

# Red Abalone Fishery Management Plan Update

Dr. Rogers-Bennett CDFW

July 21, 2016

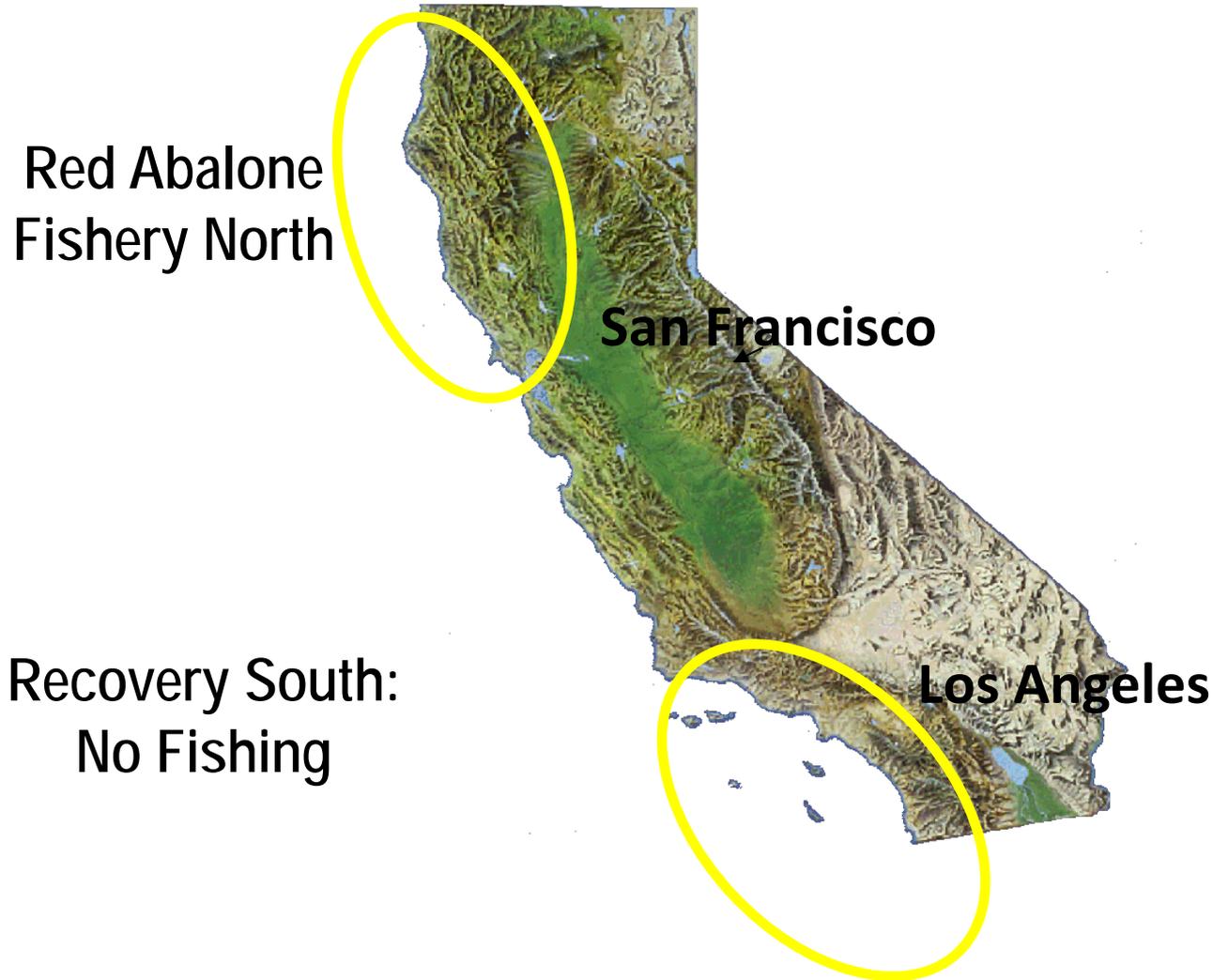
Petaluma Regional Library



# Talk Outline

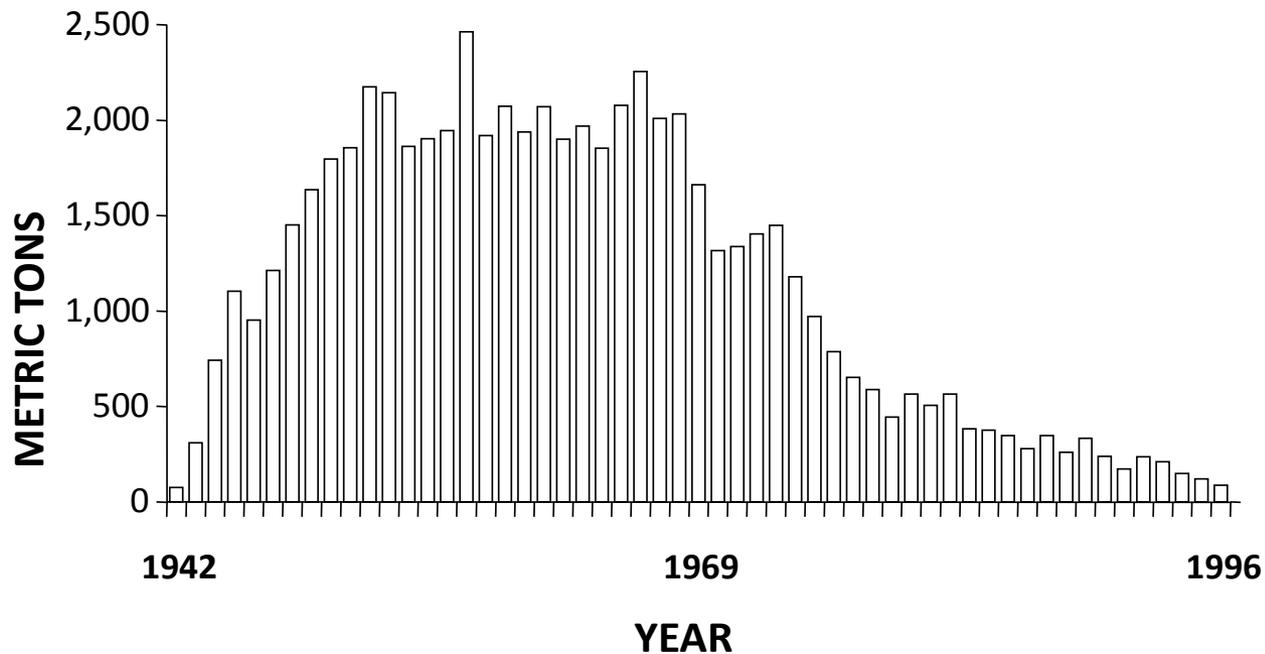
- Abalone Fishery Background
- Process to Update Fishery Management Plan
- Progress Fishery Management Plan Progress

# Abalone Regions in California



# Historic Commercial Abalone Catch South

Fishery Closed in 1997



- Despite management fishery not sustainable

# Northern California: Recreational Abalone Fishery

- Largest Recreational abalone fishery world
- Ave. 310 mton / year
- Biggest Abalone in the World
- Red Abalone
- *Haliotis rufescens*



John Pepper World Record 313mm

# Northern Rec. Fishery Management

- Free Diving Only (No Scuba)
- Size Limit 7"
- Bag Limits 3/day
- 7 months of fishing
- Must have report card
- Fishing starts 8 am
- Annual Limit 18/ year
  - 9 of 18 from Sonoma Co.
- Fort Ross Closed

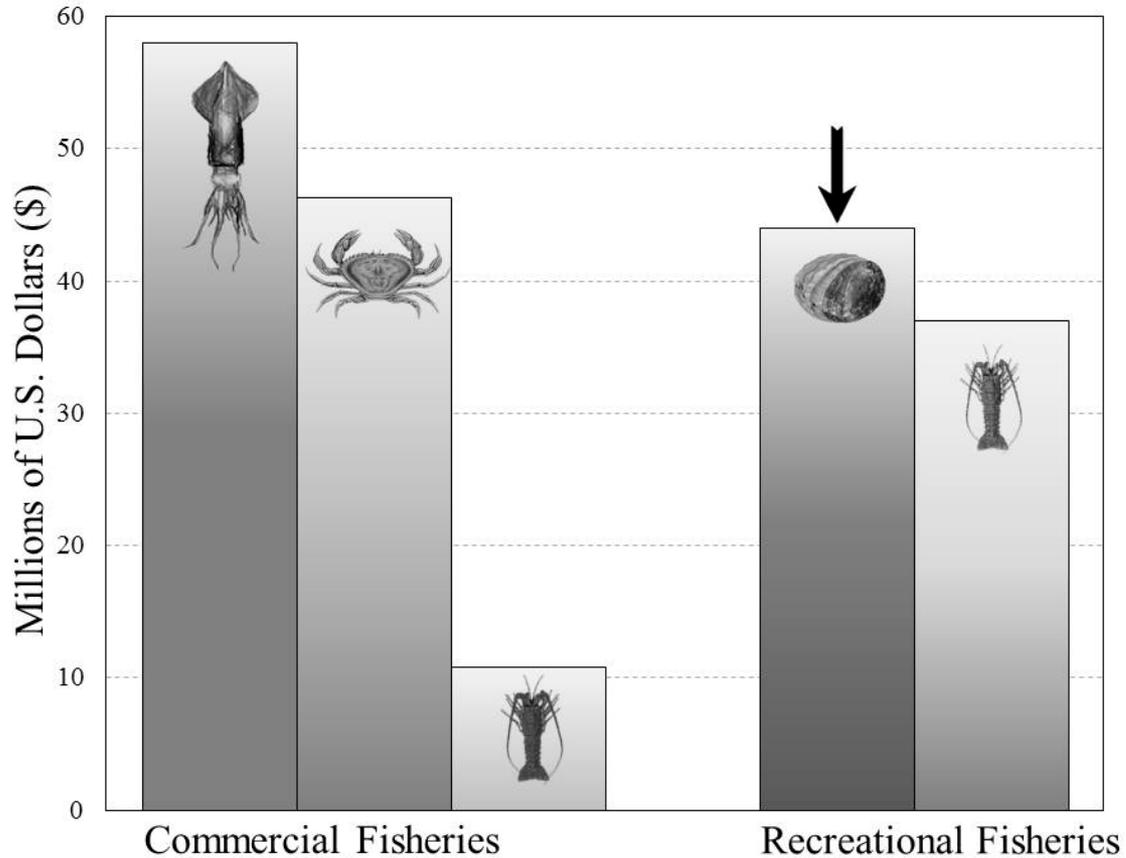


# Highly Successful Fishery

- Most participants get daily limits!
- 35,000-40,000 participants
- 264,000 abalone average / year
- Abalone Fishing part of Natural Fishing Heritage of California

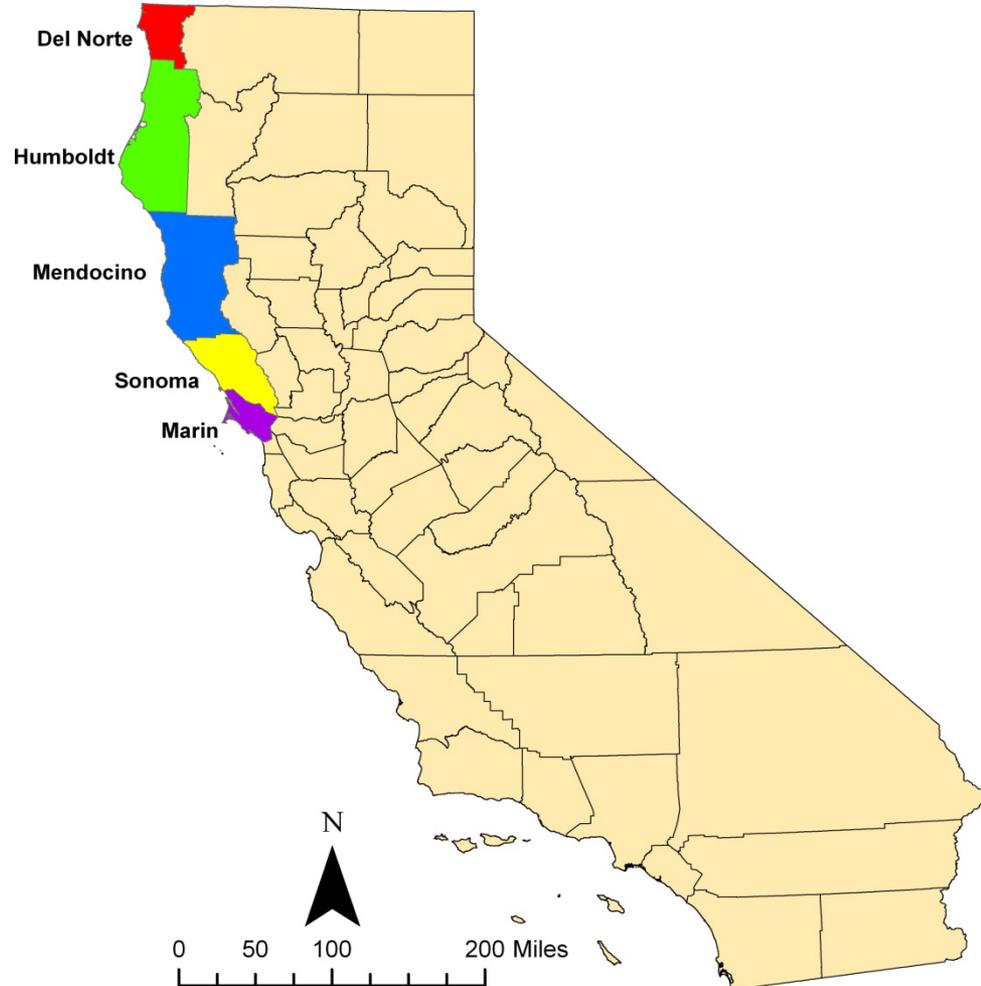
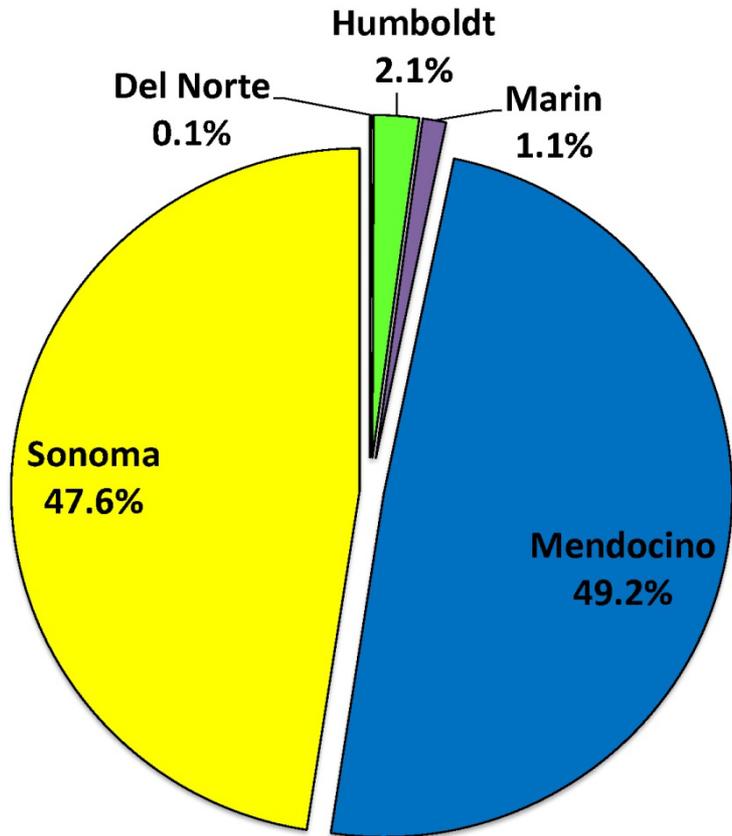


# Economically Important \$44M/year



Conservation Strategy Fund & DFW

# Abalone Catch by County



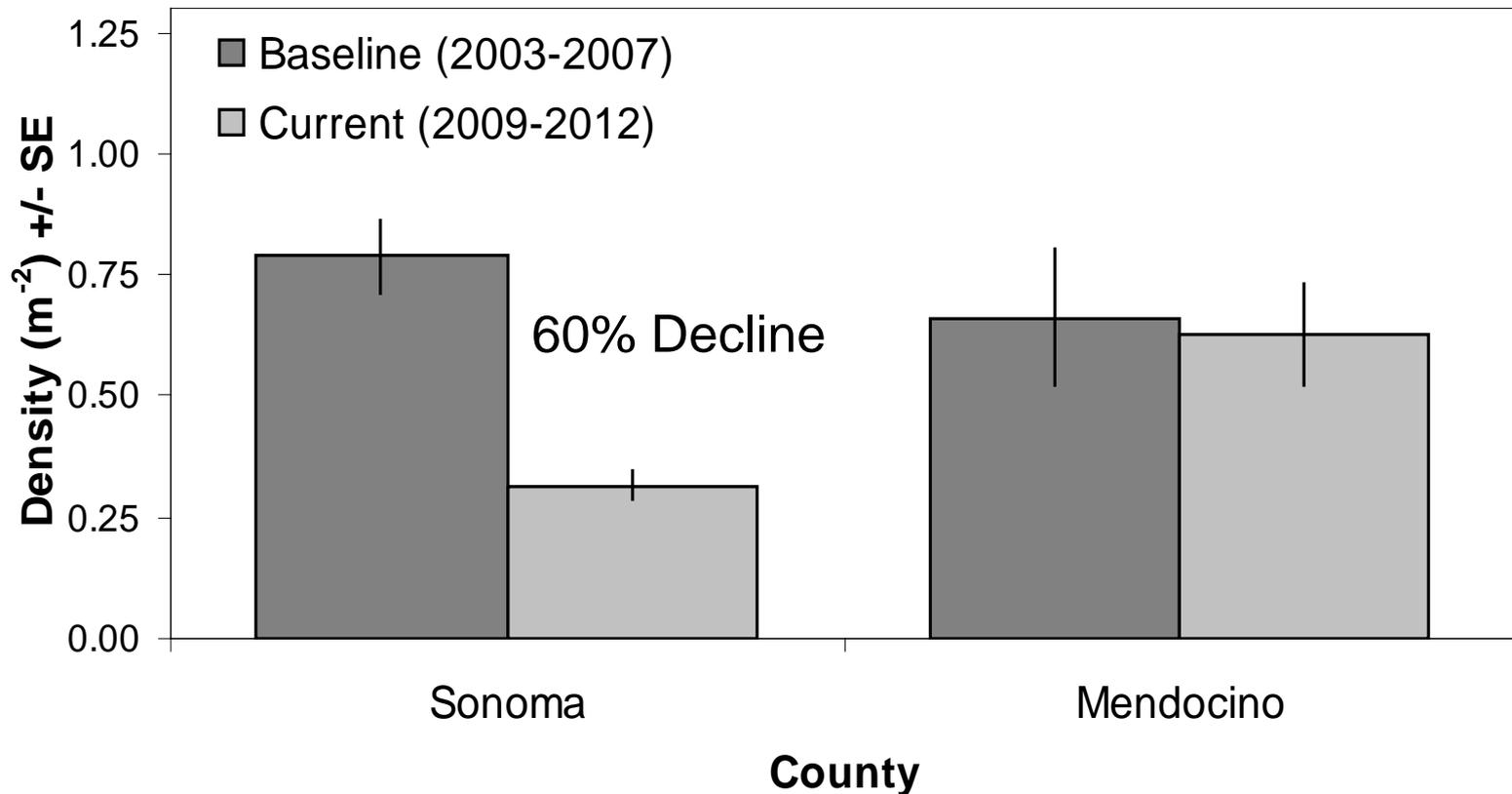
\*total number of red abalone harvested = 1,352,353

# Harmful Algal Bloom (Red Tide): impacted ½ Sonoma Co. in 2011



Photos N. Buck

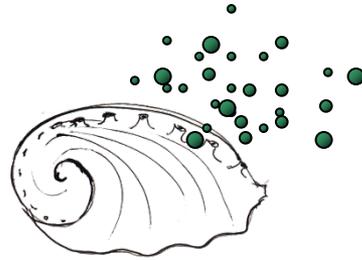
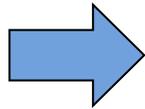
# Abalone Density by County



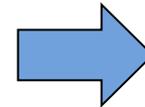
\*Sonoma Co. Sign. Different time (ANOVA  $p < 0.001$ )

# Density Key for Productivity

Low  
Density

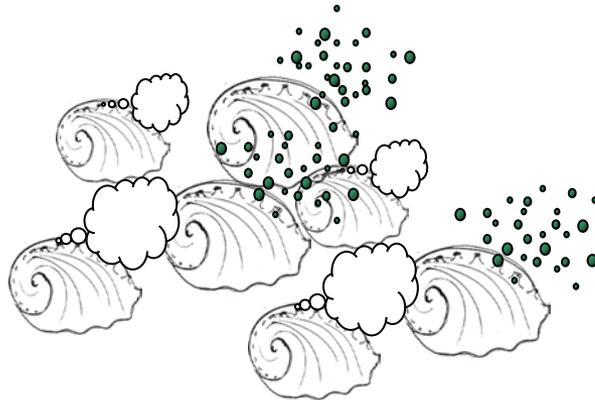
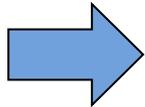


Small Aggregations /  
Solitary Abalone

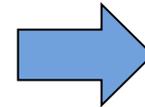


Low / No  
Reproduction

High  
Density

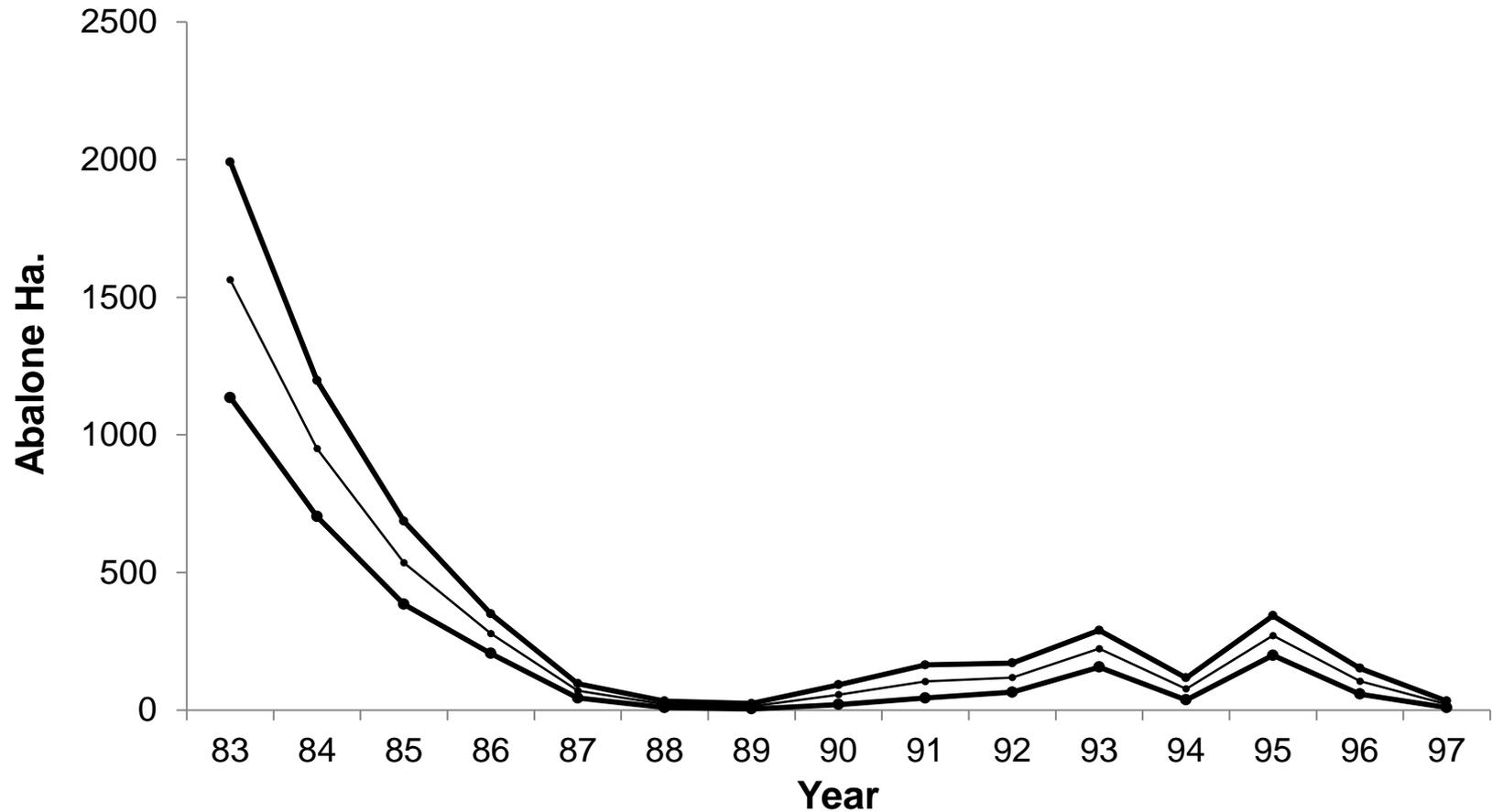


Large Aggregations



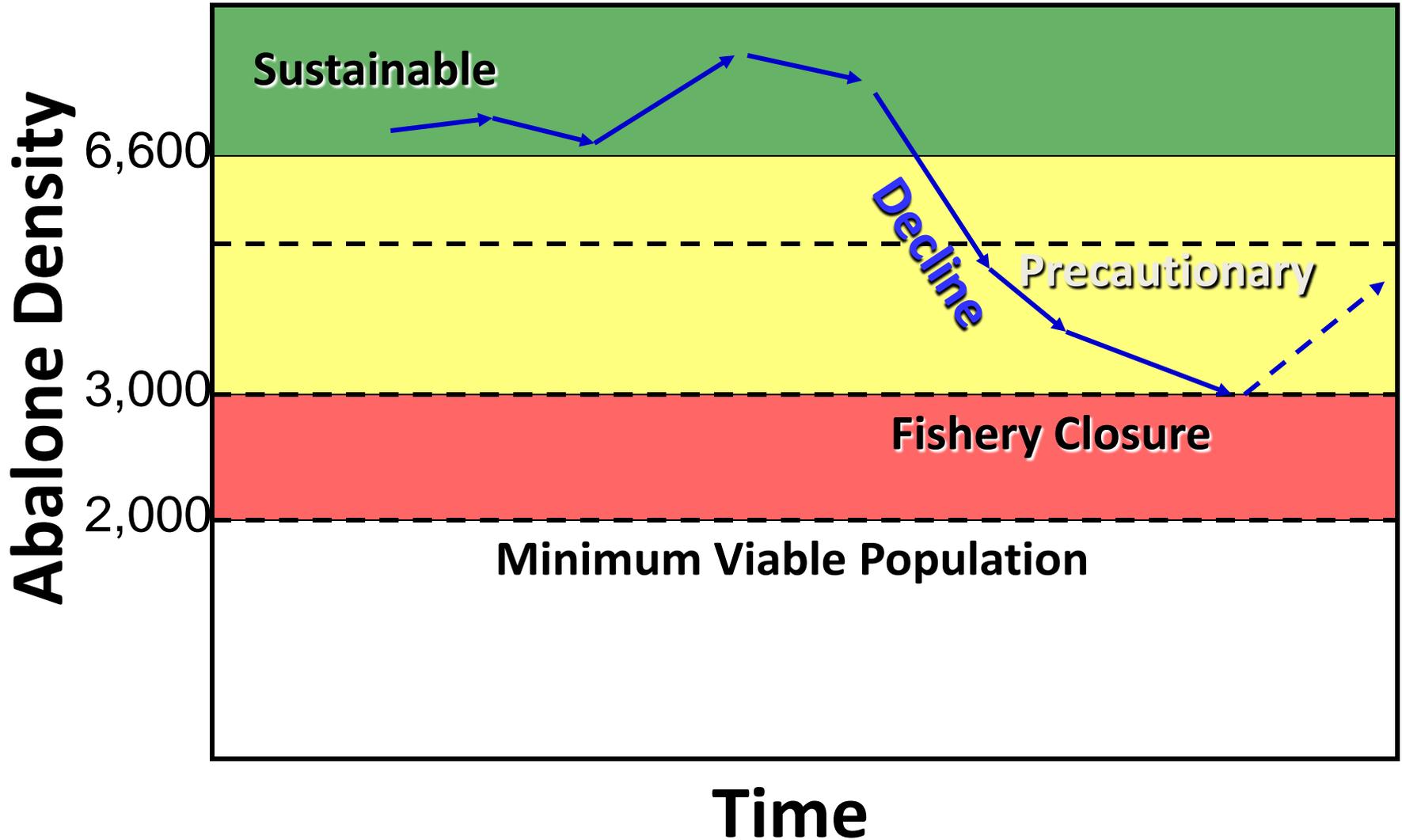
High Reproduction

# Red Abalone Density (number/Ha. $\pm$ s.e.) Santa Rosa Island



Karpov et al. (2000) Can. J. Fish. Aquat. Sci. 30: 11-20.

# Abalone Recovery and Management Plan (ARMP) Adopted FGC in 2005



# Density Survey Site Map

- 10 Survey Sites
- Sonoma and Mendocino Co.
- Survey Sites produce 48% of the catch



# ARMP Catch Adjustment Table

CRITERIA					ACTION
<i>Recruitment</i>		<i>Density (abalone/m<sup>2</sup>) – emergent surveys</i>			
		Deep (refuge)		All Depths	
<i>N/A</i>		0.33/m <sup>2</sup>	AND	0.66/m <sup>2</sup>	2) Maintain TAC
No	AND	< 0.25/m <sup>2</sup>	OR	< 0.50/m <sup>2</sup>	3) Reduce TAC by 25%

[www.dfg.ca.gov/marine/armp/index.asp](http://www.dfg.ca.gov/marine/armp/index.asp)

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- \*Fort Ross Closed
- \* New Regs for 2014



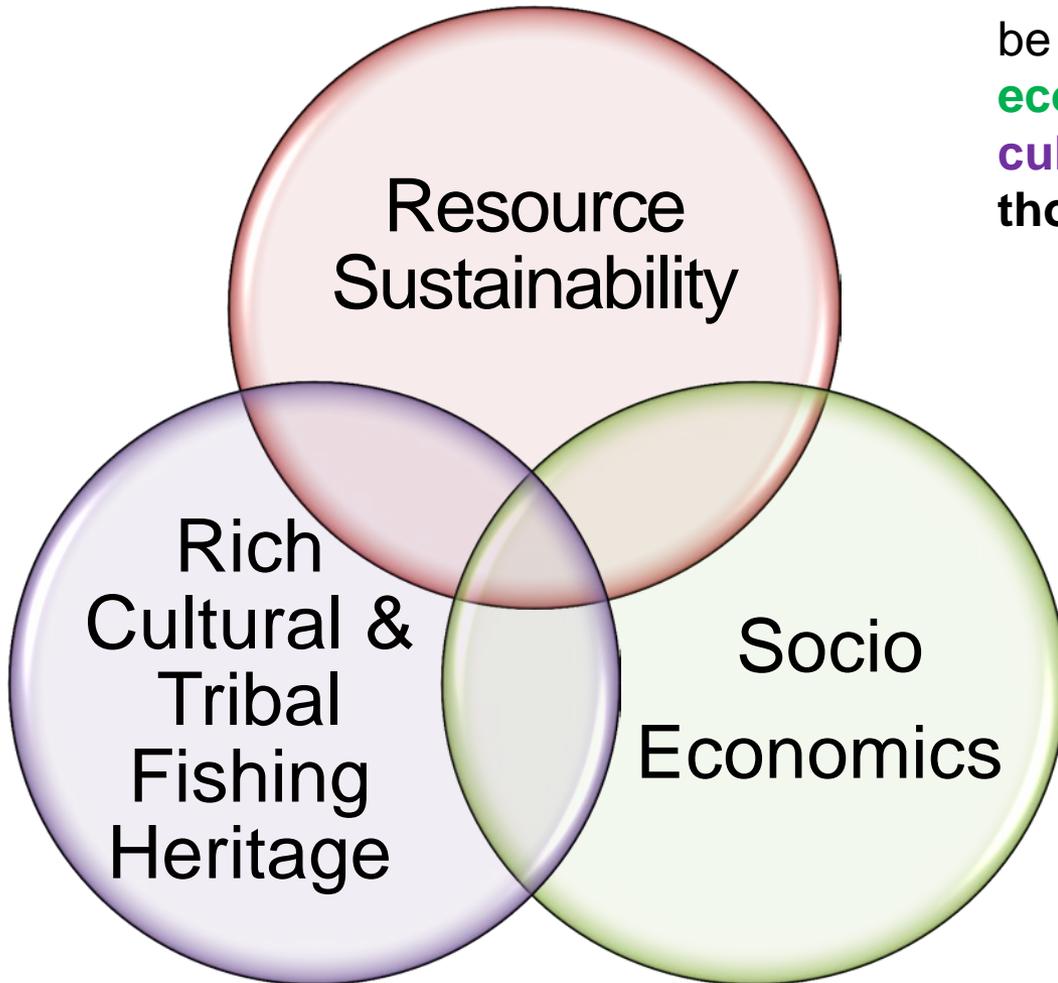
# Talk Outline

- Abalone Fishery Background (Handout)
- Process Update Fishery Management Plan
- Process Fishery Management Plan Progress

# Update Fishery Management Plan: Balance

Foundation **Marine Life Management Act (MLMA)**, California's fisheries shall be managed to assure the "long-term **economic, recreational, ecological, cultural, Tribal, and social benefits** of those fisheries..."

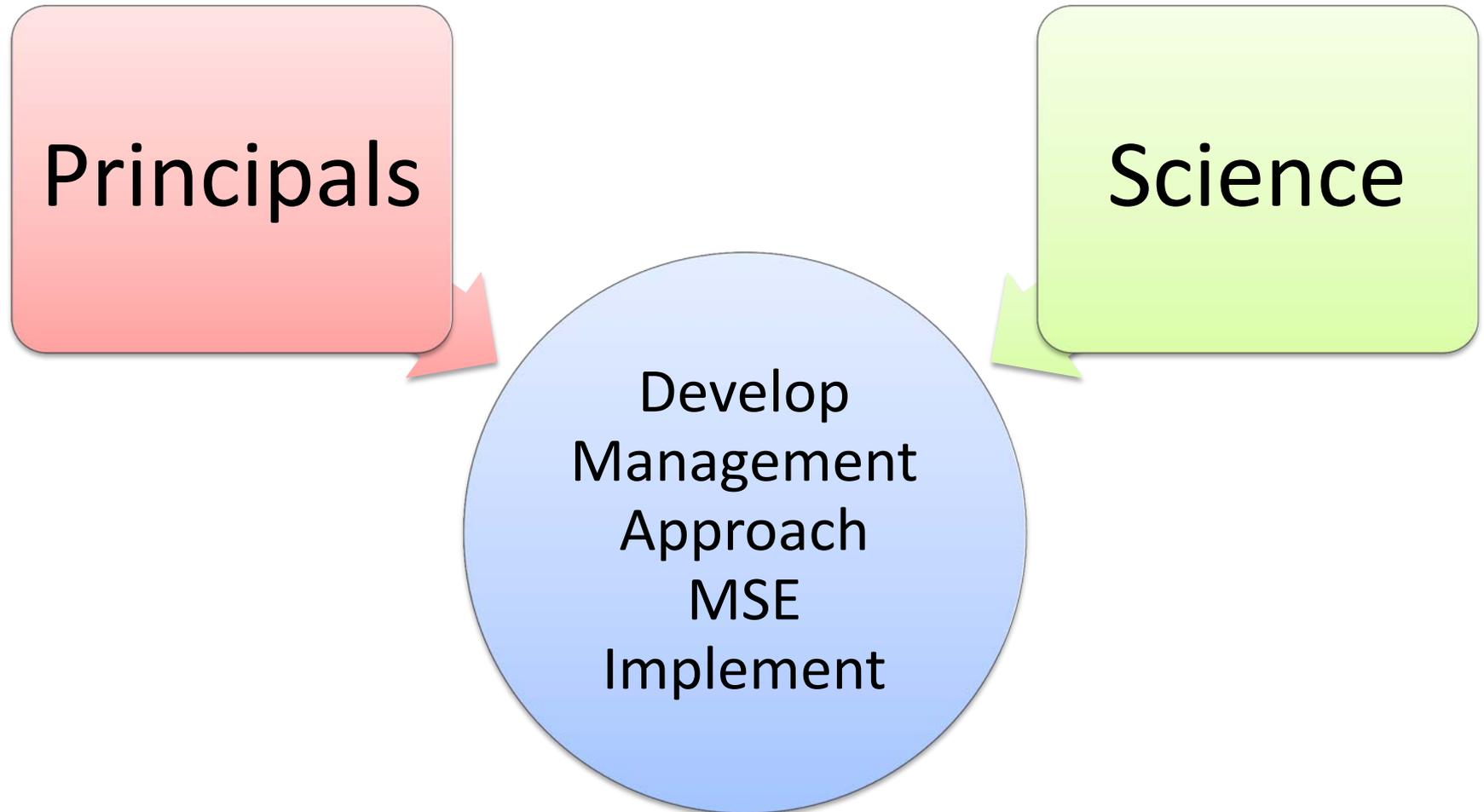
(FGC 7055a)



# Goals of the FMP

- Science-based decisions
- Transparent FMP with clear regulations
- Widely understood and supported process
- Utilize multiple data sources
- Use for making decisions on fishery
- Effectively respond to changes in the fishery

# FMP Development Process



# FMP Development Milestones: Phase I

- Abalone Recovery and Management Plan (ARMP)
- DFW Foundation MLMA - Sustainability
- Abalone Fisher Surveys - Maintain Access
- External Science Panel - Ecosystem Indicators
  - Environmental Impacts e.g. water temp, kelp, urchin
- Conservation Strategy Fund - Economic Value
  - Economic value of the fishery, enhance data collection
- Nature Conservancy - Size/Indicator Workshop
  - Hierarchical tree and system for summing indicators

# Decision Tree Framework



Density is the Foundation of the Decision Tree

# Decision Tree Inputs

- Baseline Approach – compare with earlier time period when fishery was productive
- Fishery Independent info. – e.g. Density
- Fishery Dependent info. – e.g. Catch
- Ecosystem and Environment

# Branches of the Tree

- Recent experience fishery dynamics indicates beneficial to broaden information base
- Complement density information
- Now we have data on other aspects of the ocean that impact abalone productivity
- The broader tree can help us respond to a wider array of changes to the fishery

# Respond to Fishery Changes

- Overfishing – Sustainable
- Red Tides – No Red Tides
- Lack Kelp/ Warm Water – Kelp and Cold
- Poor Reproduction – Good Reproduction
- Want To Track Fishery using Indicators



# Strategic Evaluation of Branches

- Do the data contribute new information:
- Do the data reflect change in stock:
- Time scales of the data
  - Timeframe to collect and analyze data
  - Timeframe for management decisions
  - What is the dynamic that it is reflecting (e.g. growth slow whereas HABs is fast)

# Evaluate Different Strategies

- Examine behavior of multiple management strategies
- Look at multiple options
- Examine a number of scenarios
  - We can look at previous fishery scenarios
  - We can look at future fishery scenarios
- Management Strategy Evaluation





# Future Inputs into FMP Process: Phase II

- Future opportunities for public input/involvement in the FMP process
- Public input: Phase II workshops, Review FMP
- Peer Review of the FMP
- webpage at:  
<http://www.dfg.ca.gov/marine/redabalonefmp/>

# Thank You



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**California Department of Fish and Wildlife**

**[www.wildlife.ca.gov/Science-Institute](http://www.wildlife.ca.gov/Science-Institute)**  
**Marine Invertebrate Survey Assessment Project**