

## COMMITTEE STAFF SUMMARY FOR NOVEMBER 15, 2016

**5C. RECREATIONAL RED ABALONE REGULATIONS****Today's Item****Information** ☒**Direction** ☒

Update on the need for emergency action for red abalone and receive DFW overview of options.

**Summary of Previous/Future Actions**

- DFW briefs FGC on changes affecting abalone Feb 10-11, 2016; Sacramento
- DFW updates MRC on changes affecting abalone Jul 21, 2016; MRC, Petaluma
- FGC informed of possible need for emergency action Oct 19-20, 2016; Eureka
- **Today's overview of possible emergency action** **Nov 15, 2016; MRC, Los Alamitos**
- Emergency rulemaking; and Notice hearing Dec 7-9, 2016; San Diego

**Background**

Management and recovery of all abalone species in California is currently guided by the Abalone Recovery and Management Plan (ARMP), adopted by FGC in 2005 based on legislation in 1997, prior to enactment of the Marine Life Management Act (MLMA) that requires FMPs form the primary basis for managing the state's marine fisheries. DFW is currently developing an FMP for the existing northern California recreational red abalone fishery separate from recovery under the ARMP (see Agenda Item 6A, this meeting). However, until the FMP is completed and adopted by FGC, management is still governed by the triggers and management measures identified in the ARMP.

In Feb and Jul 2016, DFW briefed FGC and MRC on a series of unprecedented environmental and biological events in Northern California that have resulted in wide-sweeping changes in density and health of red abalone, sea urchin, and the kelp they depend upon for food. Through summer and fall, DFW conducted surveys to quantify the changes as they relate to reductions in density and health of red abalone. In Oct 2016, DFW notified FGC that its survey results indicate that density levels have declined to levels identified as "triggers" for possible FGC action under to the ARMP. The ARMP identifies biological "triggers" or "action points" associated with specific levels of lower population density, occurrence, and size. Based on DFW survey results, DFW recommends immediate to reduce the annual catch target through fishery management measure changes.

Today DFW will provide an overview of the biological need and options for regulation change for the red abalone fishery consistent with the ARMP; DFW provided presentations on these topics to the Recreational Abalone Advisory Committee (RAAC) for discussion on Nov 5, 2016 (exhibits 1-3).

**Significant Public Comments (N/A)****Recommendation**

*FGC Staff:* Supports DFW recommendation. Staff recommends that MRC clarify the options to achieve necessary take reductions, receive stakeholder input, and develop recommendation for FGC consideration for regulatory change.

## COMMITTEE STAFF SUMMARY FOR NOVEMBER 15, 2016

*DFW*: DFW recommends emergency action in Dec 2016 to ensure reductions are in effect before the 2017 abalone season, and to concurrently pursue a regular rulemaking to enact the changes long-term.

**Exhibits**

1. [DFW presentation on ecosystem health and abalone fishery in northern California presented to the RAAC on Nov 5, 2016](#)
2. [DFW presentation, on red abalone catch density and reproduction data, presented to the RAAC on Nov 5, 2016](#)
3. [DFW presentation on options for Red Abalone Emergency Regulations, presented to the RAAC on Nov 5, 2016](#)

**Committee Direction/Recommendation**

Consider a recommendation for FGC concerning options to achieve take reductions consistent with the ARMP.

# RECENT KELP LOSS IMPACTS ECOSYSTEM HEALTH AND ABALONE FISHERY IN NORTHERN CALIFORNIA

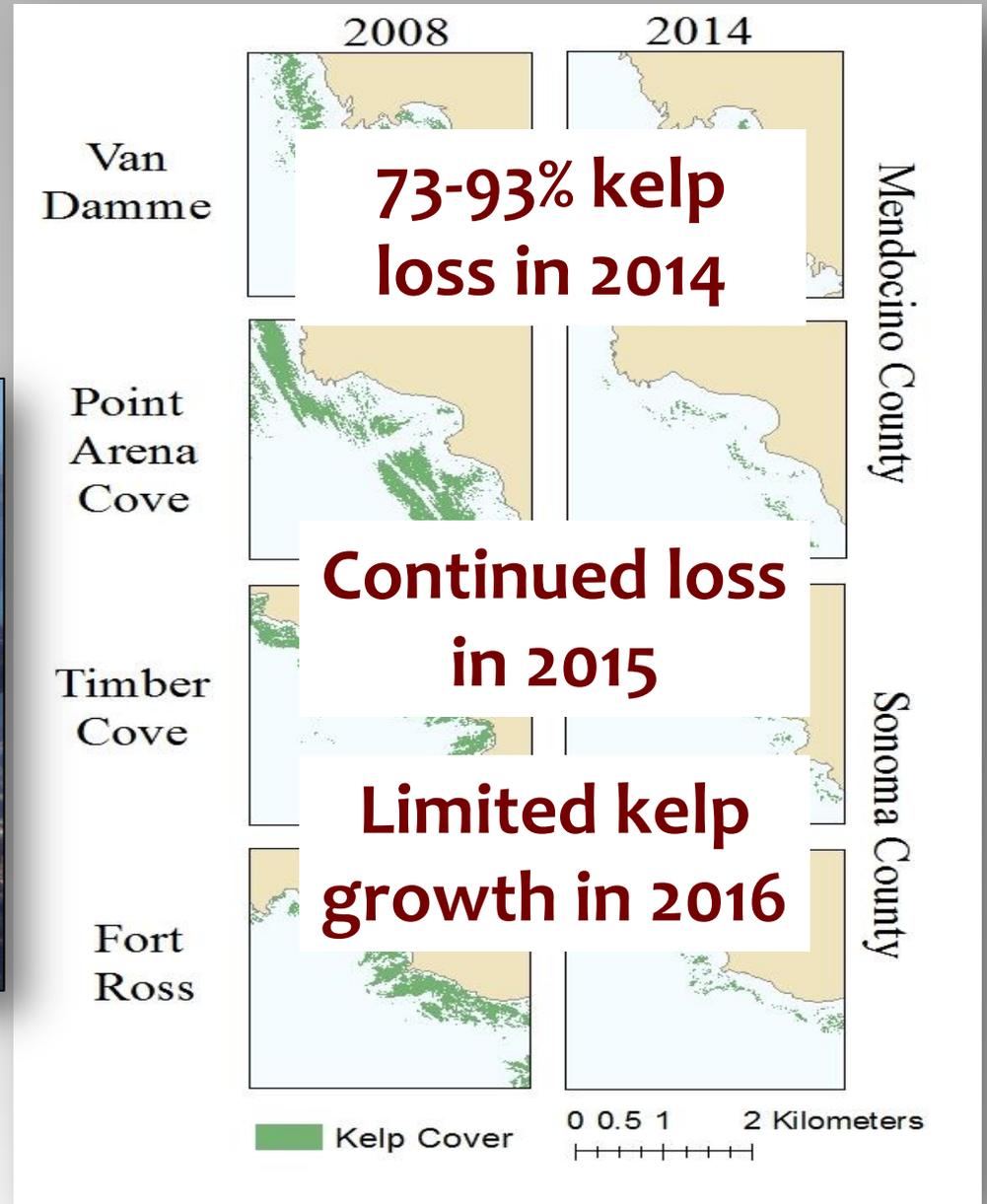
DR. CYNTHIA CATTON &  
THE CDFW INVERTEBRATE MANAGEMENT TEAM



# Kelp Fly-Over Data CDFW



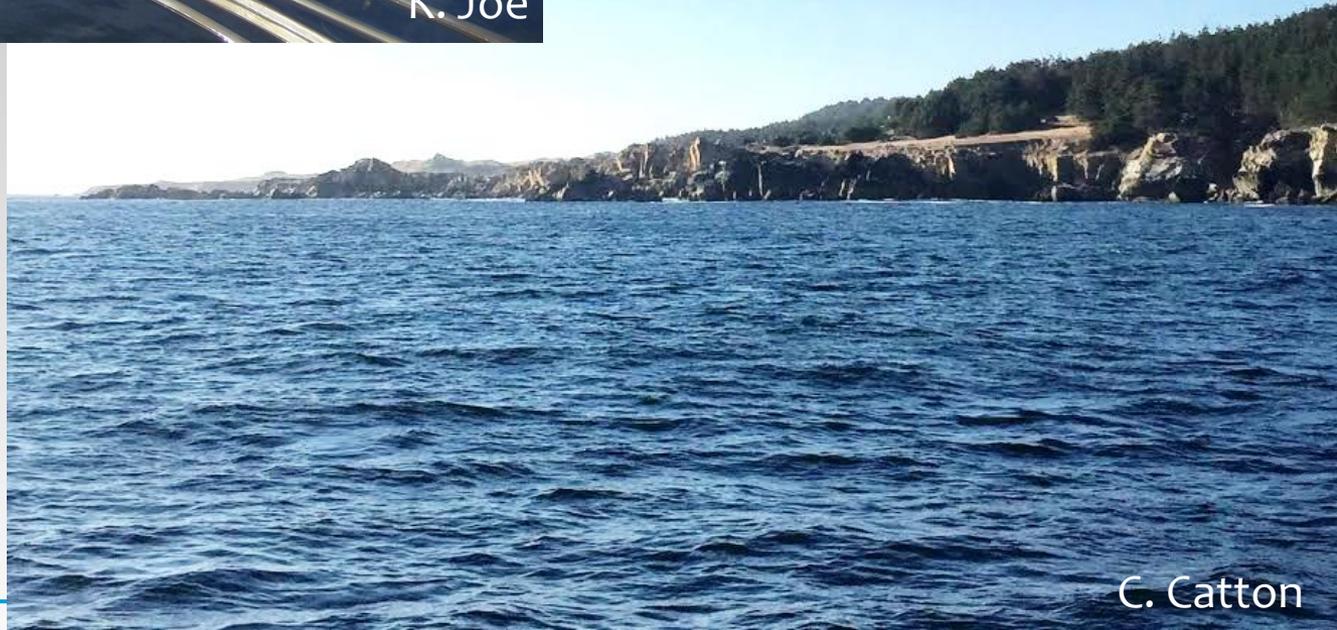
Photo by: G. Lee (Abalone Diver)  
Mendocino Headlands 2016



Ocean Cove / Salt Point  
September 13-14, 2012



Ocean Cove / Salt Point  
September 14, 2016



# Unprecedented Large-Scale Purple Sea Urchin Explosion



- **60x historic densities in N. California**

High numbers of urchins have persisted in northern California since 2014

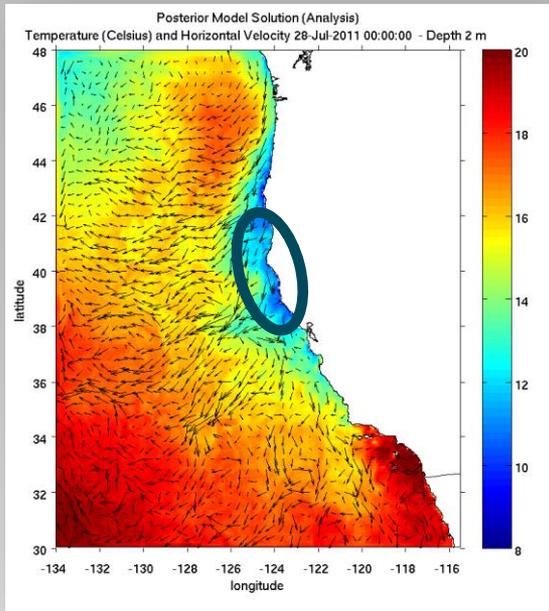
# Subtidal Algal Impacts in 2016



**Bare Rock**

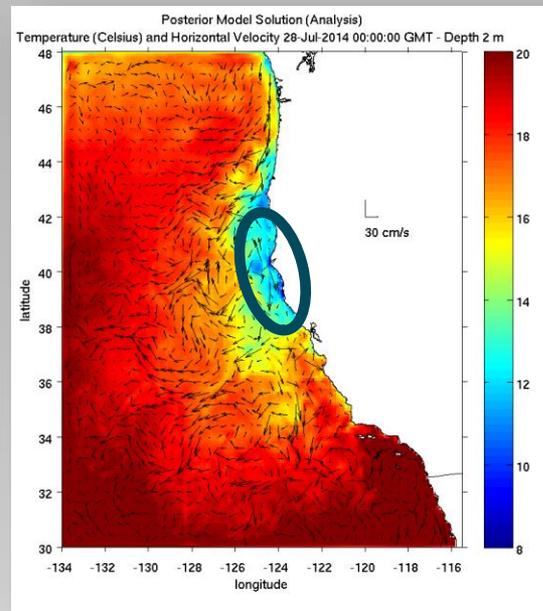
Urchins are starting to eat through the calcified coralline crust (pink rock)

# Persistent Warm Water Conditions



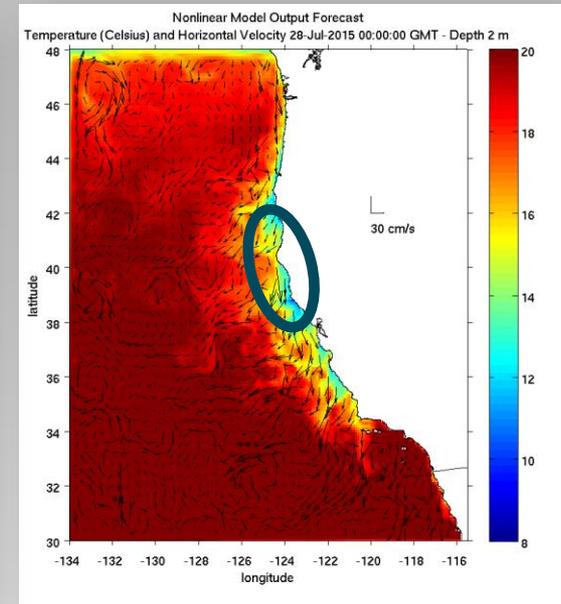
\* July 28, 2011

**Normal**



• July 28, 2014

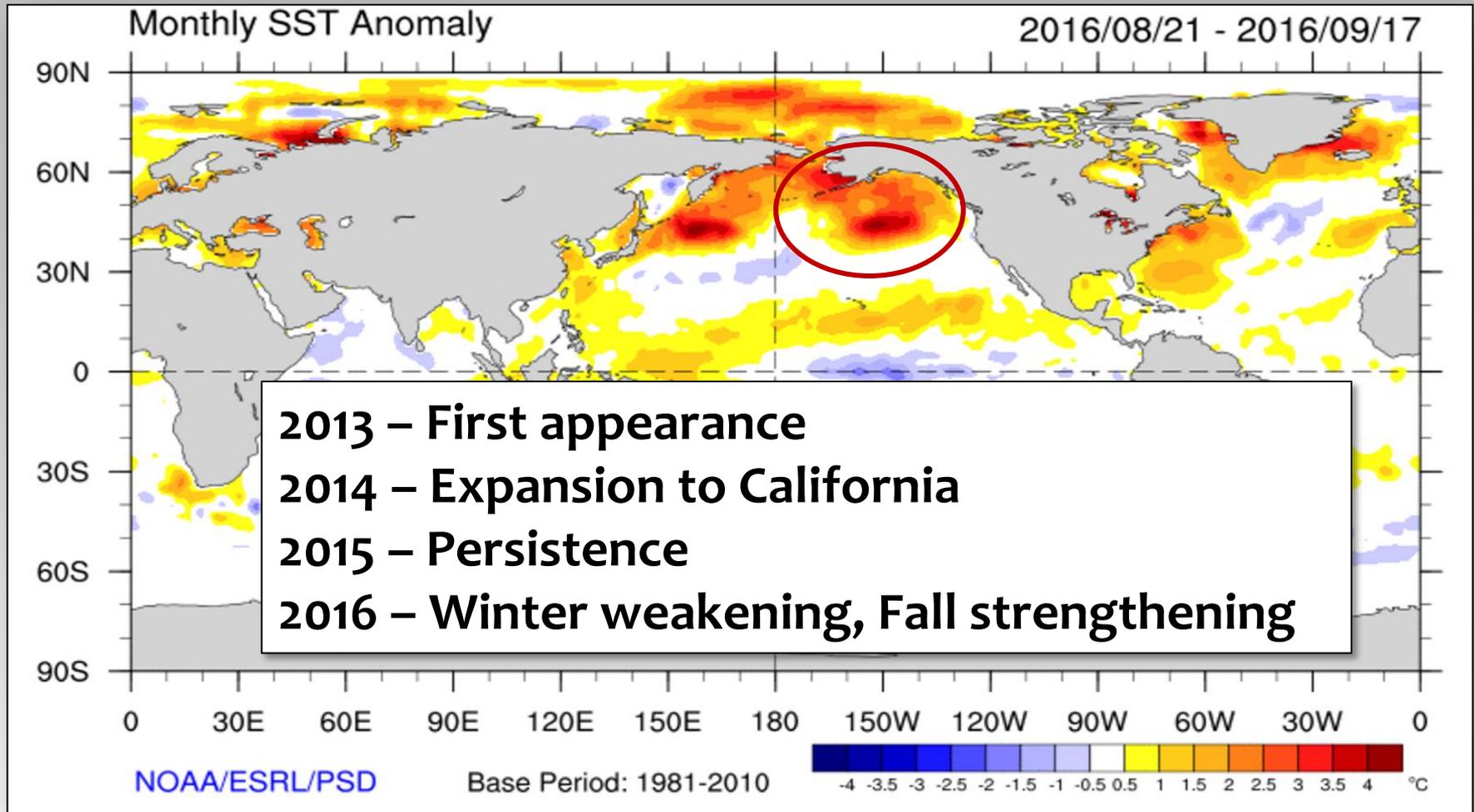
**“Warm Blob”**



• July 28, 2015

**“Warm Blob” +  
Strong El Niño**

# The Warm Blob Strengthening in Fall 2016

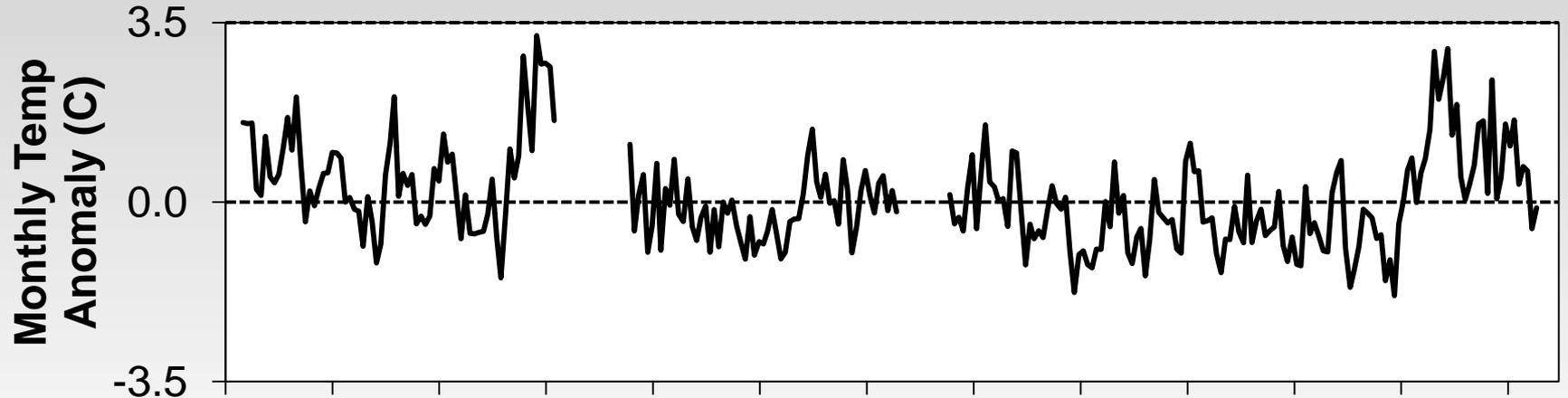
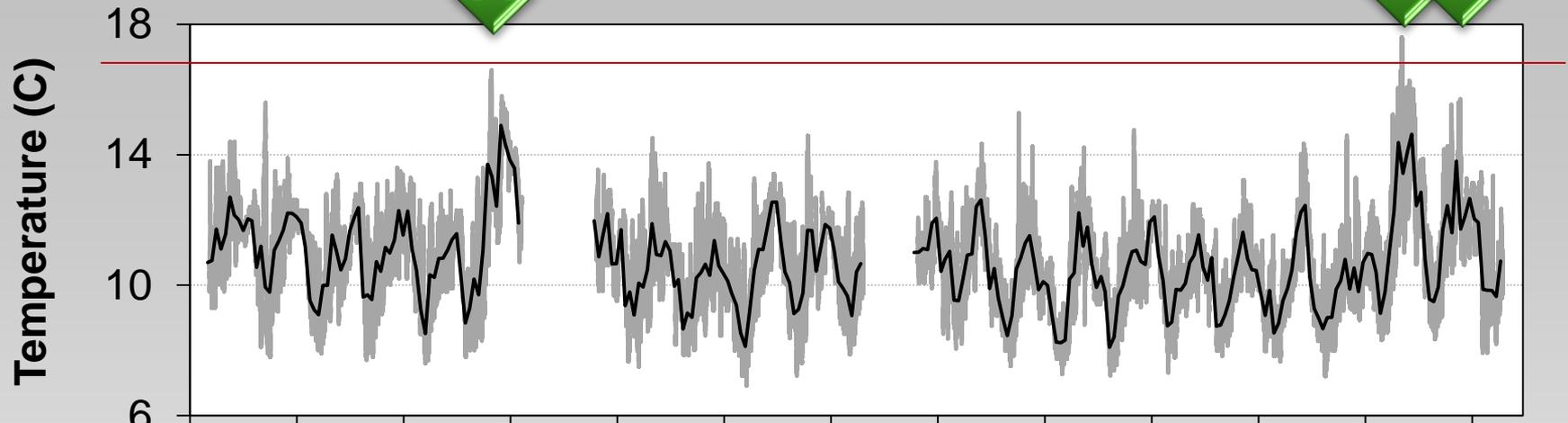


# Daily 10-m Seawater Temperature

Mendocino County

Fall 1997

Fall  
2014 & 2015



# Kelp loss threatens fisheries and the ecosystem

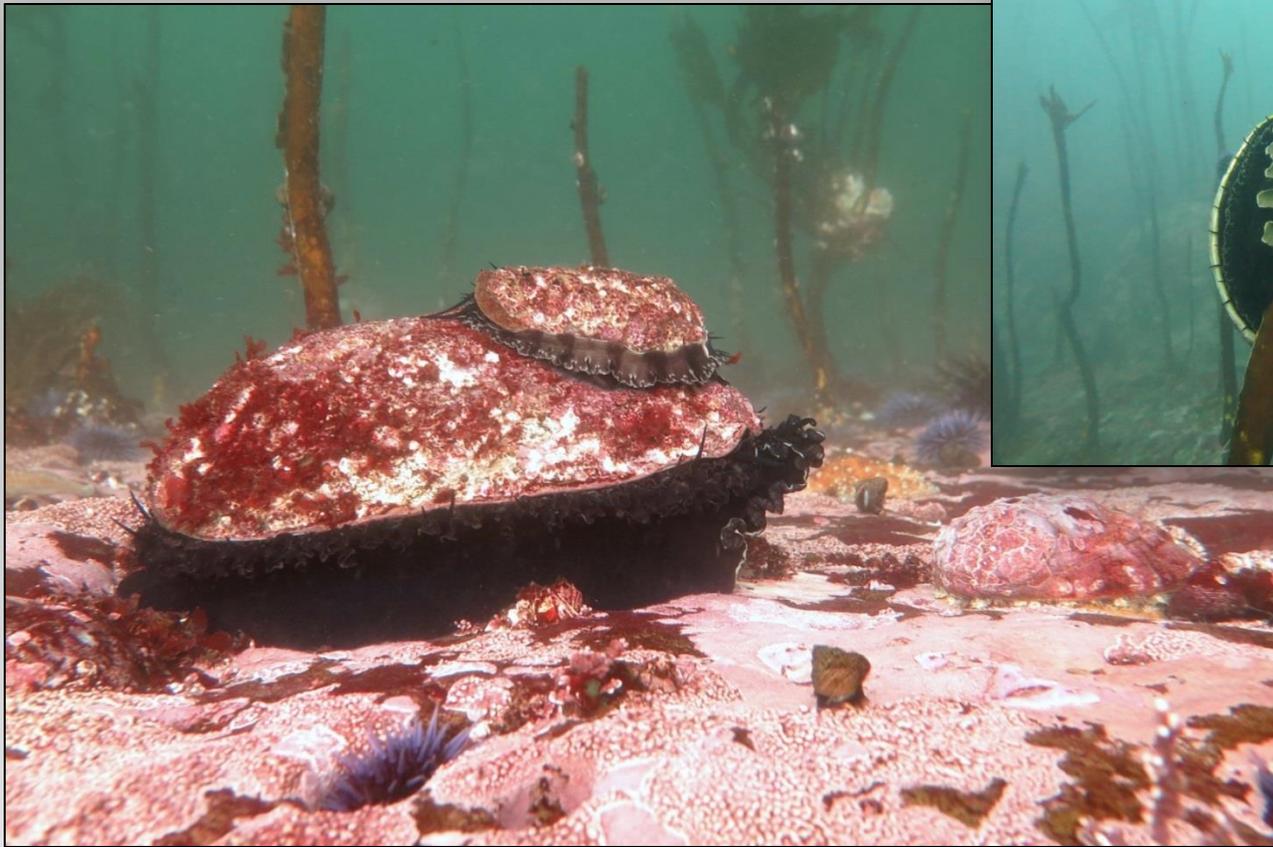


L. Rogers-Bennett (CDFW)



A. Weltz (CDFW)

# Starvation Conditions in Northern California (2014-2016)



A. Maguire (CDFW)



K. Joe (CDFW)

# Red Abalone Health Assessment

Creel surveys

Sonoma, Mendocino, and Humboldt

Spring 2016

~6,000 abalone inspected



**> 25% of abalone shrunken at key fishery locations**

Body Shrinkage  
Score 0

Body Shrinkage  
Score 1

Body Shrinkage  
Score 2

Body Shrinkage  
Score 3

# Large swells dislodge dying abalone



# Impacts to Body Mass and Reproduction Van Damme and Fort Ross



Photo Jack Likins

**Body mass:**  
20% reduced at  
Van Damme

**Reproduction:**  
60-90%  
reduced

# Implications for Long-term Red Abalone Fishery Productivity

- **Increased natural mortality**
  - Weakened / poor abalone health
  - Unknown recovery time
  - Susceptible to large swell conditions
- **Negative impacts to abalone reproduction**
  - Very low gonad index values (2015 and 2016)
  - Long recovery time (> 1 year with high food availability)
  - Limits future fishery growth
- **Ongoing starvation conditions predicted**
  - Persistent urchin barrens
  - Possible return of warm water conditions

# Questions & Comments



K. Joe (CDFW)

**Dr. Cynthia Catton**

Marine Region

Invertebrate Management Project

[Cynthia.Catton@wildlife.ca.gov](mailto:Cynthia.Catton@wildlife.ca.gov)



# Red Abalone Catch Density and Reproduction Data

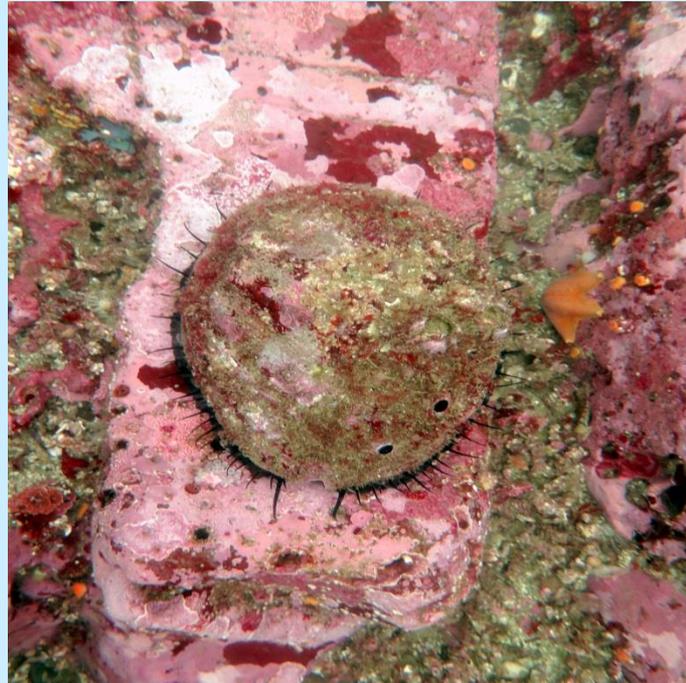


Photo: A. Maguire

Laura Rogers-Bennett  
California Department of Fish and Wildlife  
RAAC November 5, 2016

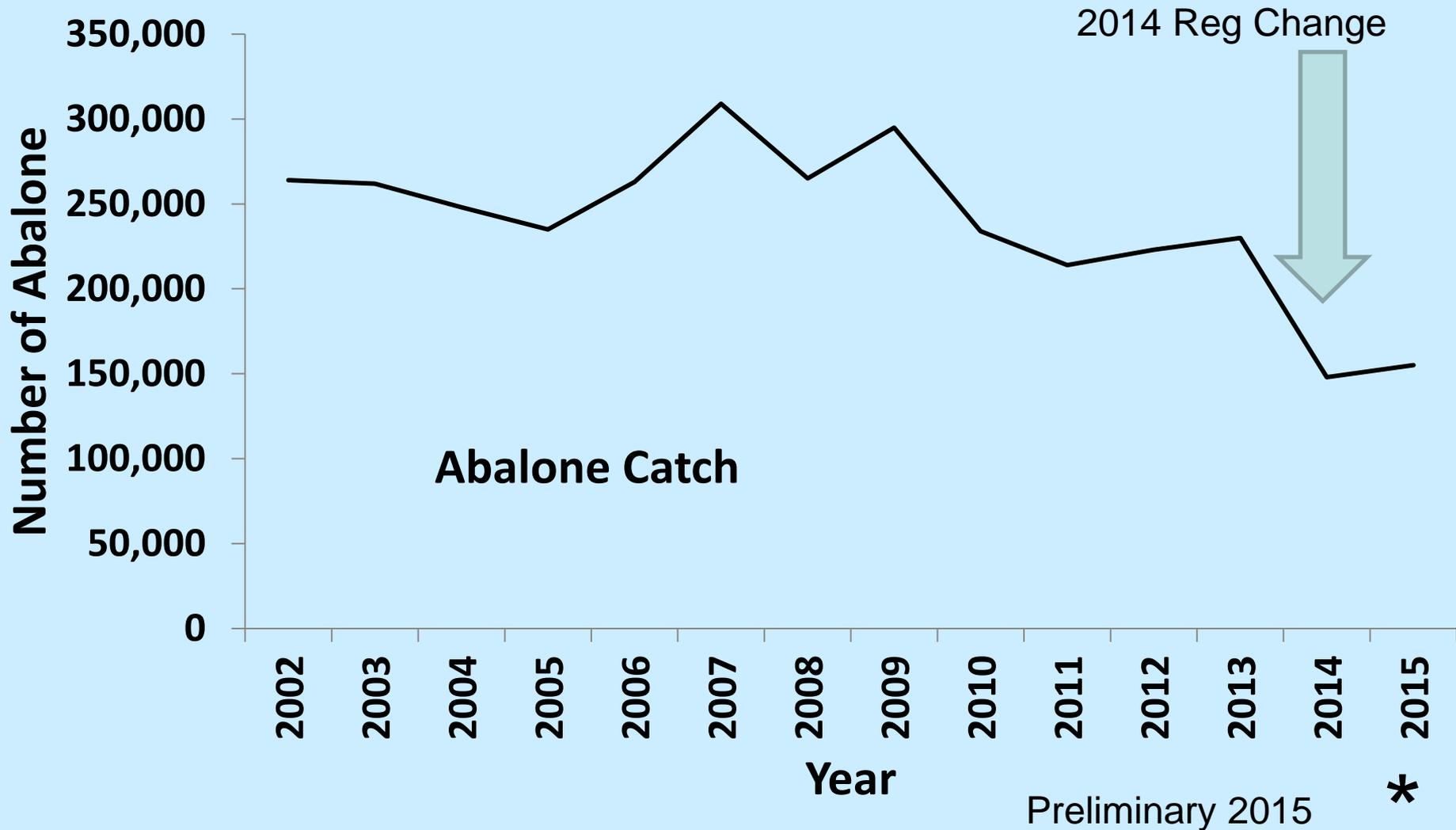


# Talk Outline

- Abalone Fishery: Catch and punchcards
- Abalone Density on fishing grounds
- Deep density and ARMP
- Abalone Productivity Data
  - Larval abalone
  - Newly settled
  - Juvenile red abalone

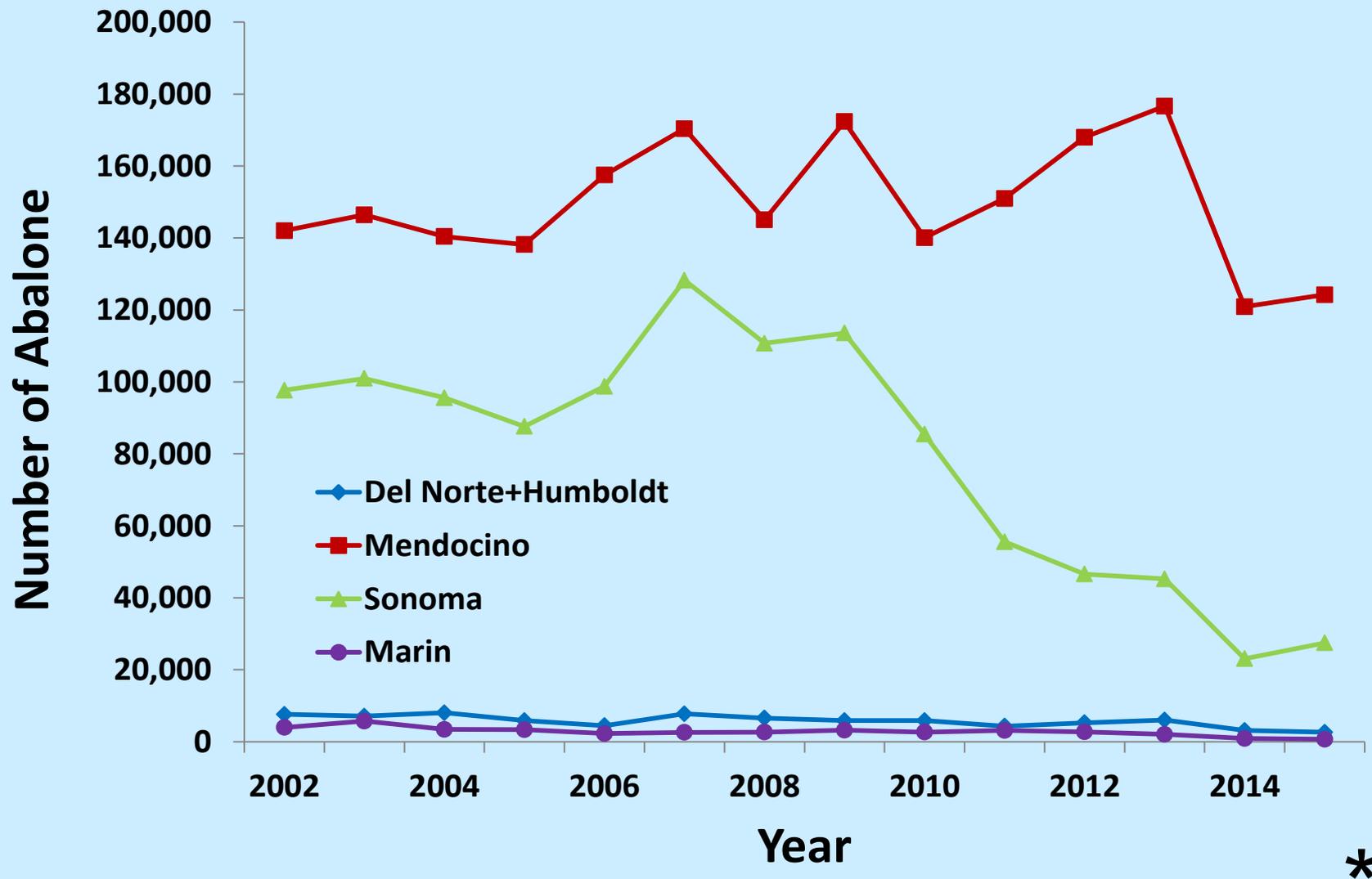


# 2002 – 2015\* Red Abalone Catch



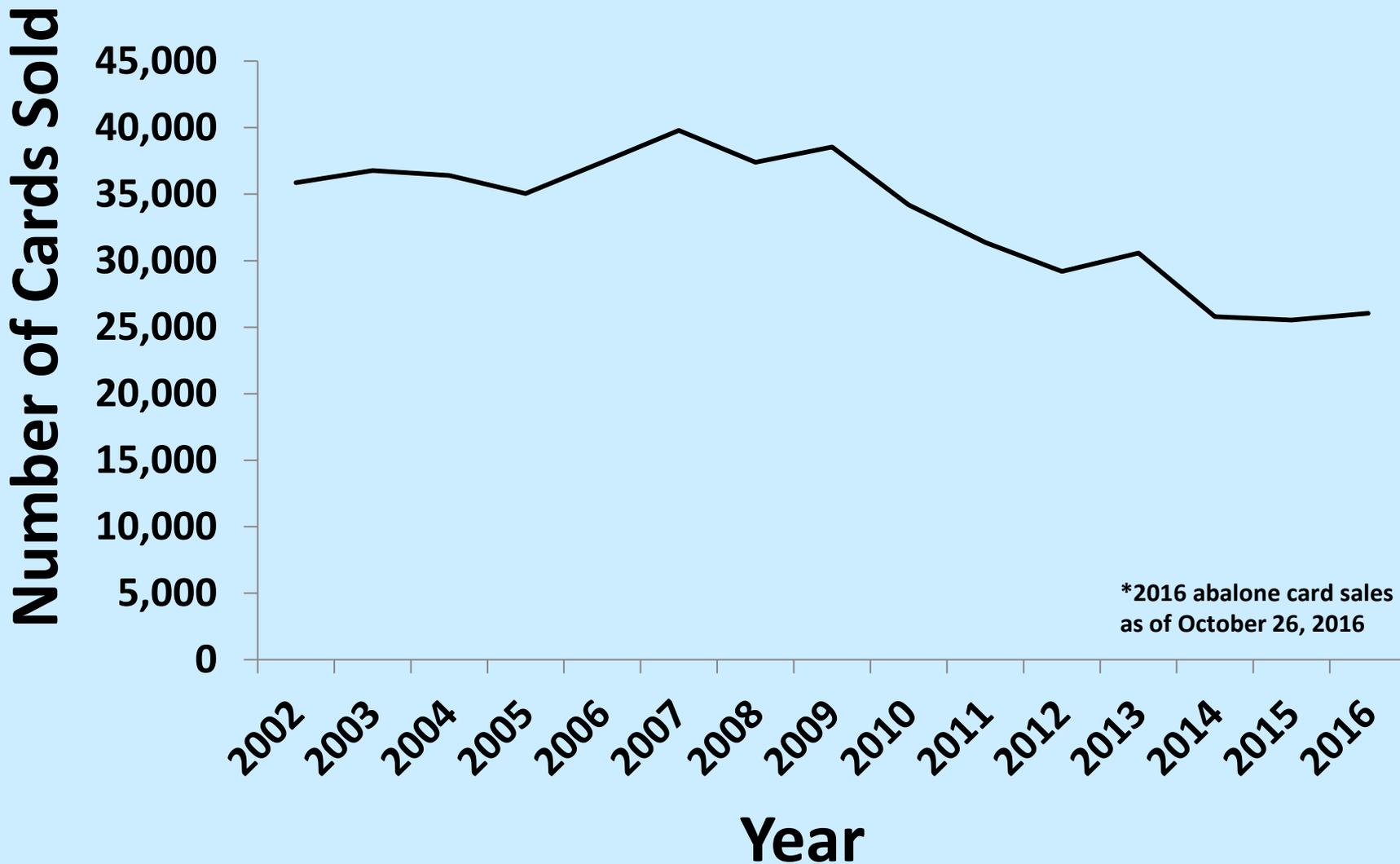


# 2002 – 2015\* Red Abalone Catch by County





# 2002 – 2016\* Abalone Card Sales





# Abalone Card Purchase Frequency: 2011 - 2015

<b>Years Purchased</b>	<b>Card Sales</b>	<b>Percentage of Total</b>
<b>1</b>	<b>33,482</b>	<b>50%</b>
<b>2</b>	<b>11,680</b>	<b>18%</b>
<b>3</b>	<b>7,437</b>	<b>11%</b>
<b>4</b>	<b>5,679</b>	<b>9%</b>
<b>5</b>	<b>8,078</b>	<b>12%</b>
<b>Total</b>	<b>66,356</b>	<b>100%</b>

## 2015 Customers

<b>Sales</b>	<b>25,536</b>
<b>Avid %</b>	<b>32%</b>



# Density Survey Data



Photo: A. Maguire



# Mendocino Abalone Sites Surveys 2013-2016

Mendocino County Index Sites	Year	Transect #	Square Meters Surveyed	Abalone Counted	Abalone Density (m <sup>-2</sup> )	Deep (Refuge) Density
Point Arena	2014-15	26	1560	1115	0.66	0.51
Van Damme	2016	34	2040	645	0.33	0.07
Casper Cove	2013	45	2700	1045	0.35	0.13
Todd's Point	2013	37	2220	1051	0.47	0.35
Russian Gulch	2014	32	1920	1218	0.60	0.28



# Sonoma Abalone Sites Surveys 2012-2016

Sonoma County Index Sites	Year	Transect #	Square Meters Surveyed	Abalone Counted	Abalone Density (m <sup>-2</sup> )	Deep (Refuge) Density
Fort Ross	2015	35	2100	951	0.44	0.2
Timber Cove	2015	36	2160	829	0.38	0.14
Ocean Cove	2016	36	2160	897	0.44	0.11
Salt Point	2016	36	2160	744	0.35	0.06
Sea Ranch	2012	34	2040	780	0.37	0.13



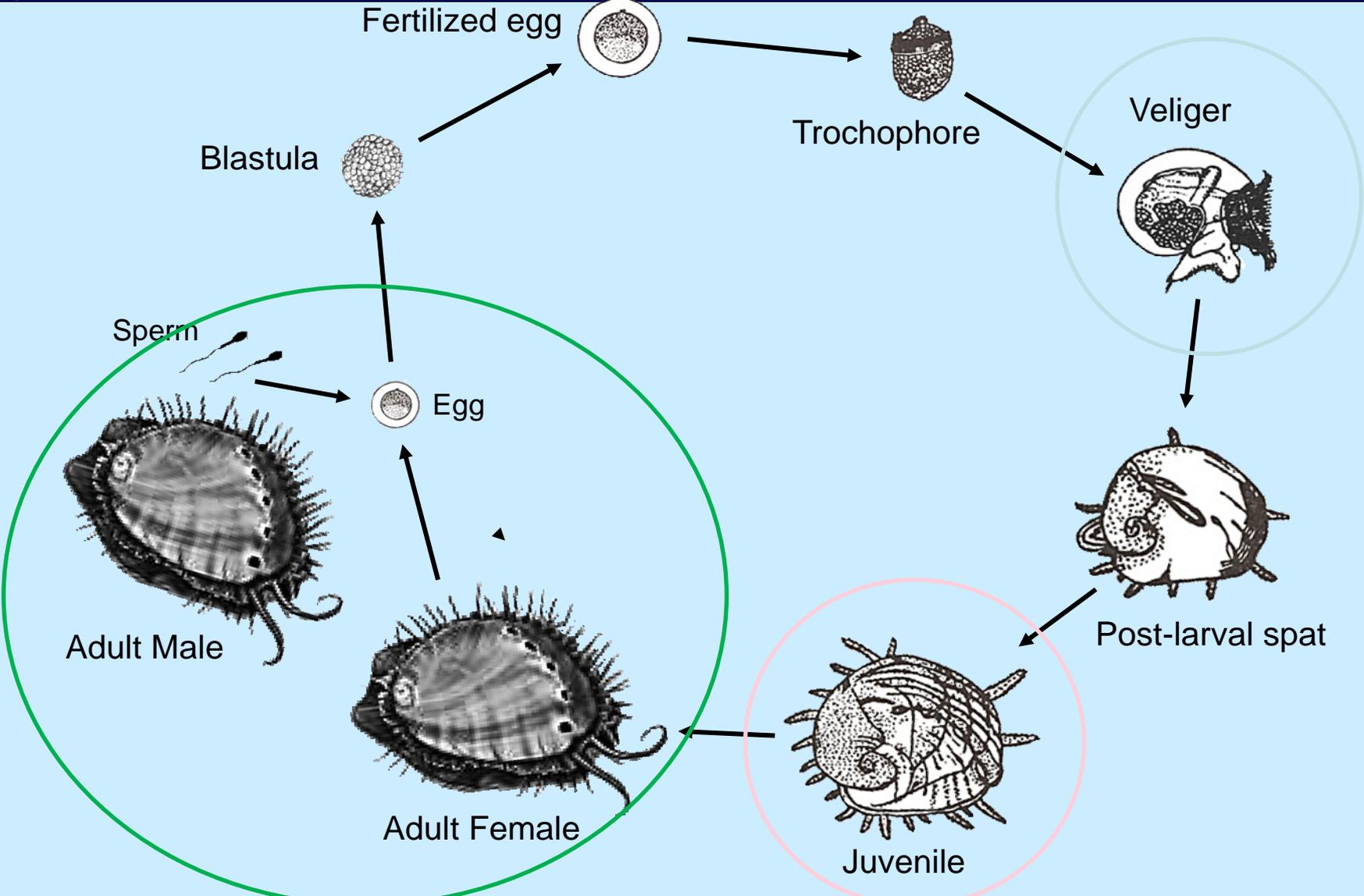
# Abalone Density per m<sup>2</sup>

OVERALL AVERAGE	2012-16	Density 0.44	Deep 0.20
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ARMP Deep density trigger is  $< 0.25$

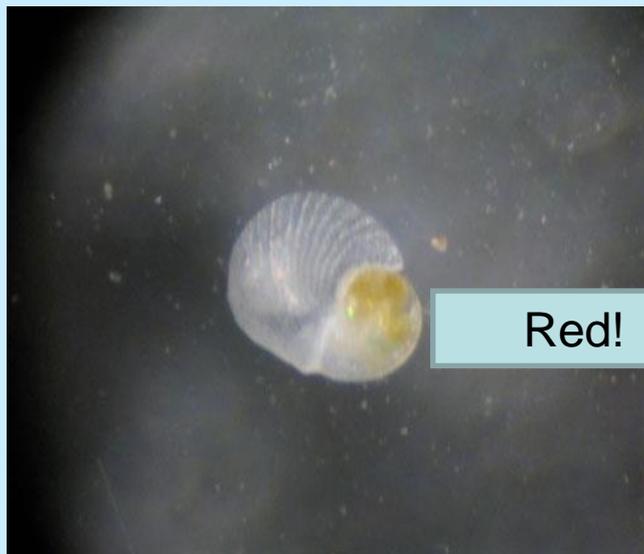


# Abalone Life Cycle





# Genetic ID of red abalone

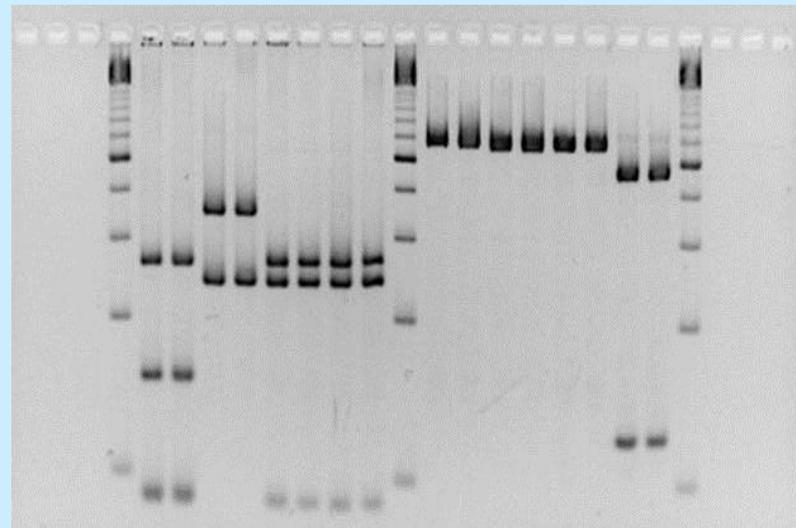


Red!



Digested by Fok I

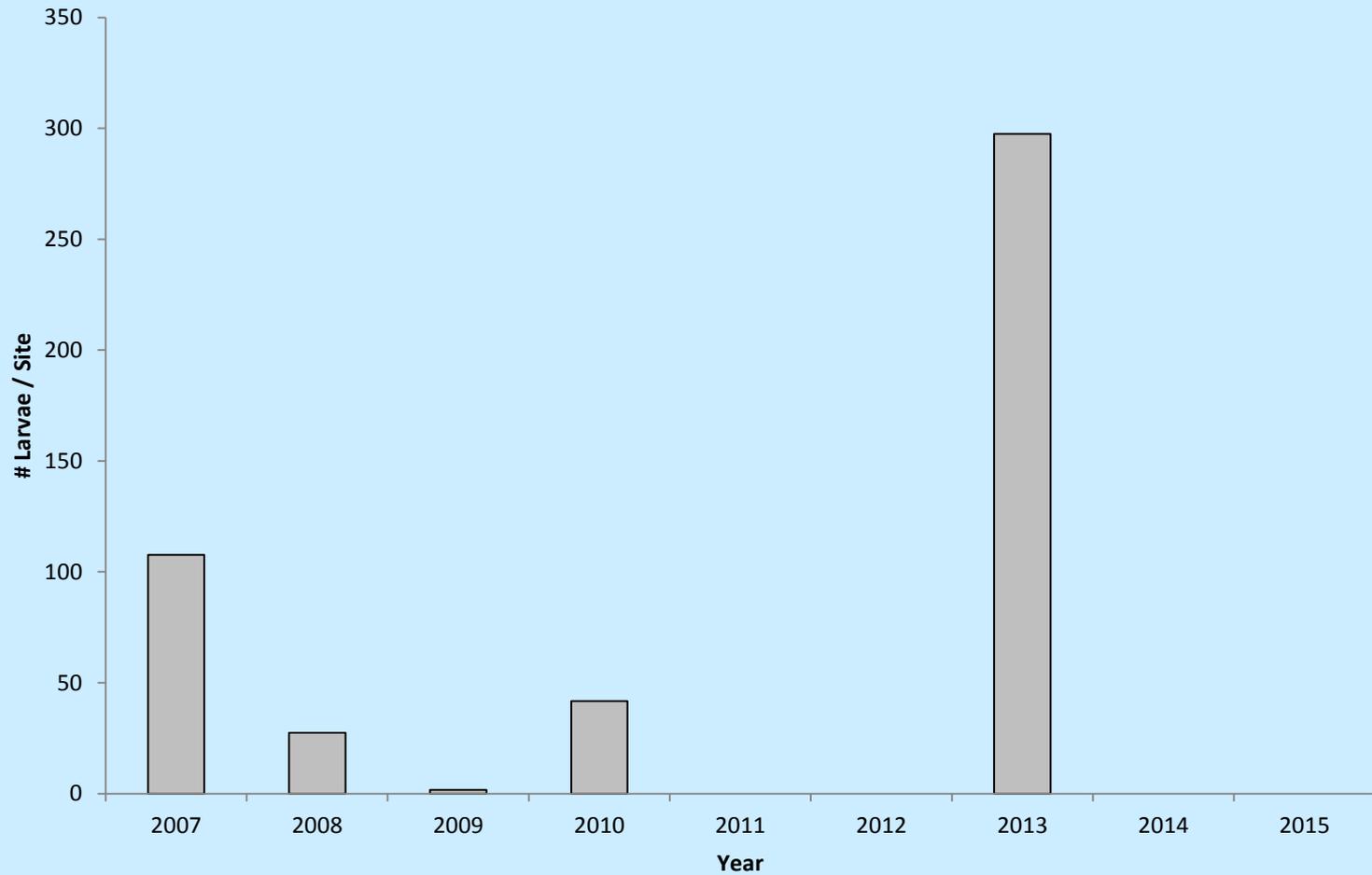
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Red Black Flat PintoRed Black Flat Pinto



# Planktonic Abalone

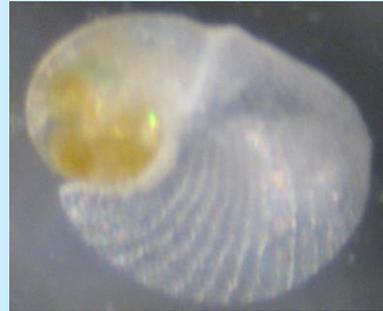




# Monitoring *Tiny* Juveniles



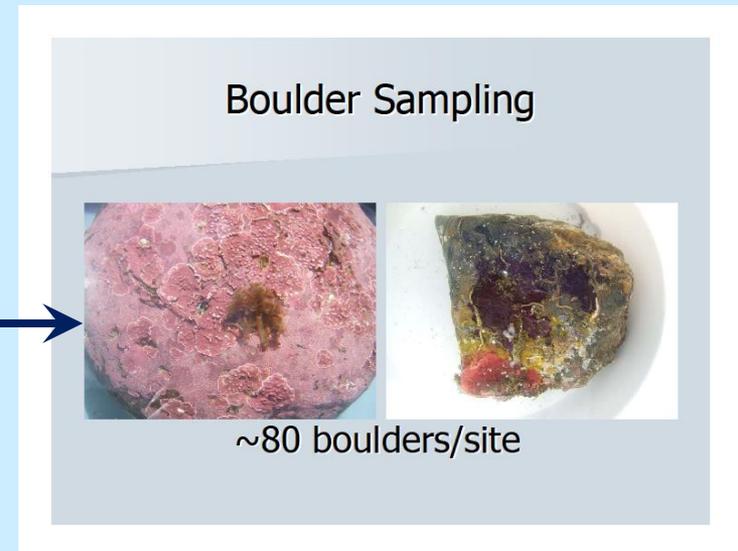
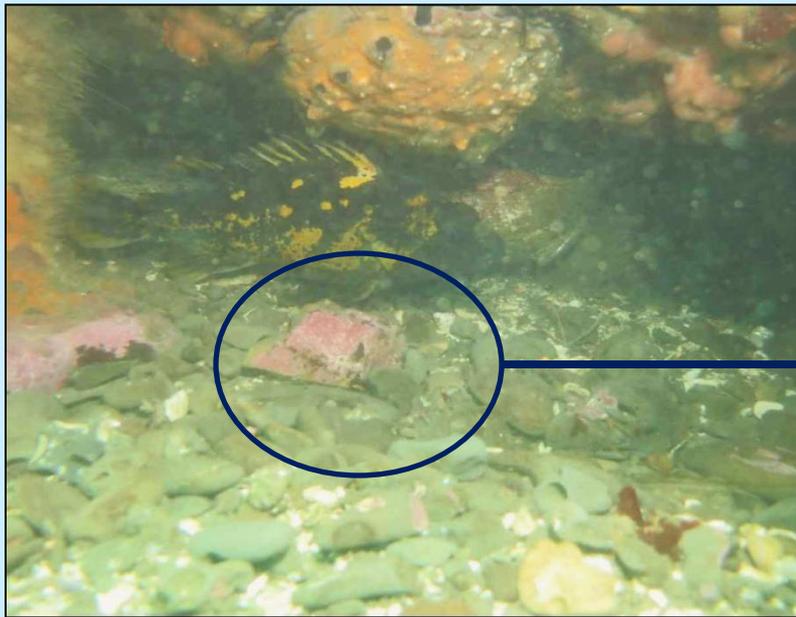
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450 um

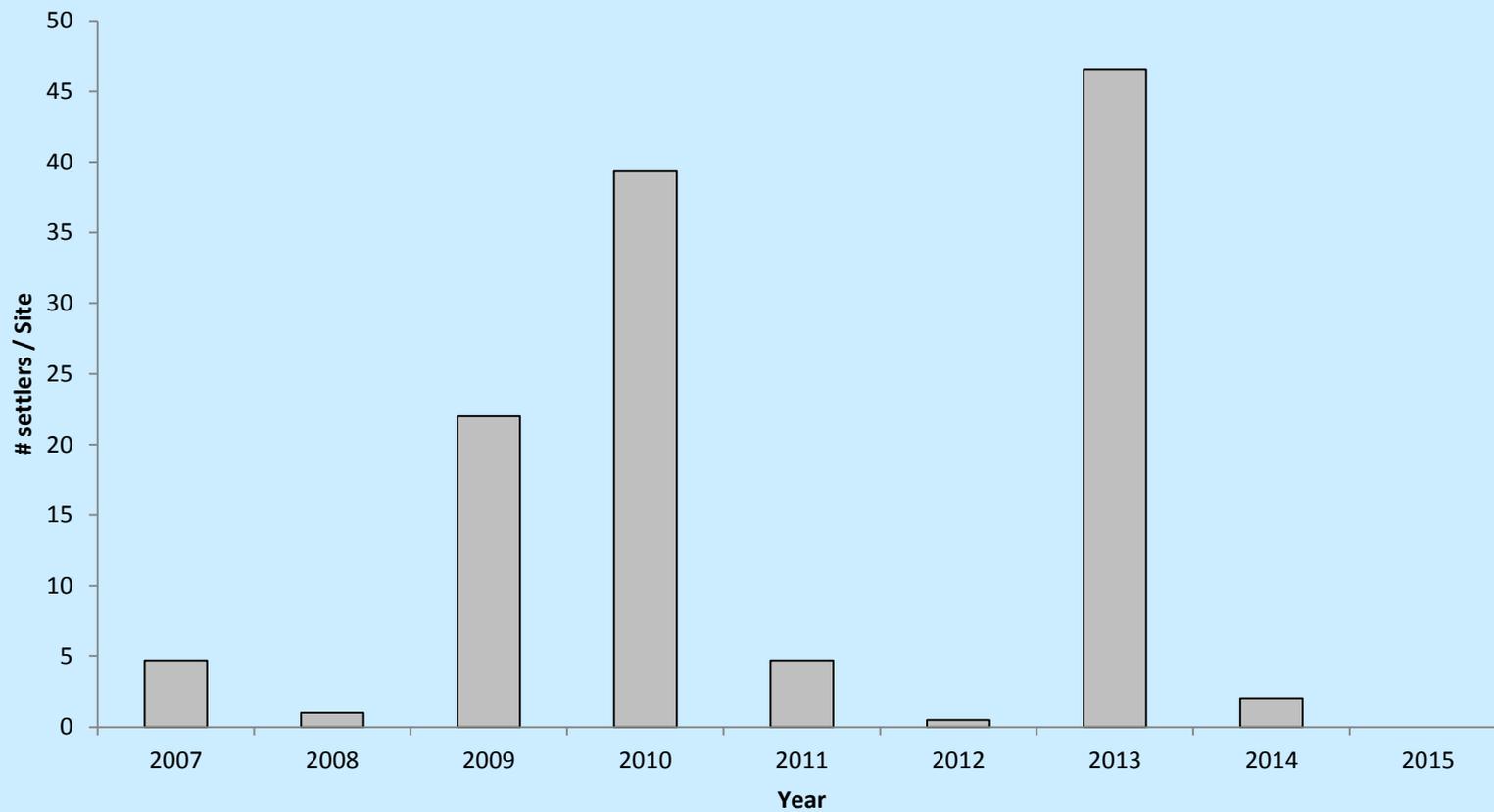


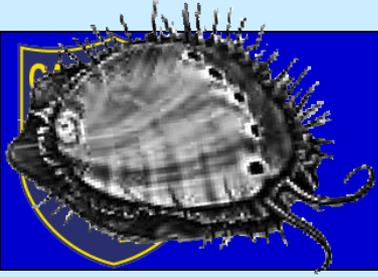
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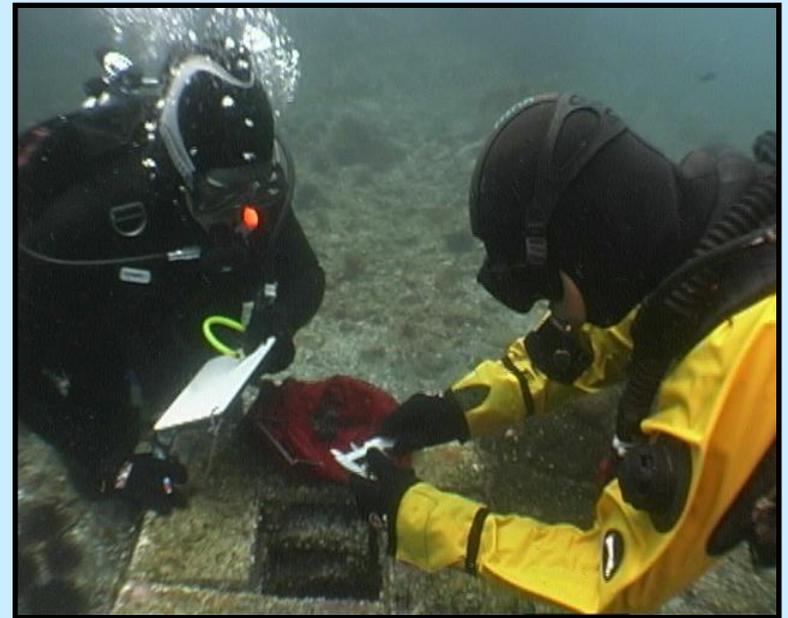
# Newly Settled Abalone





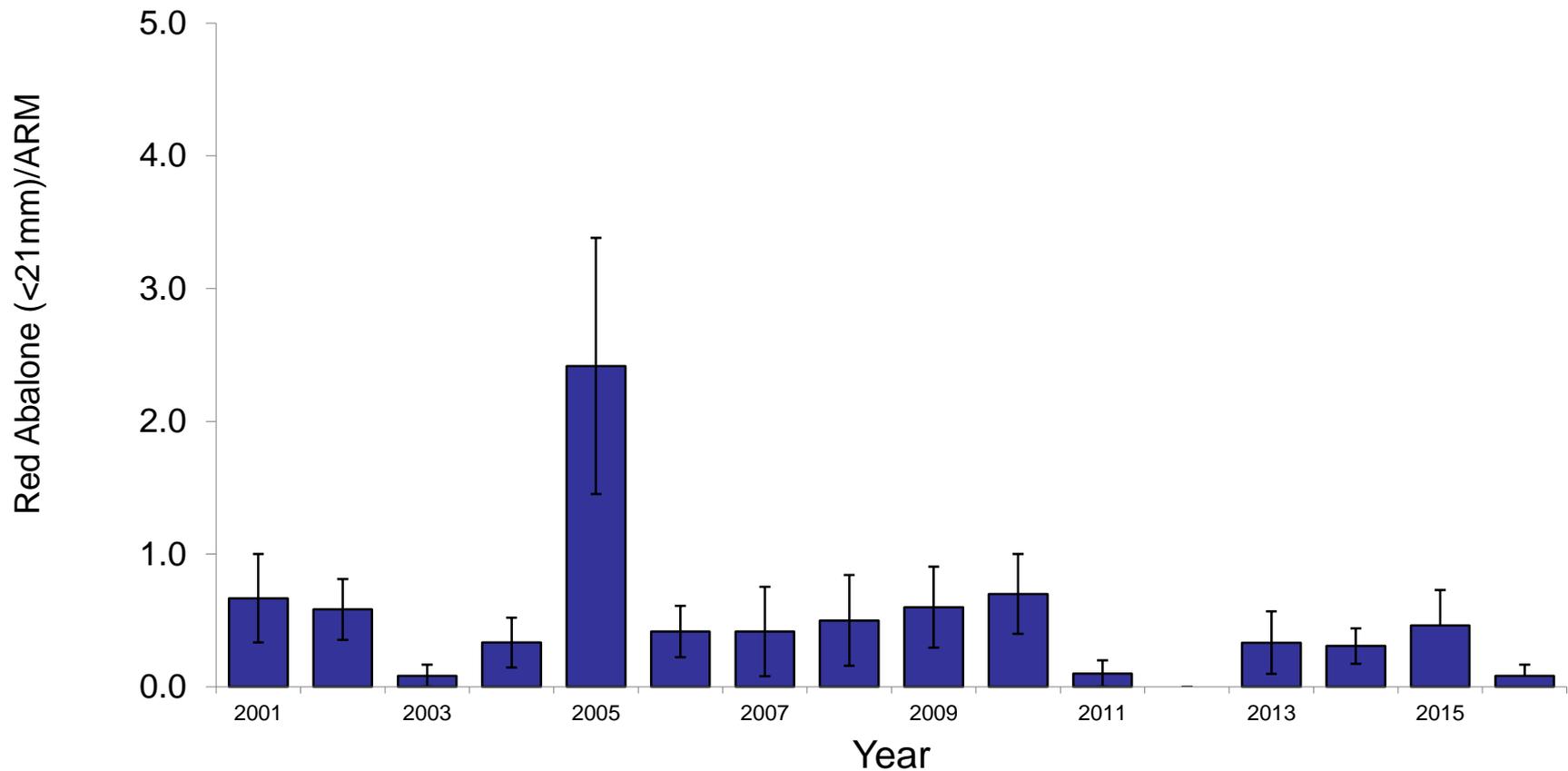
# Monitoring Juveniles

## ARTIFICIAL RECRUITMENT MODULES (ARMs)





# Young-of-the-Year Reds (<21mm) 2001-2016





# Abalone Productivity

2013-2016	Few Larvae 2014-15	Few Newly Settled 2014-15	Few Juveniles 2016
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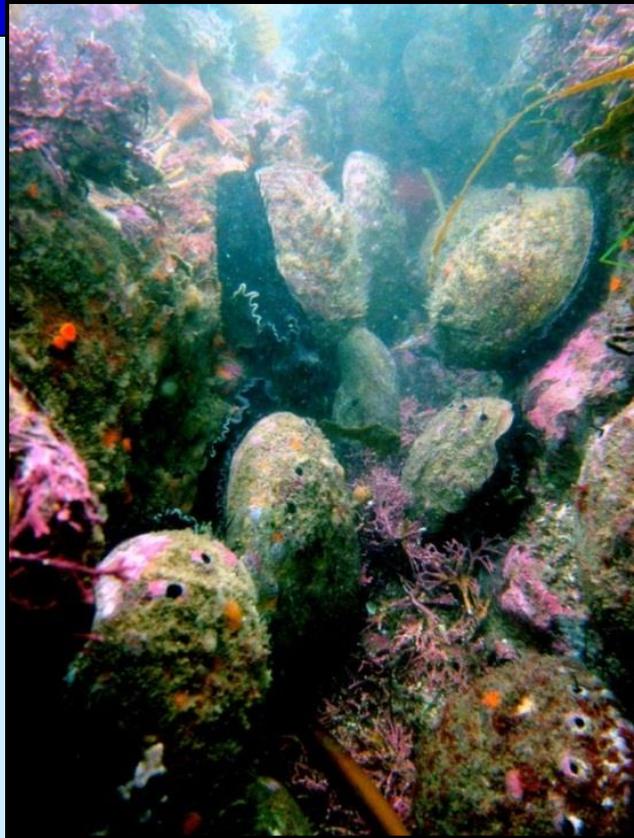


# Conclusions

- Catch is lower following 2014 regulation
- ARMP calls for examining 2016 catch
- Density Overall has not improved
- Deep density below trigger  $<0.25 \text{ m}^2$
- Abalone Productivity is low
  - Larvae are low density
  - Newly settled abalone are at low density
  - Juveniles are at low densities



# Thank You



**Drs. Laura Rogers-Bennett**  
Laura.Rogers-Bennett@wildlife.ca.gov



# Discussion of Red Abalone Emergency Regulations



Sonke Mastrup

Environmental Program Manager, Marine Region



# Presentation Outline

- **So Now What? Recent timeline and ARMP Guidance**
- **Proposed Changes**
- **Next Steps and Timeline**





# Recent Fishery Timeline

- 2013 - FGC adjusted the TAC to 190,000 (-32%) and adopted regulation changes
- 2014 - Catch 148,000 (-36% from 2013)
- 2015 - Catch 155,000\* (-31% from 2013)
- 2016 - Decline in population triggers action
- 2017 – Uncertain ongoing environmental conditions



# Density Data

County	Site Name	Year	Average Density	Deep Density
Sonoma	Fort Ross	2015	0.44	0.20
	Timber Cove	2015	0.38	0.14
	Ocean Cove	2016	0.44	0.11
	Salt Point	2016	0.34	0.06
	Sea Ranch	2012	0.37	0.13
Mendocino	Point Arena	2014-2015	0.66	0.51
	Van Damme	2016	0.33	0.07
	Russian Gulch	2014	0.60	0.28
	Caspar Cove	2013	0.35	0.13
	Todds Point	2013	0.47	0.35
OVERALL AVERAGE		2012-16	0.44	0.20



# ARMP Guidance

- Existing TAC = 190,000 (amended 2013)
- Deep trigger resets TAC = 142,500 (-25%)
- Continuing avg. density decline – 2<sup>nd</sup> trigger – resets the TAC = 106,875 (-25%)
- Considerable uncertainty exists:
  - Response of fishers
  - Future environmental conditions
  - Response of abalone population



# Possible Solutions

Target TAC = 107,000 Daily Bag Limit = 3	Annual Limit (% reduction in take)				
	6	9	12	15	18
Estimated Catch	93,000 (-40%)	119,000 (-23%)	136,000 (-12%)	149,000 (-4%)	155,000 (0%)
Estimated Catch with November Closure	91,000 (-41%)	118,000 (-24%)	135,000 (-13%)	147,000 (-5%)	155,000 (0%)
Estimated Catch with November and April Closures	80,000 (-48%)	104,000 (-33%)	119,000 (-23%)	129,000 (17%)	136,000 (-12%)



# Proposed Changes

- Option 1 – Balancing Uncertainty and Risk with Impacts
  - Reduce annual limit to 9
  - Close November
- Option 2 – Full ARMP Solution
  - Reduce annual limit to 9
  - Close November and April



# The Conundrum

- All indicators are negative
- Previous reductions appear ineffectual
- Precaution warranted
- Consequence of failure could be generational
- Changes only affect 1/3 of fishers
- Fishing not the cause, but too much fishing could make it much worse



# Next Steps and Timeline

- **Discussion at MRC on November 15 in Los Alamitos**
- **Discussion at CV Starr Center on December 3 in Ft. Bragg**
- **Possible action at FGC meeting on December 7 in San Diego**
- **Possible changes effective for 2017 season**
- **Please send public comments to [FGC@FGC.CA.GOV](mailto:FGC@FGC.CA.GOV)**



# So Lets Talk

