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FISHERY MANAGEMENT COUNCIL

Mackerel & RH/S

August 2018

Jason Didden

Overview

- The Council was officially notified of mackerel's overfishing status on July 19, 2018
- Needed 2019 specifications anyway and catches under rebuilding options not that different from current (limits already reduced 91% since 2009)
- Use Framework for rebuilding + specs + RH/S

Decisions

- Rebuilding (Set 1)
  - Timeline + risk adjustment if necessary?
  - ABC cap (33,474 MT)?
  - Canadian catch reduction?
  - Recreational catch?
  - Management uncertainty buffer?
  - Discards?

Decisions

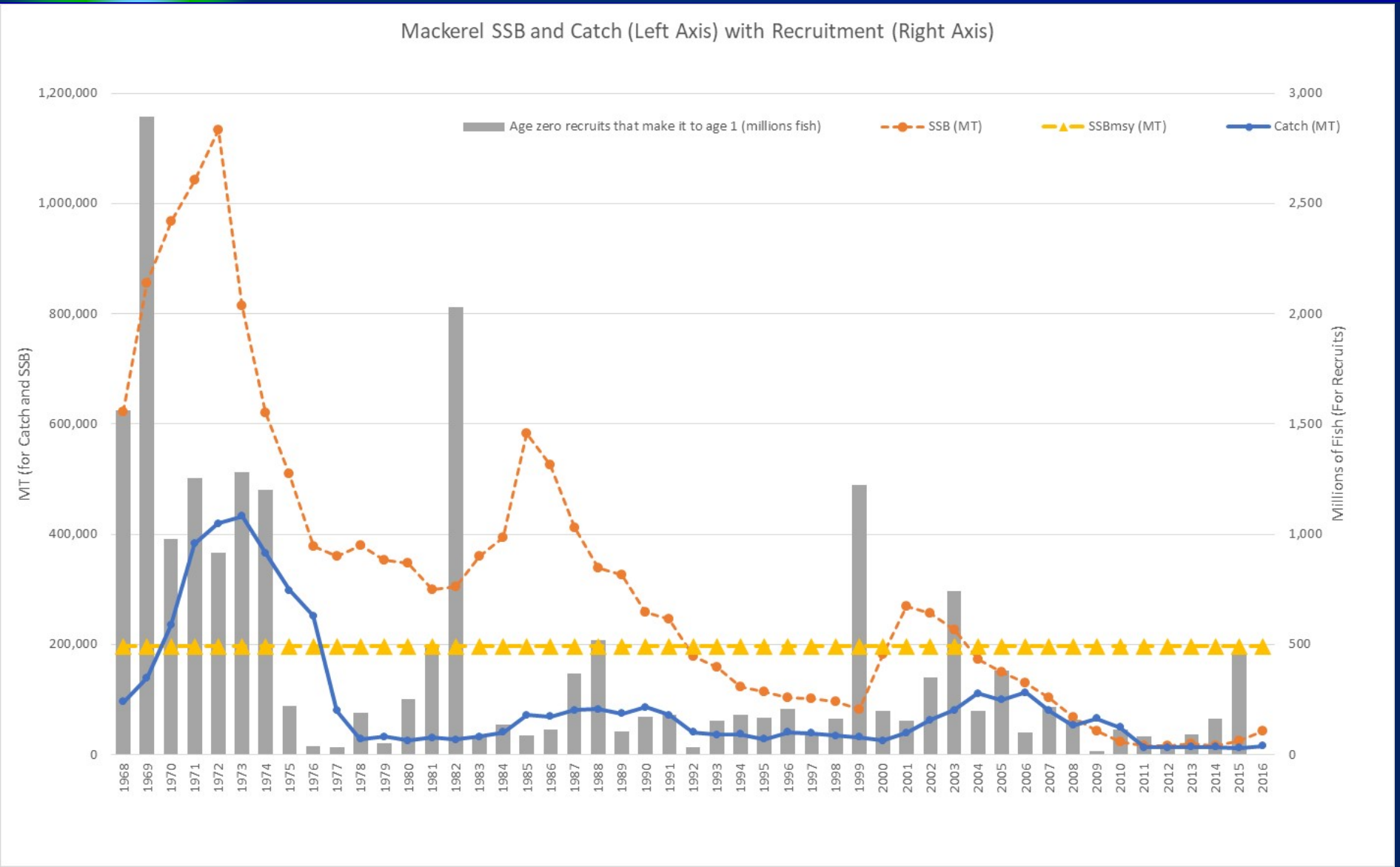
- In-season management (Set 2)
  - How to use quota during the year?
  - Give NMFS flexibility?

- RH/S Cap (Set 3)
  - Cap amount/approach?
  - 2-phase trigger?

Mackerel Assessment

- Incorporation of range-wide egg survey (US + CAN data) critical advancement.
- Age structure truncation indicated in fishery dependent and independent data.
- Apparently good 2015 year class and assumed median recruitment beyond 2015 drives the projections. These are uncertain but were used and reviewed in the accepted assessment and by SSC.

Mackerel Assessment



Assessment/Projections

- Projections in assessment done for Fmsy-proxy (F=0.26), no fishing, and 2016 F (F =0.47).
- NEFSC re-ran the projections with 2017 catch data and expected catch given 2018 quotas (US and CAN) and rebuilding options
- Runs: P* (happens to rebuild in 3-years), 5-year, and 7-year.

Projections

- Same methodology as assessment, done by NEFSC staff with updated catch data
- Projected fishing mortalities 2019-2021
  - P*/3-yr: 0.14, 0.19, 0.18
  - 5-yr: 0.237 each year (less in 2021 if ABC capped at 33,474 MT)
  - 7-yr: 0.252 each year (less in 2020/2021 if ABC capped at 33,474 MT)
- ABCs generated from applying F to stock size

Projections

- Given the nature of all projections, there's roughly a 50%-50% chance of rebuilding (or not) in the specified timeline for each alternative.

- Variability is expected - actual biomass could be higher or lower than predicted after any given amount of time.

2015/2016 Year Classes

- Appendix 3
- Showing up in catch but only an update will really give us more info on strength…

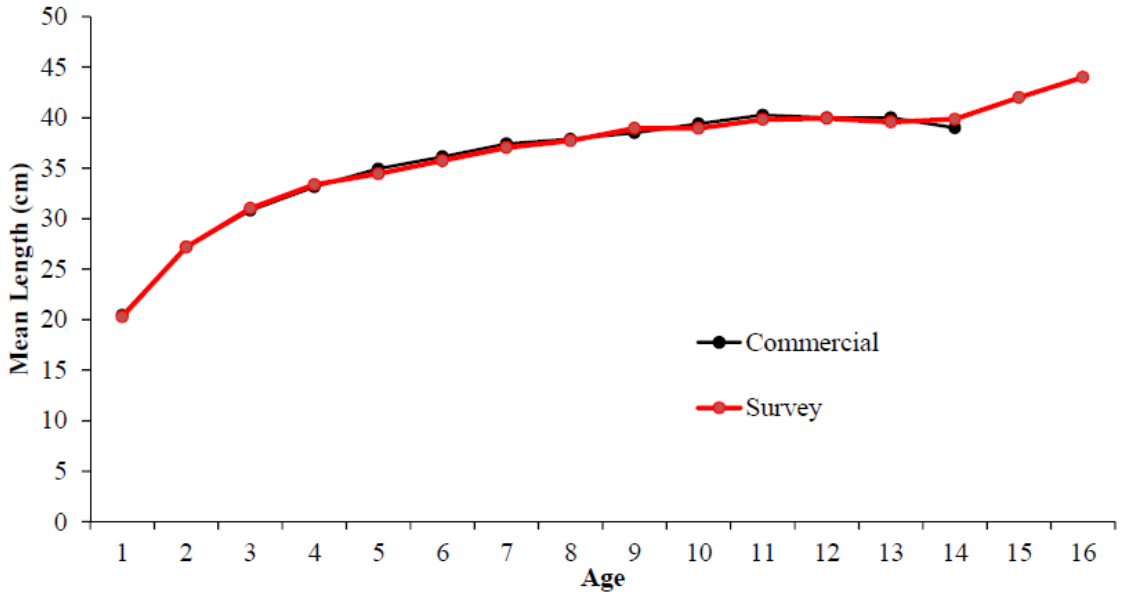
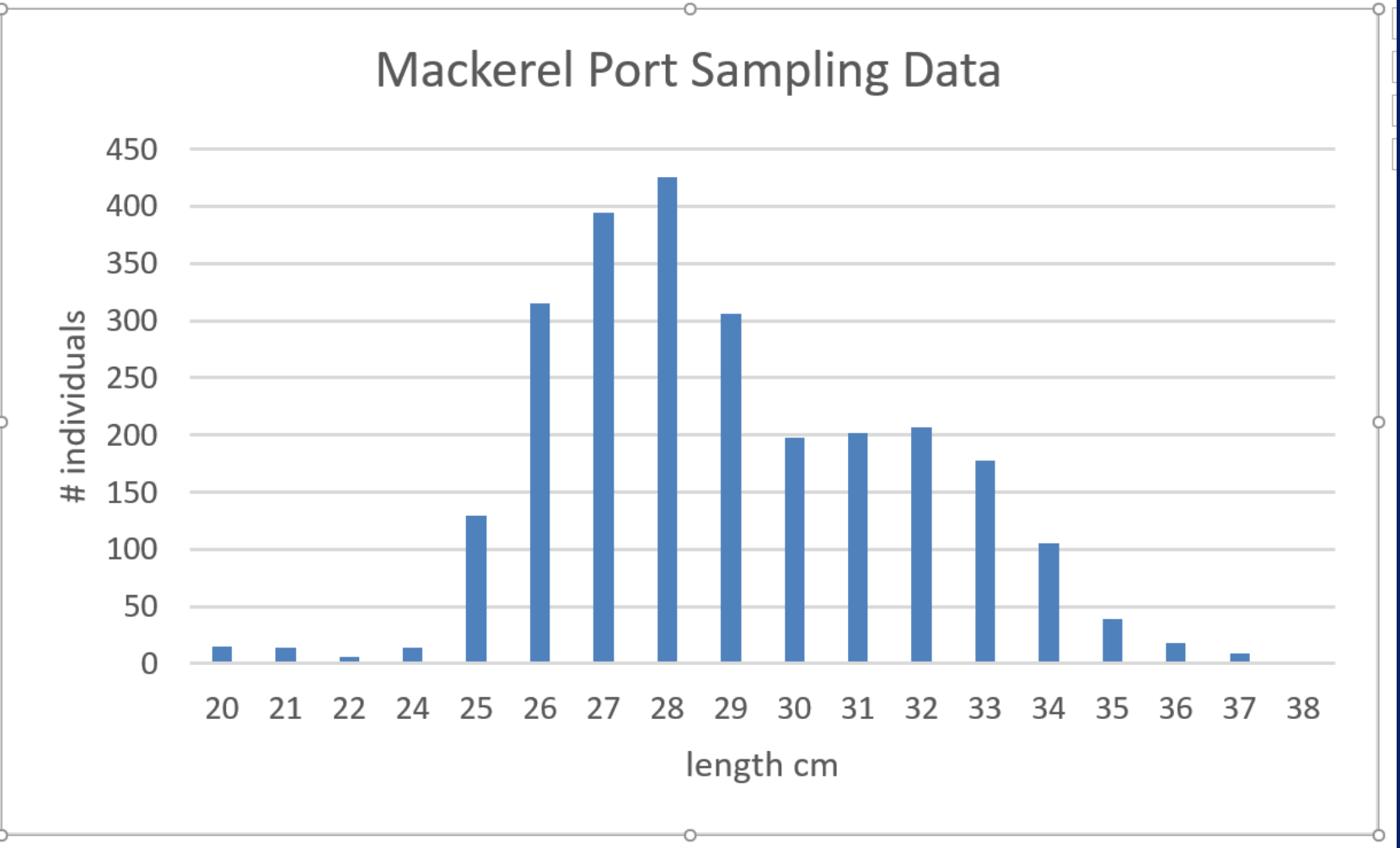


Figure A4: Atlantic mackerel mean length-at-age derived from U.S. commercial age samples and NEFSC spring bottom trawl survey age data.

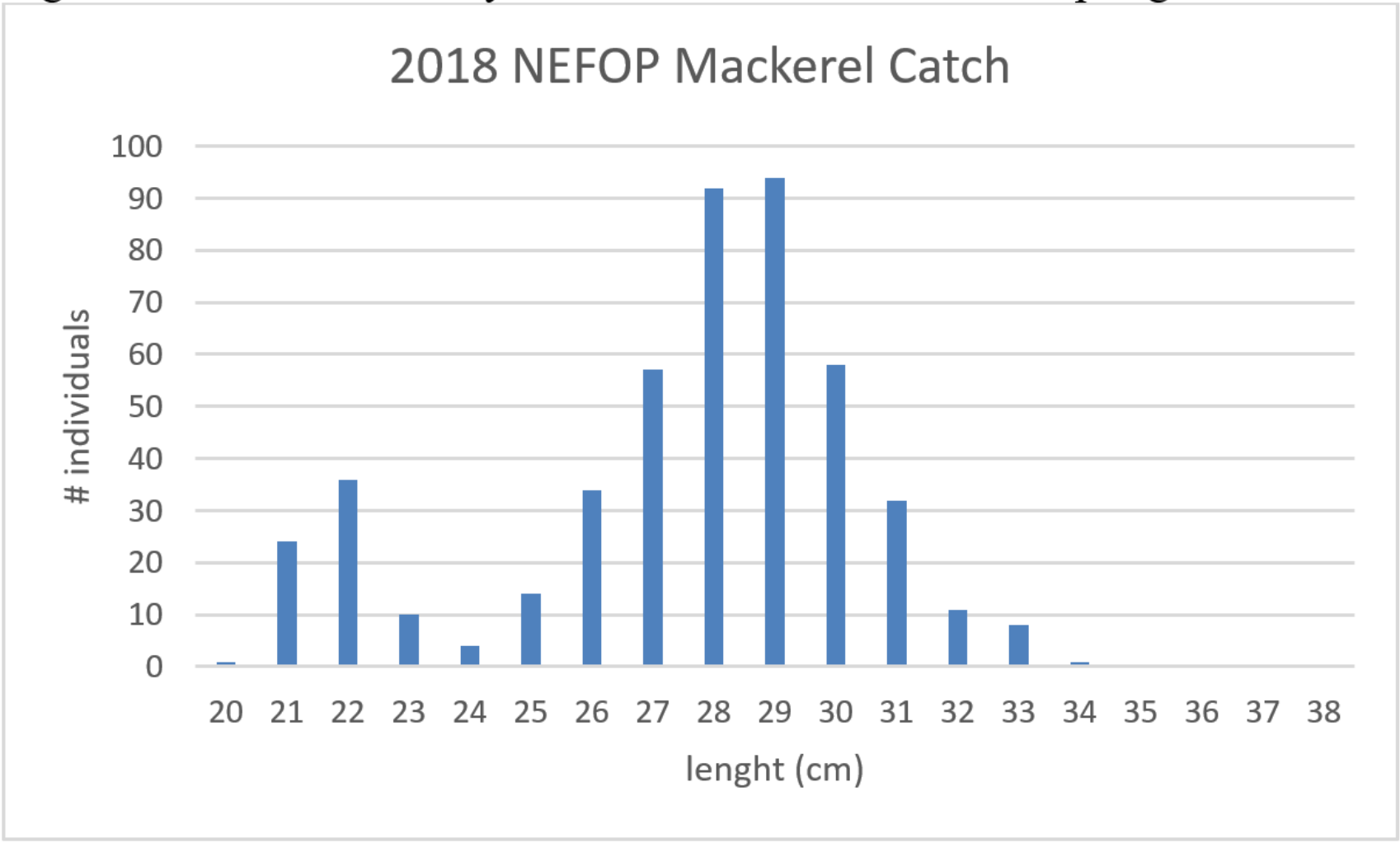
2015/2016 Year Classes

Figure M.A1. NMFS Early 2018 Mackerel Port Sampling Data



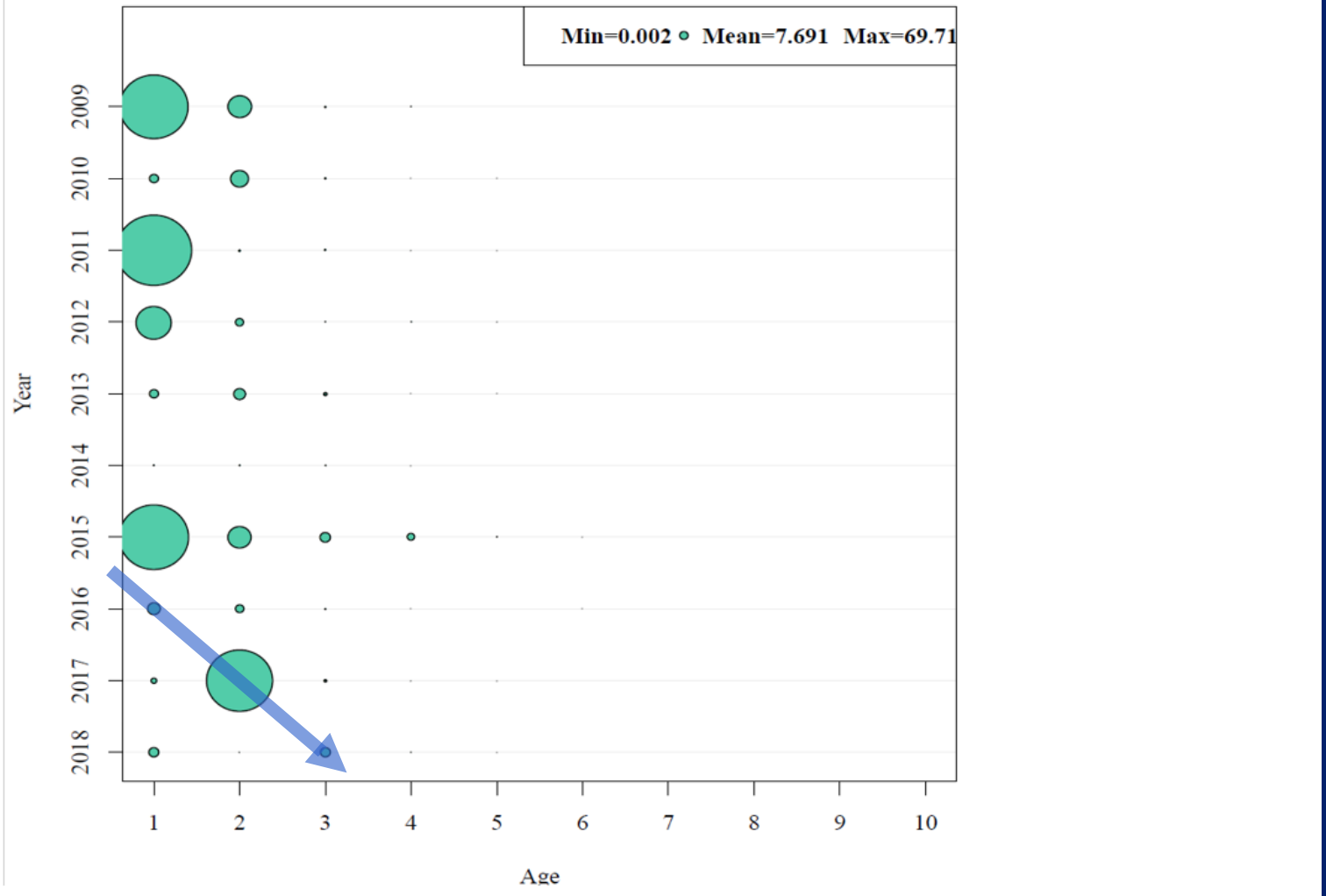
2015/2016 Year Classes

Figure M.A2. NMFS Early 2018 Mackerel Observer Sampling Data



2015/2016 Year Classes

Figure M.A3. Atlantic mackerel catch-at-age in the NEFSC spring Bigelow 2009-2018.



Rebuilding

- Risk policy (Aug 2010) says to use lesser of rebuilding ABC or P* ABC.
- Impacts to be considered in future actions…

- The only way to consider a range of rebuilding paths is to consider an adjustment to the risk policy.

Rebuilding

- Council can use 3/5/7 year rebuilding
- Requires an evaluation described in Magnuson:
  - be as short as possible, taking into account the status and biology of any overfished stocks of fish, the needs of fishing communities,…and the interaction of the overfished stock of fish within the marine ecosystem
  - Generally cannot exceed 10 years

Trade-offs

- Be as short as possible

- Needs of fishing communities…revenues
- Status and biology of mackerel…
- Interaction of mackerel in the marine ecosystem…

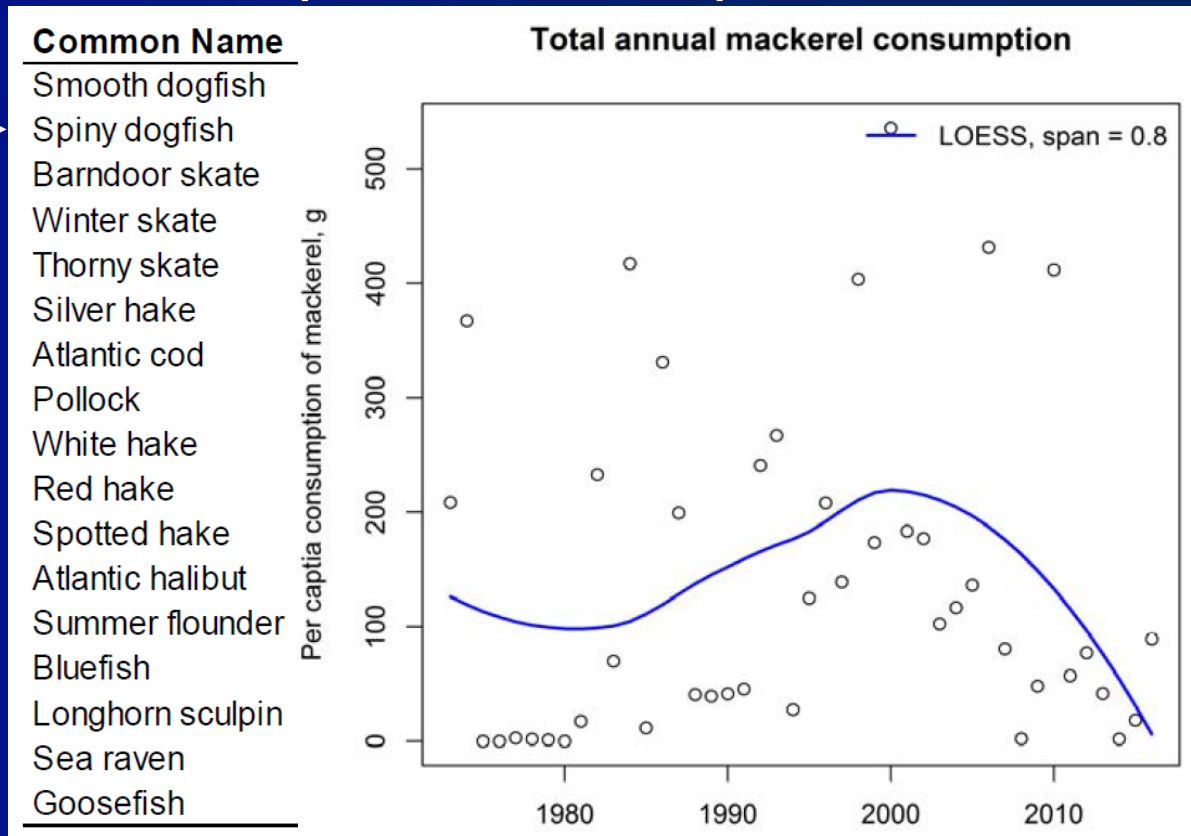
Ecosystem

- Mackerel eaten by variety of predators, only formally quantified for finfish caught in NMFS survey. No info on HMS, mammals, birds

67%
occurences

-0.2% of all stomachs had Atl. or unidentified mackerel
-1% of dogfish stomachs, 0-29% by mass generally in 4%-15% range

Common Name
Smooth dogfish
Spiny dogfish
Barndoor skate
Winter skate
Thorny skate
Silver hake
Atlantic cod
Pollock
White hake
Red hake
Spotted hake
Atlantic halibut
Summer flounder
Bluefish
Longhorn sculpin
Sea raven
Goosefish



ABCs From SSC…

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Bill Overholtz, NEFSC

May 2018 SSC Meeting

ABC Recommendations for Atlantic Mackerel

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Level of Uncertainty in the OFL

- The SSC acknowledges tremendous progress made for Atlantic Mackerel, a stock that previously required *ad hoc* ABC specifications.
- The SSC accepted the overfishing limit (OFL) estimate for 2019 provided in the assessment, and
- Determined the level of uncertainty of OFL in the assessment requires an SSC-specified coefficient of variation (CV).

OFL

- New biological reference points were proposed in the benchmark assessment, which were reviewed and accepted by SARC 64.
- $F_{40\%}$ (F = 0.26) is used as a proxy for F_{MSY} and total spawning stock biomass at $F_{40\%}$ ($SSB_{40\%}$) is used as the proxy for the stock biomass reference point.
- OFL = **31,764 MT** for 2019

ABC

SSC was asked to provide three ABC recommendations:

- P* approach
- 5-yr rebuilding
- 7-yr rebuilding

ABC: P* Approach

- For P* approach, factors the SSC considered in assigning an OFL CV included:
  - Data and model considerations
  - Retrospective analyses
  - Trend in recruitment
  - Assessment accuracy under different Fs
  - Ecosystem considerations

ABC: P* Approach

- Collectively, attributes of the assessment suggest a high level of confidence in the results; however, a lot is riding on the estimate of terminal year (2015) recruitment without confirmation
- SSC selected 100% CV for the OFL, and assuming a typical life history, the SSC's recommendations are:

Year	**ABC (mt)**	P*
2019	**19,025**	0.27
2020	**26,183**	0.33
2021	**33,001**	0.39

ABC: Five- and Seven-Year Rebuilding

- SSC notes that both rebuilding options suggest a more aggressive harvest policy than the Council would use under the P* approach for both an overfished stock and for a stock at or above its target biomass.
- Both options result in a smaller difference between the ABC and OFL than the SSC would recommend under the standard risk policy for a stock above its target biomass.

ABC: Five- and Seven-Year Rebuilding

- ABCs under five-year rebuilding scenario:

  2019: **29,184 mt**

  2020: **32,480 mt**

  2021: **35,195 mt**

- ABCs under a seven-year rebuilding scenario:

  2019: **30,868 mt**

  2020: **34,016 mt**

  2021: **36,551 mt**

Next Year the SSC would like to look at:

- Age structure in the fishery, as well as the survey
- Continued evidence of the influence of the 2015 year class (and other strong year classes)
- Egg index
- Fishery performance reports (especially factors influencing catch)

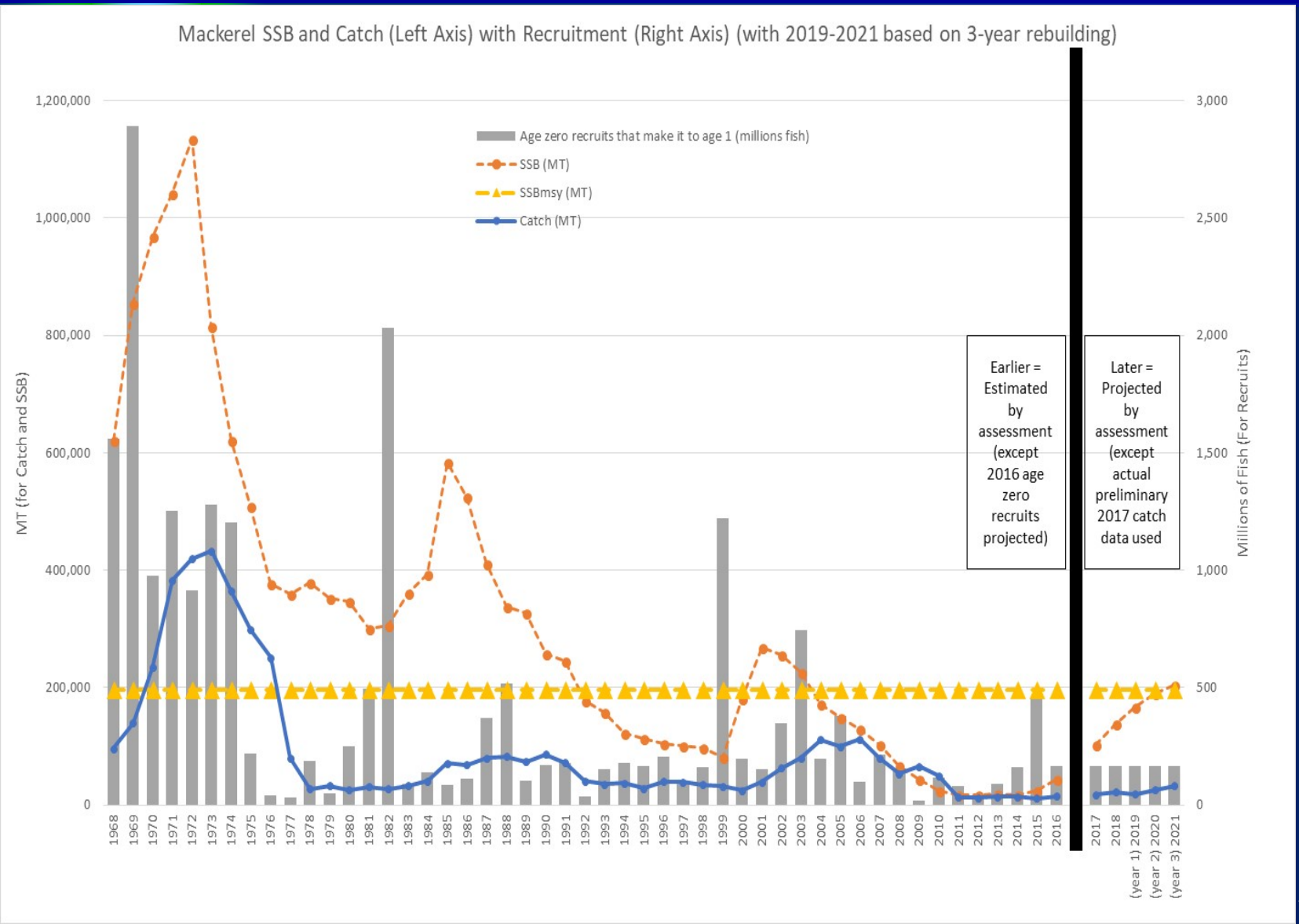
Most Significant Sources of Scientific Uncertainty

- The estimated size of the most recent year class in the assessment (substantially higher than most recent recruitments) drives assumptions about rebuilding times, OFLs, and ABCs;
- Conversion of egg survey results to the spawning stock biomass estimate;
- The assessment is sensitive to the distribution of Atlantic Mackerel, which has been changing and may continue to change;

Most Significant Sources of Scientific Uncertainty (cont'd)

- Trawl survey representation of abundance and age structure;
- The assumption of fixed natural mortality rate and data gaps associated with major predators of Atlantic Mackerel; and
- Missing catch information from bait and recreational fisheries in Canada.

Projections – P*



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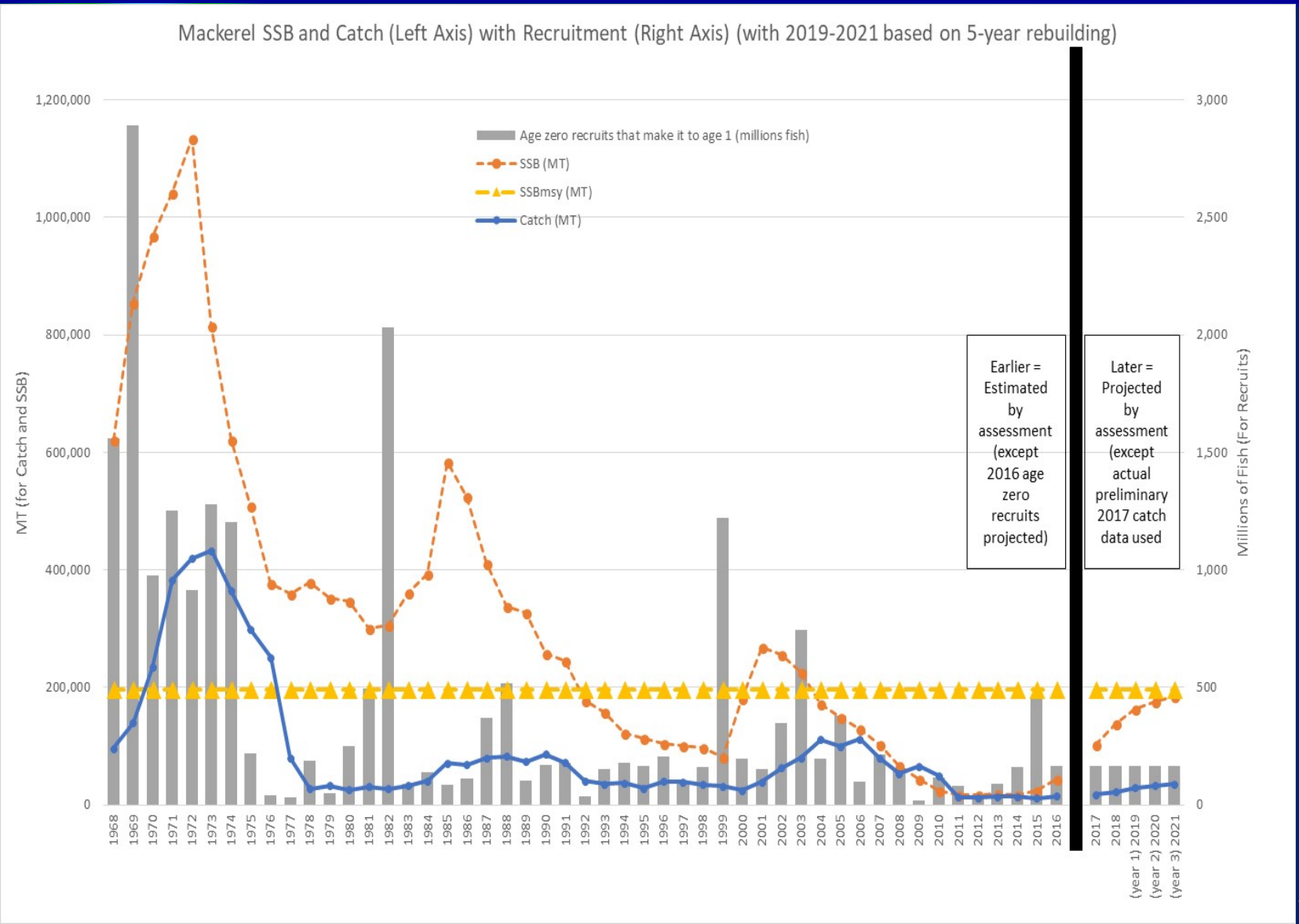
Projections – 5 yr



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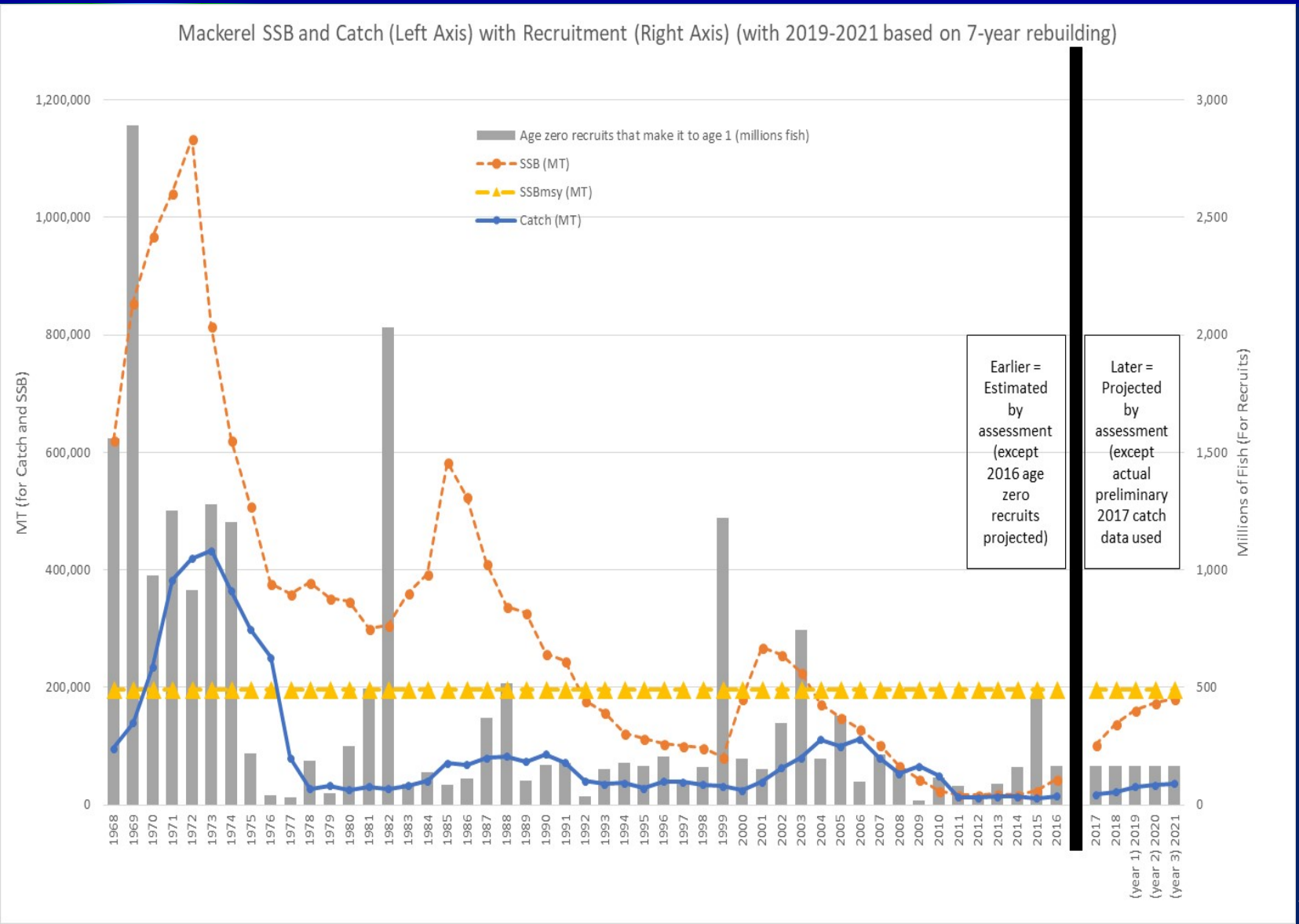
Projections – 7 yr



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Projections – Revenues 3 years

Table 22. Potential revenues from mackerel rebuilding options when deducting 50% of ABC for Canada (Canada1)

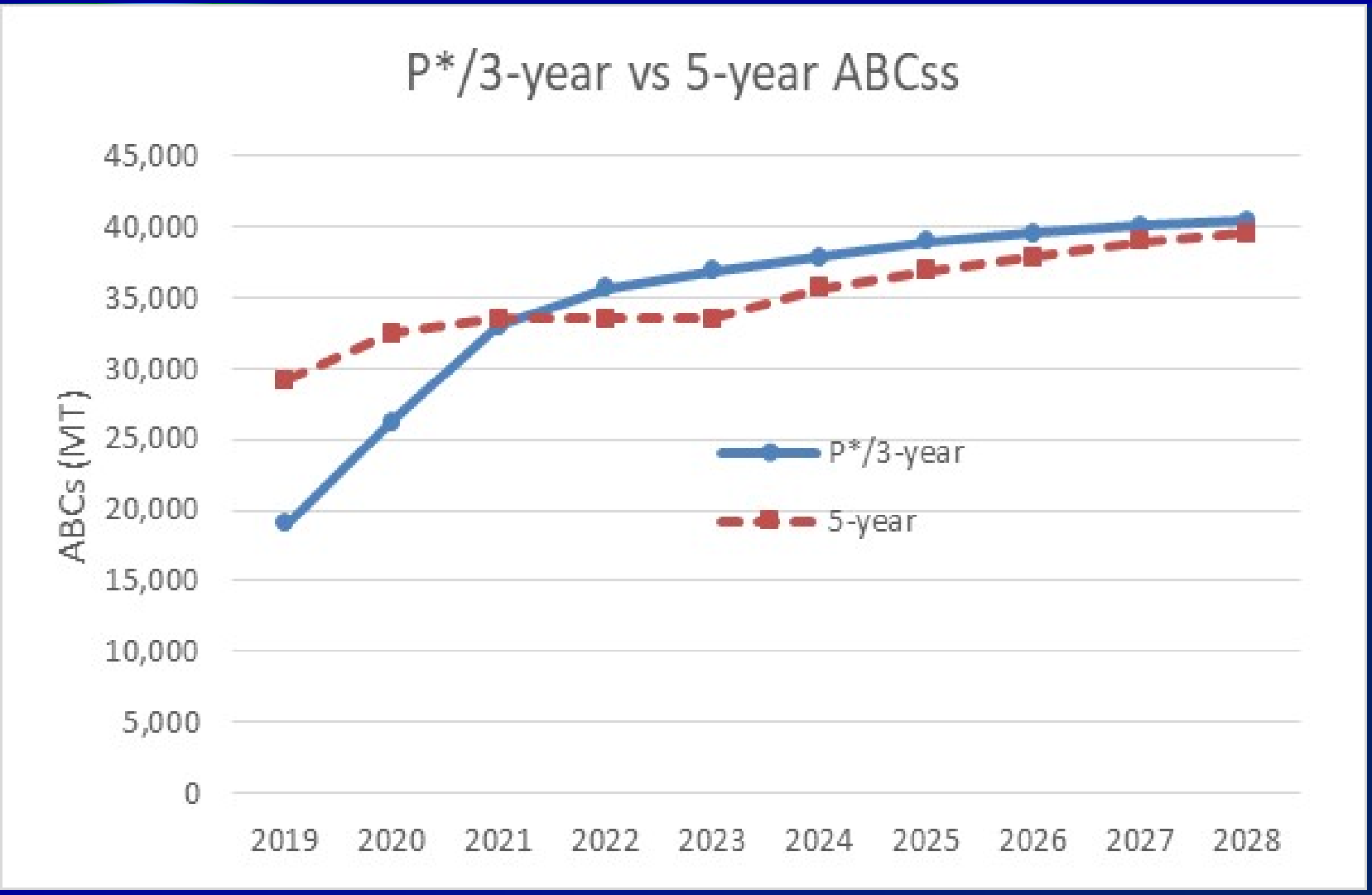
Canada1 - 50% deduction for Canada.				
	2019	2020	2021	Total 2019-2021
1a	$5,506,200	$5,345,825	$5,190,122	$16,042,147
1b	$4,814,756	$6,689,347	$8,357,738	$19,861,841
1c	$7,760,087	$8,461,820	$8,487,000	$24,708,906
1d	$8,248,318	$8,741,610	$8,487,000	$25,476,927

Table 23. Potential revenues from mackerel rebuilding options when deducting 10,000 MT of ABC for Canada (Canada2)

Canada2 - 10,000 MT deduction for Canada.				
	2019	2020	2021	Total 2019-2021
1a	$5,506,073	$5,345,702	$5,190,002	$16,041,777
1b	$4,532,081	$8,429,731	$11,910,658	$24,872,470
1c	$10,422,743	$11,974,677	$12,169,181	$34,566,601
1d	$11,399,204	$12,534,257	$12,169,181	$36,102,643

$600/mt, 2020 and 2021 discounted using a 3% discount rate

Projections 10 years



With P*, biomass levels out at 122% of target

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Projections 10 years

- $600/mt

Canada2 - 10,000 MT deduction for Canada. Annual Discounted Revenues (3% discount rate)											
Rev	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total Discounted Revenues
1a	5,506,200	5,345,825	5,190,122	5,038,953	4,892,187	4,749,696	4,611,356	4,477,044	4,346,645	4,220,044	48,378,073
1b	4,532,081	8,429,731	11,910,658	12,991,402	13,227,921	13,310,310	13,460,690	13,382,629	13,221,712	12,985,933	117,453,068
1c	10,422,743	11,974,677	12,169,181	11,814,739	11,470,621	12,245,643	12,468,584	12,546,244	12,687,991	12,614,411	120,414,834
1d	11,399,204	12,534,257	12,169,181	11,814,739	11,470,621	12,245,643	12,468,584	12,546,244	12,687,991	12,614,411	121,950,876

Canada1 - 50% deduction for Canada. Annual Discounted Revenues (3% discount rate)											
Rev	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total Discounted Revenues
1a	5,506,200	5,345,825	5,190,122	5,038,953	4,892,187	4,749,696	4,611,356	4,477,044	4,346,645	4,220,044	48,378,073
1b	4,814,756	6,689,347	8,357,738	8,828,137	8,878,461	8,853,700	8,864,854	8,763,654	8,622,836	8,446,345	81,119,828
1c	7,760,087	8,461,820	8,487,000	8,239,806	7,999,811	8,321,366	8,368,801	8,345,461	8,355,975	8,260,584	82,600,711
1d	8,248,318	8,741,610	8,487,000	8,239,806	7,999,811	8,321,366	8,368,801	8,345,461	8,355,975	8,260,584	83,368,732

Projections 10 years

Rev	Total Discounted Revenues
1a	48,378,073
1b	117,453,068
1c	120,414,834
1d	121,950,876

- Canada 2

Rev	Total Discounted Revenues
1a	48,378,073
1b	81,119,828
1c	82,600,711
1d	83,368,732

- Canada 1

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Decisions

- Rebuilding (Set 1)
  - Timeline + risk adjustment if necessary?
  - ABC cap (33,474 MT)?
  - Canadian catch reduction?
  - Recreational catch?
  - Management uncertainty buffer?
  - Discards?

Decisions – Public Comments

Split perspectives

- Commercial mackerel fishing interests generally support the Committee recommendation (5-year)
- Mix of environmental groups, public, and recreational fisherman support status quo or P*/3-year

Decisions

- Rebuilding (Set 1)

  Motion from Committee:

  Move to recommend that the Council adopt for 2019-2021 Alternative 1 C with Canada 2 and include the FMAT recommended ABC Cap of 33,474 MT for 2021.

  (close vote (tie) to amend to 1B)

Decisions

- Rebuilding (Set 1, 1c)
  - Timeline = 5-year with risk adjustment
  - Use ABC cap (33,474 MT)
  - 10,000 MT Canadian catch reduction
  - 1,209 recreational catch deduction
  - 3% management uncertainty buffer
  - 0.37% discards

Decisions

Table 3. Specifications for a 5-year rebuilding (1c)

Proposed Option 1c All numbers are in metric tons (MT)						
Specification	Mackerel 2019 (MT)		Mackerel 2020 (MT)		Mackerel 2021 (MT)	
	Canada1	Canada2	Canada1	Canada2	Canada1	Canada2
Overfishing Limit (OFL) (only available for 2019)	31,764	31,764	na	na	na	na
Total Acceptable Biological Catch (ABC) from	29,184	29,184	32,480	32,480	33,474	33,474
Canadian Deduction (1/2 of ABC or ABC-10,000)	14,592	10,000	16,240	10,000	16,737	10,000
U.S. ABC = ACL (Canadian catch deducted)	14,592	19,184	16,240	22,480	16,737	23,474
Recreational Allocation	1,209	1,209	1,209	1,209	1,209	1,209
Commercial Allocation (rest of ACL)	13,383	17,975	15,031	21,271	15,528	22,265
Management Uncertainty Buffer = 3%	401	539	451	638	466	668
Commercial ACT (97% of ACL)	12,982	17,436	14,580	20,633	15,062	21,597
DAH (0.37% discards)	12,933	17,371	14,526	20,557	15,006	21,517

Decisions

- Rebuilding (Set 1)

  Motion from Committee:

  Move to recommend that the Council adopt for 2019-2021 Alternative 1 C with Canada 2 and include the FMAT recommended ABC Cap of 33,474 MT for 2021.

  (close vote (tie) to amend to 1B)

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Alternative Set 2

- Difficult to predict how any closure will work out – haven't had a closure due to mackerel landings and haven't seen yet how late August through December works with a 20,000 pound trip limit.

Table 9. Closure Options Summary

	2a (no action) with 2018 DAH of 9,177	2b with DAH of 17,371 (Alt 1c 2019)	2c with DAH of 17,371 (Alt 1c 2019)	2d with DAH of 17,371 (Alt 1c 2019)	2e with DAH of 17,371 (Alt 1c 2019)
1st closure directed	95% trigger, 20,000 pound trip limit	80% trigger, 40,000 pound trip limit	85% trigger, 20,000 pound trip limit	95% trigger, 20,000 pound trip limit	90% trigger, 40,000 pound trip limit
1st closure incidental	na, always 20,000 pound trip limit	5,000 pound trip limit	5,000 pound trip limit	5,000 pound trip limit	5,000 pound trip limit
2nd closure directed	100%, 5000 pound trip limit	98% trigger, 5000 pound trip limit	98% trigger, 5000 pound trip limit	100% trigger, 5000 pound trip limit	98% trigger, 5000 pound trip limit
2nd closure incidental	100%, 5000 pound trip limit	no change, 5,000 pound trip limit	no change, 5,000 pound trip limit	no change, 5,000 pound trip limit	no change, 5,000 pound trip limit
Overall difference/reserve between commerical allocation and directed fishery closure	1,492 MT	4,013 MT	3,144 MT	1,409 MT	2,276 MT
Trips supported at the trip limit proposed for each alterntaive between 1st and 2nd closure	51	172	249	96	77

Decisions – Public Comments

- Several ideas expressed in comments and AP input – Committee asked for 2d and 2e to be added for consideration

- Several comments expressed concern about open access/incidental permits going from 20,000 pounds to 5,000 pounds. (jig fishery)

Correction

- If July-December handline/jig landings are examined from 2015-2017, a 5,000 pound trip limit would have impacted 21 federally-permitted vessels. Had they been limited to 5,000 pounds, their combined mackerel landings would have been reduced by 17% not 15%.

Table 9. Closure Options Summary

	2a (no action) with 2018 DAH of 9,177	2b with DAH of 17,371 (Alt 1c 2019)	2c with DAH of 17,371 (Alt 1c 2019)	2d with DAH of 17,371 (Alt 1c 2019)	2e with DAH of 17,371 (Alt 1c 2019)
1st closure directed	95% trigger, 20,000 pound trip limit	80% trigger, 40,000 pound trip limit	85% trigger, 20,000 pound trip limit	95% trigger, 20,000 pound trip limit	90% trigger, 40,000 pound trip limit
1st closure incidental	na, always 20,000 pound trip limit	5,000 pound trip limit	5,000 pound trip limit	5,000 pound trip limit	5,000 pound trip limit
2nd closure directed	100%, 5000 pound trip limit	98% trigger, 5000 pound trip limit	98% trigger, 5000 pound trip limit	100% trigger, 5000 pound trip limit	98% trigger, 5000 pound trip limit
2nd closure incidental	100%, 5000 pound trip limit	no change, 5,000 pound trip limit	no change, 5,000 pound trip limit	no change, 5,000 pound trip limit	no change, 5,000 pound trip limit
Overall difference/reserve between commerical allocation and directed fishery closure	1,492 MT	4,013 MT	3,144 MT	1,409 MT	2,276 MT
Trips supported at the trip limit proposed for each alterntaive between 1st and 2nd closure	51	172	249	96	77

Questions/Motions?

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Alternative Set 3: RH/S

- RH/S Committee Reviewed Annual Update
- Several follow-ups
  - High "Herring, NK" in 2017 doesn't appear related to mackerel fishing (herring/silver hake)
  - Bump on "other" trips in 2010 = lobster
  - Added Long Island Sound RH/S indices

Alternative Set 3: RH/S

- 3a: stay at 82mt
- 3b: Scale with quota based on 2014-2015 approach and 2015 ratio (.74/.53)
- 3c: Scale with quota based on current ratio (.89/.64)
- 3d: Use a double trigger (like 2015) when quotas are higher – RH/S cap is 89 MT when landings are less than 10,000 MT mackerel

Alternative Set 3: RH/S

- Observed ratios and extrapolations depend on what else is caught with mackerel.
- Unusual mixing will affect cap operation.

How the RH/S cap has operated depends on baseline

- 2017-2018 RH/S catch higher on mackerel trips than 2014-2016
- For the mackerel fishery based on cap trips, from 2005-2012 (the base years for setting the cap) the average RH/S catch was 242 MT with a median of 89 MT.
- For all years when the cap has been in operation (2014-2018), the average was 36 MT of RH/S and the median was 13 MT.

Decisions

- RH/S Cap (Set 3)
  - Cap amount/approach?
  - 2-phase trigger?

- RH/S Committee Motion: Move to recommend the staff recommendation of 3b (scaling) in combination with 3d (double trigger).

Decisions – Public Comments

Split perspectives

- Commercial mackerel fishing interests generally support 3c.
- Mix of environmental groups, public, and recreational fisherman support status quo (82 MT RH/S) cap.

Decisions

- At higher and higher quota levels, static 82 MT cap would require lower and lower RH/S encounter rates to catch quota (lower than baseline median rates)

- With 3d, fishery will have to have lower RH/S encounter rate than 2018 to get beyond 10,000 MT of mackerel.

Decisions

- RH/S Cap (Set 3)
  - Cap amount/approach?
  - 2-phase trigger?

- RH/S Committee Motion: Move to recommend the staff recommendation of 3b in combination with 3d.