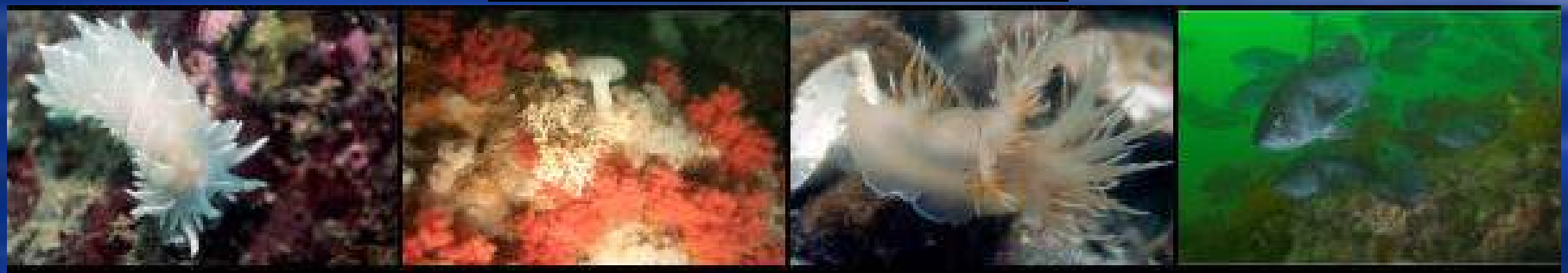
Implementing a Network of Artificial Reef Ball Structures to Enhance Habitat in the Marine Ecosystem off the Ogden Point Breakwater

In cooperation with the Veins of Life Watershed Society, Ralmax, Ogden Point Dive Centre, DFO Habitat Enhancement, Artificial Reef Structures and the Township of Esquimalt



Background

- The Provincial Government has ownership of the waterfront property off Ogden Point
- Ralmax donated 125 Reef Ball for future habitat offsets.
- **Artificial Reef Structures Ltd.** Using Reef Ball Design Mold to make Reef Balls
- Town of Sidney put Reef Balls off Pier in 1996 and SPARS has been monitoring its growth

Reefballs Donated

- Ralmax owns Point Hope Shipyards and placed 25 Reef Balls under the shipyard.
- Ralmax has a longtime partnership with the Veins of Life and donated over 100 Reef Balls to be placed off Ogden Point to be used as banked habitat, as a credit for future coastline development

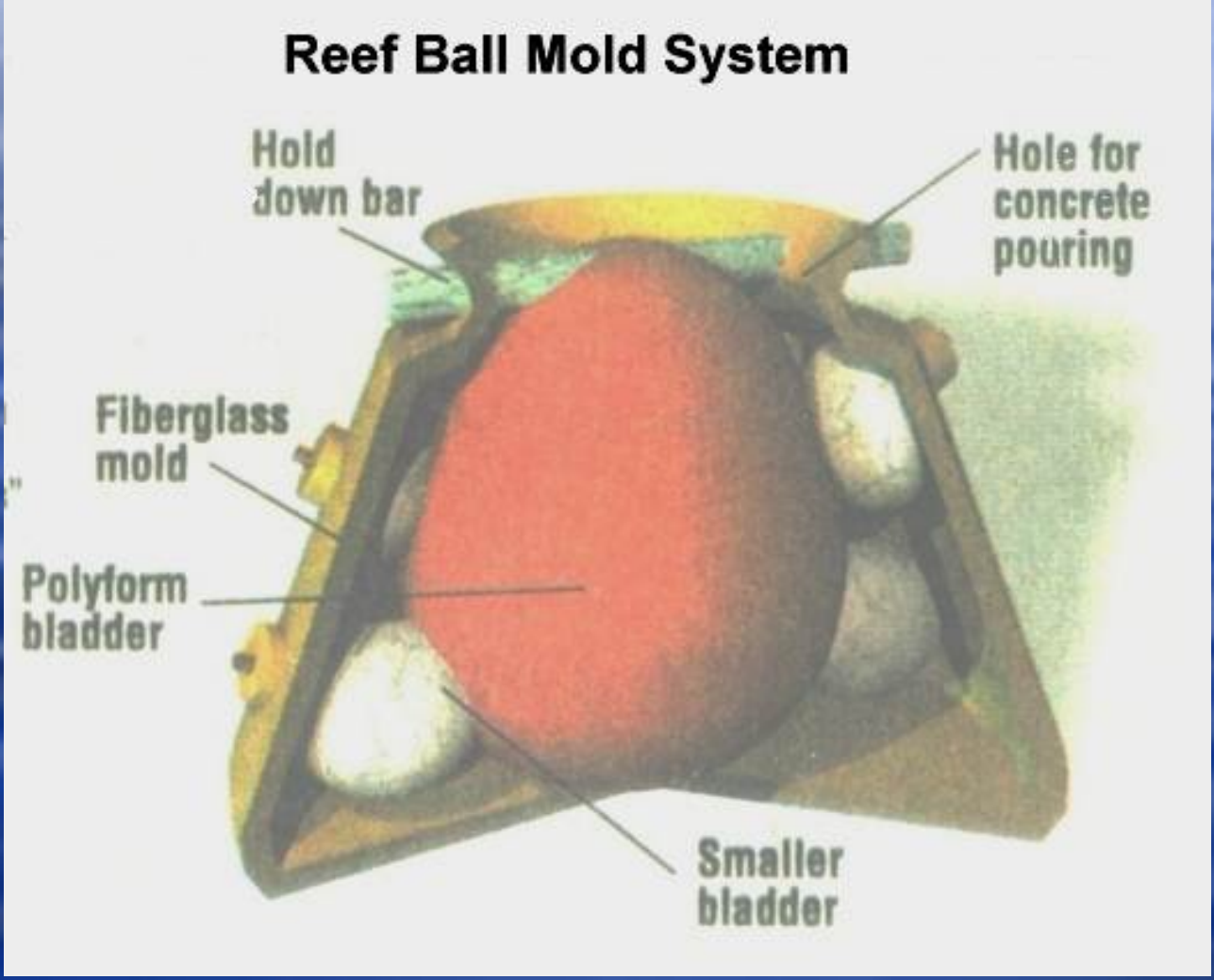
What is a Reef Bball?

An artificial structure designed to effectively create sustainable marine reef habitat. They are manufactured in over 10 different sizes and 20+ styles by The Reef Ball Foundation, an International and Environmental NGO that has deployed over 1/2 million Reef Balls in over 70 countries.

Mission Statement

“ Our mission is to rehabilitate our world's ocean reef ecosystems and to protect our natural reef systems using Reef Ball artificial reef technologies. Reef Balls are artificial reef modules placed in the ocean”

How Reefballs are Made



Deployment

- The Veins of Life NGO plans to deploy the 400lb Reef Balls in late April with a small crane and barge, hopefully using Coast Guard Vessels

Utility in Habitat Enhancement

Reefballs are shaped to optimize protective void spaces for fish and include features such as rough surface textures to enhance invertebrate settlement. Holes designed to create turbulent vorticies help bring nutrients to organisms living on the Reef Ball surface.

SPARS- Sidney Pier Artificial Reef Science

"When you put a rock under water, you'll see barnacles growing on it in six months. With reef balls, you see growth within weeks and in a few months, they're covered."

-Bruce Minter (Molder of the Reef Balls)

Pycnopodia are the first to attack Reef Balls! (not surprising)

SPARS Video Monitoring of Sidney Reef Balls

February 1/97: 80 days
March 6/97: 113 days
May 1/97: 169 days
Sept 4/97: 304 days

5 Goals for Implementing Reef Balls at Ogden Point?

1. Offset Degradation to Victoria Inner Harbor
2. Restore Natural Kelp Forest Ecosystem and Enhance Fish and Invertebrate Habitat
3. Relieve Pressure of Fishing/Diving from Breakwater Environment
4. Monitor Reef System and Investigate Research Questions
5. Bolster Community Involvement and Awareness of Local Marine Ecology

1. Offset Degradation of Victoria's Inner Harbour

Fisheries & Oceans states you must replace every 1/3 of natural Habitat destroyed with 2/3 of new Habitat created locally

Currently, over half of the Gorge Waterway shoreline has been altered or hardened with fill materials and/or seawalls of concrete and most of the shoreline and upland areas are privately owned

- Rankin. Society for Ecological Restoration,

August 24-26, 2004, Victoria, Canada

Historic Harbour Ecosystem

- The City of Victoria's Inner Harbour Waterway is characterized by rocky shores, active currents, and rich aquatic life that includes kelp forest, eelgrass, shellfish, herring and salmon species, migratory birds and river otters.

- Rankin. Society for Ecological Restoration, August 24-26, 2004, Victoria, Canada

Stressors to the Marine Ecosystem at Ogden Point

- Long history of Human Use from First Nations to Colonialism and Industrialization
- Loss of Habitat
- Invasive Species
- Intense Boat Traffic
- Polluting Effluent
- Contamination from Sewage from Inadequate Storm Drain System
- Ocean Temperatures Rising
- Overfishing

2. Restore Natural Kelp Forest Ecosystem and Enhance Fish and Invertebrate Habitat

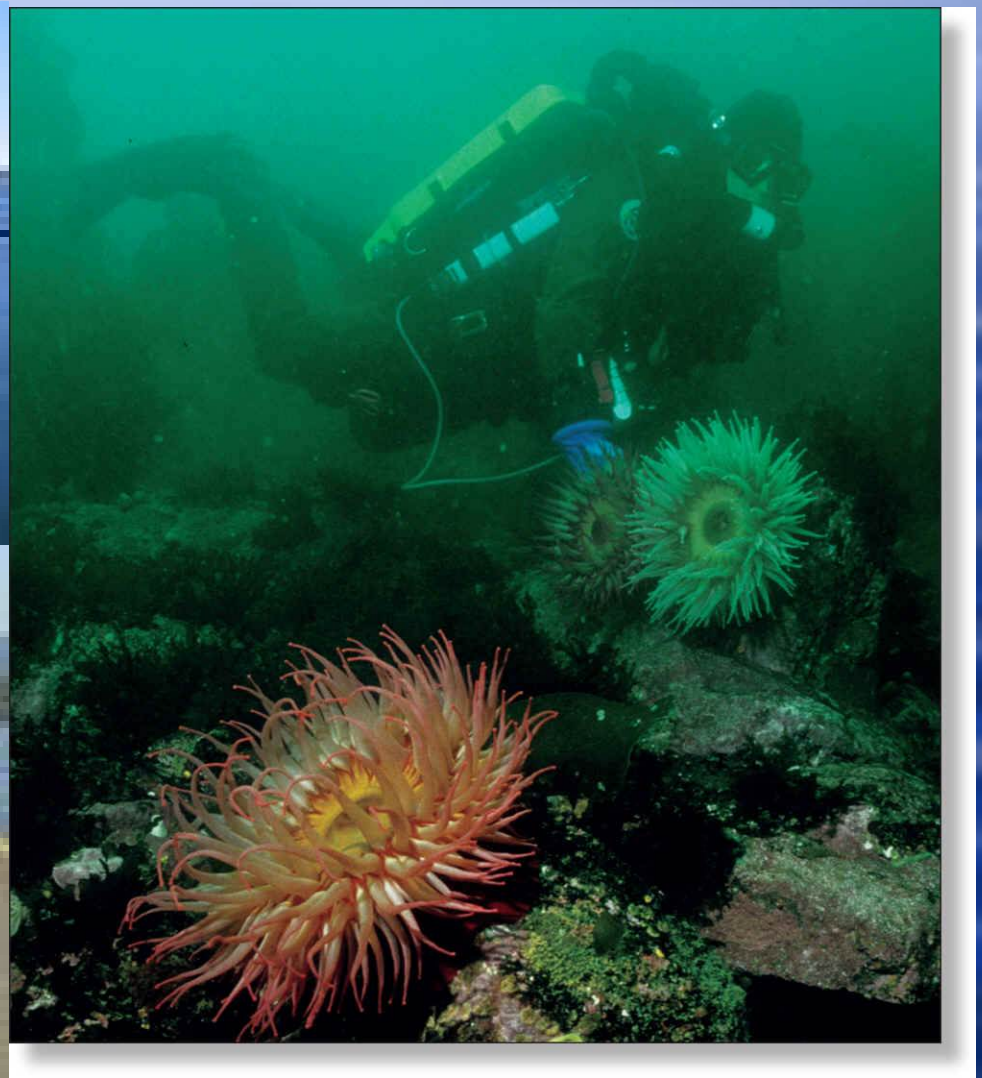
3. Relieve Pressure of Fishing/ Diving from Breakwater Environment

4. Monitor Reef System and Investigate Research Questions

Goals for a Monitoring Plan

- Document Digitally and Manually the Seral Stages of Reef Development in terms of Recruitment, Colonization and Inhabitment
- Set the Record for Future Studies as a Baseline of Reef Ecosystem Procession in terms of Rates of Growth and Biodiversity
- Utilize Divers, train Scientific Divers and Involve all willing members of the Greater Community in monitoring the reef

Potential Research Questions



Where We Will Place the Reef System Relative to Bio/Physical Factors and In What Configuration of Replicate Groups?

What Scaling Relationship might there be Among the Effects of Size, Shape, Surface Area, Rugosity and Density on Reef Biodiversity?

Exposed Versus Sheltered?

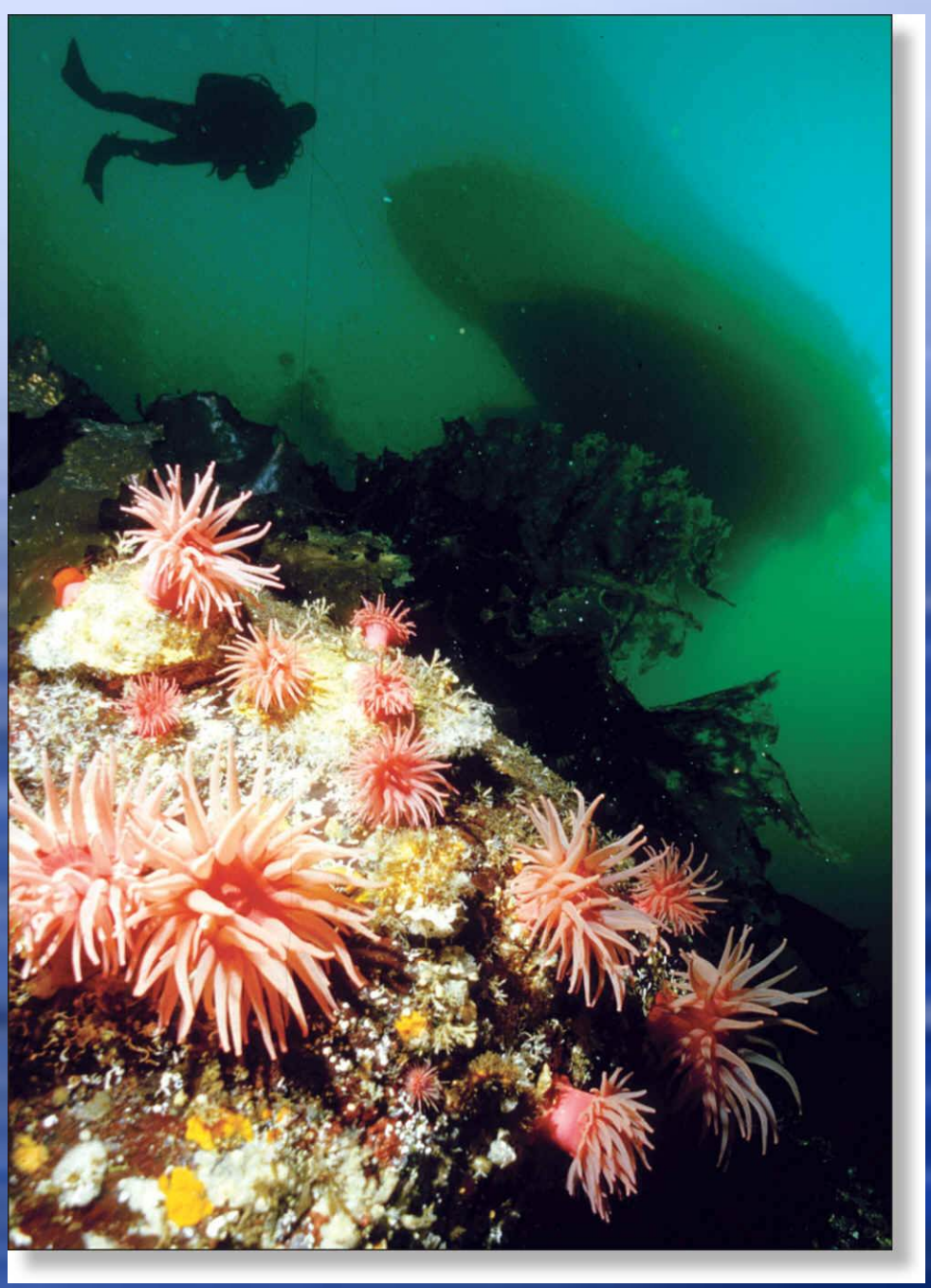
Could Superstructure Modification of the Reef Balls Enhance Fish Recruitment?

How might Climate Change and Invasive Species shift the Natural Ecosystem Baseline?

Could Reef Balls Constitute Critical Rockfish Habitat and Protection?

Volunteers?

Anyone who is passionate about Diving and/or Marine Ecology who can donate their time or monies to this project would be greatly appreciated



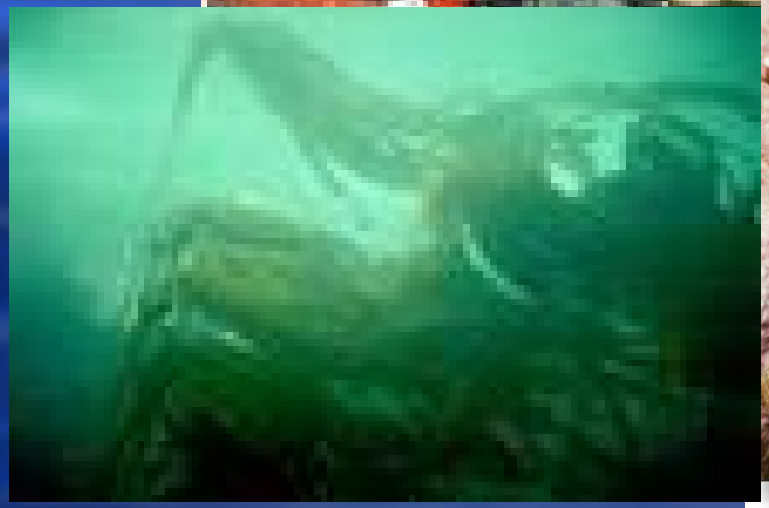
5. Bolster Community Involvement and Awareness of Local Marine Ecology

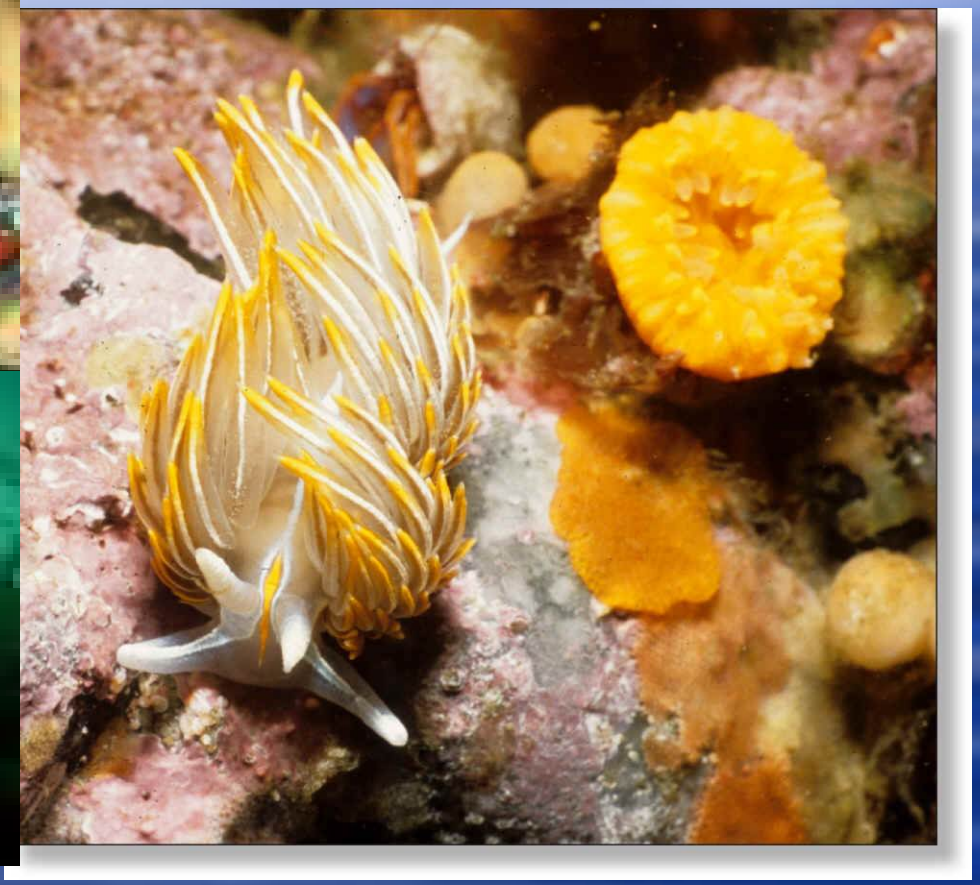
- Personal commitment to Marine Ecological Restoration
- Community engagement in the long-term success of Marine Restoration
- Collaborative relationships involving "professionals" and community participants in restoration projects.

Hart (2002), encourages “scientists” to participate in and contribute to [local restoration] projects “to help identify the threats to ecological integrity and develop methods for facilitating the recovery of complex systems, look for opportunities to use restoration projects as true experiments and encourage the acquisition of data to determine how ecological systems respond to the restoration ‘treatment’... [and] communicate with nonscientists about the scientific enterprise and the ways it can be used both to create new knowledge and to help solve real-world problems.”

- *Page 3 16th Int’l Conference, Society for Ecological Restoration, August 24-26, 2004, Victoria* Canada

More Pretty Breakwater Pics





Appreciation

- John Roe, CEO of Veins of Life Watershed Society
- Our Partners Ralmax and Uvic Dive Club
- My Co-workers: Scott Stevenson-Professional Underwater Photographer and Erin Bradley- Owner of Ogden Point Dive Center
- Maeva!!! Who I met luckily down at the Dive Shop
- Dr. Tom Reimchen- Past Supervisor and Dive Buddy
- Everyone in this room I've had the pleasure of knowing during my time at Uvic