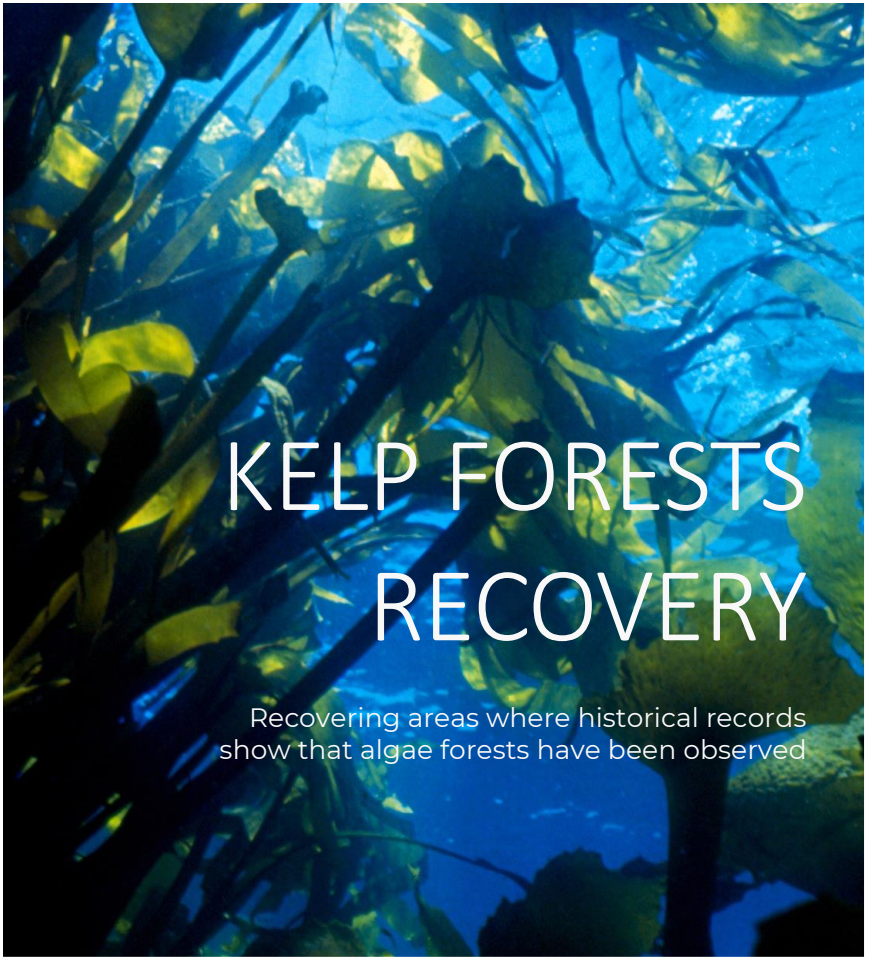

KELP FORESTS RECOVERY

Recovering areas where historical records show that algae forests have been observed

BIOMARES
Program
Task start:
2018

INTRODUCTION

The large brown algae form forests that other species can use as a shelter, maternity zone and food. Some of the species that seek these habitats have high commercial value. These brown algae are of great importance in the ecosystem because they are more than three meters high - a real forest! This is the refuge from the large amount of biodiversity associated with these habitats. However, these habitats have suffered from human impacts, which has led to a sharp decrease in their populations. The BIOMARES program, with its various projects over time, has developed work to recover these populations.

GOAL

To test ways to recover brown algae ecosystems in areas in the Professor Luiz Saldanha Marine Park where historical records indicate that they existed in the past.

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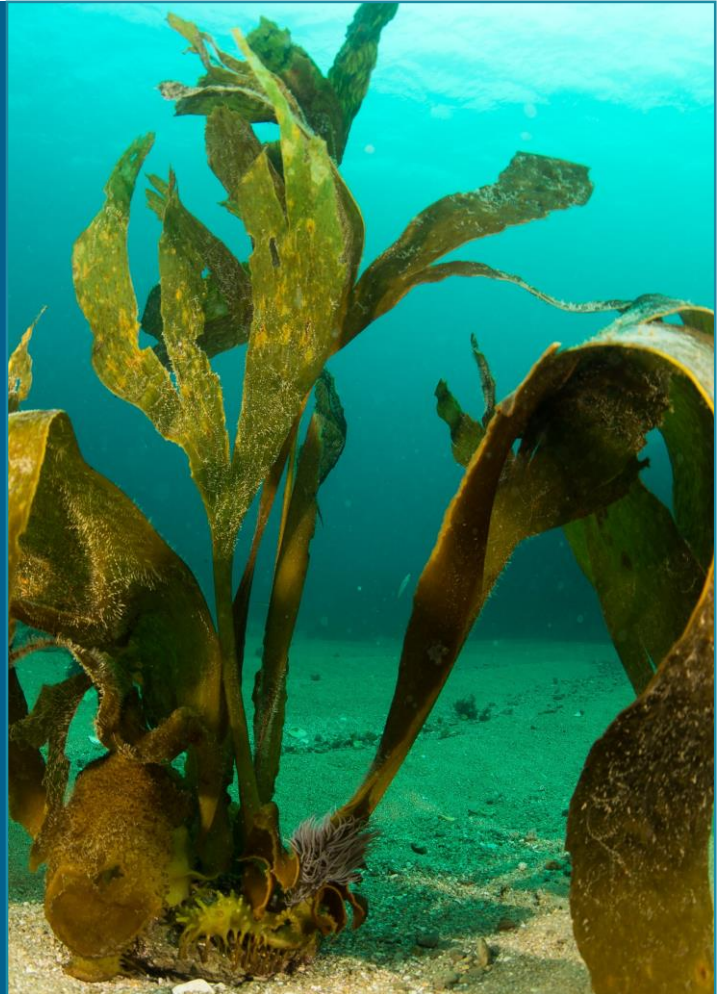
METHODS

We use methodologies based on transplants of algae reproductive states and on the artificially induced reproduction of algae cultivated in captivity; these are then transplanted into the sea when they reach a minimum size.

PERIOD

Transplants were performed in 2018 (A) and 2019 (B). Since then they have been monitored once per season to date (August 2020).



MAIN RESULTS

Brown algae grew in the transplanted areas. To demonstrate whether the brown algae that grew in the transplant areas are descended from natural populations or from those that were transplanted, genetic tests can be done.

Small microscopic algae were transplanted in July 2019 into small rocks that were glued to the natural rocks. In October 2019, juveniles were observed growing in the transplanted rocks. In July 2020, a *Laminaria* algae was observed, with dimensions clearly visible, in the transplanted stones. The remaining transplanted algae were not observed, however, as many other competing algae species are found growing on the rocks. Thus, it is not possible to know if the *Laminarias* remain: they may have died or remain very small for years until conditions are favorable to their growth.

Figure 1. **Collection of germ tissue for the cultivation of sporophytes in the laboratory.** Upper left corner: *L. ochroleuca* blade with evidenced of reproductive tissue (dark spot). Lower left corner: Tissue collection method for genetic analysis and sporophyte cultivation. Right side: Processing of samples before placing them on structures.

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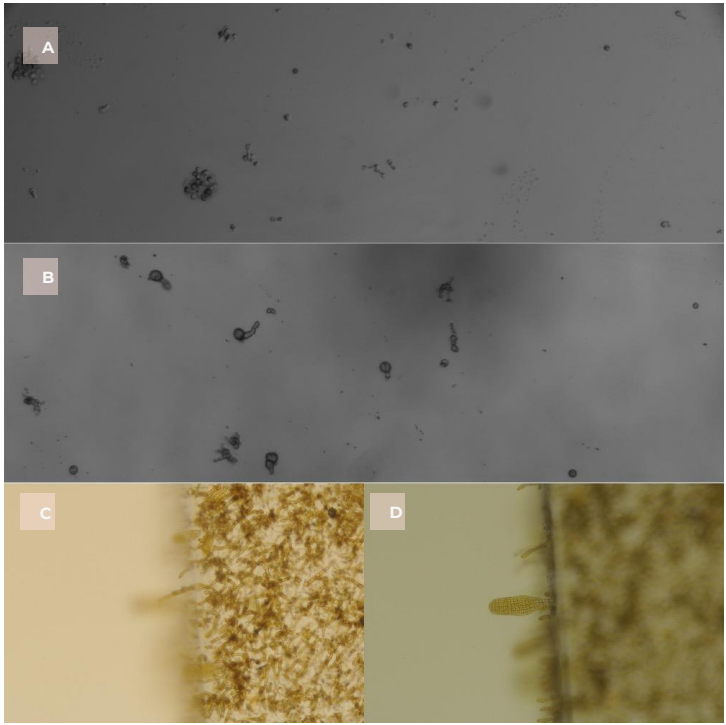

Figure 2. **Microscope photographs of the growth of *L. ochroleuca* sporophytes in the laboratory with an x10 lens.** A - Upon spore release, B - Growth three weeks after release, C and D - Growth 5 weeks after release.

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***Figure 3*. Possible recruit of *L. ochroleuca* in e a transplanted rock.** The base will have grown out of the transplanted rock, to a natural substrate.

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CONCLUSIONS

Testing the methodology for placing reproductive tissue directly at the site to be recovered showed that it is possible to grow new algae in places where they were absent. These works were very affected by the winter storms. The transplanted rocks were colonized by other organisms, namely other algae that compete with the transplanted ones.

The species *Laminaria ochroleuca* in the marine park represents the southernmost population of the mainland. It is important to keep knowledge of the status of these populations up to date.

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Task implementation: 2018

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