2017 Blue Crab Advisory Report Preview

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Chair, Chesapeake Bay Stock Assessment Committee

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Sustainable Fisheries GIT Meeting

Chesapeake Bay Program
Science. Restoration. Partnership.

Results of 2016/17 Winter Dredge Survey

2016 Harvest

Status of the Stock

Recommendations

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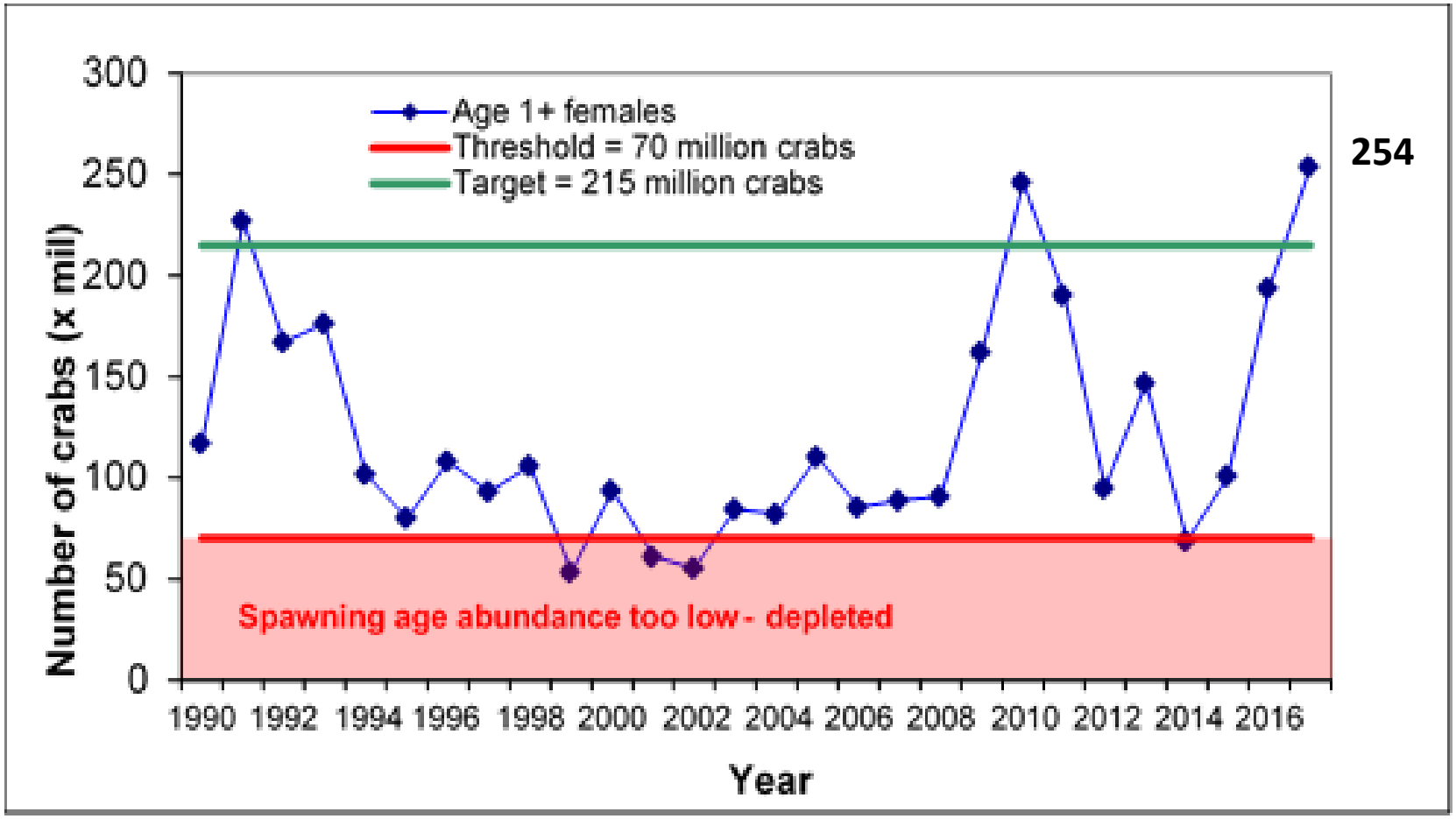
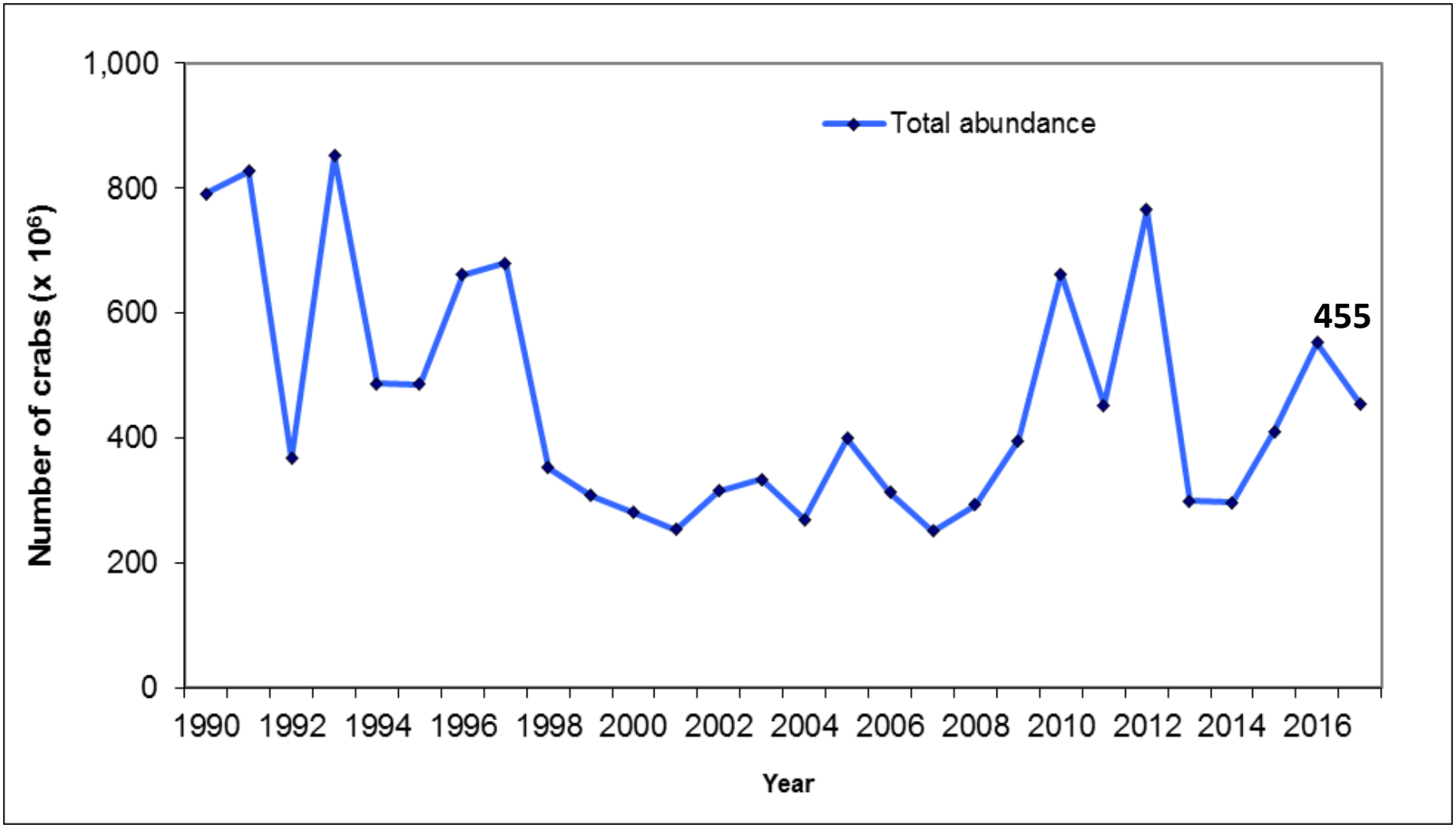
Adult Female Abundance

Winter dredge survey estimate of **abundance of female blue crabs age one year and older** (age 1+) 1990-2017 with female-specific reference points. These are female crabs measuring greater than 60mm across the carapace and are considered the 'exploitable stock' that will spawn within the coming year.



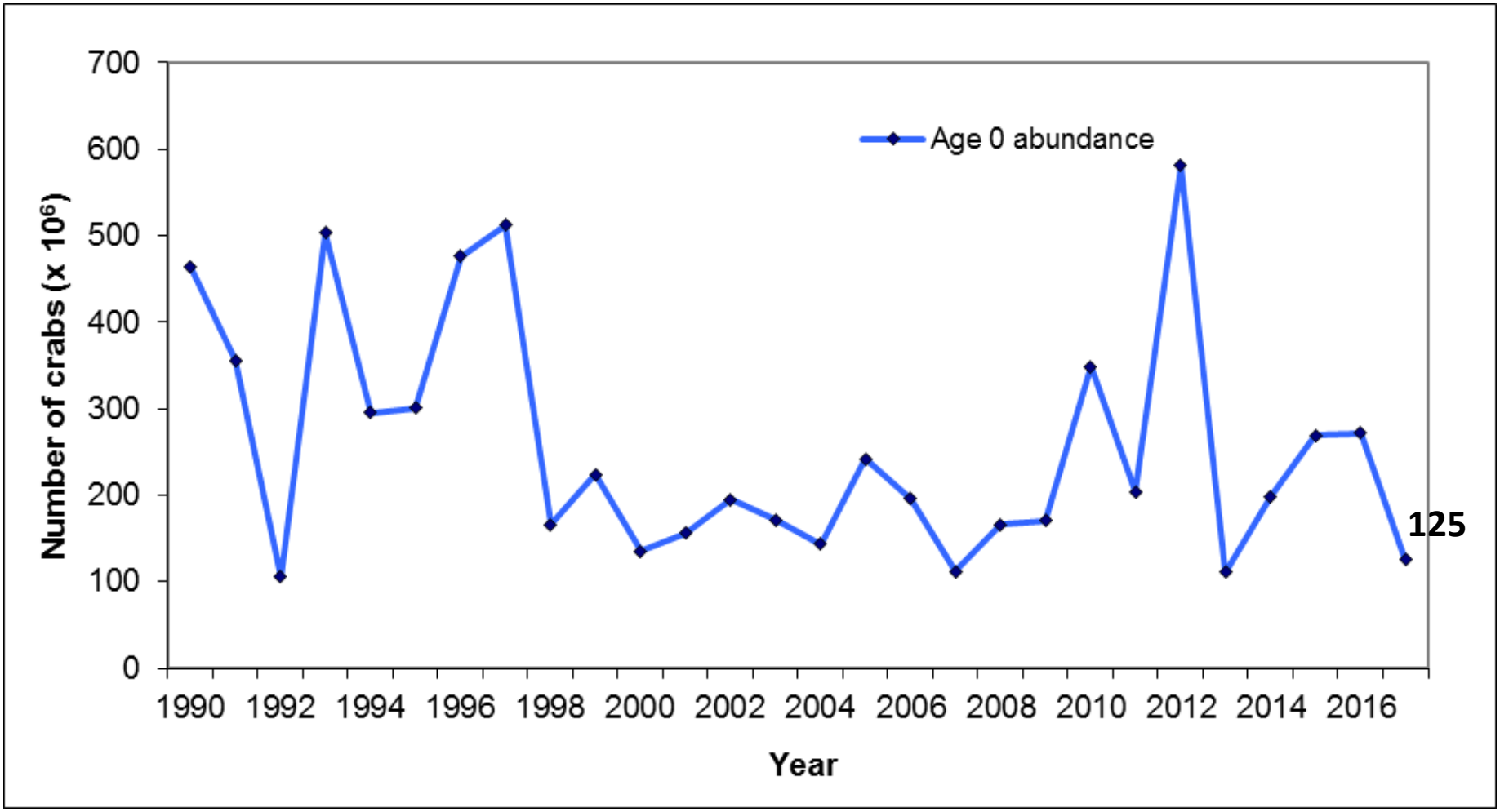
Total Abundance

Winter dredge survey estimate of **abundance of all crabs (both sexes, all ages)**, 1990-2017.



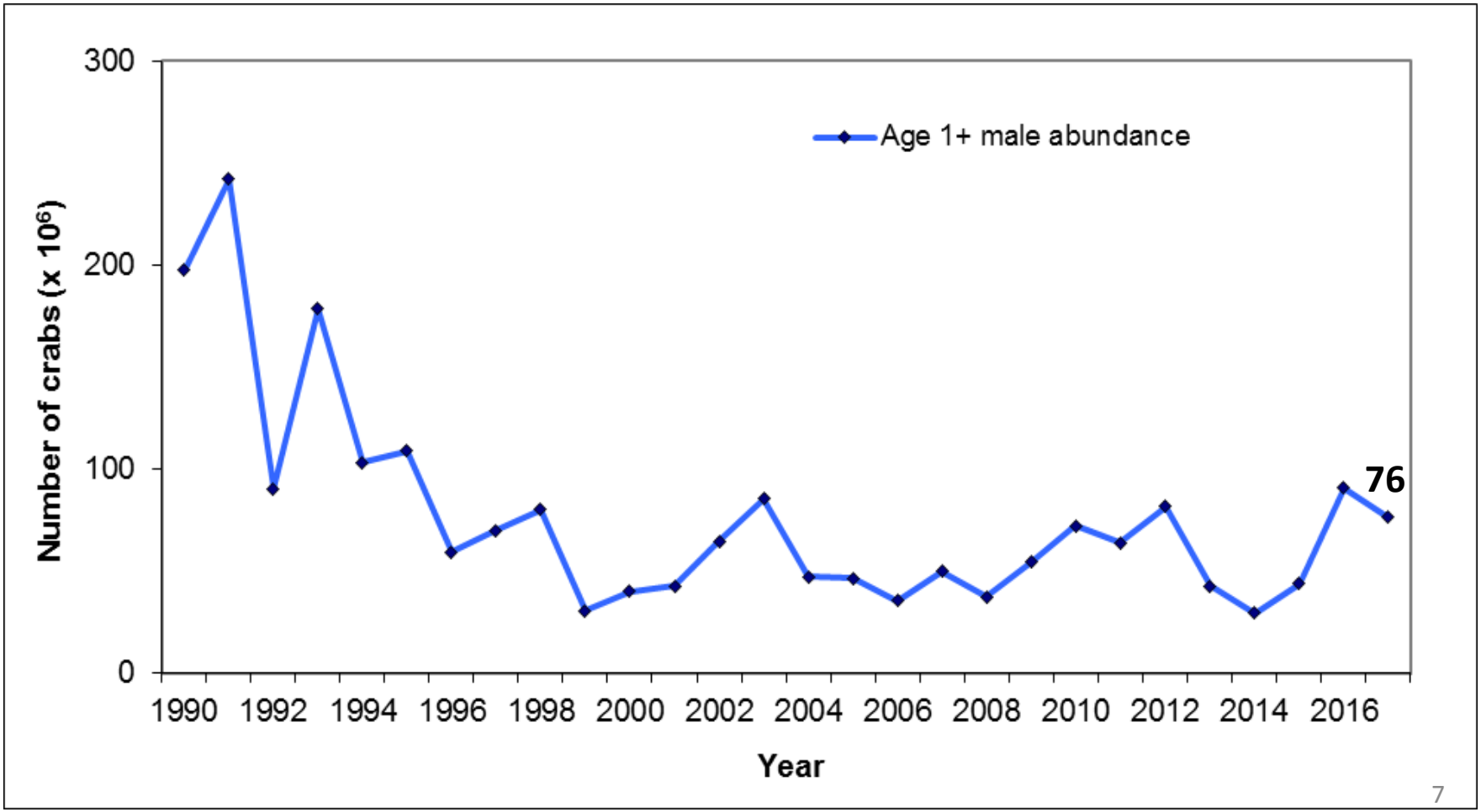
Juvenile Abundance

Winter dredge survey estimate of **abundance of juvenile blue crabs (age 0)**, 1990-2017 calculated without the catchability adjustment for juveniles. These are male and female crabs measuring less than 60mm across the carapace.



Adult Male Abundance

Winter dredge survey estimate of **abundance of male blue crabs age one year and older (age 1+)** 1990-2017. These are male crabs measuring greater than 60mm across the carapace and are considered the 'exploitable stock' capable of mating within the coming year.



Overwintering Mortality

Interest in overwintering mortality after cold winter and high mortality estimates in 2015. Overwintering mortality in 2017 was below average, much lower than the high values seen in 2015.

Baywide Age/sex group	1996-2011 average	2012	2013	2014	2015	2016	2017
All crabs	4.78%	1.59%	4.00%	3.79%	15.68%	1.9%	1.9%
Juveniles	1.00%	0.52%	0.00%	0.89%	10.84%	0.5%	0.5%
Adult Females	9.53%	2.69%	3.00%	7.68%	19.25%	3.0%	4.2%
Adult males	9.11%	4.90%	13.88%	13.58%	28.11%	1.1%	1.7%

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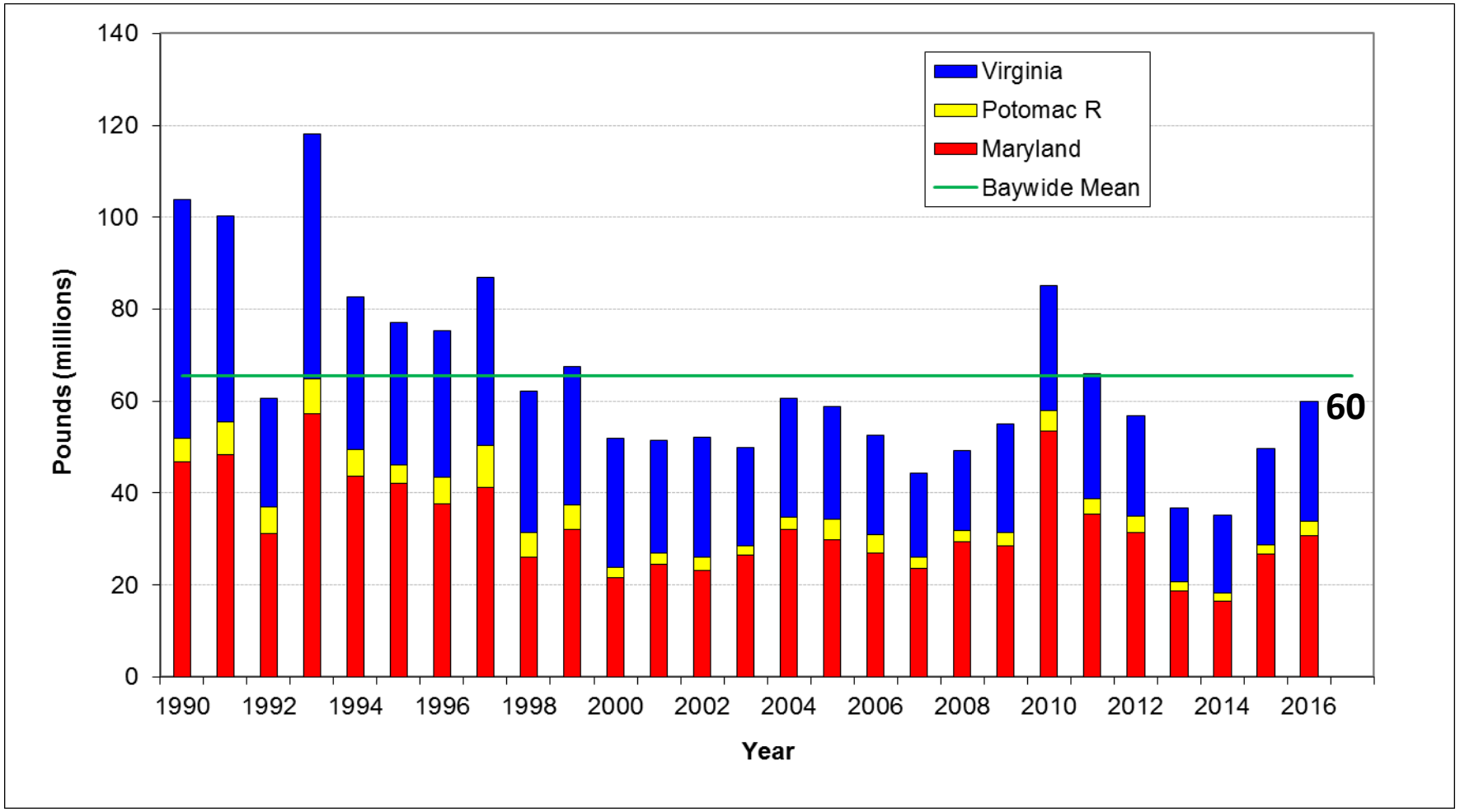
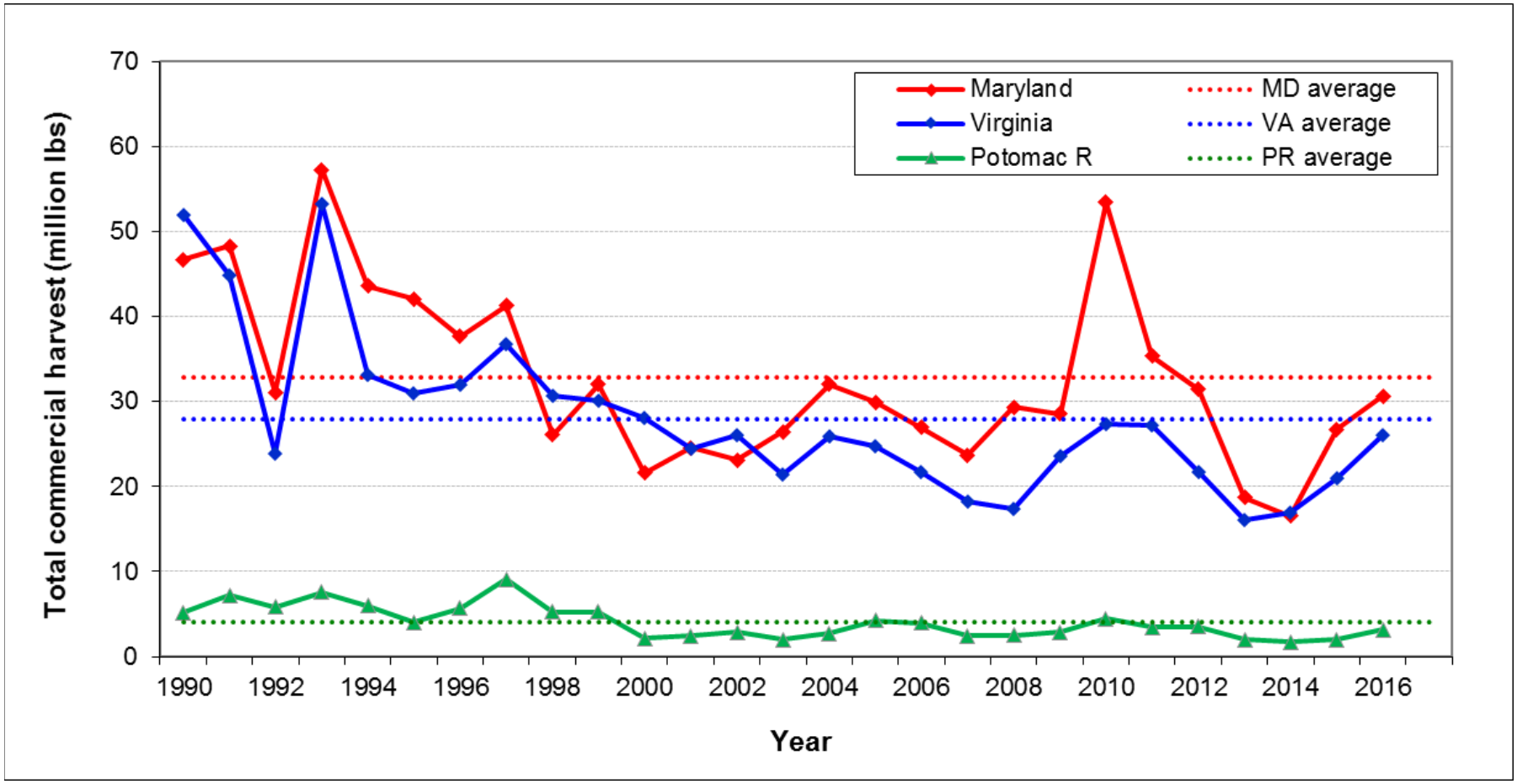
Commercial

Total commercial blue crab landings (all market categories) in Chesapeake Bay, 1990-2016.



Commercial

Maryland, Virginia and Potomac River commercial blue crab harvest in millions of pounds from Chesapeake Bay, all market categories, 1990-2016.



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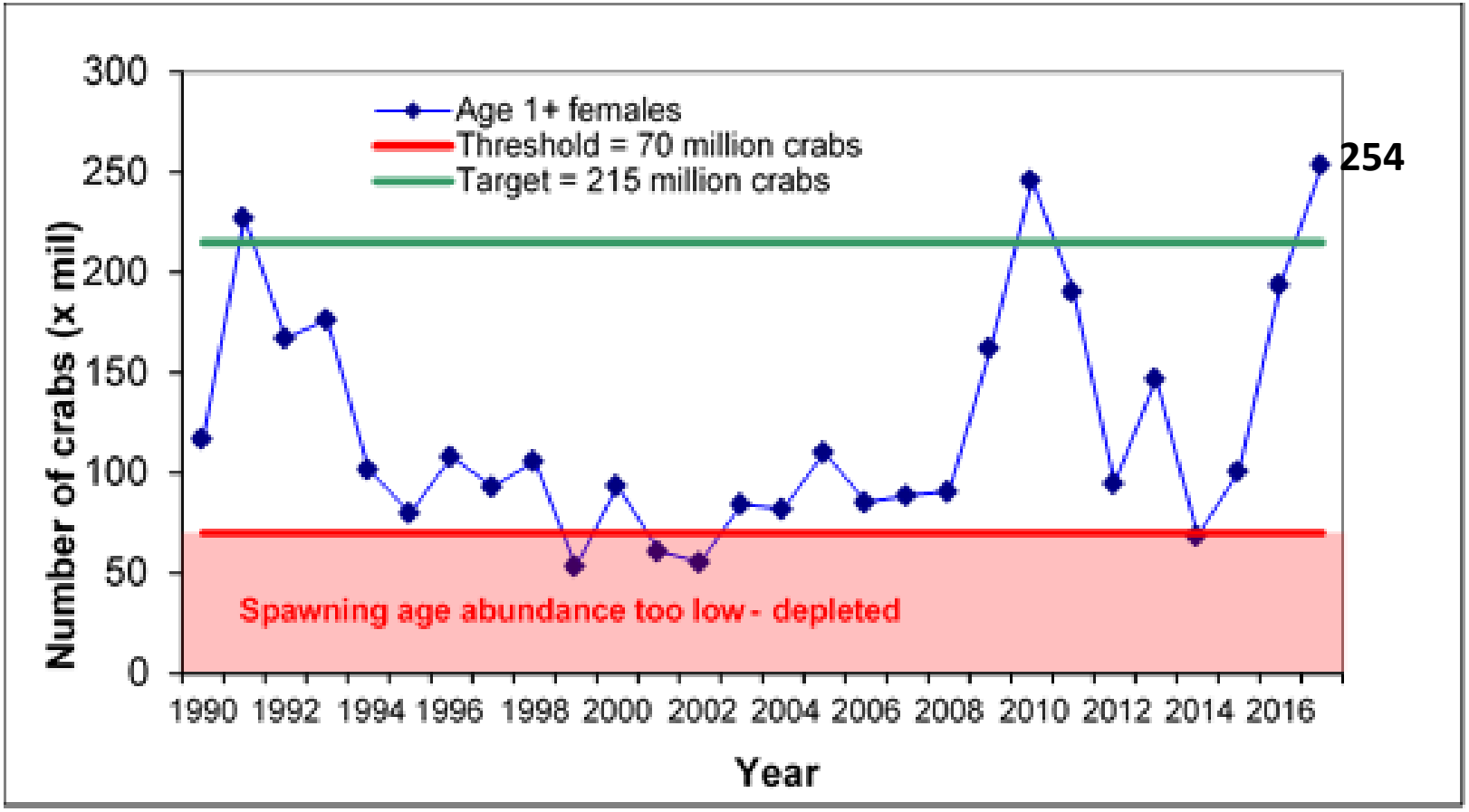
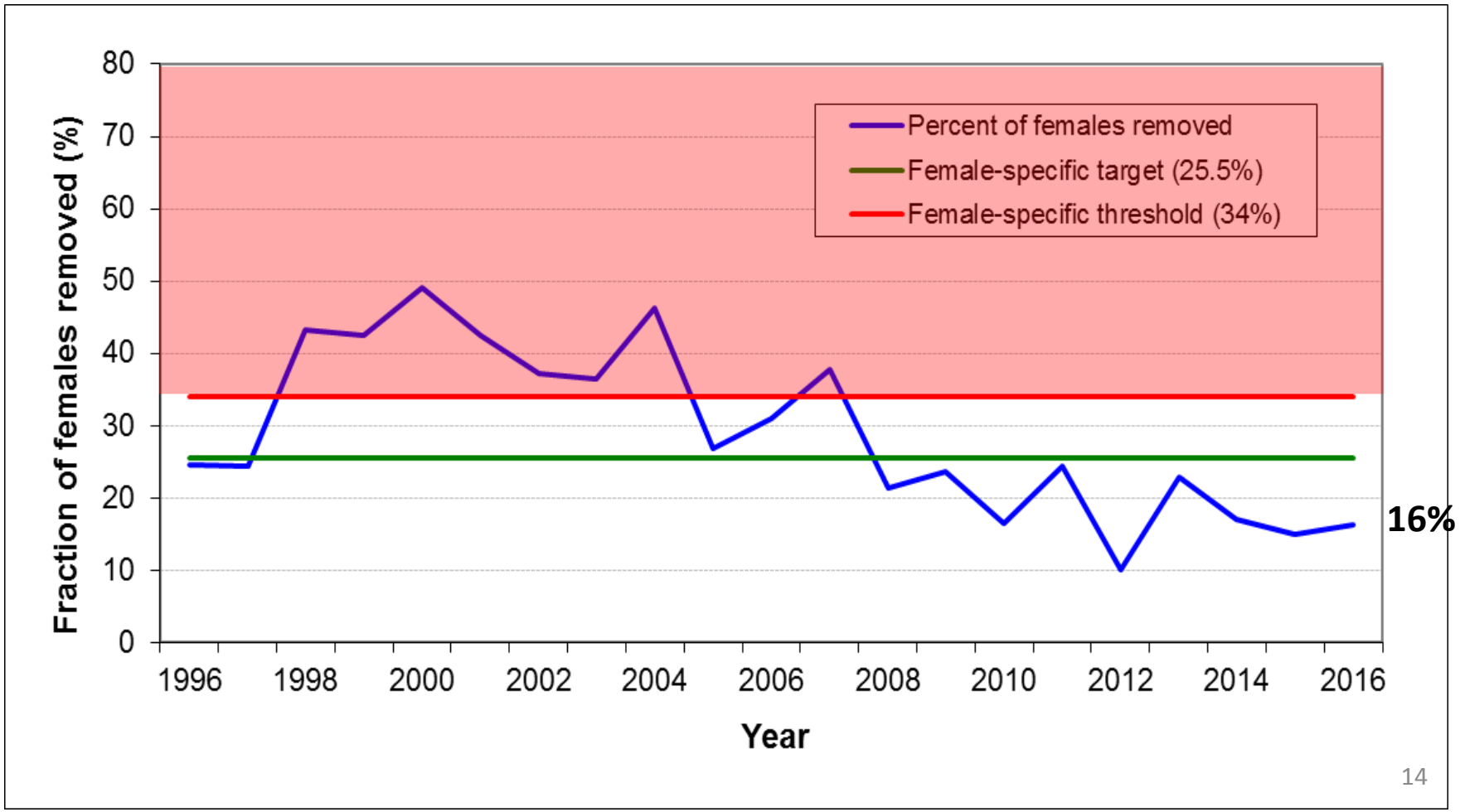
Winter dredge survey estimate of **abundance of female blue crabs age one year and older** (age 1+) 1990-2017 with female-specific reference points. These are female crabs measuring greater than 60mm across the carapace and are considered the 'exploitable stock' that will spawn within the coming year.



Female Exploitation Rate

The percentage of all female blue crabs removed from the population each year from 1990-2016 by fishing relative to the female-specific reference points. Exploitation rate (% removed) is the number of female crabs harvested within a year divided by the female population (age 0 and age 1+) estimated at the beginning of the year. Below target and threshold for ninth consecutive year.

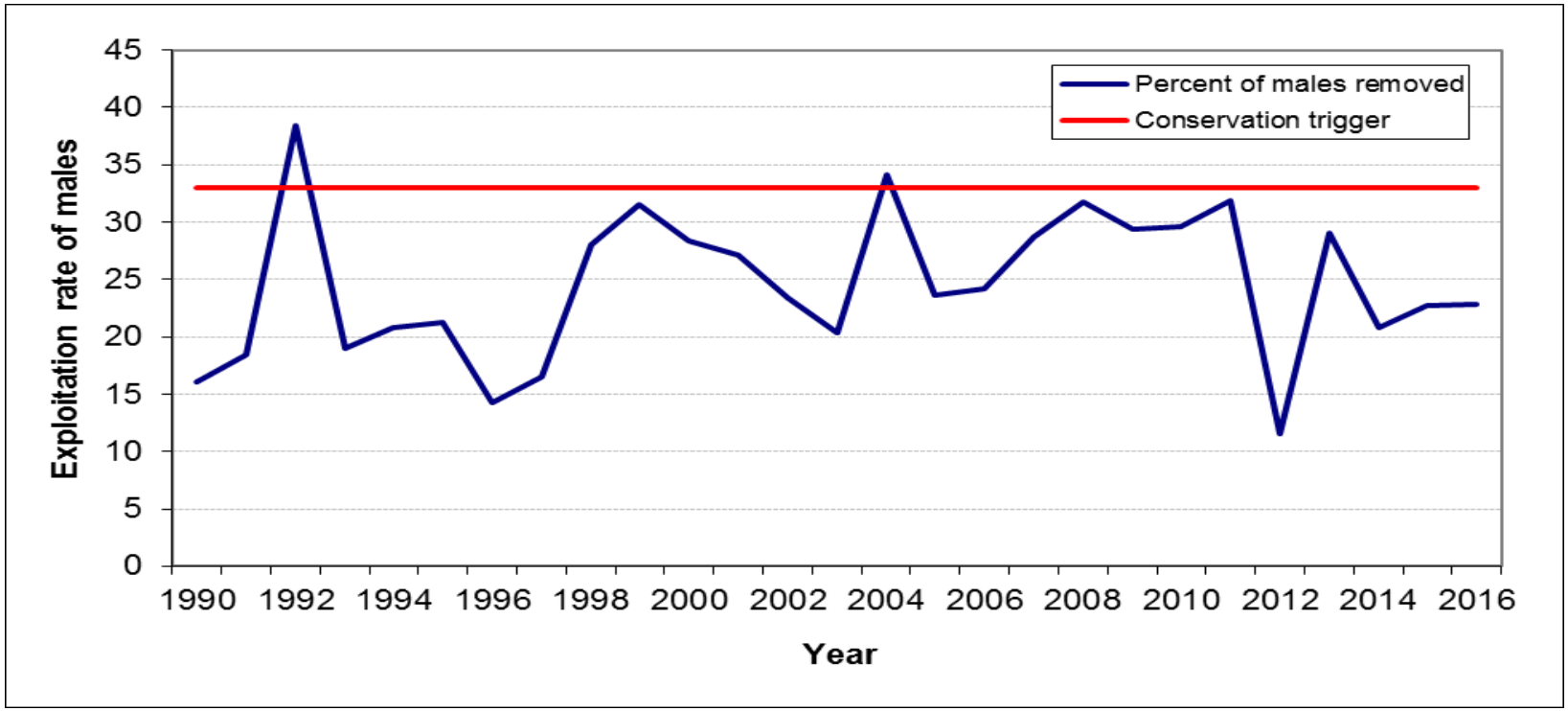


Control Rule	Reference Points			Stock Status						
	Period	**Target**	**Threshold**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Exploitation Fraction (age 0+ female crabs)	Current, Female-specific	25.5%	34% (max)	24%	10%	23%	17%	15%	**16%**	TBD
Abundance (millions of age 1+ female crabs)	Current, Female-Specific	215	70 (min)	190	97	147	68.5	101	194	**254**

Stock Status: The Chesapeake Bay blue crab stock is **not depleted and overfishing is not occurring.**

Male Conservation Triggers

Conservation measures should be considered for males if the male exploitation rate exceeds 33%, which is the second highest exploitation fraction observed for male crabs since 1990.



The 2016 male exploitation fraction was 23%, so no additional management action for male blue crabs is recommended at this time.

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Short-term Management Advice:

“Based on analysis of the 2017 winter dredge survey results, CBSAC recommends the jurisdictions maintain a cautious, risk-averse approach in the 2017 season, and consider scaling back the 2017 fall fishery from last year's more liberal fall regulations in order to protect the age 0 crabs. This incoming year class will become vulnerable to the fall fishery and represent the majority of spawners for next year.”

Short-term Management Advice:

Continue efforts to improve quality of commercial catch data.

- electronic reporting that is accurate and accountable
- better estimates of exploitation
- determine biological characteristics of the catch

Improved estimates of recreational harvest

- last study was 2009
- results of recent SERC study in MD

Long-term Management Advice:

Characterizing and quantifying effort

- better estimates of amount and temporal/spatial characteristics of effort
- improvements to stock assessments

Evaluate latent effort

- Initial analysis of annual active licenses vs. annual abundance estimates indicates that latent effort has probably <u>not</u> had a significant impact in recent years.
- Need to continue analysis and consider socioeconomic influences and changes within each season (intra-annual).

Critical Data and Analysis Needs:

1. Increased accountability and improved harvest reporting
   - commercial electronic reporting that is verifiable
   - more accurate estimate of exploitation
   - improve estimates of recreational harvest

2. Continue analysis of winter dredge gear efficiency
   - further evaluation of the multi-year dataset of paired vessel tows

3. Improved estimate of recruitment
   - VIMS is actively pursuing funding to conduct a shallow-water survey to assess juvenile crabs that are potentially not sampled by the dredge gear.

4. Application of fishery-independent data
   - Review existing survey data to provide additional information on blue crabs at other times of the year (VIMS, CHESMAP, CHESFIM, MDNR, SERC)

Critical Data and Analysis Needs:

5. Fishery-dependent data
    - understand catch composition (sex, size, etc.)

6. Other sources of mortality
    - analyze the magnitude of incidental mortality, including sponge crab discards, unreported losses from peeler fishery
    - non-harvest mortality estimates will inform future stock assessments

7. Potential for sperm limitation
    - quantify the reproductive value of male blue crabs

8. Biological parameters
    - continue to improve understanding of longevity, growth rates, etc. to inform future stock assessments

Upcoming:

- Uncertainty surrounding estimates
- Review of derelict pot study
- Research Overview
  - List of recent and ongoing research on blue crabs

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Final Report available later this week or early next week.

http://www.chesapeakebay.net/groups/group/sustainable_fisheries under "Publications"

THANK YOU! QUESTIONS?

CBSAC Members:

Glenn Davis (Chair)	Maryland Department of Natural Resources
Joe Cimino	Virginia Marine Resources Commission
Ellen Cosby	Potomac River Fisheries Commission
Lynn Fegley	Maryland Department of Natural Resources
Daniel Hennen	NMFS, Northeast Fisheries Science Center
John Hoenig	Virginia Institute of Marine Science
Eric Johnson	University of North Florida
Katie May Laumann	Virginia Marine Resources Commission
Rom Lipcius	Virginia Institute of Marine Science
John McConaugha	Old Dominion University
Tom Miller	UMCES, Chesapeake Biological Laboratory
Rob O'Reilly	Virginia Marine Resource Commission
Amy Schueller	NMFS, Southeast Fisheries Science Center
Mike Seebo	Virginia Institute of Marine Science
Alexei Sharov	Maryland Department of Natural Resources
Mike Wilberg	UMCES, Chesapeake Biological Laboratory
Emilie Franke (Coordinator)	ERT/NOAA Chesapeake Bay Office