Lessons Learned:

- Tying directly to the reef is not recommended as it is more likely to abrade and be lost.

- Larger lines require cleaning maintenance as corals do not overgrow the line or do not overgrow it quick enough to mitigate fouling impacts.

- Longer, straighter branches are more efficient. On a bent branch, you may wrap the line around the branch between top and bottom loops to maintain contact.

- During disease seasons or outbreaks, it is strongly recommended to visit the nurseries regularly. Where disease is noted, break the continuous tissue line a few centimeters above and below the disease front, taking care to not cut the line.

- Remove the dead material before it attracts fouling. It is not advised to replace the dead as the line could be seeded with disease. For longer-term sets of high-value material or high-disease areas or seasons, set gaps in the continuous (coral) tissue.

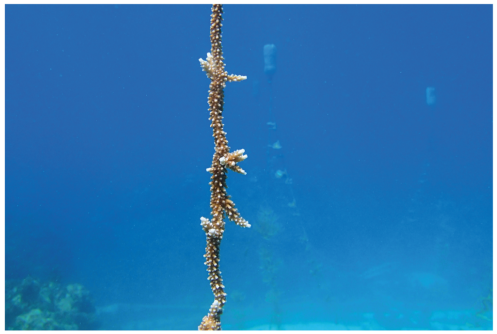
- As the system is dynamic, not all branches will fuse but rather abut with a fault line. Such fissures do not appear to hinder health nor system durability, but fusing may be forced with a stabilizing tie or wire.

For more information: www.seascapecarib.com/ US Patent No.US20170196206A1

This document is part of the Coral Restoration Consortium's Guide to Coral Reef Restoration: Methods to Optimize Efficiency and Scale.

Coral Nursery Structure Designs

Vertically Tensioned Line Nursery (VTL)

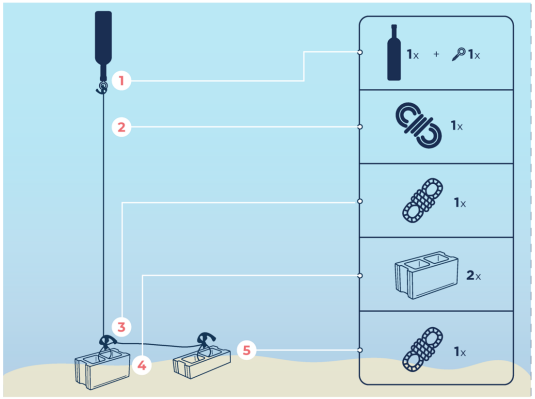


Description of the Nursery

The Vertically Tensioned Line Nursery is a rapid-set system that can serve as a main nursery structure and is useful for emergency triage following storm or grounding damage. These structures also allow for a set and forget approach, where the corals grow large enough to sink the line and corals onto suitable substrate, thus self-outplanting. The basic components can be changed according to availability, are achievable almost anywhere, and on any budget. They are easy to put together and therefore can be assembled on-site or pre-assembled and bundled for deployment. This system is best suited for staghorn corals and similar morphologies with the ability to quickly overgrow substrates. As designed, coral tissue will overgrow the structure, eliminating fouling for a maintenance-free coral nursery.

The following are instructions for building a Vertically Tensioned Line Nursery that holds **40 corals**, with a secondary anchor, floating approximately **40 cm above the bottom** at a **sandy** nursery site with a **depth of 8 m**.

Diagram:



Supplies Needed:

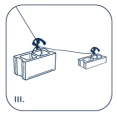
1		1x	**Buoy** – 750ml glass bottle with cork; see Chapter 1: Floats/buoys
1		1x	**Screw Eye** – diameter that the vertical line can fit through
2		1x	**Vertical Line** – 4 m segment of 80 lb braided UHDPE (SpectraTM/DyneemaTM) fishing line
3		1x	**Anchor line** – 1 m segment of 6 mm polypropylene twisted line
4		2x	**Anchors** – 20 cm x 20 cm x 40 cm (17 kg) cement block; see Chapter 1: Anchor Types and Anchor Line Types
5		1x	**Secondary anchor line** – 2 m segment of 6 mm polypropylene twisted line

Details of Construction and Installation:

I. Prepare the buoy. Install a screw eye into the cork. Place glue around the cork and secure it in the bottle to form an air-tight seal.

II. Install the anchor. Tie a loop in one end of the anchor line then double-tie the other end through the concrete block and place it in the nursery.

III. Install the secondary anchor. Place an additional concrete block approximately 1 m to the side of the primary anchor, and tie the secondary anchor line through each of the blocks. Bury anchors by at least 50% in sand.



IV. Install the vertical line. Tie one end of the line with a double wrap through the screw eye in the glass bottle and secure with a clinch knot. Tie the other end of the line to the anchor loop with a double-wrap and clinch knot.

V. Add corals. Because the goal of this nursery is for the corals to fuse together, all fragments on the same line should be of the same genet. Untwist a portion of the line and install the fragment approximately 1 cm from the end of the branch, such that the coral is entwined. Hold the fragment along the line and insert 1 cm of the other end of the fragment in another twist. Make sure that each fragment is tightly secured at both ends. Repeat with the next fragment immediately below the first, such that they overlap. Continue until either your source coral or your line is exhausted.

NOTE: For use in outplanting, remove the buoy and anchor and lay the line across the reef allowing corals to self-attach, or tie, nail, screw or cement to secure immediately.