North Coast Kelp Recovery Project

Improving Resilience of Vulnerable Bull Kelp Ecosystems in The Greater Farallones National Marine Sanctuary

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January 10th, 2018
Outline of Talk

Northern California kelp forests

Background on bull kelp decline

Impacts on nearshore ecosystems

Fisheries impacts and regulations

North Coast Kelp Recovery Project
- Proposed working group formation
Kelp Ecosystems in California

Giant kelp – Southern and Central California

Kelp forms essential habitat for nearshore ecosystems

Bull kelp – Central and Northern California
Northern California’s Kelp Forests

Dominated by bull kelp (*Nereocystis leutkeana*)

Challenging conditions
Cold temperatures, wave action, currents, surge, low visibility, overall high exposure

Very little data on ecosystem dynamics and responses relative to other kelp ecosystems (i.e. *Macrocystis*)
“Perfect Storm” Decimates Northern California Kelp Forests (CDFW)

Dramatic changes have occurred in bull kelp forest ecosystems due to compounding multiple regional and large-scale stressors.

Total bull kelp habitat area ~15 km²
Key range ~250 km coast
Within GFNMS borders ~100 km
Compounding Stressors

- Harmful Algal Bloom (2011)
- Sea Star Wasting Disease (2013)
- Purple Urchin Explosion (2014 - )

>60 km

>4,000 km

>600 km

>4,000 km
Kelp Fly-Over Data (CDFW)

73-93% kelp loss in 2014

Additional 33% loss in 2015

Limited kelp growth in 2016

Van Damme
Point Arena Cove
Timber Cove
Fort Ross
Bull Kelp Canopy and Sub-Canopy Biomass
86-97% of Kelp Biomass Lost

2012

2016

L. Rogers-Bennett (CDFW)

A. Weltz (CDFW)
Near Salt Point, Sonoma County

August 2016 at 8 meter depth

(video)
Benthic Algal Impacts

Urchins are grazing through the calcified coralline crust.
Economically Important Fisheries

For this region:

Recreational Red Abalone
~$44 million dollars (non-market value)

Commercial Red Sea Urchin
~$3 million dollars (ex-vessel value)
CDFW Emergency Regulations

2017
- Shortened season
  - 7 months to 5 months
- Annual limit reduced
  - 18 abalone to 12 abalone

2018
- Complete closure
- Causes:
  - All abalone found in less than 4 meter depth (vulnerable to recreational fishery), >25% in starvation condition
  - Population density average of 0.16 per m²; abalone fishery closure trigger is 0.3 per m²

G. Lee
Concern for Bull Kelp Recovery

1-year life span

SPORES

SMALL SPOROPHYTES

GAMETOPHYTES

fronds

sorus

holdfast

slipe
Moving Forward
North Coast Kelp Recovery Project

Goals would include identifying the management, restoration and research needed to facilitate recovery and increase resilience of bull kelp forests to regional and large-scale stressors.

A. Maguire
Propose the formation of an interdisciplinary working group through the SAC to address the kelp decline. This working group would:

- Consist of individuals representing interested stakeholder groups.
- Provide comprehensive management recommendations based on available scientific data and community insight.
Proposed working group would accomplish objectives within a time frame of one year – three meetings proposed in 2018. Members would provide specific expertise on:

- Site selection criteria for restoration and monitoring
- Kelp ecosystem dynamics and responses to stressors
- Restoration methods and Long-term recovery management
- Scientific monitoring protocols
- Socio-ecological impacts
Interested Stakeholders/Groups

California Department of Fish and Wildlife
Reef Check California
The Nature Conservancy Coastal Ocean Program
UC Santa Cruz, Long Marine Lab
UC Davis, Bodega Marine Lab
Partnership for the Interdisciplinary Studies of Coastal Oceans (PISCO)
California Sea Urchin Commission
Sherwood Valley Band of Pomo Indians

Potential guest speakers from: The Bay Foundation, Northwest Straights Commission, Puget Sound Restoration Fund, Washington State Department of Natural Resources
Thank you!