

Scaling Up Coral Production for Conservation Aquaculture – *Building an Industrial-Scale Coral Seeding Pipeline*



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Time: 2026. 08. 26 Wed. 15:40

**Venue: Lounge C102, 1st Floor,
Interdisciplinary Research Building
跨領域科技研究大樓1樓C102交誼廳**

Host: Dr. Sen-Lin Tang 湯森林研究員



Abstract

Scaling reef restoration to achieve ecosystem-level impacts requires transformative innovation in coral production workflows. This study synthesizes five years of research from the Coral Aquaculture and Deployment (CAD) subprogram of the Reef Restoration and Adaptation Program (RRAP), which focused on optimizing ex situ sexual coral production methodologies for large-scale deployment on the Great Barrier Reef. Here, we evaluated technological and process innovations across the coral production pipeline—from gamete capture and larval rearing to symbiont inoculation, settlement, and device assembly. Key advancements include the automation of fertilisation using an AutoSpawner system, high-density larval culture with computer vision monitoring, optimized conditioning and preservation of settlement substrata, novel bioreactor systems for symbiont culturing, and development of biofouling- and predation-resistant seeding devices suitable for diver-free deployment. Comparative analyses revealed reductions in labour of between 1.4 and 28.6-fold across key processes, resulting in up to as much as a 20.4-fold increase in production capacity per unit area in the facility, and a 4.3-fold reduction in seawater use, while preserving biological performance and genetic diversity. These outcomes demonstrate the feasibility of producing millions of coral spat annually within a single facility. Together they establish a practical and scalable pathway toward ecosystem-scale coral reef restoration under accelerating climate change.