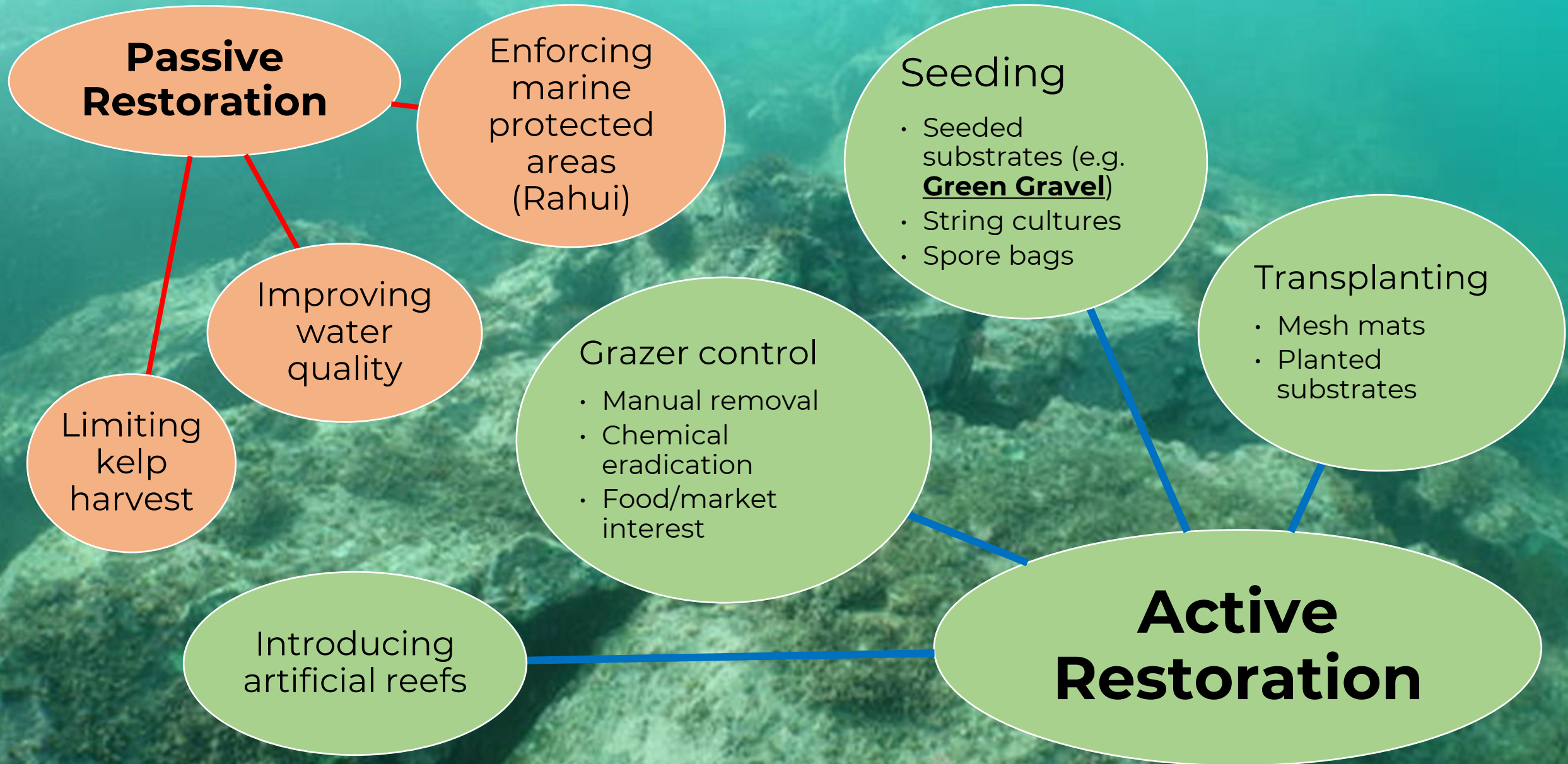
The importance of kelp forests

Carbon
Sink

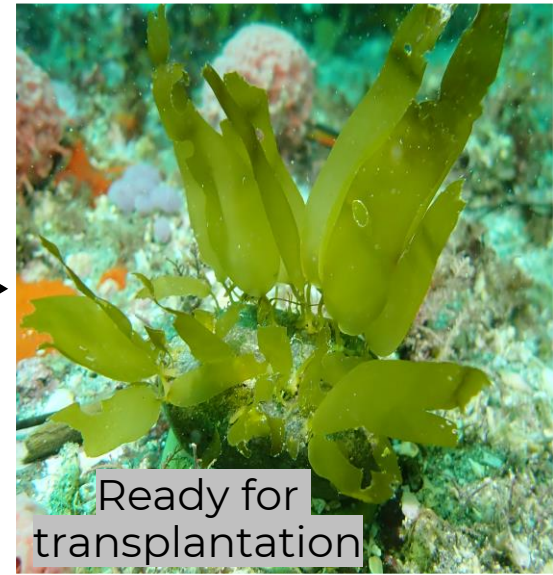
HOME for
many
organisms

Coastal
protection

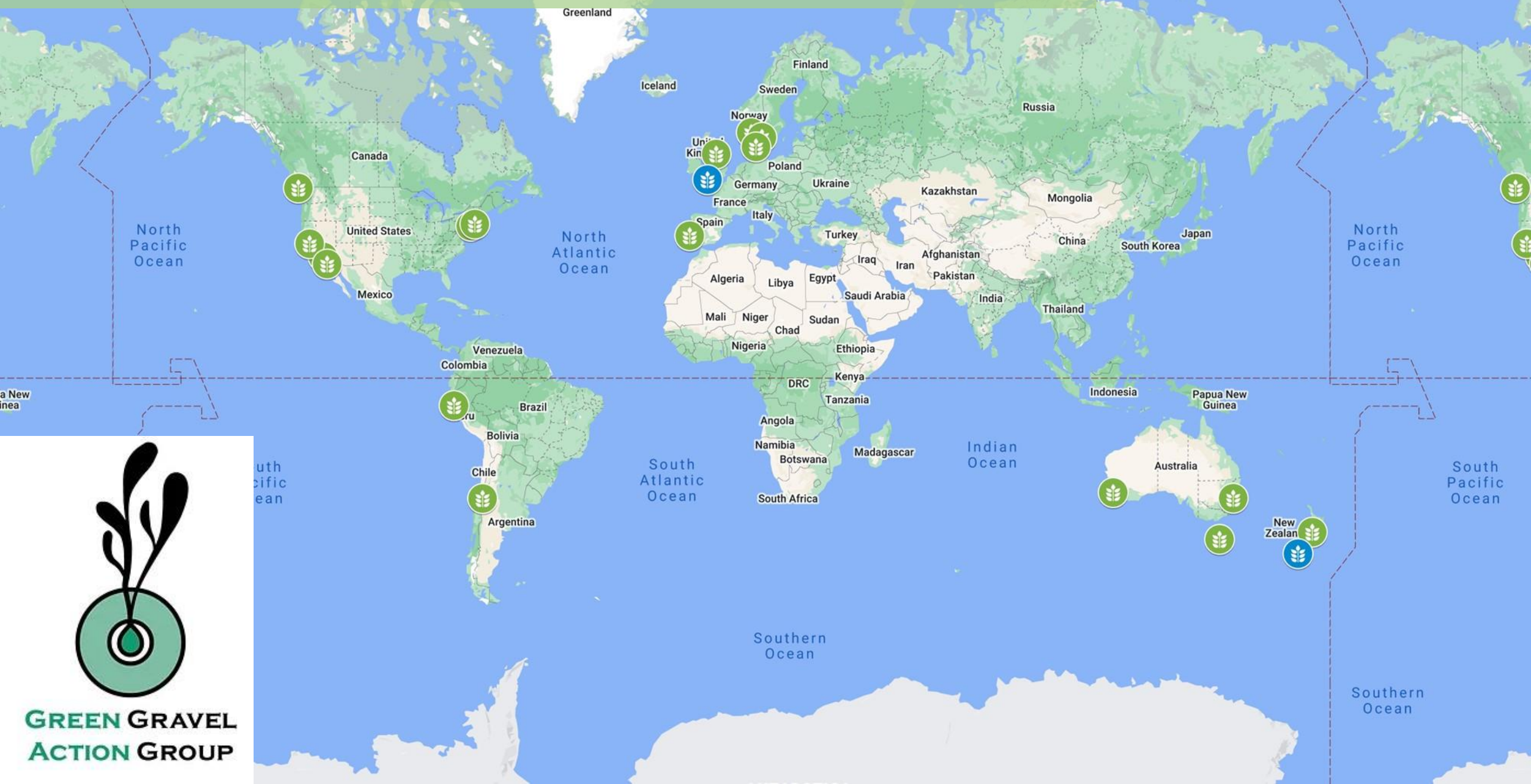
Methods for Restoration – Passive vs Active



GREEN GRAVEL

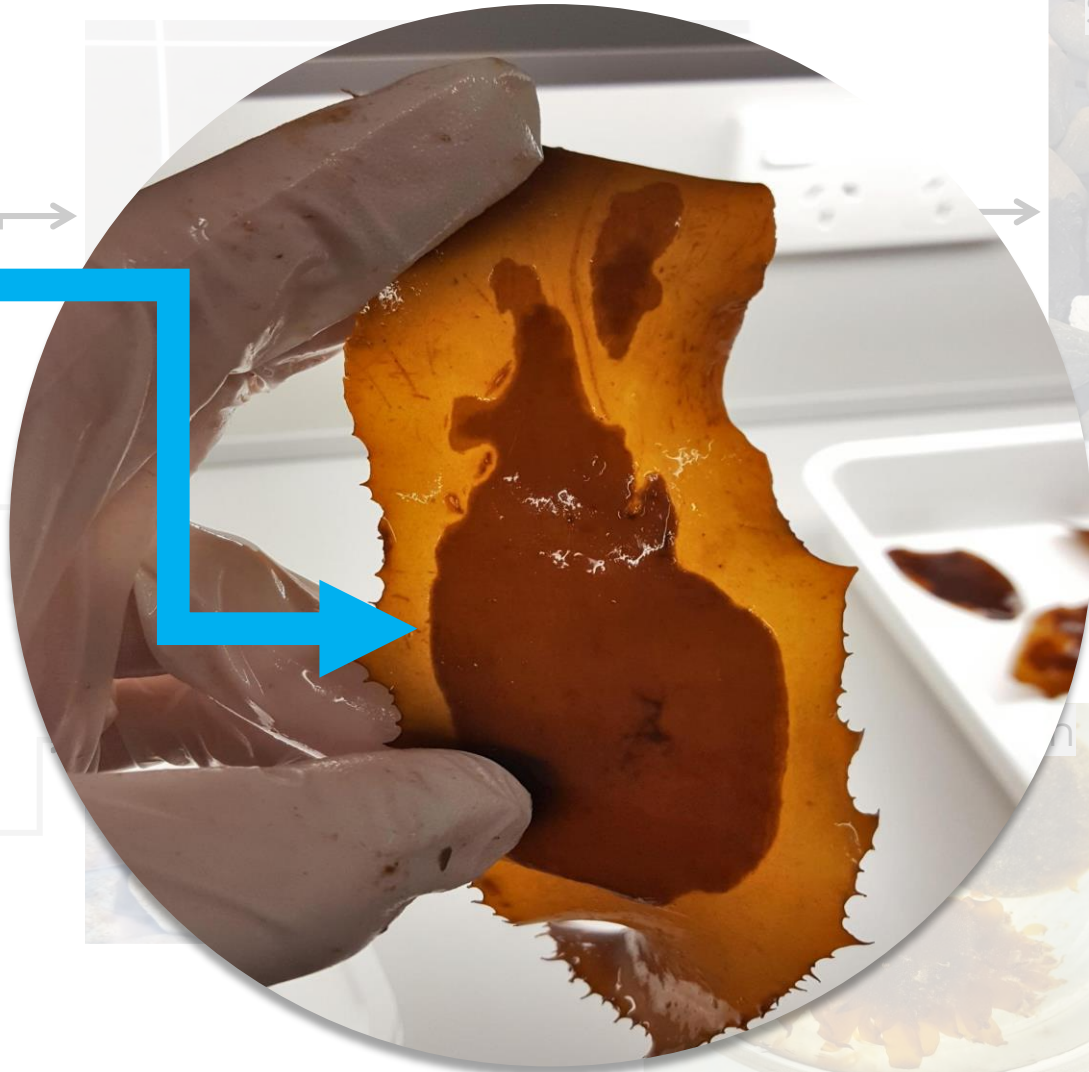


Green gravel around the world

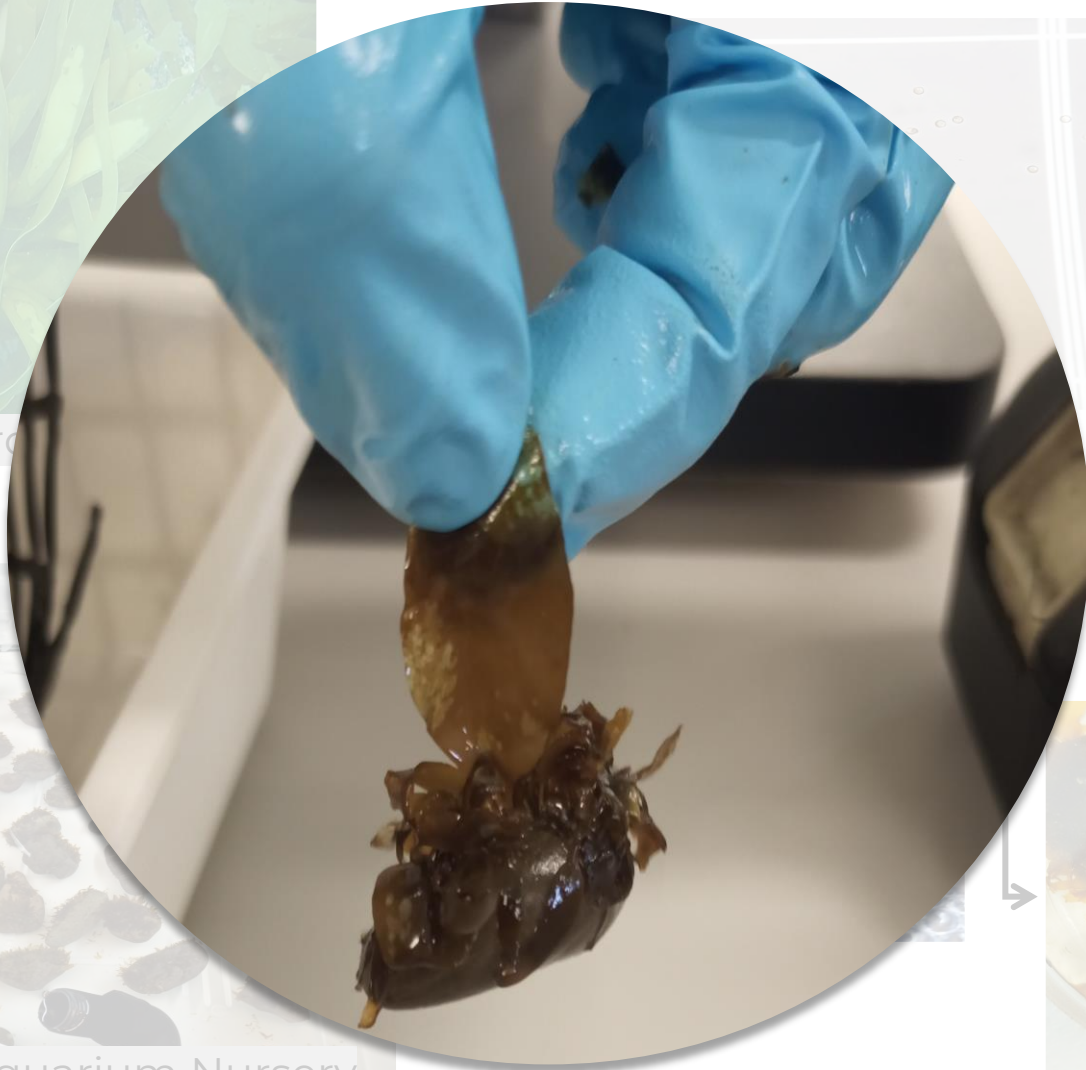


**GREEN GRAVEL
ACTION GROUP**

GREEN GRAVEL



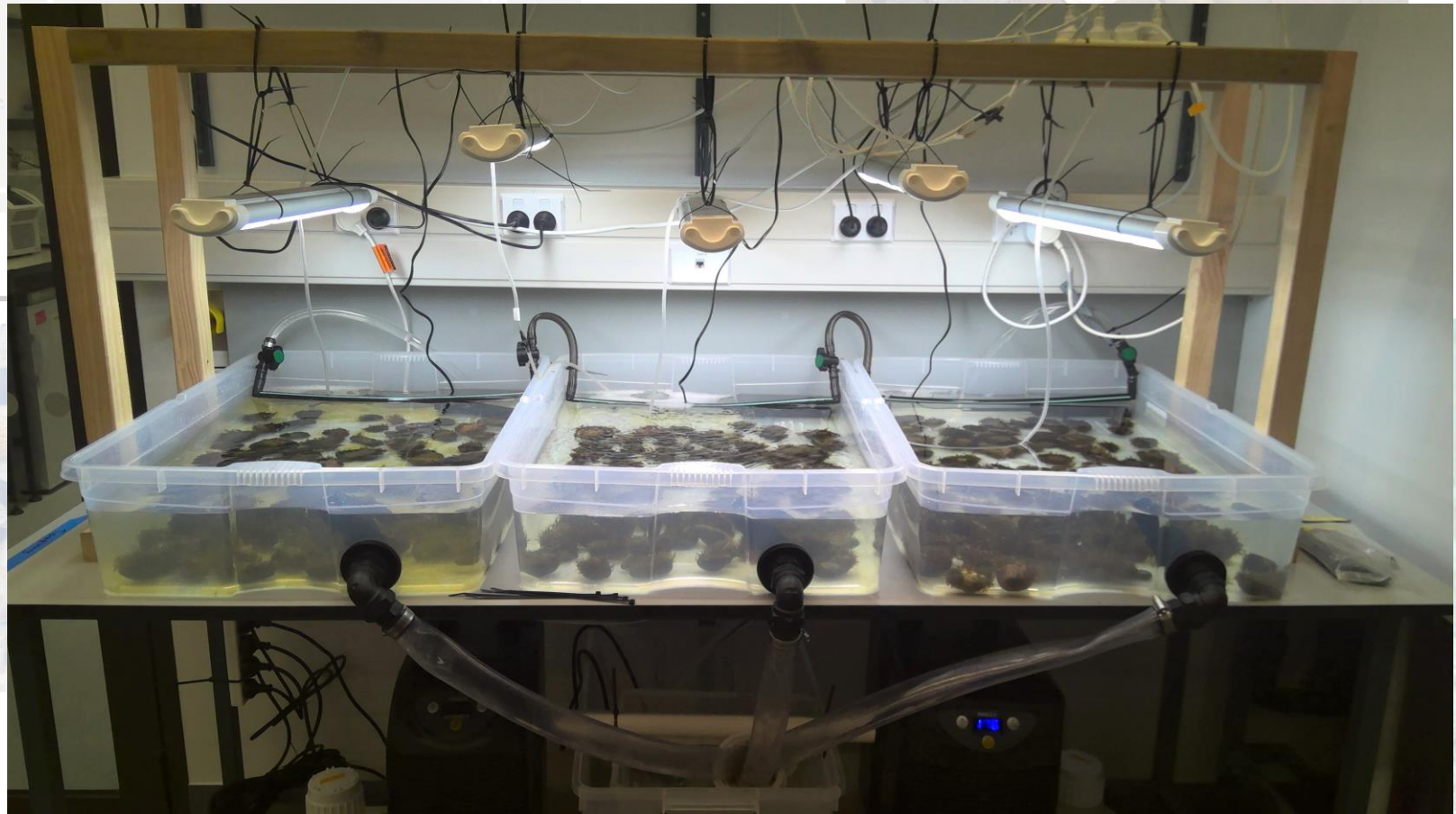
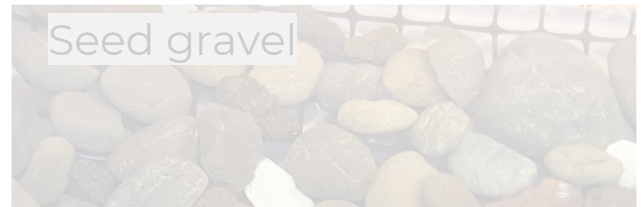
GREEN GRAVEL



Transfer to Aquarium Nursery



GREEN GRAVEL



Trialling different rock types and cleaning methods - in the lab



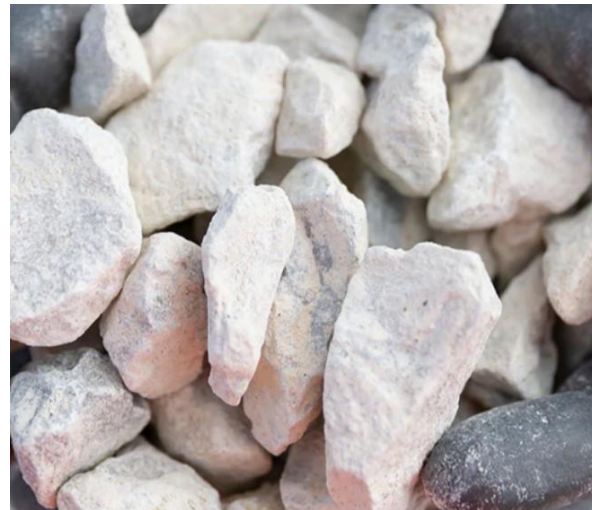
River Pebble



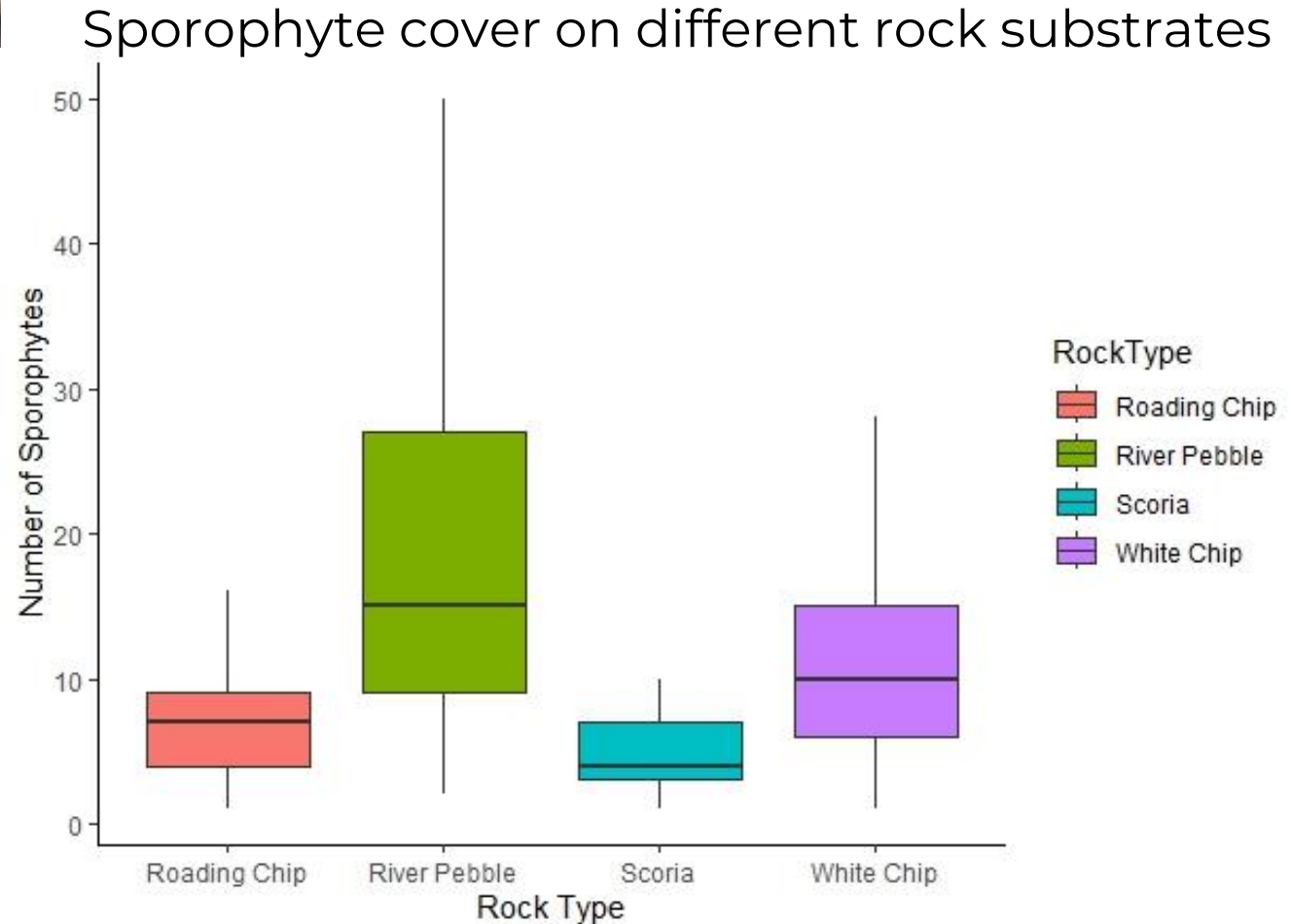
Scoria



Roding Chip



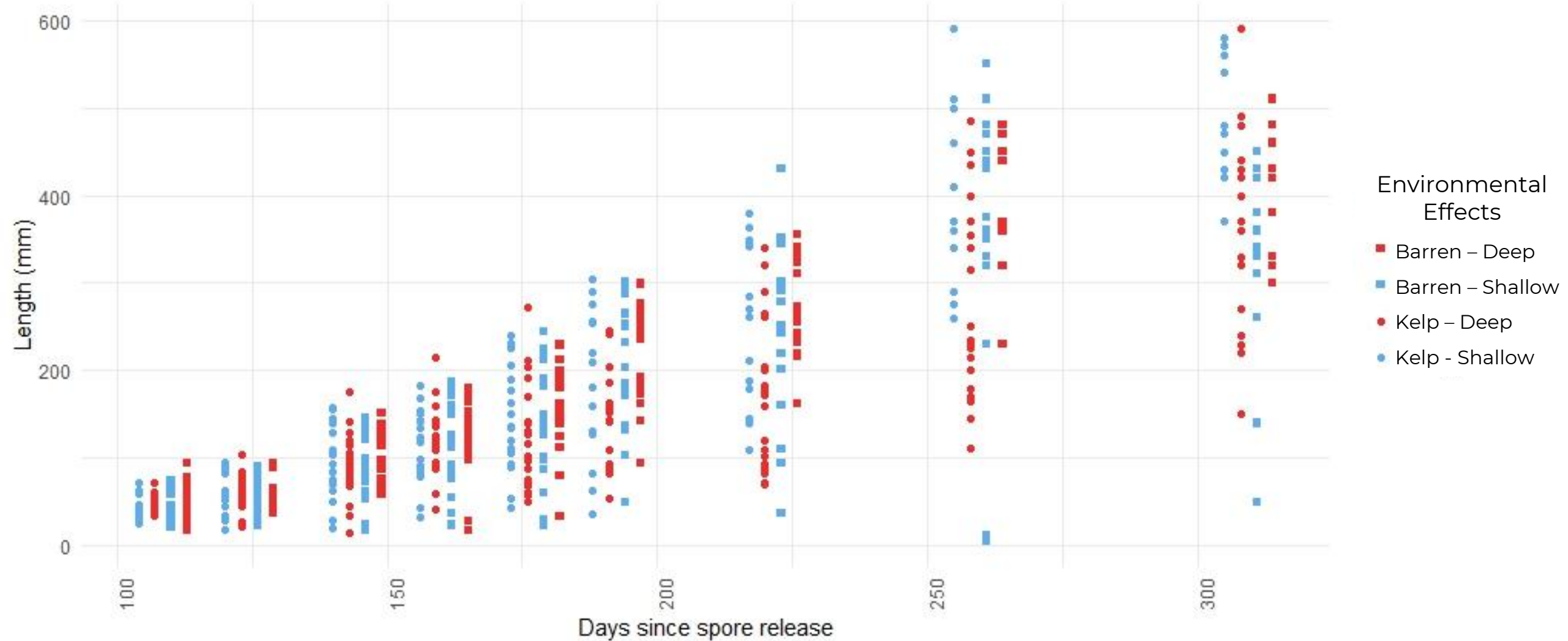
White Chip



River Pebbles had highest sporophyte coverage overall

Only Glued Rocks - Growth

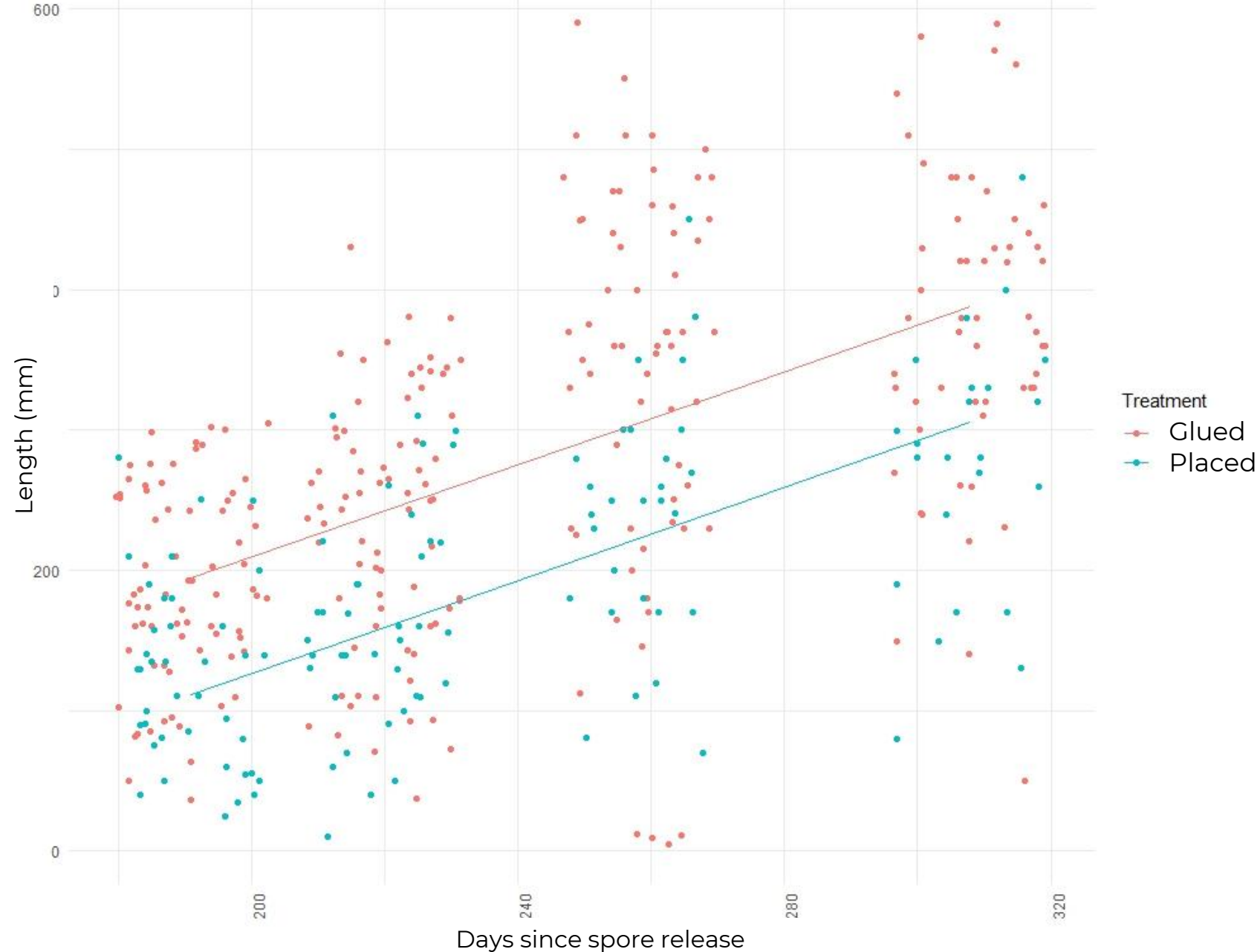
No significant effect of canopy cover or depth on sporophyte growth



Glued and Placed Rocks - Growth

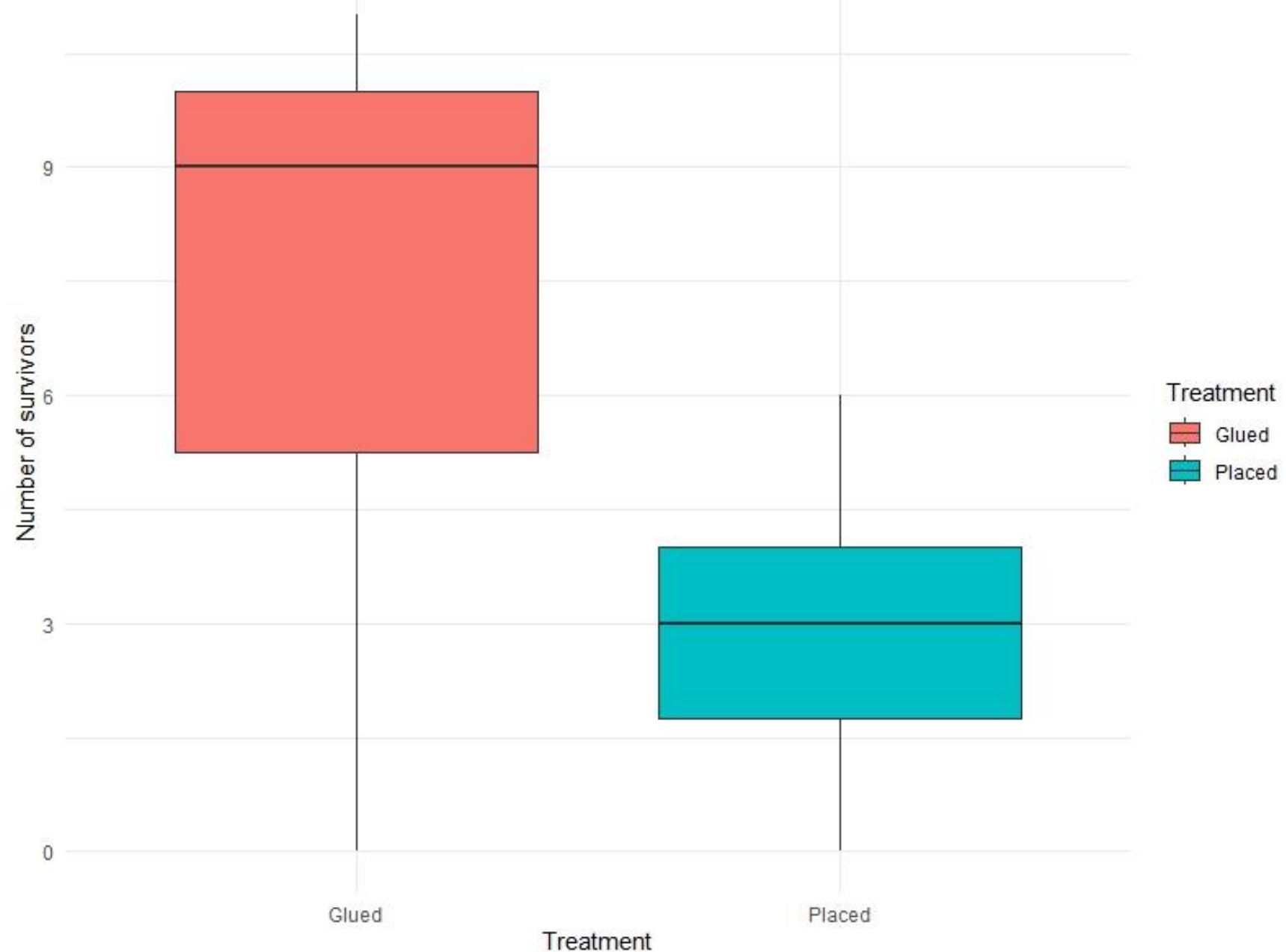
No effect on sporophyte growth from canopy cover or depth

Sporophyte length is greater on Glued rocks



Glued and Placed Rocks - Survival

Survival was higher for glued rocks compared to placed rocks



In conclusion:

- **Depth and canopy cover had no significant effect** on the growth of sporophytes on both glued and placed rocks
- **Manually attached rocks had significantly greater growth** of sporophytes compared to placed rocks - Glue could be a valuable tool for Green gravel techniques
- Although **placed rocks had a significantly lower survival** - they are still a promising technique for restoration, especially for communities with limited resources

Take home message:

- Green gravel appears to be a **promising tool for affordable and easily accessible kelp reforestation efforts in New Zealand**
- Green gravel is so far the **most encouraging technique requiring the least amount of input** compared with other techniques we have trialled in our research group.
- Future efforts will be to **assess the reproductivity** of the planted green gravel and **investigate the effect of rock size on survival** after transplantation
- *I look forward to implementing this technique with local community groups around New Zealand – stay tuned*

Thank you very much!
Please let me know if you have any questions

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