HSIL – San Juan Island Archipelago Marine Vegetation Sunflower Star Restoration Pilot Project

Project aims

1. Pilot the release of Sunflower Stars restoration synergistically with marine vegetation restoration
2. Assess the survival and site retention of released captive bred Sunflower Stars
3. Investigate the interactions between released Sunflower Stars with marine vegetation and benthic fauna

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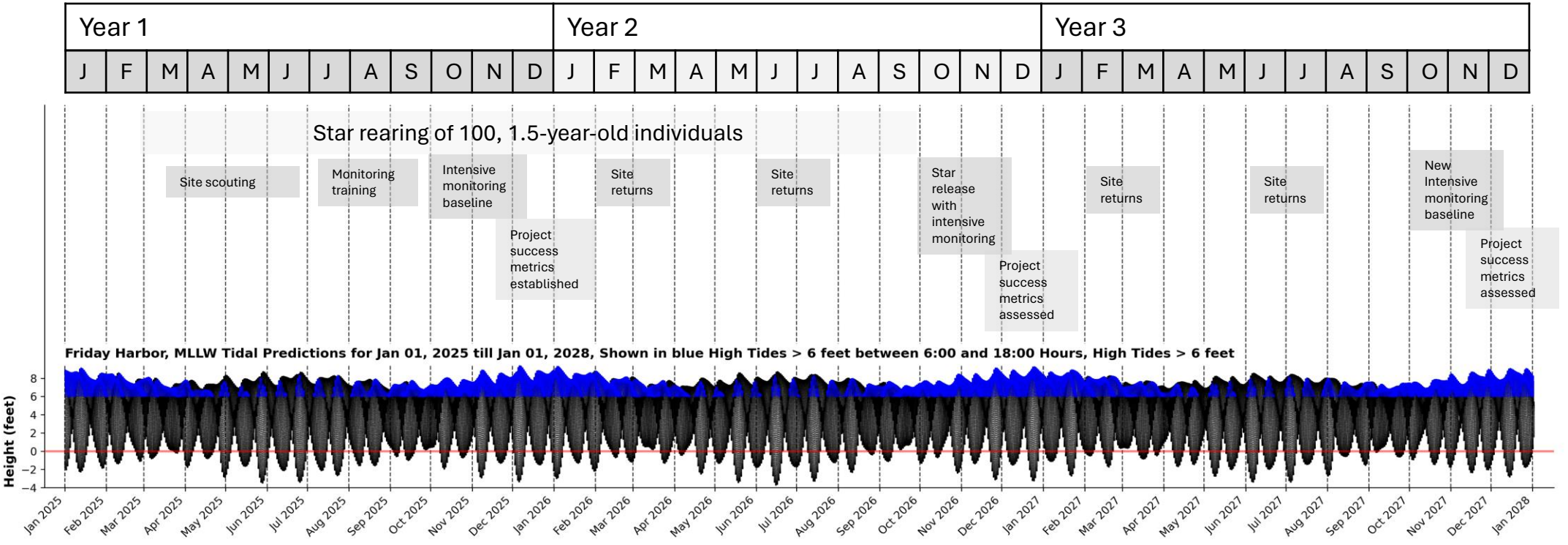

Project success metrics

1. Sunflower Star observation probability and density
2. Sunflower Star habitat occupancy and site fidelity maps
3. Sunflower Star diet observation measurements
4. Benthic fauna and marine vegetation density measures
5. Benthic meiofauna sediment core measures
6. Small benthic fauna assemblage from uniform point counts

Intensive monitoring

- Take success metrics at all sites within a short window of time, with S.S specific metrics at release sites

Site return monitoring

- Take site density, assemblage and sediment core measures.

Release sites

- **3 locations** in the SJI selected from long term WDNR monitoring locations.

Control sites

- **3 locations** site paired to the release sites
- **3 locations** in the SJI not site paired to the release sites

Project Title: HSIL – San Juan Island Archipelago Marine Vegetation Sunflower Star Restoration Pilot Project

Background: The San Juan Island Archipelago has experienced a significant decline in marine biodiversity, particularly affecting the Sunflower Star population. These keystone species, which were devastated by sea star wasting disease in 2013-14, are crucial for maintaining the ecological balance of marine habitats. This project proposes a synergistic approach to restoring Sunflower Stars (*Pycnopodia helianthoides*) in conjunction with marine vegetation, promoting a holistic recovery of the ecosystem.

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Aims:

1.To pilot the release of Sunflower Stars in a controlled manner to enhance marine vegetation restoration efforts.

2.To evaluate the survival rates, site fidelity, and overall health of the restored Sunflower Star populations.

3.To study the interaction between restored Sunflower Stars and the existing marine flora and fauna to ensure a beneficial ecological impact.

Objectives:

•Successfully rear and release 100, 1.5-year-old Sunflower Stars.

•Implement intensive monitoring protocols to track the progress and health of the released population and their environmental interactions.

•Conduct comparative analyses between release sites and control sites to evaluate project success.

Methods:

•**Release Site Selection:** Choose three locations within the San Juan Island Archipelago for Sunflower Star release which are current and ongoing WDNR long term monitoring eelgrass restoration sites.

•**Control Site Selection:** Choose three locations within the San Juan Archipelago from ongoing WDNR long term monitoring eelgrass restoration sites which are site pairs to the release sites. Choose three choose WDNR sites which are not site pairs.

•**Monitoring:** Employ standardized monitoring techniques to collect data on Sunflower Star observation probability, density, habitat occupancy, and diet. Concurrently, assess assemblage and density of benthic fauna and marine vegetation density.

•**Data Analysis:** Use statistical models to interpret interactions between Sunflower Stars and marine vegetation, comparing data across release and control sites.

Expected Outcomes:

•A demonstrable increase in Sunflower Star populations at the release sites.

•Improved marine vegetation coverage and health, supported by the presence of Sunflower Stars.

•Valuable data on the ecological interactions within the restoration sites, informing future conservation efforts.

Budget Overview:

•Estimated total cost: $450,000 over three years.

- Year 1: Site scouting, star rearing, and baseline site metrics - $150,000.
- Year 2: Site returns, star rearing, and star releases with intensive monitoring - $200,000.
- Year 3: Site returns, final intensive monitoring, and groundwork for extended monitoring - $100,000.

Funding will be allocated towards personnel, equipment, and research expenses. With the bulk allocated to field operations.

Conclusion: The San Juan Island Archipelago Marine Vegetation Sunflower Star Restoration Pilot Project aims to serve as a model for marine restoration, demonstrating the effectiveness of integrated conservation strategies. With the support of HSIL, this project has the potential to significantly contribute to the recovery of local marine ecosystems and the global body of marine conservation science.