



# Shoreline Habitat Injury and Restoration Projects

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# Shoreline Habitats

- Exposure & Injury
- Compensatory Restoration Projects

# Injury Assessment

## Exposure evaluation

- Shoreline oiling levels & surveys
- Porewater chemistry
- Surfwater chemistry
- Forensic chemistry
- Four shoreline invertebrates
  - mussels
  - sand crabs
  - polychaetes
  - beach hoppers/talitrids



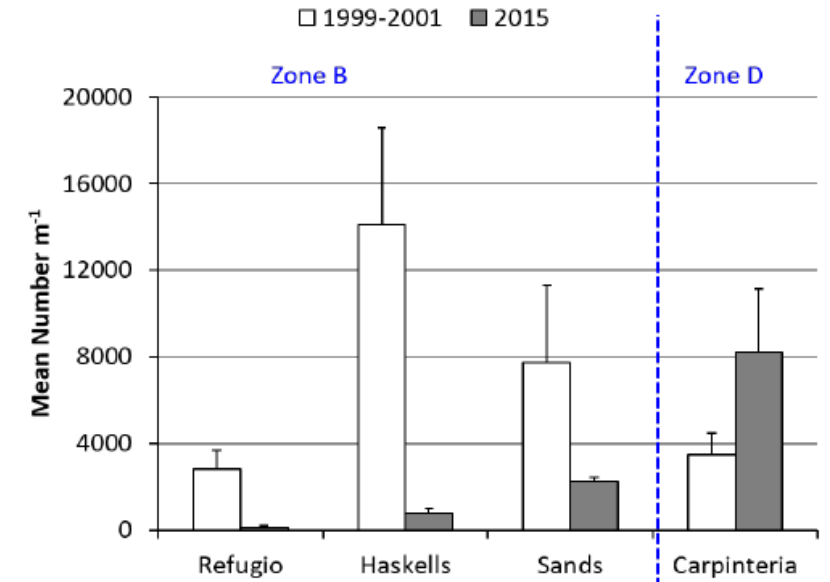
# Injury Assessment

## Injury evaluation

- Observed effects
- Rocky intertidal surveys
- Population studies of beach hoppers
- Exceedance of water toxicity thresholds
- Laboratory toxicity tests (3 species)



Talitrid Amphipod Abundance June



# Proposed Restoration Projects

- Ellwood Seawall Removal
- Black Abalone Restoration & Relocation
- Ventura County Dunes Restoration
- Santa Monica Bay Beach & Dune Restoration

# Ellwood Seawall Removal

- **Project will:**
  - Increase width & diversity of sandy beach intertidal habitat
  - Restore upper beach zones
    - currently absent on armored coastline
- **Intertidal ecosystem functions to be restored:**
  - Wrack (stranded kelp) deposition
  - Processing of wrack
  - Invertebrate abundance & diversity
  - Bird abundance & diversity
  - Grunion spawning habitat



# Black Abalone Restoration & Relocation

## **Black abalone are:**

- Important herbivores for intertidal habitats of some CA shorelines
- Protected by U.S. Endangered Species Act

## **This project aims to:**

- Transplant black abalone from donor population
- *Goal:* Enabling local reproduction of this species at the new sites



# Ventura County Dune Restoration

## Primary goals are:

- Reduce invasive plant abundance
- Restore native plant cover
- Restore dune forms and processes that support rare coastal species

## Three dune projects located at:

- Ormond Beach
- San Buenaventura
- McGrath State Beaches





# Santa Monica Bay Beach & Dune Restoration

## Project Goal:

- Restore sandy beach & coastal dune habitat
  - has been degraded by intensive mechanical grooming

## This restoration project will allow:

- Natural coastal processes to reshape topography & ecology
- Promote recovery of natural biodiversity & function



# Summary

## Black Abalone Restoration



## Santa Monica Restoration



Spill Location

## Ellwood Seawall Removal



## Dune Invasive Plant Removal



20 km