

Successful cultivation of bull kelp can potentially generate large-scale economic, ecological & social benefits.

Creating opportunities for bull kelp aquaculture

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INTRO

- Bull kelp *Durvillaea* is high in alginate – a gelling compound used in a myriad industries to make ice cream, yoghurt, drinks, wound dressings, dental impressions, etc.
- Demand for alginate is rising; one major harvesting operation in Australia – Kelp Industries on King Island, Tasmania – supplies ~5% of the world's alginate production by harvesting beach-cast *Durvillaea*.
- We know very little about *Durvillaea*'s reproduction; successful cultivation has never been achieved.
- This project fills this knowledge gap by assessing reproductive biology, alginate variation & potential cultivation techniques for *Durvillaea*.

METHODS

- Reproductive period of *Durvillaea* in Tasmania will be identified by assessing maturity of sexual organs (i.e., conceptacles) across multiple sites and seasons.
- Optimal reproductive conditions (e.g., temperature, light, nutrient, etc.) for spawning & early growth in the hatchery will be determined via lab experiments.
- Variations in alginate content and composition will be assessed using analytical methods, e.g., H-NMR.
- Factors governing at-sea cultivation success, such as age and size of seedlings for out-planting, substrate that allows strongest attachment and survival, etc., will be examined by trialing methodology used for other seaweed species.

Enhance Australian aquaculture

by pioneering a bull kelp aquaculture industry. There is an increasing demand for alginates and related products. With two endemic bull kelp species and successful cultivation methods, Australia has great potential to become a major supplier of alginate internationally, boosting the Australian marine production.

Complement offshore development

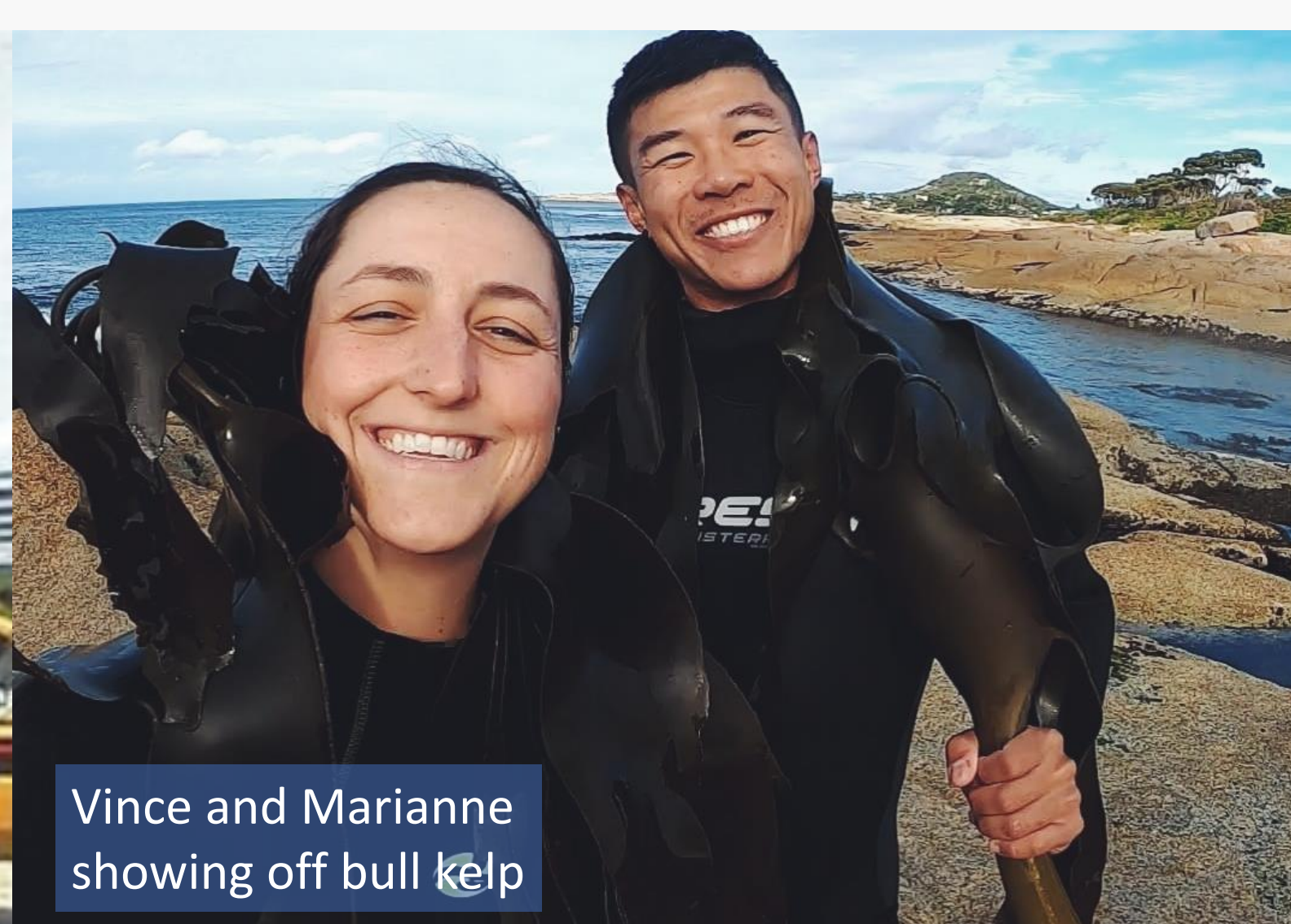
namely wind and wave energy production. As the BE CRC spearheads the movement of marine industry offshore, bull kelp presents a highly viable option as it thrives in high wave-energy environments. Future offshore kelp production can be sustained adjacent to wind and/or wave energy generators, optimising resource expenditure and mitigating reliance on non-renewables, while improving social license of aquaculture practices.

Reinforce natural kelp populations

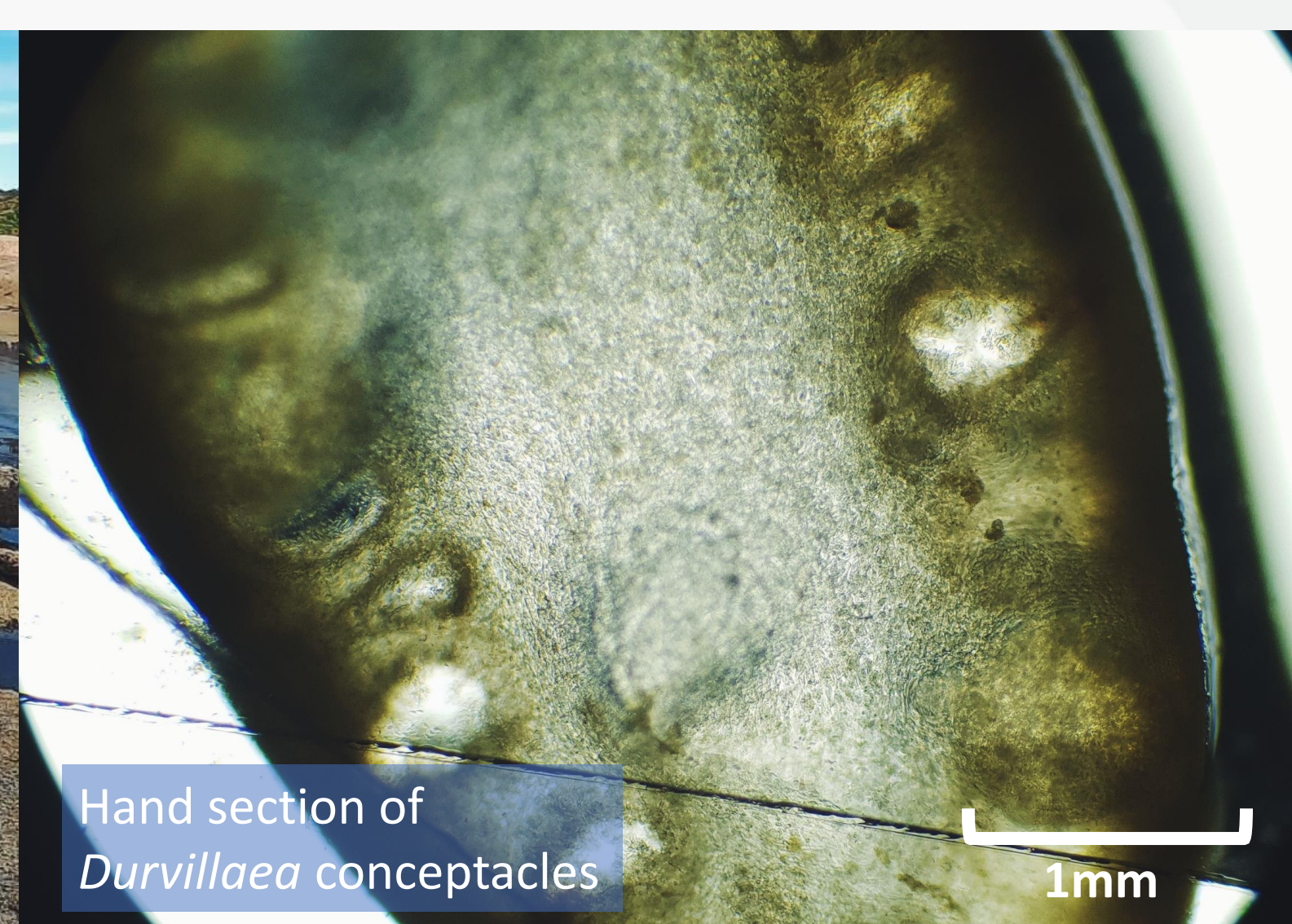
by transplanting cultivated *Durvillaea* back into natural environments. There has been a drastic decline in kelp populations globally. Restoring these kelp forests will facilitate the rehabilitation of associated communities while also assimilating ocean carbon. The large, thick, and leathery blades of bull kelp also dampen waves, which can protect coastal environments from erosion.



Kelp Industries Pty. Ltd.
(King Island, Tasmania)



Vince and Marianne
showing off bull kelp



Hand section of
Durvillaea conceptacles

1mm



Bull kelp at low tide
(Tessellated Pavement, Tasmania)