ASMFC Lobster Technical Committee Report

Bob Glenn, Chair

8/4/2016

Task

- Conduct analysis on management strategies that may achieve a 20% to 60% increase in egg production in the Southern New England (SNE) lobster stock
  - Minimum size changes
  - Maximum size changes
  - Trap Reductions

Potential Egg Production-Gauge Size Changes

- Projection model used to analyze potential impacts of gauge size changes
  - Model carries forward the terminal year results
    - Baseline = 2013 population structure (abundance & size structure)
  - Allows for investigation into how different parameter influence the population structure in future years
    - Life history - growth
    - Fishing pressure – catch/exploitation rate
    - Population dynamics - M
    - <u>Regulations – i.e. min and max size changes</u>

Presented to board previously

Potential Egg Production-Gauge Size Changes

- Model parameters held constant
  - Natural Mortality = 0.285
  - Fishing Mortality – mean rate from 2008 to 2012
  - Recruitment – mean recruitment 2012 to 2014

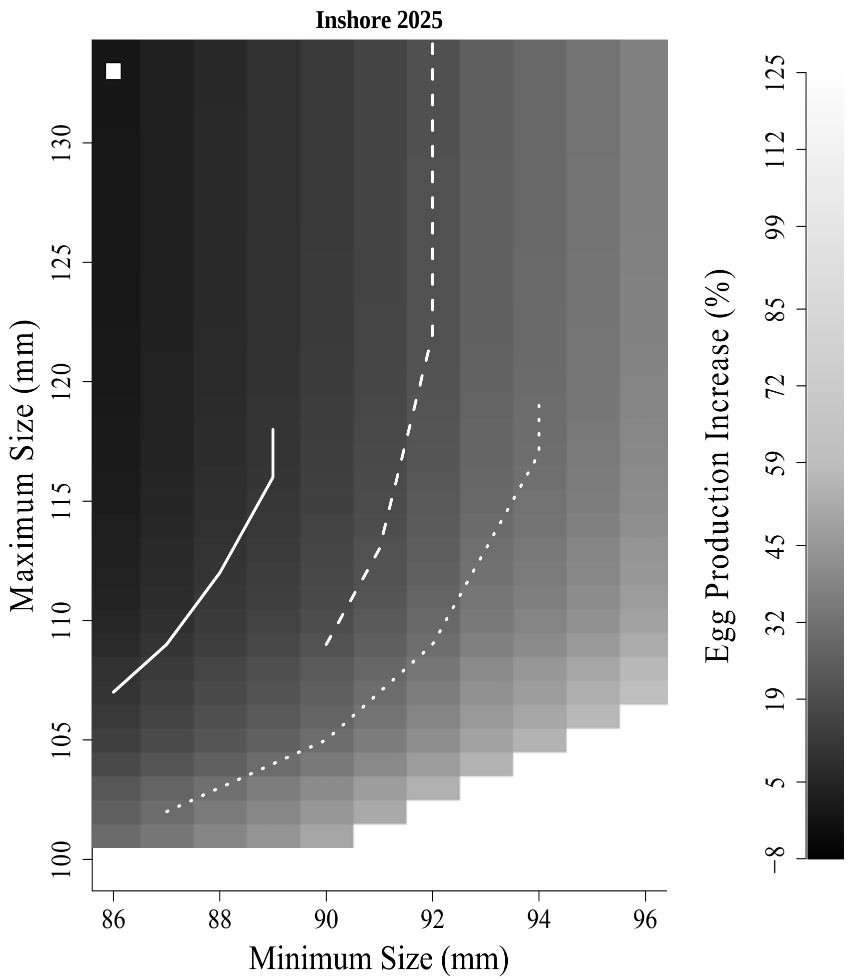
- Female abundance converted to egg production
  - $EP_L = P_{C,L}\ x\ F_L\ x\ N_L$
    - Where:
      - $P_{C,L}$ - is the probability of the female carrying a clutch at length
      - F_L- is the fecundity at length
      - N_L - is the number of females at length

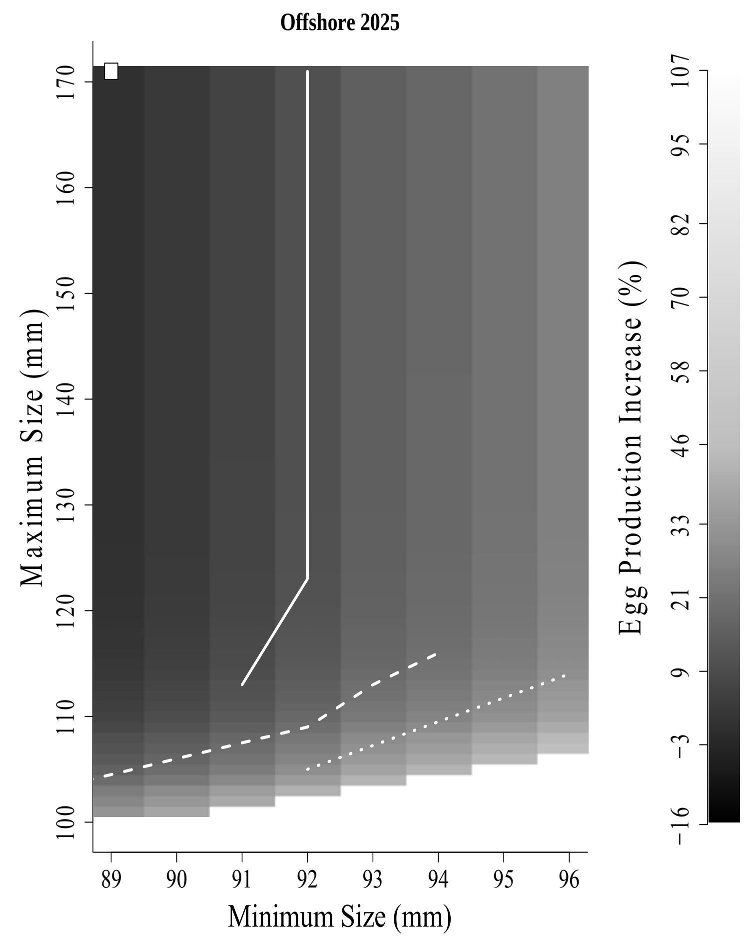
Potential Egg Production-Gauge Size Changes

- Egg production estimates are based on projection scenarios when the population reaches equilibrium
  - Roughly 10 years
  - We present results for equilibrium states because:
    - The initial size compositions for projection runs are based on the size composition from the terminal year of the assessment model, which are notoriously unstable.
    - Because lobsters grow slowly, it takes several years for changes in gauge size to take effect, particularly for larger lobsters.
    - We wished to analyze separate scenarios for inshore and offshore SNE which have different legal sizes and fishing pressures, and length compositions for subsets of the stock are unknown.

Potential Egg Production-Gauge Size Changes

Results:





Potential Egg Production-Gauge Size Changes

- Results:

Table 1. Gauge changes (in mm) for inshore/offshore under equilibrium projections that result in at least 20% and 60% increases in egg production when the other gauge is held at its current size. The current inshore gauge size is 86-133mm and the current offshore gauge size is 89-171mm.

Scenario	20%	60%
Inshore Minimum Change	92	101
Inshore Maximum Change	103	NA
Offshore Minimum Change	95	103
Offshore Maximum Change	103	NA

Potential Egg Production-Gauge Size Changes

Results:

Table 2. Gauge changes (in mm) for inshore/offshore under equilibrium projections that result in a 20% and 60% increases in egg production. The current inshore gauge size is 86-133mm and the current offshore gauge size is 89-171mm.

Scenario	20% Egg Production Increase		60% Egg Production Increase	
	Minimum	Maximum	Minimum	Maximum
Inshore	90 91 92	109 113 122-171	96 97 99 100	107 109 115 120, 121
Offshore	88 92 93 94	103 109 113 116, 117	100 102	111 119

Potential Egg Production-Gauge Size Changes

Results:

Table 1 - Supplemental. Minimum and maximum size window necessary to achieve a 20% and 60% increase in egg production respectively. Includes % change in exploitation, spawning stock biomass, reference abundance, and catch associated with the size windows presented. *Assumes changes in gauge size from the current 86 mm minimum and 133 mm maximum size inshore, and a 89 mm minimum size and a 171 mm maximum size offshore. English unit conversions are approximate.

	Min	Max	Egg Production	Exploitation	Spawning Stock Biomass	Reference Abundance	Catch
Inshore	88 mm (3 15/32")	105 mm (4 1/8")	20%	-18%	20%	9%	-11%
	91 mm (3 9/16")	115 mm (4 1/2")	18%	-22%	22%	11%	-14%
	92 mm (3 5/8")	165 mm (6 1/2")	20%	-27%	25%	13%	-17%
Offshore	91 mm (3 9/16")	105 mm (4 1/8")	22%	-21%	22%	9%	-13%
	94 mm (3 11/16")	115 mm (4 1/2")	20%	-26%	24%	12%	-17%
	95 mm (3 3/4")	165 mm (6 1/2")	21%	-28%	26%	13%	-19%
Inshore	99 mm (3 7/8")	115 mm (4 1/2")	60%	-56%	71%	32%	-42%
	101 mm (3 29/32")	165 mm (6 1/2")	59%	-59%	76%	35%	-45%
Offshore	102 mm (4")	115 mm (4 1/2")	62%	-60%	71%	31%	-47%
	103 mm (4 1/16")	165 mm (6 1/2")	63%	-63%	75%	34%	-50%

Potential Egg Production-Trap Reductions

- Task
  - Provide advice on how the currently-planned trap reductions would affect the SNE lobster stock, particularly in regards to egg production.
    - Assess 25% reduction in actively fished traps from the terminal year estimate in the assessment

Potential Egg Production-Trap Reductions

- Relationship between traps fished and fishing mortality rate is extremely complex
- Multiple factors beside the number of actively fished traps affect catch rates
  - latent effort
  - how often the traps are hauled
  - soak time
  - trap efficiency
  - the spatial distribution of the resource
  - changing fleet characteristics
- Despite these issues the TC attempted to model the relationship between the number of actively fishing traps (AFT) and fishing mortality using data and exploitation estimates from the SNE stock assessment.

Potential Egg Production-Trap Reductions

This analysis makes the following assumptions;

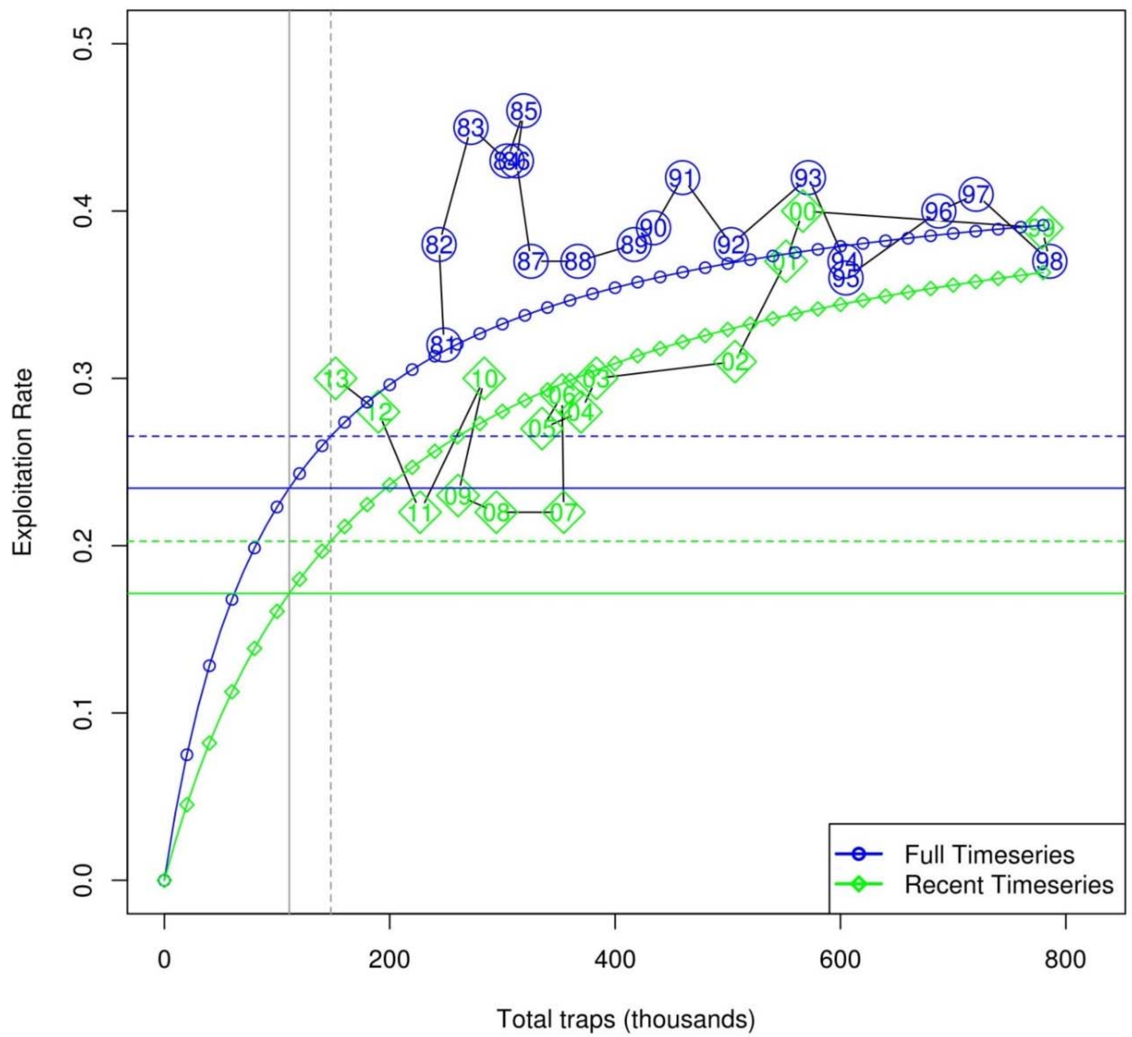
- **The 25% trap reduction will actually result in a 25% decrease in actively fished traps.**
- **Fishers do not try to compensate for the decrease in traps (i.e. Soak times, duration of fishing season, etc. remain constant)**

Potential Egg Production-Trap Reductions

- Methods
  - A time series of actively fished traps and corresponding exploitation rate (model-estimated SNE exploitation) from 1981-2013 were obtained from data presented in the latest (2015) Stock Assessment
  - Two regimes apparent in relationship
    - 1981 to 1998
    - 1999 to 2013

Potential Egg Production-Trap Reductions

Figure 7. Plotted time series of total traps in the SNE fishery and exploitation rates from the assessment model

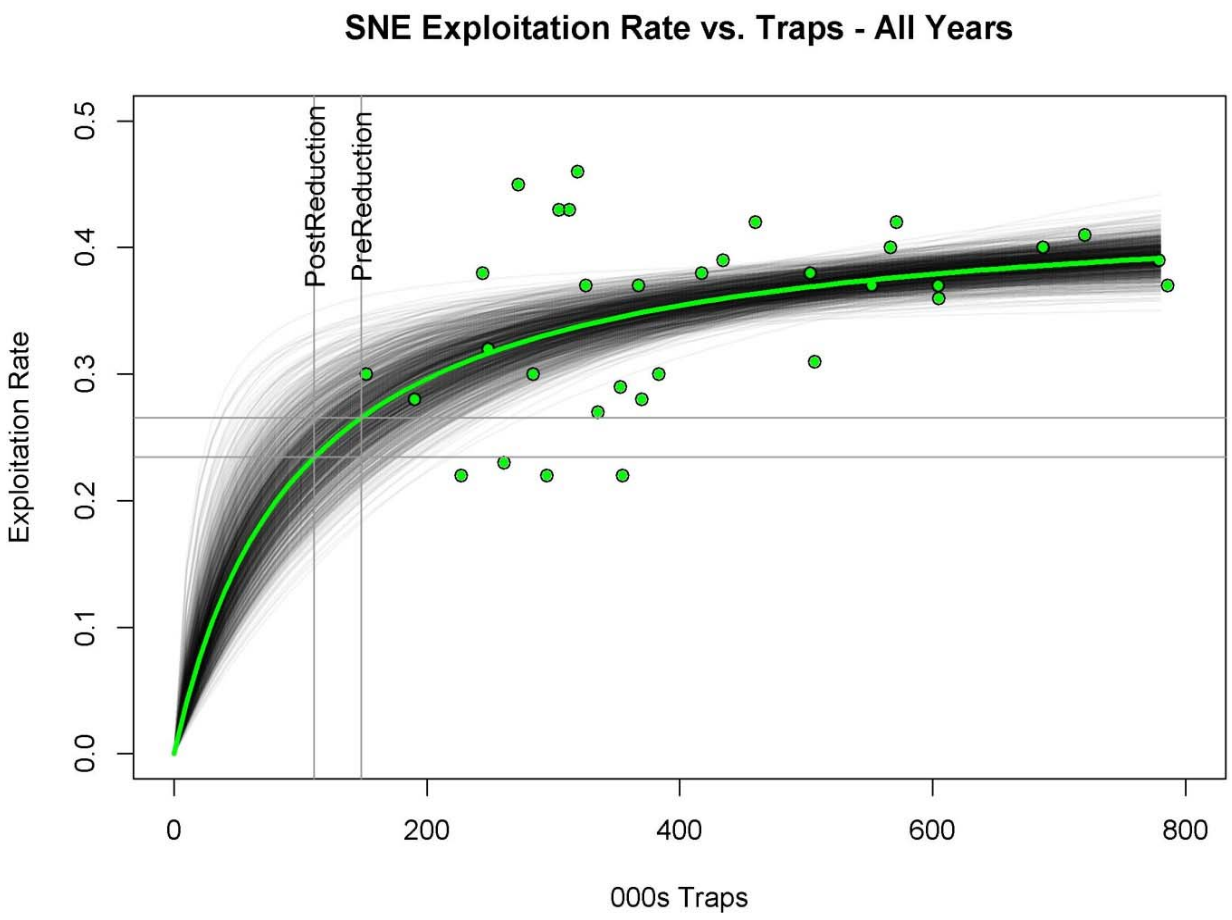


Potential Egg Production-Trap Reductions

- Methods
  - Based on these two apparent regimes we analyzed two different ways
    - All Years – 1981 to 2013
    - Recent Years – 1999 to 2013
  - Bootstrapped 1,000 models, with replacement, for both “all” and “recent” years and recorded the model-predicted exploitation rates at the current trap levels and after the 25% trap reduction

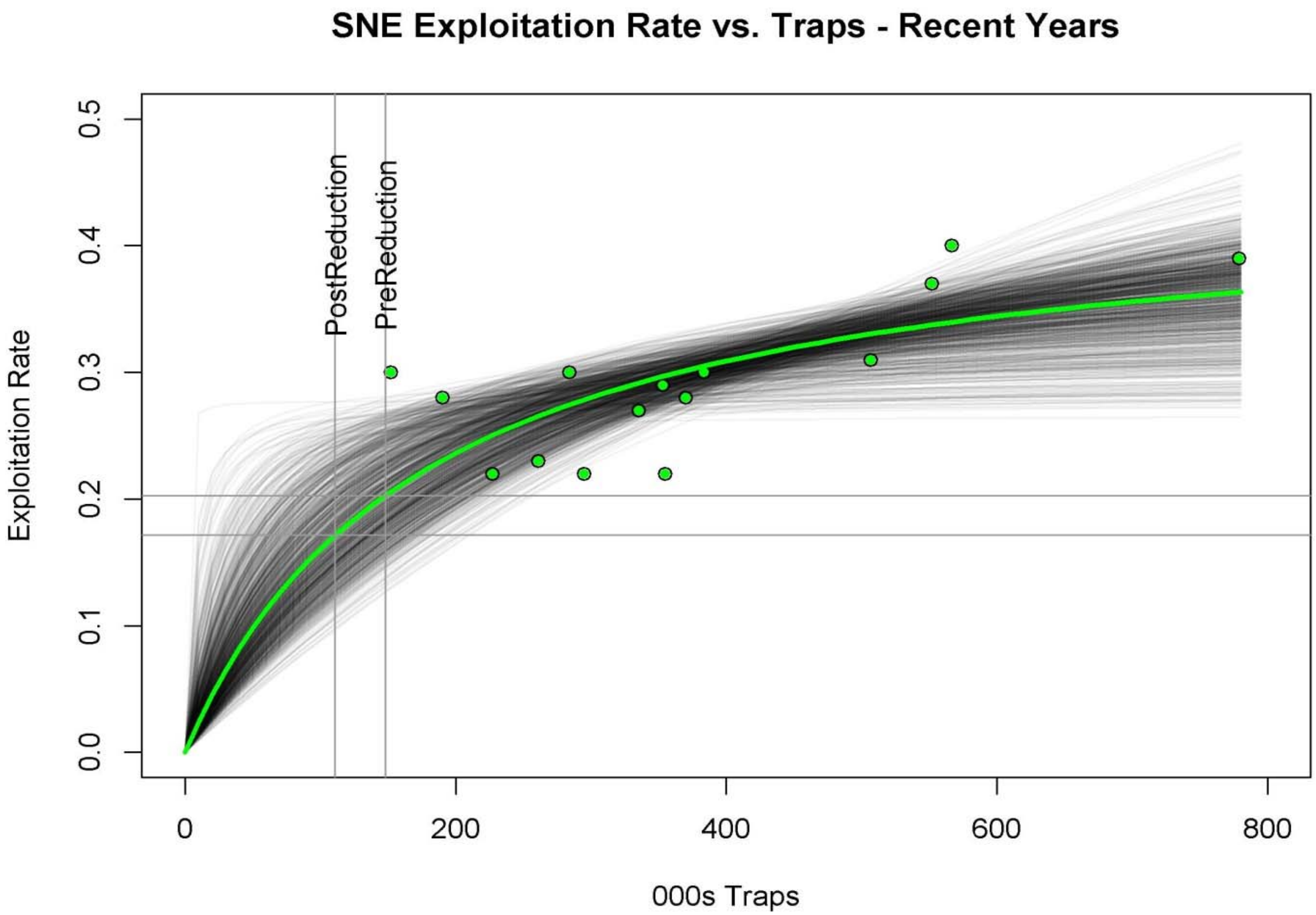
Potential Egg Production-Trap Reductions

Results



Potential Egg Production-Trap Reductions

Results



Potential Egg Production-Trap Reductions

- Results - 25% reduction in active traps fished
- "All Years"
  - Exploitation rates reduced from 0.270 to 0.239 constituting an 11.6% reduction (95% CI: 6.5% - 16.3%).
  - Egg production increase by 9.6% (95% CI: 4.5 – 13.0%)

Potential Egg Production-Trap Reductions

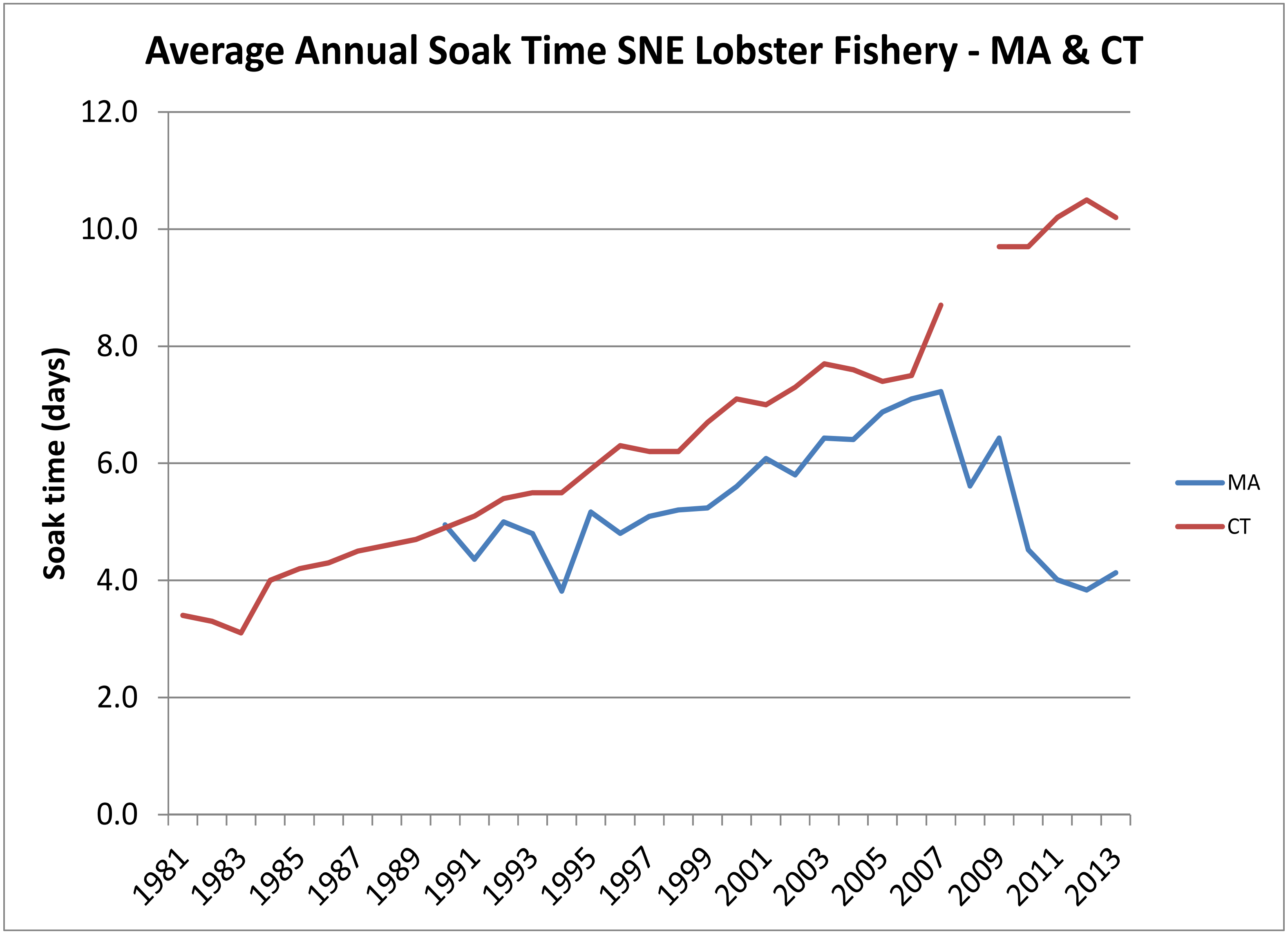
- Results - 25% reduction in active traps fished
- "Recent Years"
  - Exploitation rates reduced from 0.207 to 0.176 or a 14.3% reduction (95% CI: 3.5% - 21.2%)
  - Egg production increased 13.1 % (95% CI: 2.6 – 19.7%)

TC Concerns with Trap Reduction Analysis

– Assumption that soak time is constant is not valid
  - Empirical data for MA and CT demonstrate that there has been a trend in soak time
  - As annual average soak time decreases the number of times a trap is hauled increases and vice versa

– The total amount of effort exerted by a trap is directly proportional to;
  - how often it is hauled
  - the trap's efficiency at the point at which it was hauled
  - both of these parameters are directly influenced by soak time

SNE Soak Time

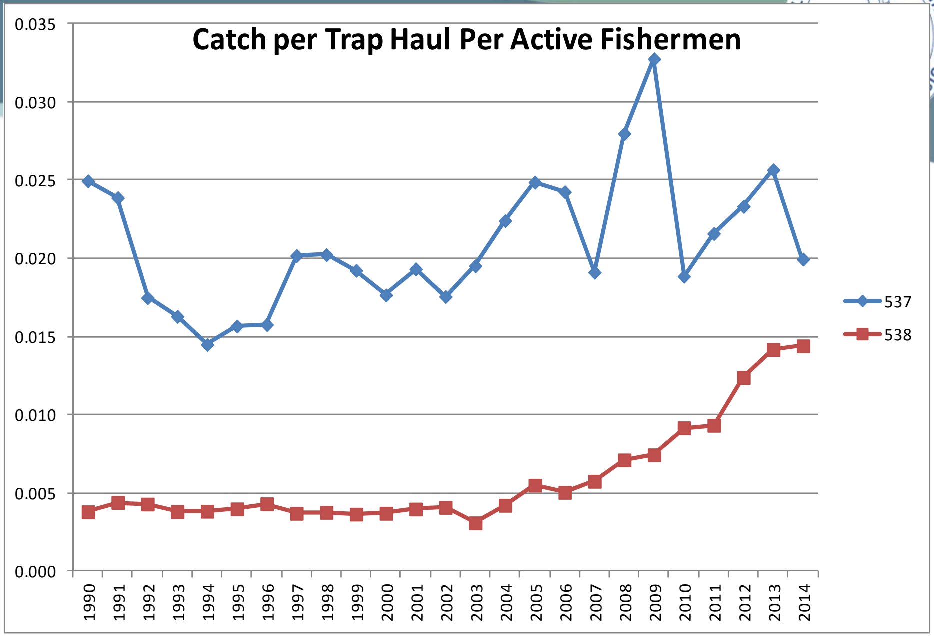


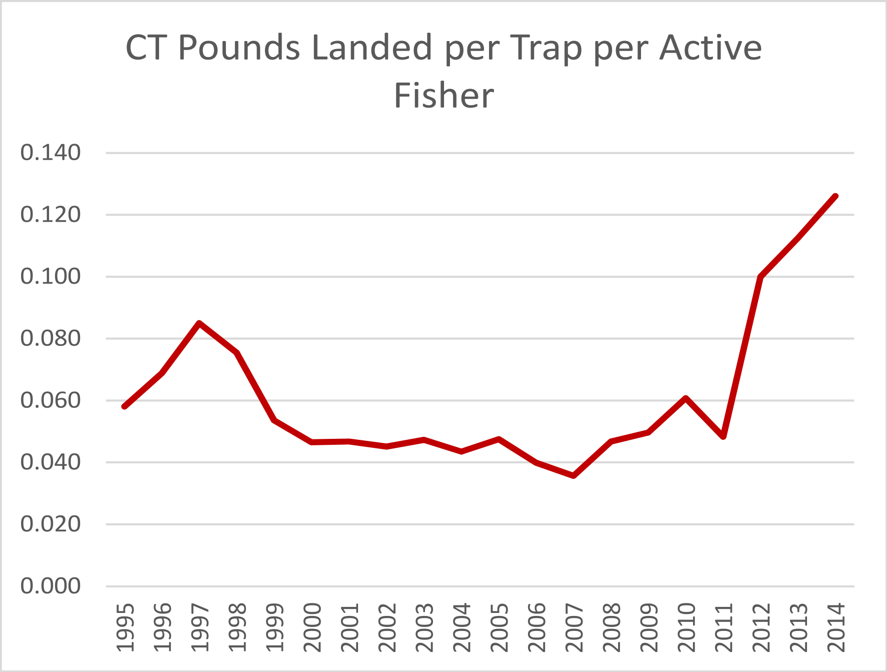
SNE CPUE

*Despite a rapid decline in the number of traps fished, CPUE (pounds per trap haul) has increased dramatically

*This demonstrates that traps in SNE are fishing nowhere near saturation levels (max efficiency)

*It also demonstrates that catch rates can be maintained even after a substantial portion of the traps have been removed





TC Concerns with Trap Reduction Analysis

- Trap efficiency (# of lobsters retained/# of lobster encountered) typically reaches its maxima between 1 to 4 days in inshore areas, and 5 to 9 days in offshore areas
- Trap efficiency is further complicated by interactions with;
    - population density
    - trap saturation
    - interspecific competition
    - bait type and quantity
    - trap size
    - spacing (trap density)
    - trap design
    - water temperature

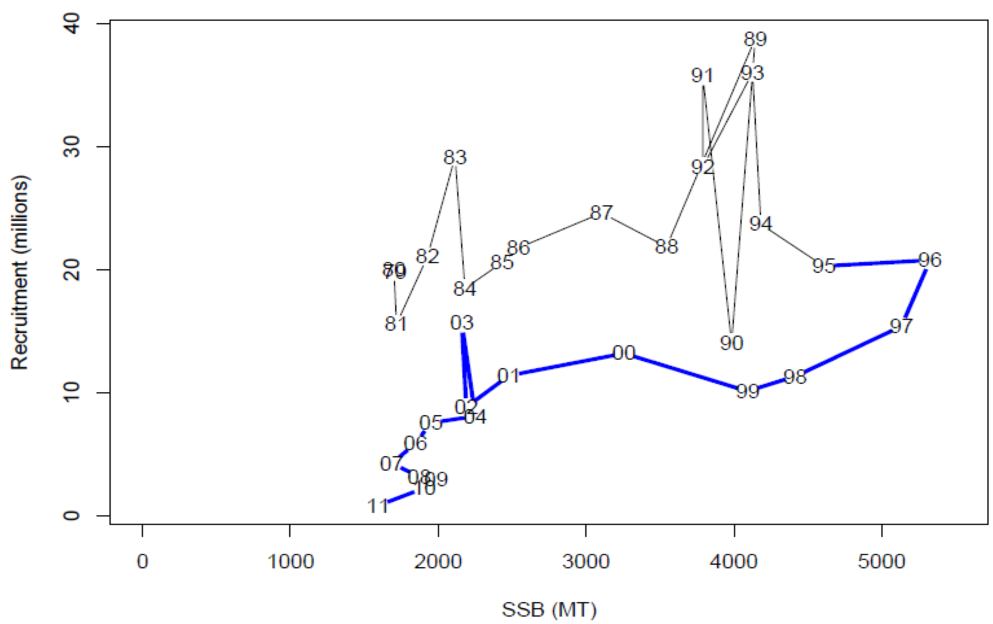
Potential Egg Production-Trap Reductions

Conclusions

- Quantifying a standard unit of effort in trap fisheries is extremely complex and notoriously elusive
- The number of traps fished is a very poor metric of fishing effort
- The number of trap hauls standardized to soak time is the only true measure of effort in a traps fishery
- The # of trap hauls is not universally available for SNE
- The assumption of constant soak time is not valid
- Best case scenario is a 14.3% reduction in exploitation with a corresponding 13.1% increase in egg production.
- **The TC strongly cautions the Board against using these analyses to quantify or predict current or future reductions in exploitation related to trap reductions.**

Final Thoughts

- Recruitment appears to be decoupled from SSB
- Prospective increases in egg production will only benefit the stock if recruitment rates remain constant or improve.
- TC warns that increasing egg production by 20%-60% is unlikely to be sufficient to prevent further declines in the SNE lobster stock
- Projection analyses provided by the TC indicate that an 85% reduction in exploitation would be necessary to stabilize the stock



Jonah Crab Draft Addendum II for Public Comment

American Lobster Management Board

August 4, 2016

Timeline

May 2016	Board initiated Draft Addendum II to consider a coastwide standard for claw harvest
August 2016	Board reviews Draft Addendum II for public comment
August – October 2016	Public comment period
October 2016	Board reviews public comment and selects final option
Implementation	TBD

Current Claw Provision

Jonah Crab FMP establishes

- A whole crab fishery
- Exception for individuals from NJ, DE, MD, and VA who can prove a history of claw landings before June 2, 2015
- Historic Delmarva claw fishery by small boat fishermen

Statement of Problem

1) Claw fishermen from NY and ME identified following approval of FMP

- These fishermen limited to whole crabs
- Concerns about equity

2) Potential challenges implementing the regulation in federal waters

- National Standard 4 requires management measures not discriminate between residents of different states

Data Limitations

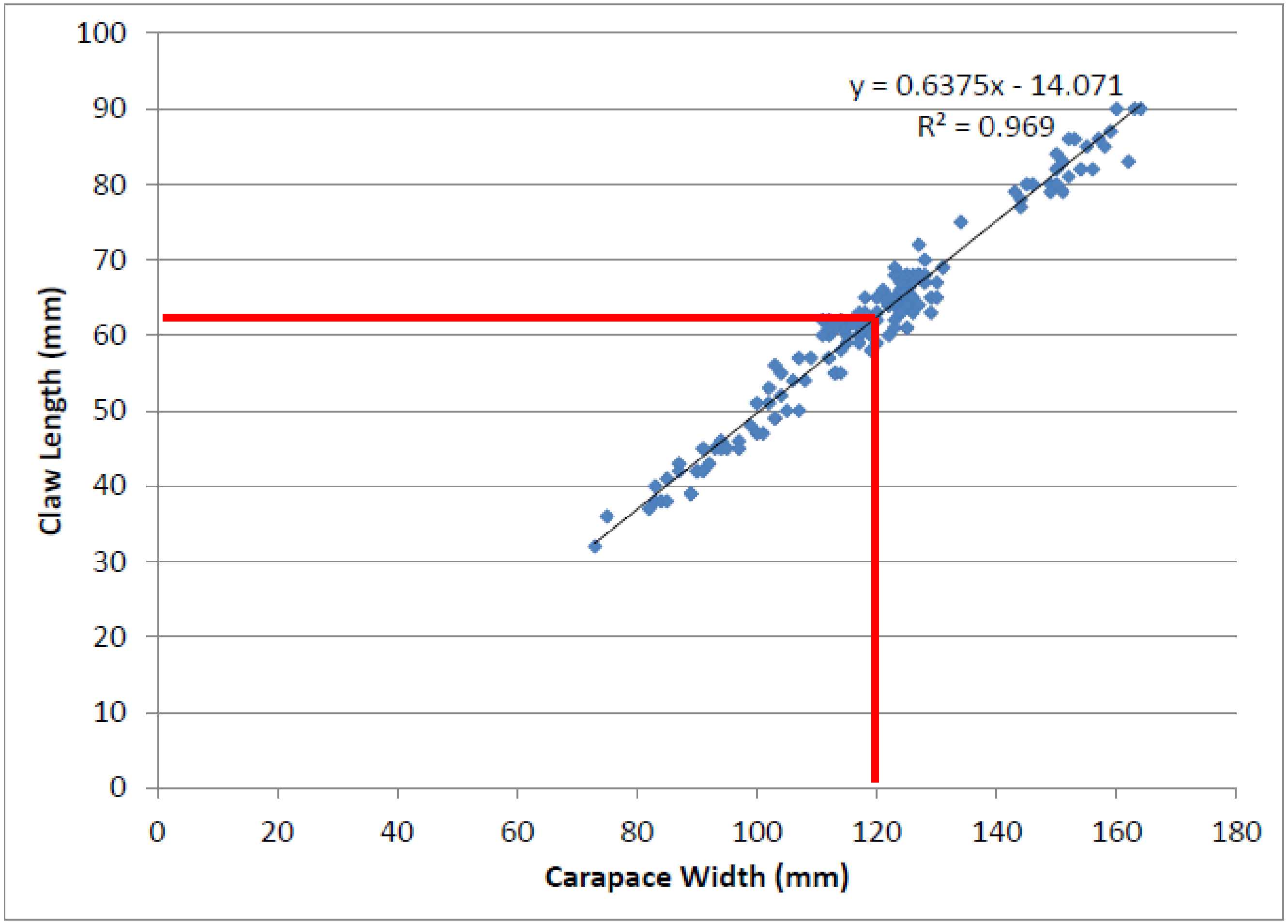
- Information on claw fishery is limited
  - Trip level harvester reporting has not been required in all jurisdictions
  - Prior to FMP, many states did not require dealer reporting to delineate between whole crabs and claws
  - Landings for personal consumption not well documented
- Unclear how many fishermen are harvesting claws or the number of pounds landed

Claw Fishery Performance

Year	Pots/traps (Type not specified)	Lobster Pot	Fish Pot	Gill Net	Otter Trawl	Total
Jonah Crab Claw Landings (lbs) 2010 – 2015	75,847	66,296	3,081	2,115	1,958	149,297
Percent of Total	50.8%	44.4%	2.1%	1.4%	1.35%	100%

Source: ACCSP Data Warehouse

Morphometric Data



Suggests that for a male crab whose carapace width meets the minimum size of 4.75" (120.65 mm), an expected claw length would be 2.47" (62.84mm).

Claw Mortality

- **Preliminary data from small scale lab study**
  - Crabs (n=232) monitored in seawaters trays over a four week period
  - 19% of crabs died when no claws were removed
  - 56% of crabs died when one claw was removed
  - 74% of crabs died when both claws were removed

Claw Fishery Summary

- There are claw fishermen in many states along the coast using a variety of gears
- The current regulation does not provide equal opportunity to like participants across the fishery
- Federal implementation of current provision may prove challenging due to National Standard 4

Management Options

Option A: Status Quo

- Only whole crabs may be retained and sold with the exception of individuals who can prove a history of claw landings before June 2, 2015 in the states of NJ, DE, MD, and VA

Option B: Coastwide Whole Crab Fishery

- Only whole crabs may be retained and sold coastwide

Management Options

Option C: Coastwide Whole Crab Fishery w/ Small Volumetric Claw Harvest

- Primarily whole crab fishery; however, there would be a 5 gallon coastwide tolerance of detached crab claws per vessel per trip which may be retained and sold
- Claws must meet 2.5” min length
- Two claws may be harvested from the same crab

Management Options

Option D: Claw Harvest Permitted Coastwide

- Detached claws which meet a min length of 2.5” may be retained and sold coastwide
- Two claws may be harvested from the same crab
- Bycatch limits remain such that a fishermen harvesting under the bycatch allowance may land up to 2,000 claws (1,000 crab=2,000 claws)

Questions?

Maine Conservation Equivalency Proposal

August 4, 2016

ME Proposal

- Request approval of a conservation equivalency proposal to continue the Trap Tag Pilot Program
  - Harvesters allowed to bring traps back to shore, cut existing tags, and reattach those same tags with hog rings to new gear
  - Eliminates issuance of 20,000 exchange tags, a frequent source of counterfeit tags in ME
  - Program has removed illegal gear from water

ME Proposal

ME Proposal

PRT Report

- **PRT supports Maine's proposal**
  - Reduce number of potential counterfeit tags in the water
  - Alleviate burden on marine patrol to trace extra tags
  - Given reports of malfunctioning tags, hog rings provide useful alternative to attached tags

AP Report

- **AP supports Maine's proposal**
  - Ability to transfer tags between traps is a time and money saver
  - Relieves burden in marine patrol to enforce exchange tags
  - Allows fishermen to use tags for the duration of the year

LEC Report

- **LEC supports Maine's proposal**
  - Pilot program removed 20,000+ exchange tags and helped alleviate existing problem of counterfeit tags
  - Proposal improves accountability in the fishery
  - Each state should be allowed the flexibility to utilize exchange tags or to allow trap-to-trap transfer of original tags as they deem necessary

Questions?