

2016 Blue Crab Advisory Report Preview



Glenn Davis (MDDNR)
Chesapeake Bay Stock Assessment Committee Chair
June 3, 2016
Sustainable Fisheries GIT Meeting

Results of 2015/16 Winter Dredge Survey

2015 Commercial Landings

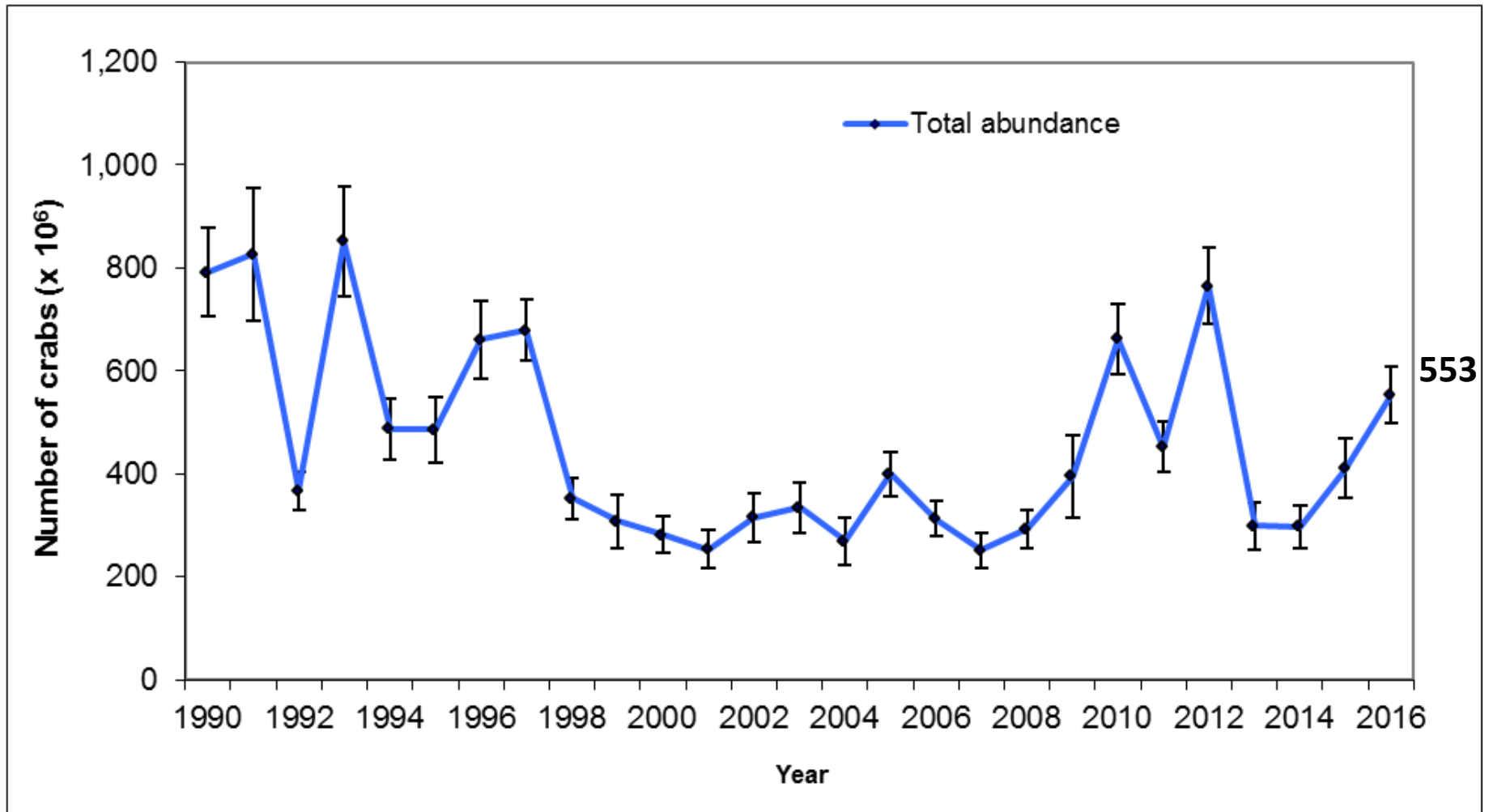
Status of the Stock

Recommendations



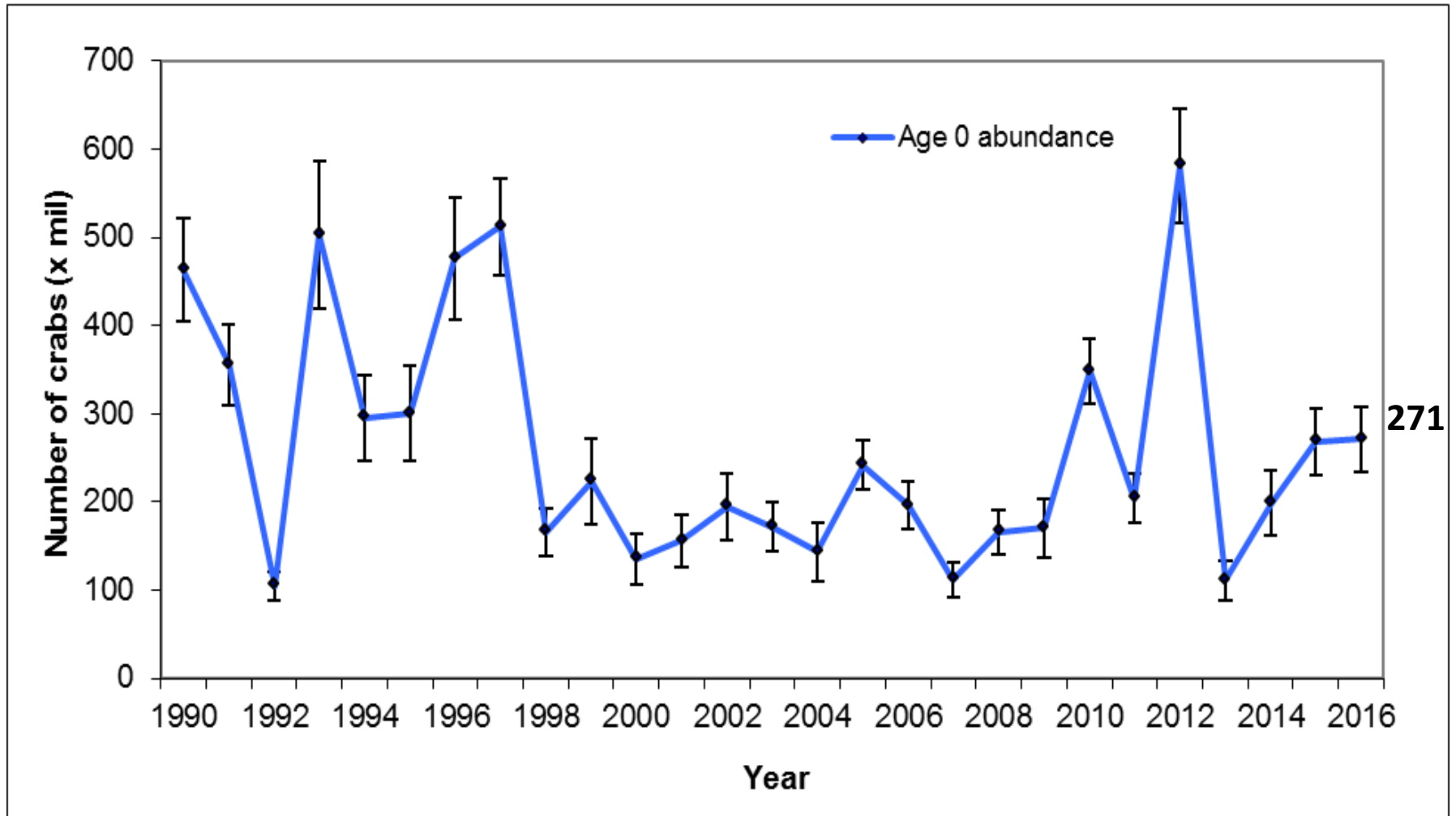
Total Abundance

Winter dredge survey estimate of **abundance of all crabs (both sexes, all ages)**, 1990-2016. Error bars represent 95% confidence intervals.



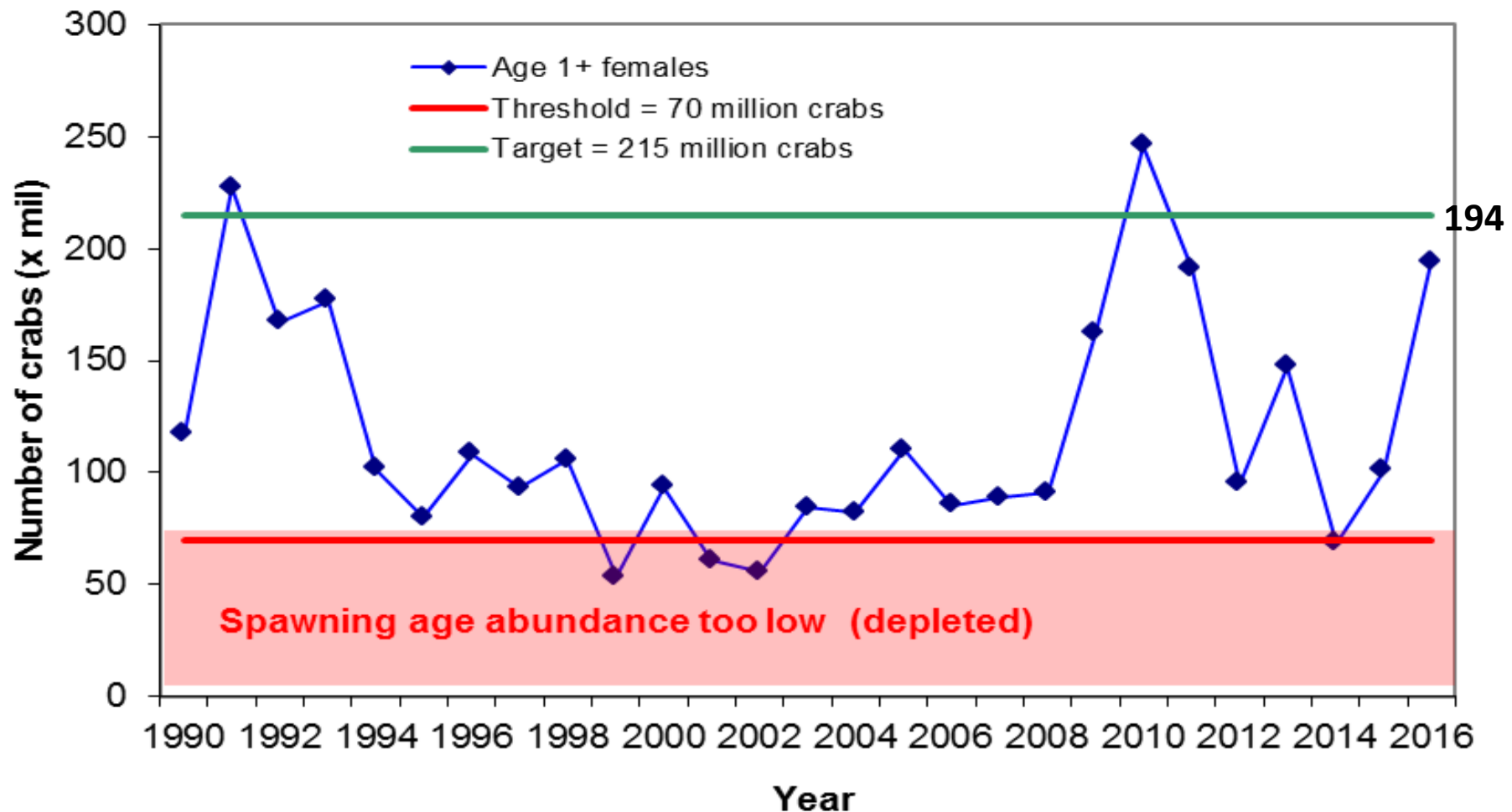
Juvenile Abundance

Winter dredge survey estimate of **abundance of juvenile blue crabs (age 0)**, 1990-2016 calculated without the catchability adjustment for juveniles. These are male and female crabs measuring less than 60mm across the carapace. Error bars represent 95% confidence intervals.



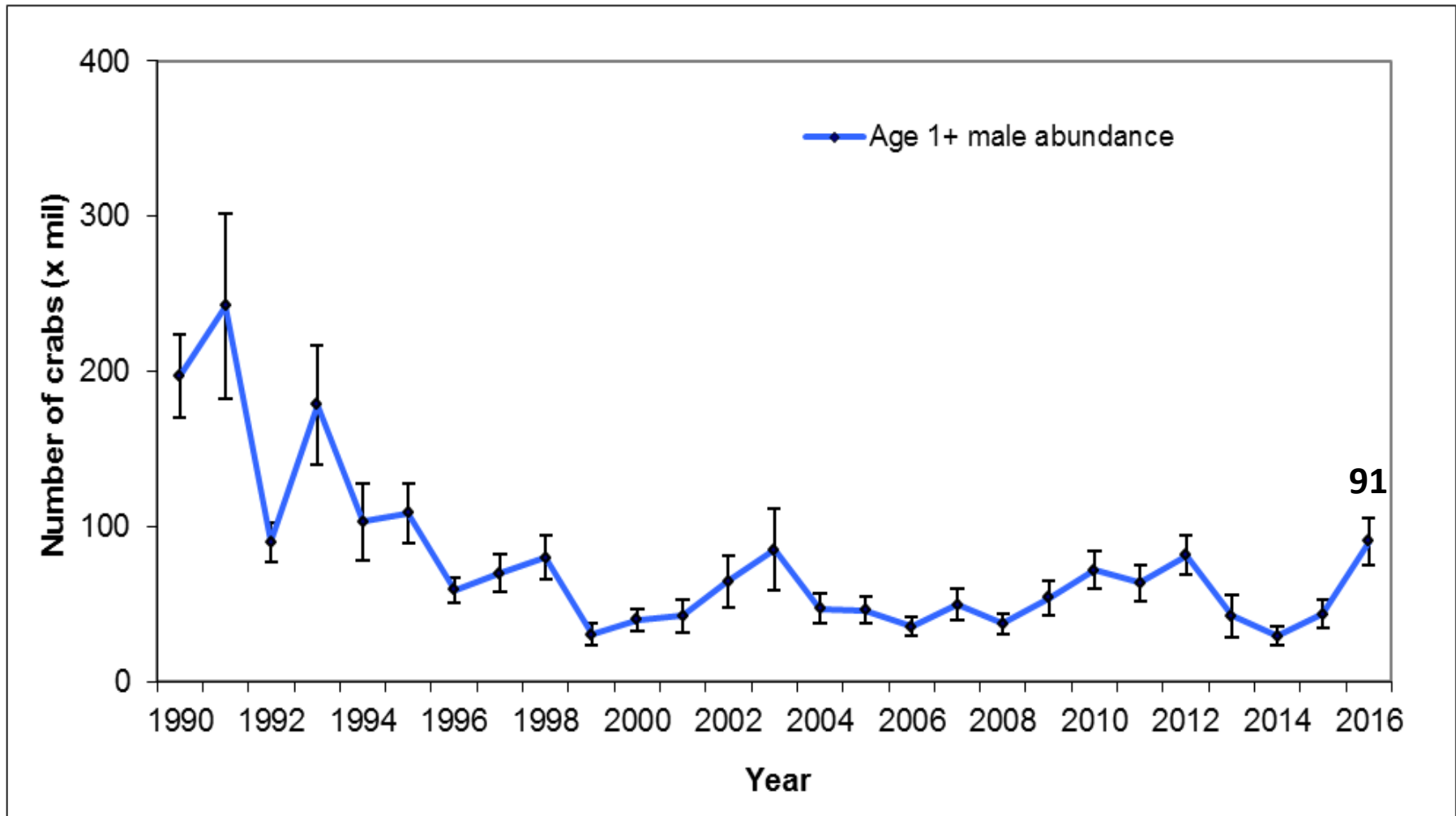
Adult Female Abundance

Winter dredge survey estimate of **abundance of female blue crabs age one year and older** (age 1+) 1990-2016 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.



Adult Male Abundance

Winter dredge survey estimate of **abundance of male blue crabs age one year and older (age 1+)** 1990-2016. These are male crabs measuring greater than 60mm across the carapace and are considered the 'exploitable stock' capable of mating within the coming year. Error bars represent 95% confidence intervals.



Overwintering Mortality

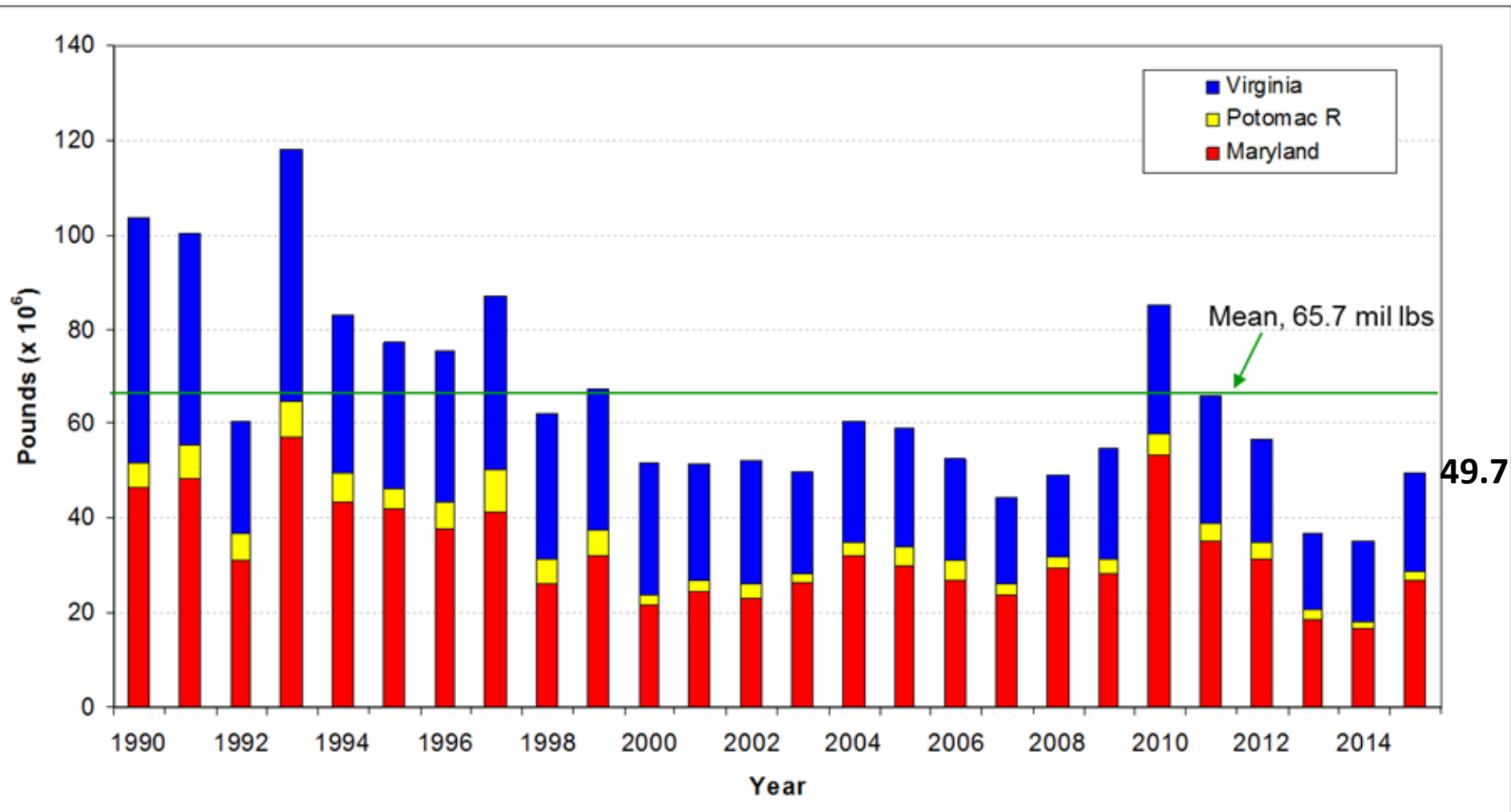
Overwintering mortality in 2016 was below average, much lower than the high values seen in 2015.

Baywide abundance estimates for 2016 before and after overwintering mortality.

Baywide Age/sex group	Abundance estimate in millions before overwintering mortality (millions of crabs)	Final abundance estimate in millions after overwintering mortality (millions of crabs)	% Overwintering mortality
All crabs	564	553	1.9%
Juveniles	273	271	0.5%
Adult Females	200	194	3.0%
Adult Males	92	91	1.1%

Commercial Harvest

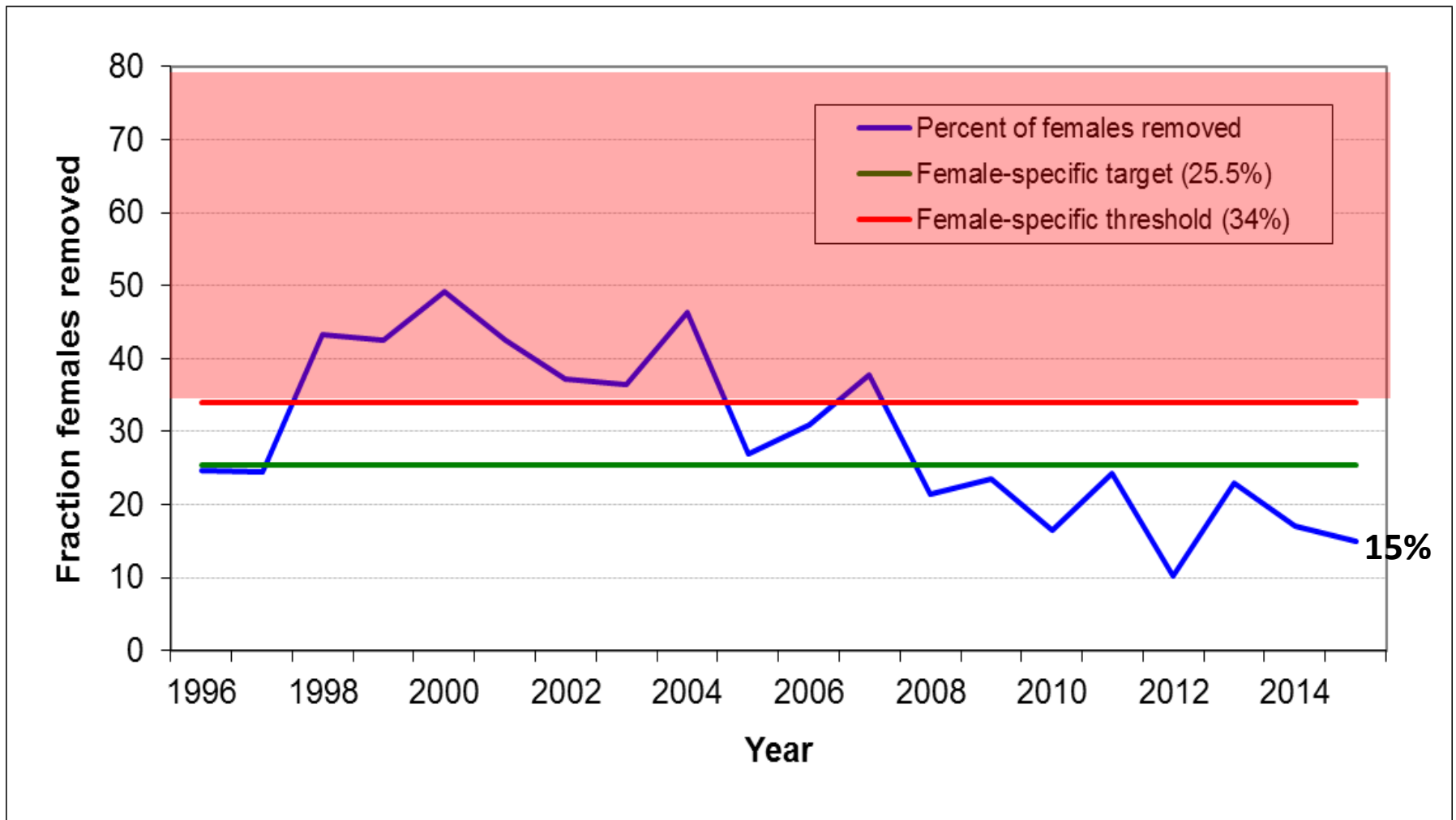
Total commercial blue crab landings (all market categories) in Chesapeake Bay, 1990-2015.



49.7

Female Exploitation Rate

The percentage of all female blue crabs removed from the population each year from 1990-2015 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.





Male Conservation Triggers



Conservation measures should be considered for males if either of the following occurs:

1. The male exploitation rate exceeds 33%.
2. The female exploitation rate is below the established overfishing threshold of 34% and the total annual exploitation rate of male and female crabs exceeds the 53% threshold of the previous control rule for both sexes combined.

Neither trigger was exceeded in 2015. No additional management action is recommended at this time specific to male blue crabs.

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

The Chesapeake Bay blue crab stock is not depleted and overfishing is not occurring.

Short term recommendations:

Continue risk-averse approach to management that is adaptive to inter-annual fluctuations in population size.

- CBSAC plans to evaluate 'July to July' management calendar, possibly juvenile abundance as a part of the control rule.

Continue efforts to improve quality of commercial catch data.

- electronic reporting that is accurate and accountable
- necessary for any form of allocation
- improvements in stock assessments
- better estimates of exploitation

Improved estimates of recreational harvest

- last study was 2009

Long term recommendations:

Output controls

- where possible, adopt an approach that sets catch levels based on abundance.
- support evaluation process of allocation-based management.

Complimentary management measures

- CBSAC supports Virginia's consideration of a year-round sanctuary for mature females
- sanctuary systems, output controls, other approaches

Characterizing and quantifying effort

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

Evaluate latent effort

- does effort change as the blue crab population rises/declines?
- socio-economic influences?

Critical data and analysis needs:

Improved harvest reporting for both commercial and recreational crabbers

- commercial electronic reporting that is verifiable
- more accurate estimate of exploitation
- provides management flexibility
- improve estimates of recreational harvest

Improved understanding of winter dredge gear efficiency

- further evaluate differences in efficiency between survey vessels (paired tow data)
- evaluate experimental design to determine efficiency?
- relative efficiency between vessels sufficient?

Improved estimate of recruitment

- shallow water surveys

Identify and quantify other sources of fishing mortality

- discards from pot fishery (sponge crabs, hypoxic conditions)
- discards from peeler fishery

Critical data and analysis needs:

Investigate the potential for sperm limitation

- quantify the reproductive value of male blue crabs

Application of other sources of fishery-independent data

- Bay-wide estimates of abundance during the active season
- trawl surveys (VIMS, CHESMAP, CHESFIM, MDNR, SERC)
- other sources?

Expansion of fishery-dependent data collection

- MDNR Cooperative Data Collection Survey

CBSAC Members:

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Ellen Cosby

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Daniel Hennen

John Hoenig

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