



MSB Specifications

June 2017

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Goals

- Mackerel Review
- Butterfish 2018-2020
- Longfin Squid 2018-2020
- *Illex* Squid 2018-2020

MSB General Info

- Recent Performance – AP Fishery Information Documents
 - <http://www.mafmc.org/ssc-meetings/2017/may-17-18>
- MSB Regulations – GARFO guide
 - <https://www.greateratlantic.fisheries.noaa.gov/regs/info.html>

MSB General Info

- Info Docs & NEFSC Updates
- AP Fishery Performance Reports
- SSC Report

- Info Docs & NEFSC Updates → AP → Staff ABC Memo → SSC → Monitoring Committee → Council.

Mackerel

- Assessment – 2008 Data
 - Not accepted, benchmark ongoing
 - Canadian assessments 2012/2014/2016
 - 2012 lowest, modest increase since
- Data Update
 - Catch remains low since 2011 (U.S. & Canada)
 - Spring trawl index near median

Mackerel – 2017 Blue

Atlantic Mackerel Quota Monitoring Report

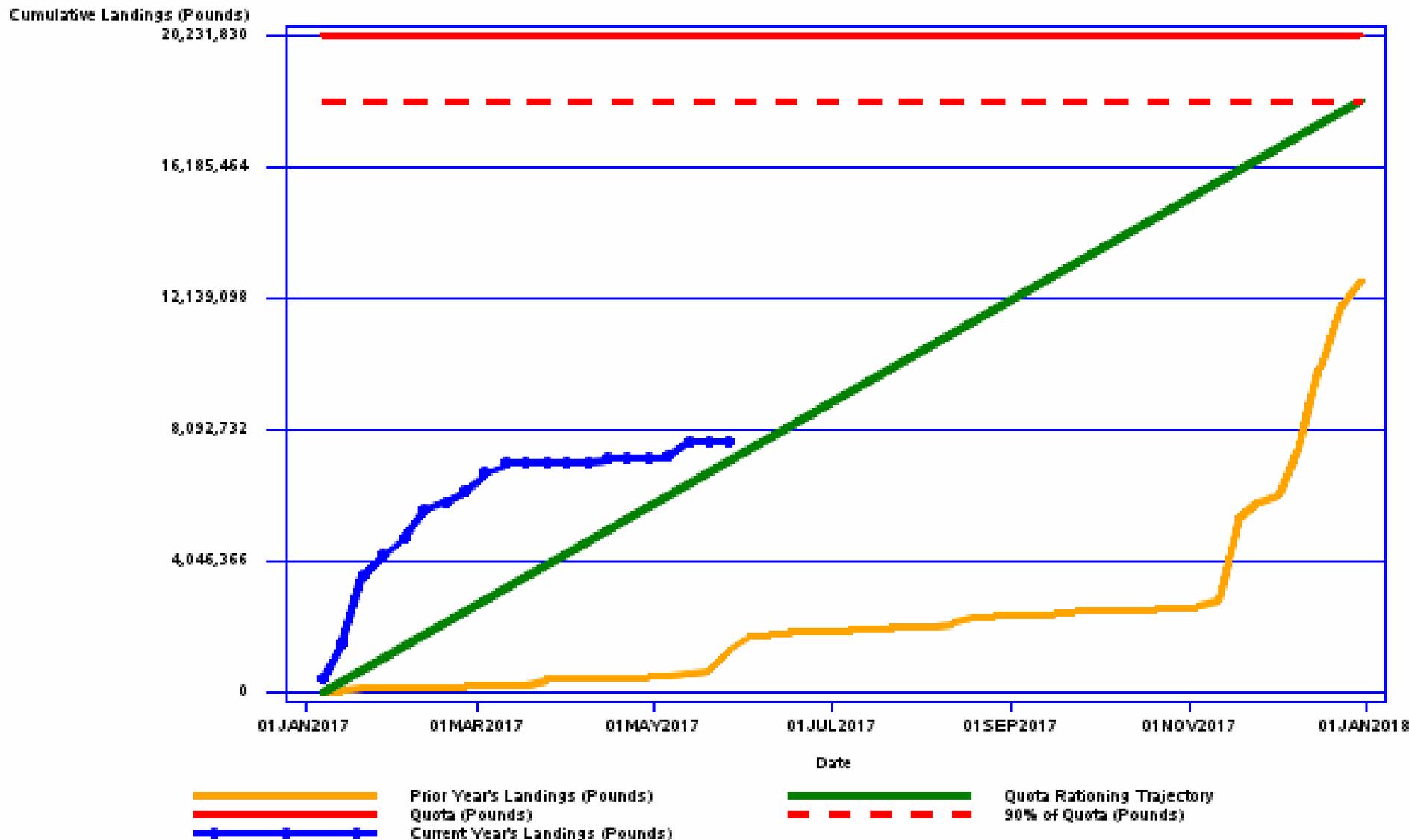
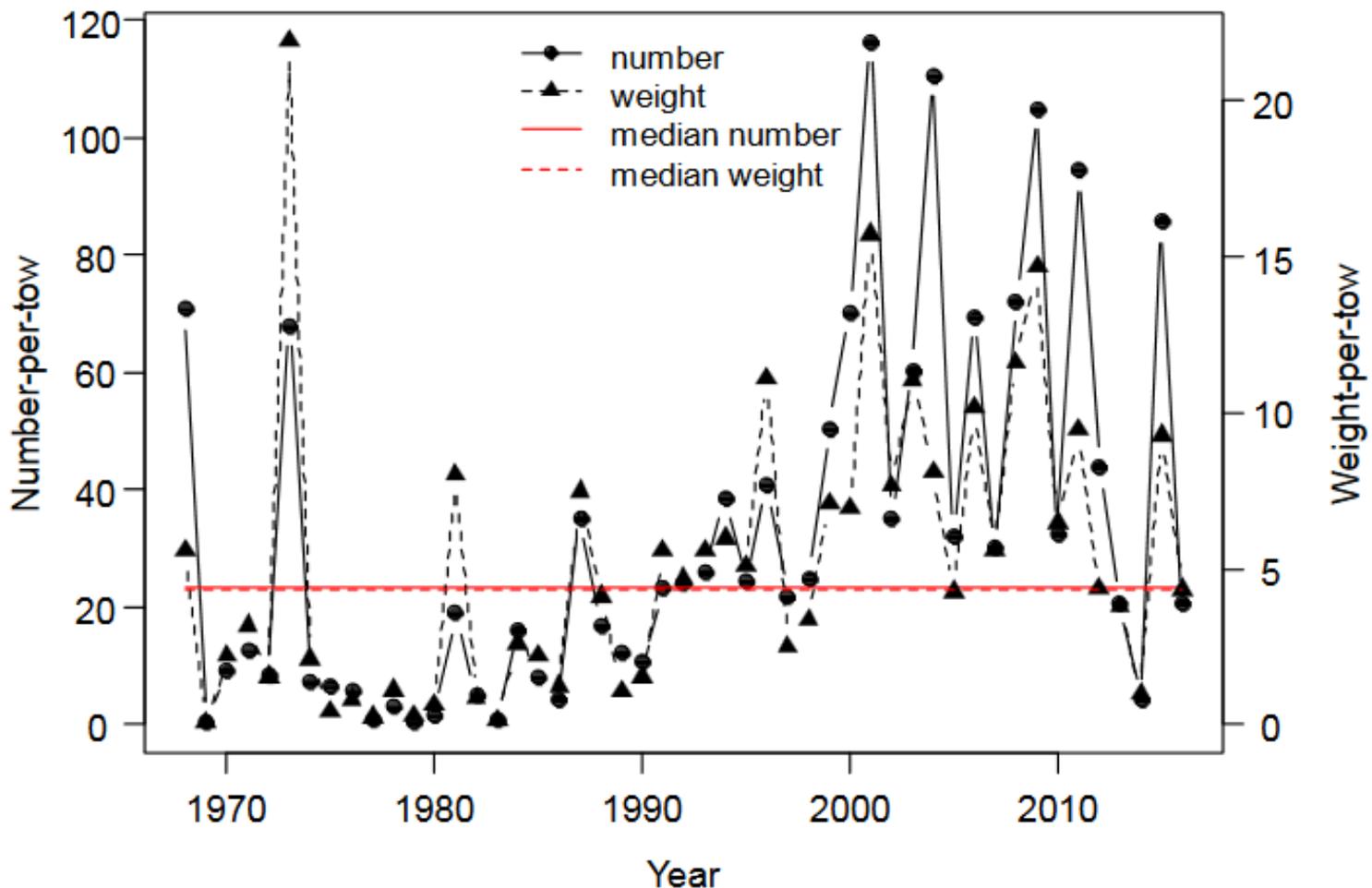


Figure 3: Atlantic mackerel relative abundance (stratified mean number-per-tow) and biomass (stratified mean kg-per-tow) indices derived from the NEFSC spring bottom trawl survey for 1968-2016. The median number- and weight-per-tow values represent the median indices over 1968-2016.



Fishery Performance Report

- Spiny dogfish issues
- Regulatory constraints
 - RH/S, herring
- Northward shift
- Availability
- Concern about catch given low availability

Mackerel Specs



MID-ATLANTIC
FISHERY MANAGEMENT COUNCIL

2016-2018 (all numbers are in metric tons)	
Specification	Mackerel
Overfishing Limit (OFL)	Unknown
Total Acceptable Biological Catch (ABC) from SSC	19,898
Canadian Deduction (Quota and 10% Management Uncertainty)	8,889
U.S. ABC = Annual Catch Limit (ACL) (Canadian catch deducted)	11,009
Recreational Allocation (6.2% of ACL)	683
Recreational Annual Catch Target (10% less than allocation to account for management uncertainty)	614
Commercial Allocation (93.8% of ACL)	10,327
Commercial Annual Catch Target (10% less than allocation to account for management uncertainty)	9,294
Landings or "Domestic Annual Harvest" (1.26% less than Annual Catch Target to account for expected discards)	9,177

Monitoring Committee

- Concern about recreational catches in terms of ACL overage if US commercial fishery is higher this year.
- Difficult for Council to control (state waters).
- Monitoring Committee will track
- Council could proactively change allocation for 2018 (6.2%)

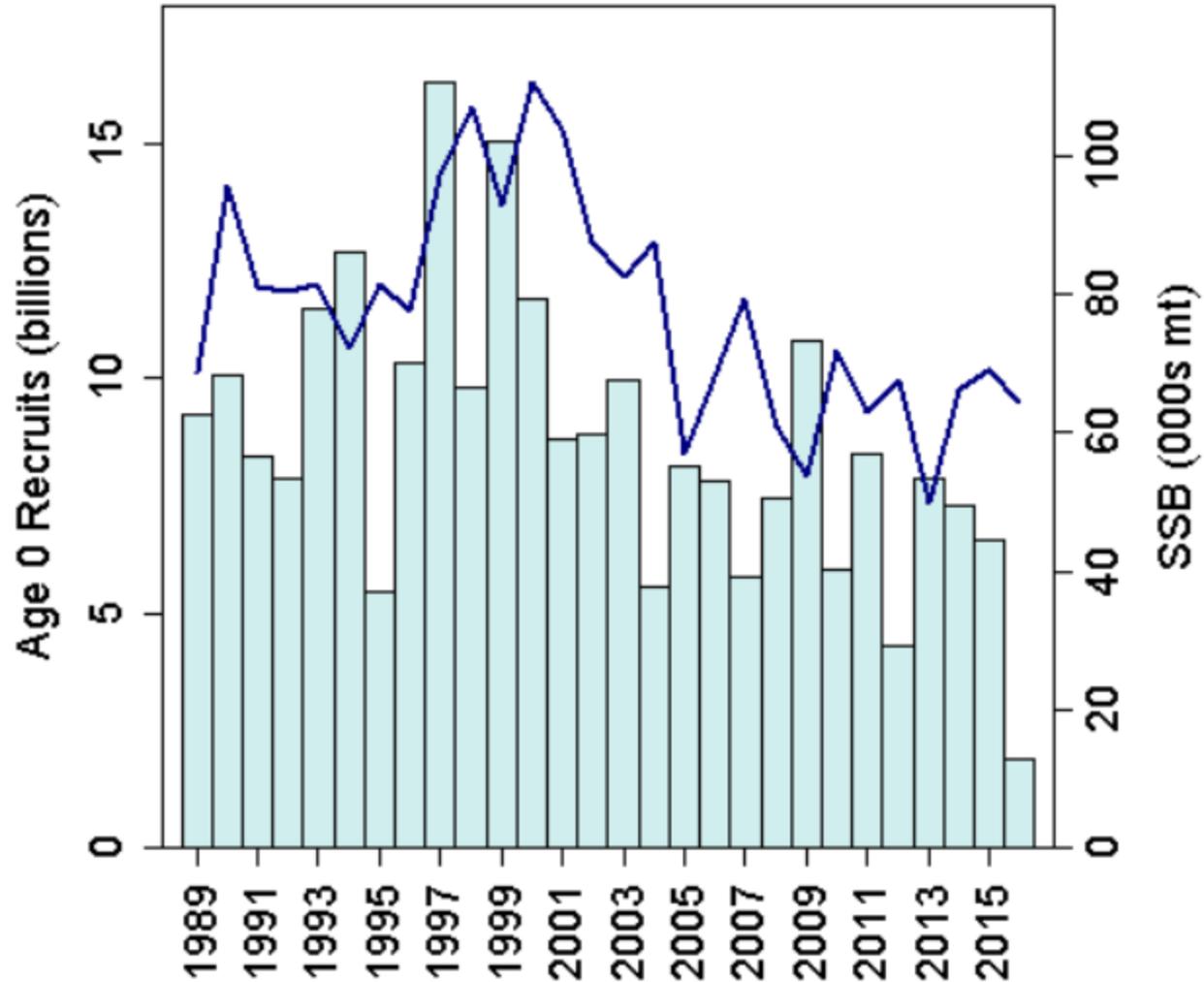
Mackerel

- No action needed – review of multi-year specifications.
- Questions?
- Motions?

Butterfish

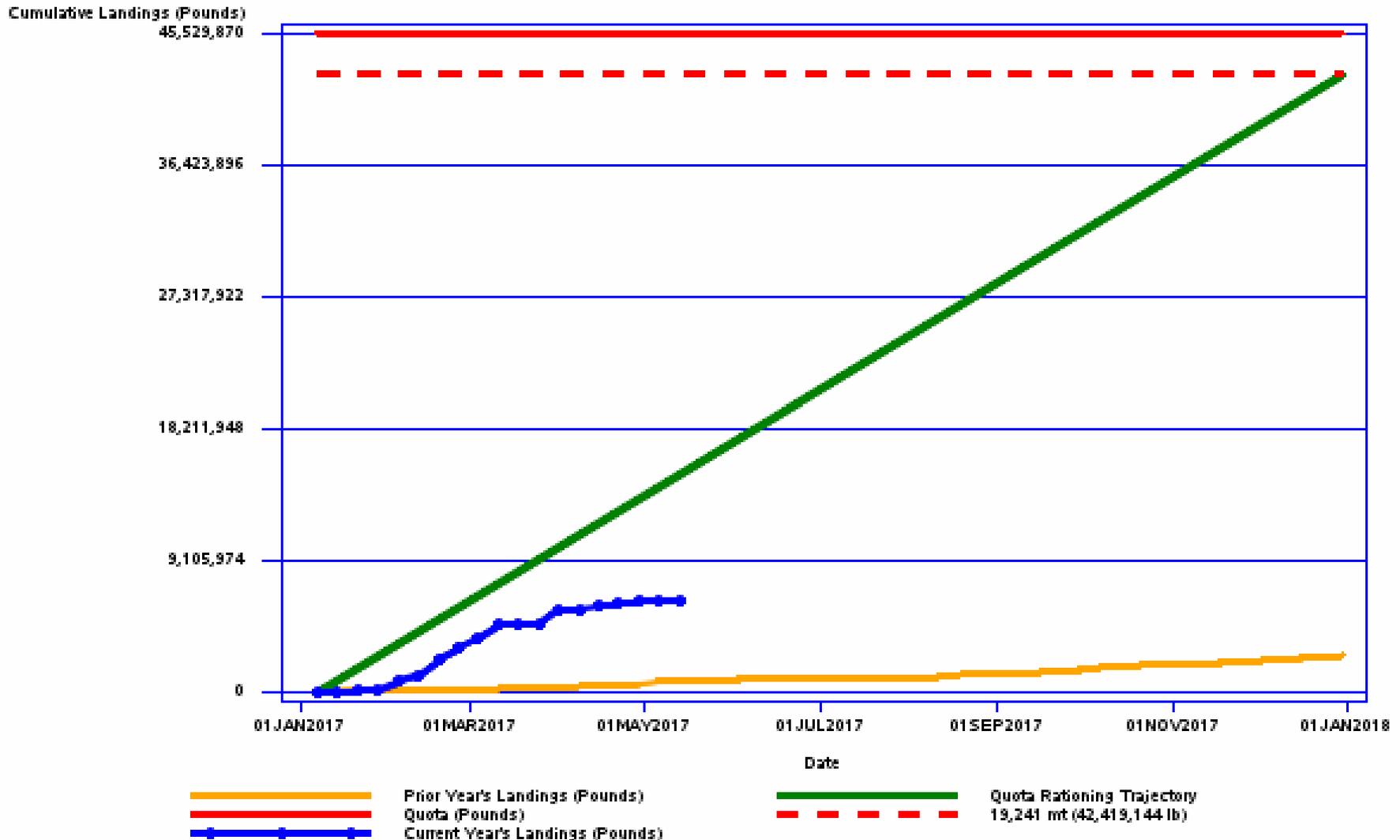
- Assessment Update with 2016 data
- 2016 SSB (64,376 mt) was 41% above the accepted biomass reference point
- Declining SSB trend with very low 2016 recruitment, but terminal recruitment revised up from last update.
- Very low fishing mortality

Butterfish



Butterfish – 2017 Blue

Butterfish Quota Monitoring Report



Fishery Performance Report

- Spiny dogfish issues
- Market Limited
- Regulatory Confusion
- Strong longfin squid in 2016 reduced incentive to fish for butterfish
- Cap issue
- Forage concerns

ABC

- Staff recommended constant, reduced ABC (24,500 mt) for 2018-2020 using P^* averaging, not accepted by SSC...



Don Flescher, NEFSC

May 2017 SSC Meeting

ABC Recommendations for Butterfish

Uncertainty Category

- An OFL was provided in the assessment
- Estimates of uncertainty around the OFL developed in the assessment underestimated the true level of uncertainty present.
- Butterfish should be considered “an OFL CV augmented by the SSC.”



OFL

- The OFL developed in the assessment is an F_{msy} proxy = $\frac{2}{3} * M = 0.81$.
- This proxy is based on an earlier determination by the SSC for a forage species like butterfish.
- The level of catch associated with this OFL is:

<u>Year</u>	<u>OFL</u>
2018	28,628 mt
2019	37,637 mt
2020	39,592 mt



ABC

- The SSC adopted a CV for the OFL of 100%.
- Since the foundation of the F_{msy} proxy considers forage species explicitly, the SSC considers Butterfish as exhibiting a typical life history.
- The SSC applied the Council's risk policy for B/B_{msy}

<u>Year</u>	<u>ABC</u>
2018	17,801 mt
2019	27,108 mt
2020	32,063 mt



ABC (cont'd)

- The SSC will evaluate survey CPUEs (NEAMAP and NEFSC Fall survey) as indices of annual recruitment for possible action.
- Currently, projections assume that future recruitments are a random sampling from the historic distribution of recruitments.
- The SSC notes there is a declining trend in recent recruitments that is not considered in this assumption.



Most Significant Sources of Scientific Uncertainty

- The foundation for the OFL was *ad hoc*.
- The application of an assumed q -value to estimate M .
- The assessment was limited to a period of low stock productivity.
- There appears to be a declining trend in annual recruitment, suggesting projections may be uncertain.



Priority Research and Monitoring

- Simulation studies to evaluate the uncertainty in the *ad hoc* F_{msy} proxy
- Develop reference points that are internal to the model
- Develop a parallel catchability estimate for Spring surveys
- Evaluate approaches to include additional surveys, e.g., from States, in the assessment model



Priority Research and Monitoring

- Analyze additional estimation of consumptive demand of predators to identify critical periods of overlap of predators and prey
- Reconsider stock structure and degree of exchange with the South Atlantic stock component
- Evaluate the potential role of variation in “available thermal habitat area” in the NEAMAP survey



Butterfish Specs - MonCom

- Use same system, but...
- Lower ACT buffer (smaller fishery, low recent discards in directed fishing)
- Lower buffer for 5,000 pound fishery
- Lower discard rate in directed fishery

Revised Butterfish Specification Recommendations

		2018	2019	2020	
A	ABC (SSC)	17,801	27,108	32,063	
B	ACT Buffer	890	2,033	3,206	
C	ACT Buffer %	5.0%	7.5%	10.0%	
D	ACT	16,911	25,075	28,857	
E	Landings or "Domestic Annual Harvest (DAH)"	12,093	20,061	23,752	These amounts total to the ACT
F	Assumed discards in butterfish fishing (2.4%)	297	493	584	
G	Assumed other discards (highest from cap years)	637	637	637	
H	Butterfish Cap (longfin discards)	3,884	3,884	3,884	
I	Close primary directed at this amount, with 1,000 mt left; go to 5,000 pound trip limit	11,093	19,061	22,752	

Butterfish

- Questions?
- Motions?

Longfin Squid

- Assessment Update with 2016 data
 - “Lightly exploited from benchmark”
- 2016 averaged biomass estimate (73,762 mt) was 74% above the accepted biomass reference point
- No fishing mortality estimate, but exploitation index near median.

Longfin

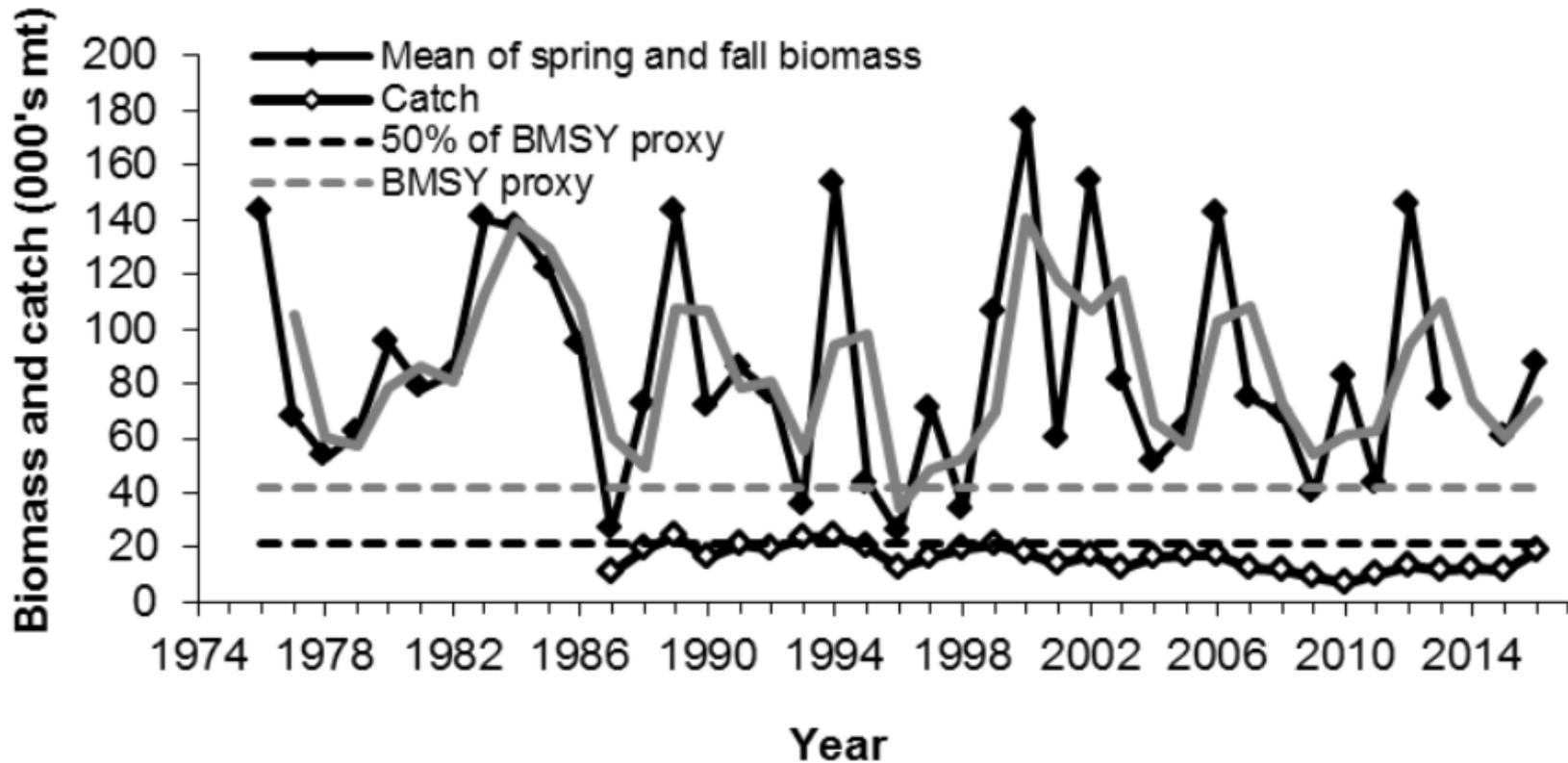
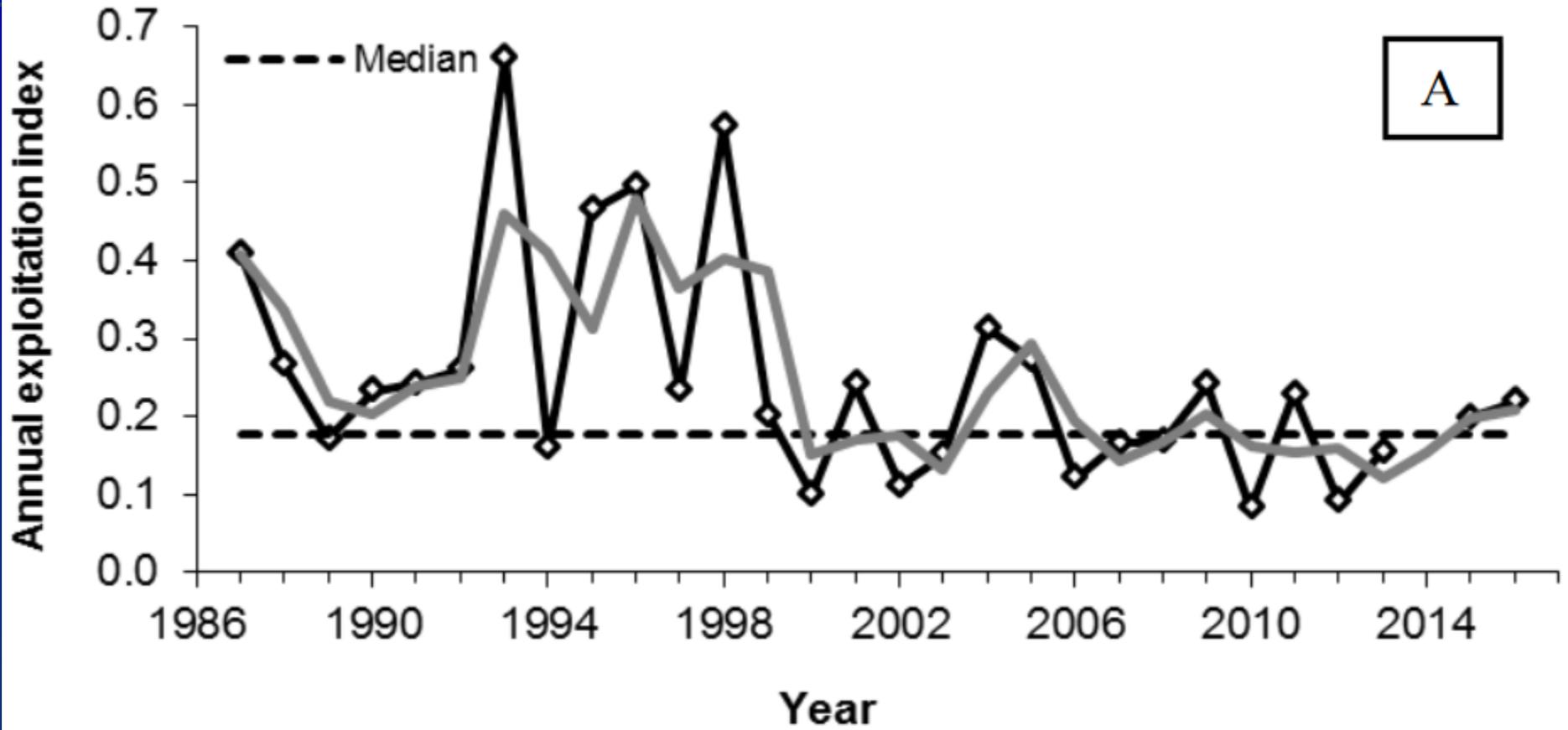


Figure 1. Annual estimates of longfin squid biomass (average of annual biomass during NEFSC spring and NEFSC plus NEAMAP fall surveys) in relation to biomass reference points and catches. The grey line represents the two-year moving average.

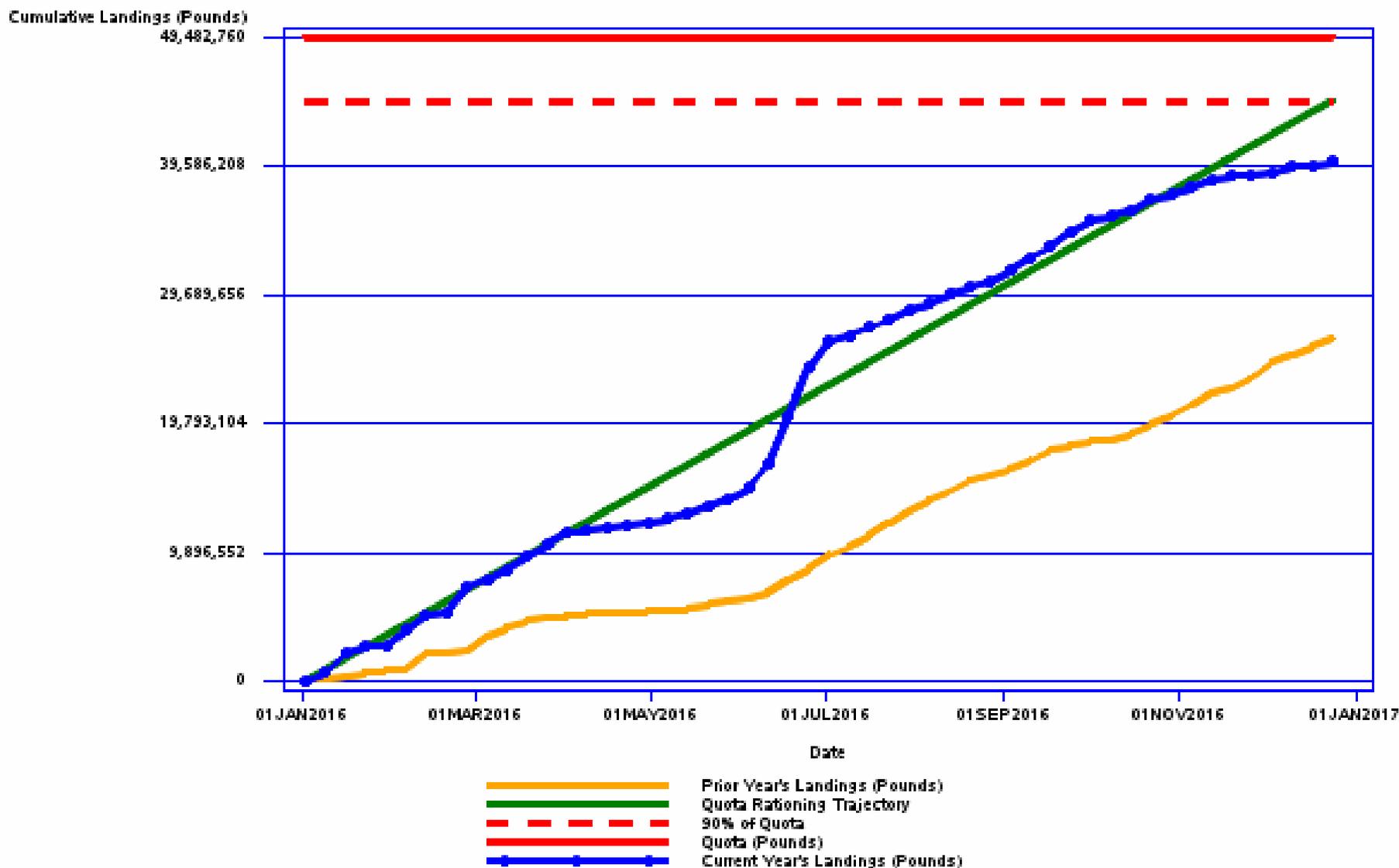
Longfin

A



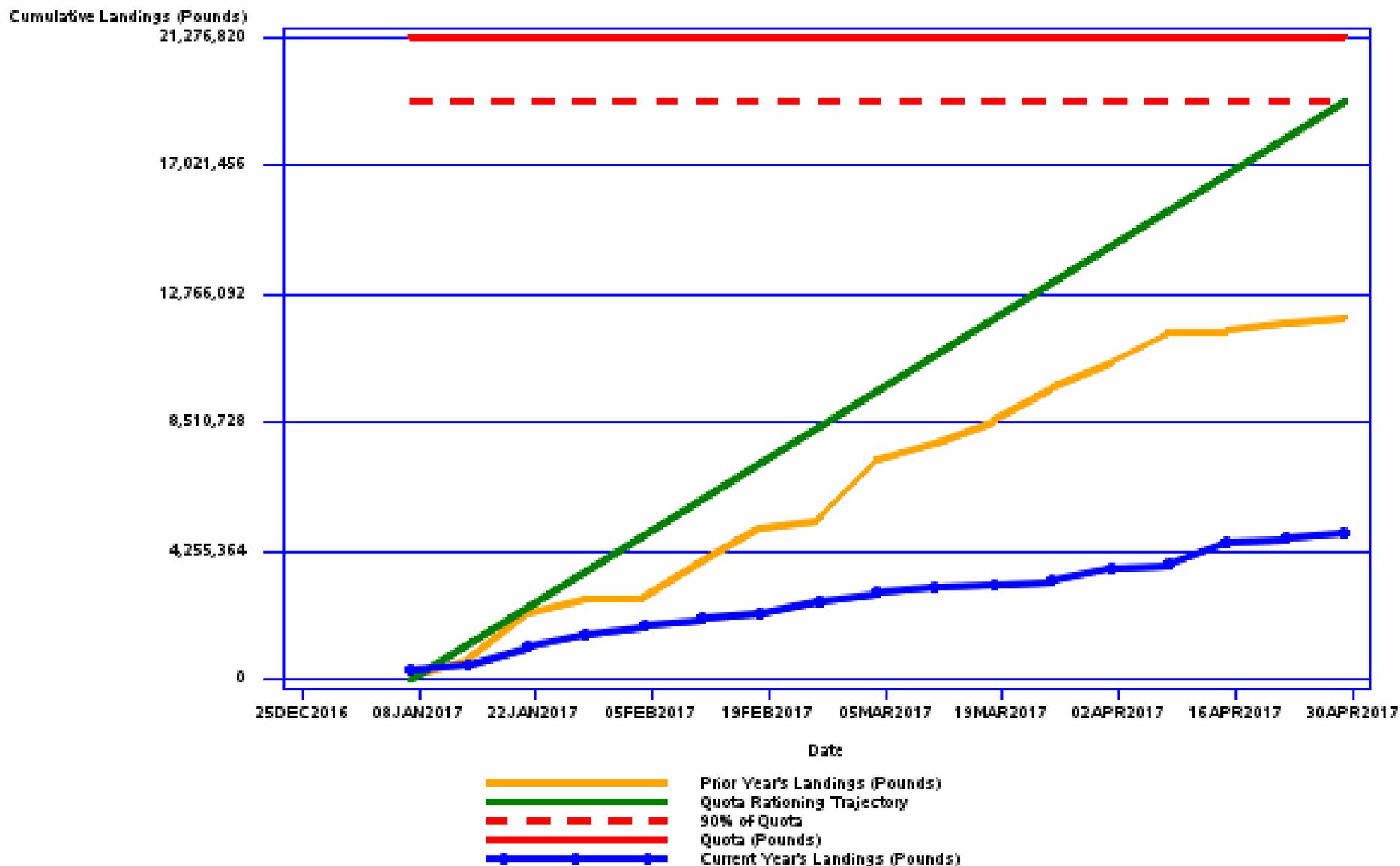
Longfin – 2016 Blue

Longfin Squid Quota Monitoring Report



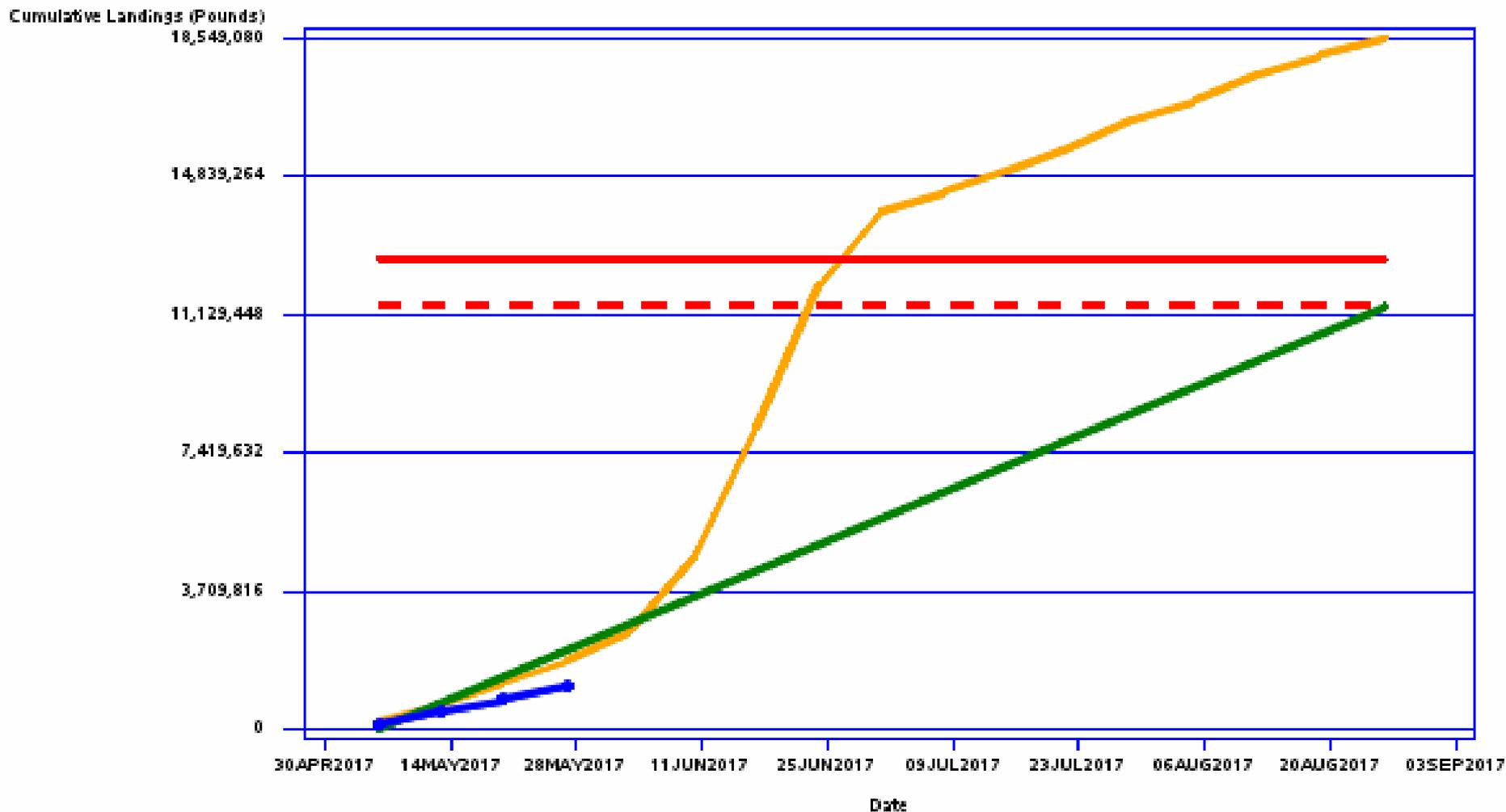
Longfin – 2017 Blue

Longfin Squid Quota Monitoring Report



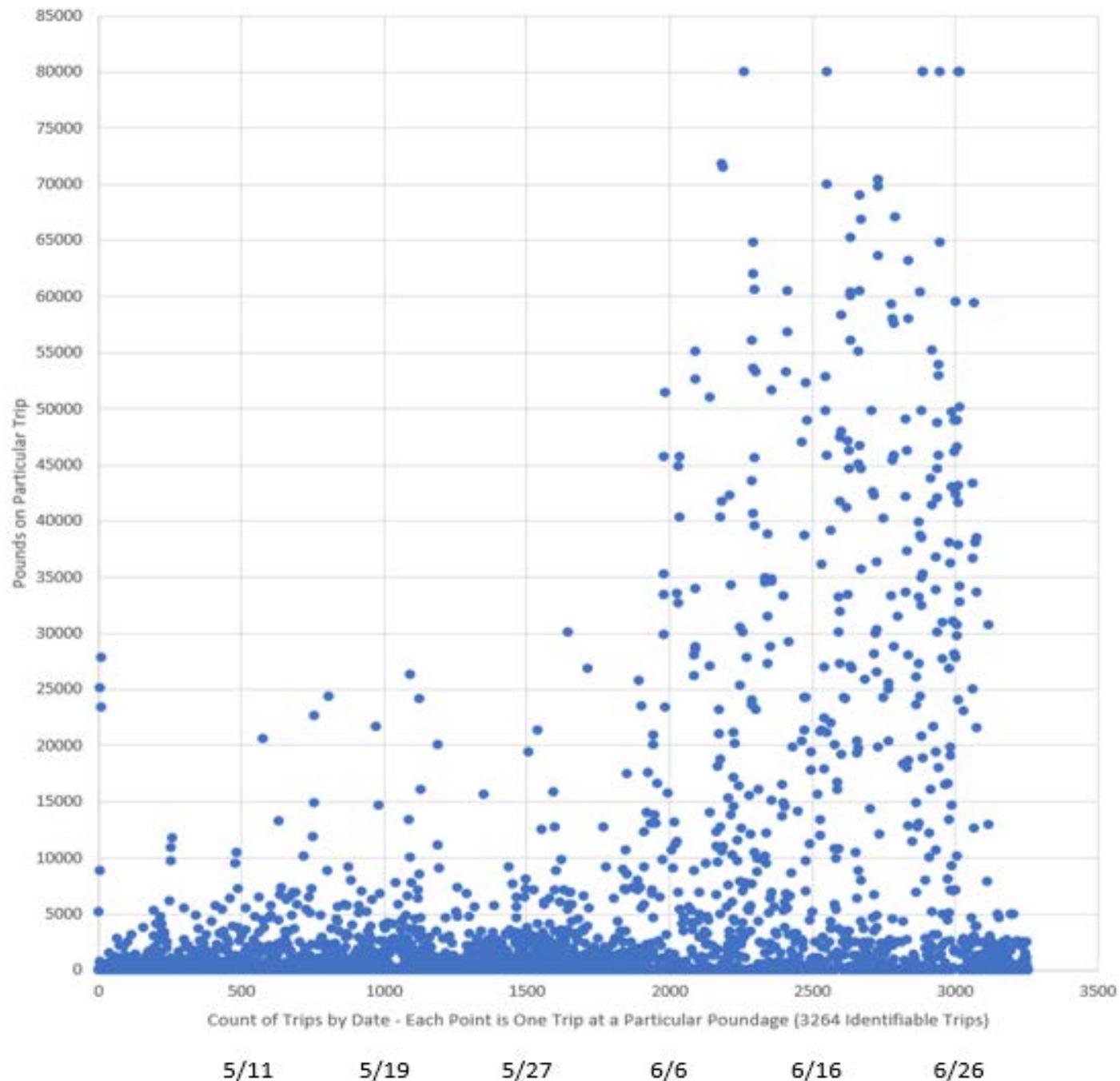
Longfin – 2017 Blue

Longfin Squid Quota Monitoring Report



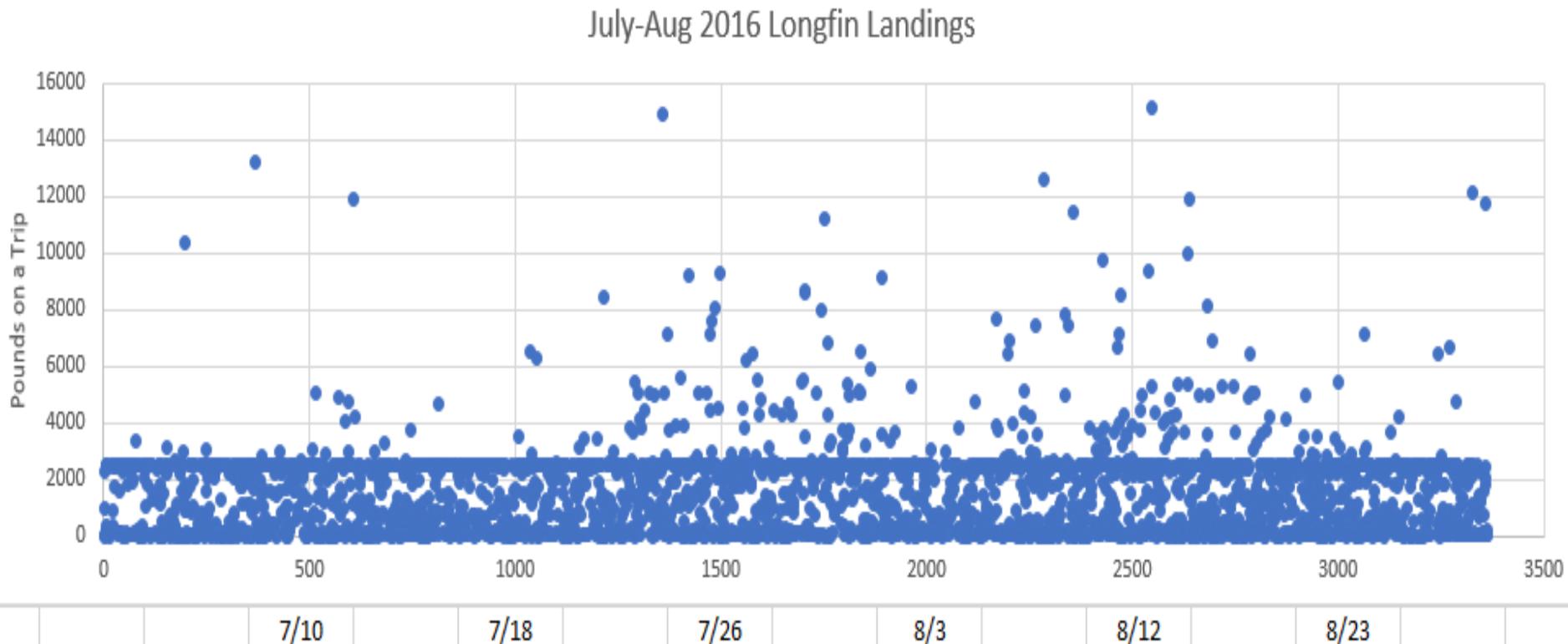
- Prior Year's Landings (Pounds)
- Quota Rationing Trajectory
- 90% of Quota
- Quota (Pounds)
- Current Year's Landings (Pounds)

Longfin 2016 May- June Trips



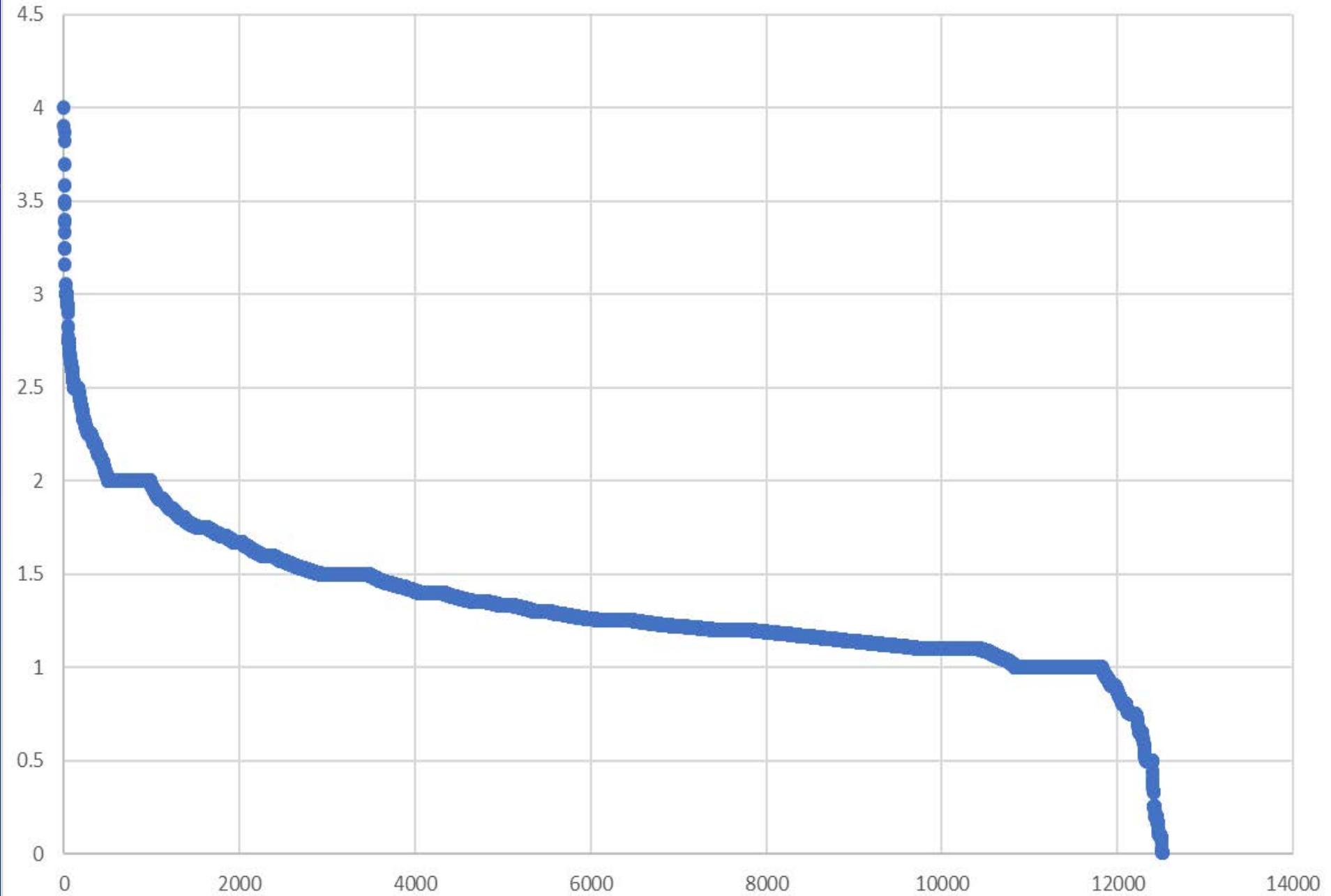
The 500th trip occurred on 5/11, the 1000th on 5/19, etc...

Longfin 2016 July-Aug Trips

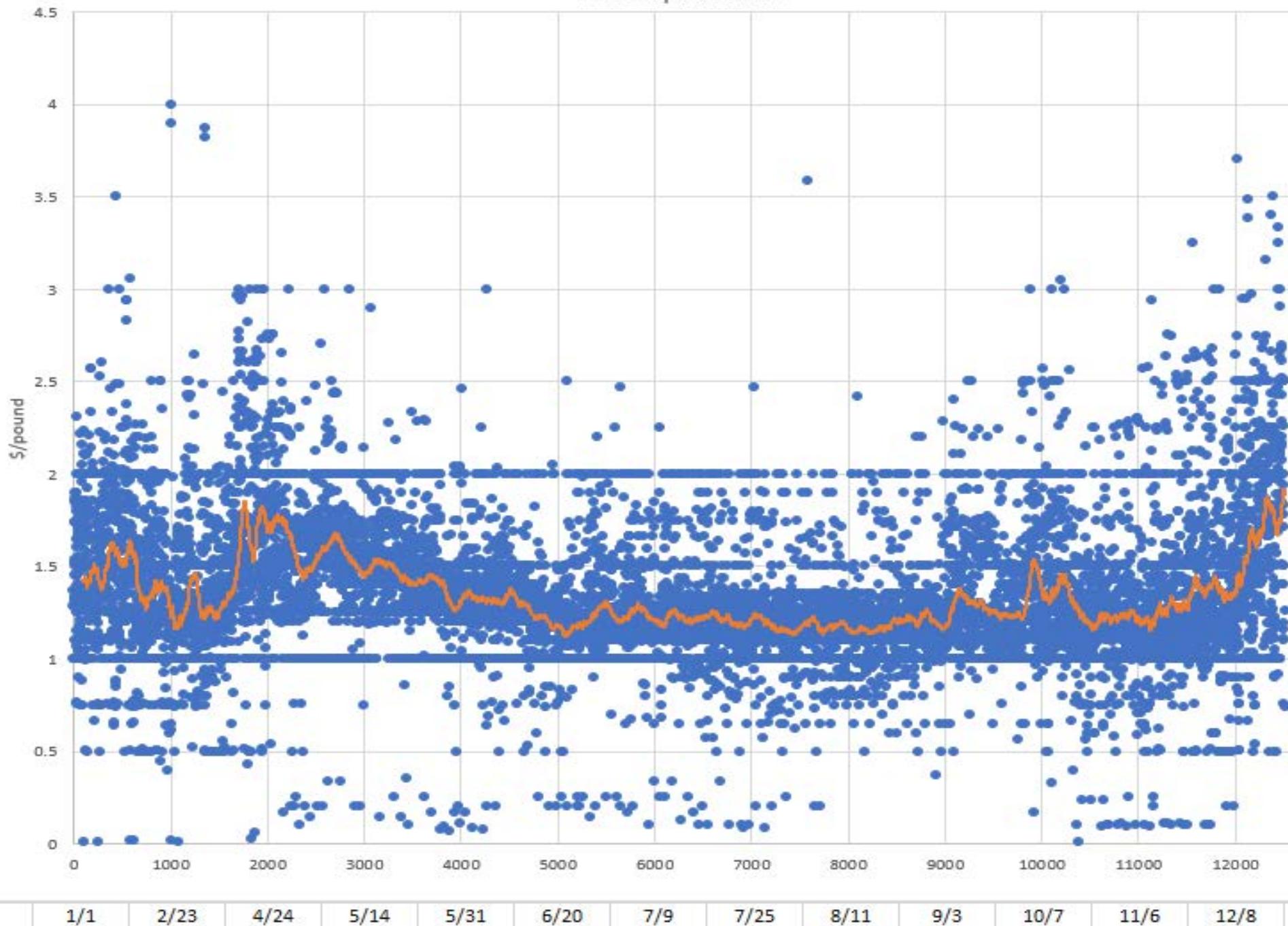


Longfin 2016 Prices

2016 Squid Prices



2016 Squid Prices

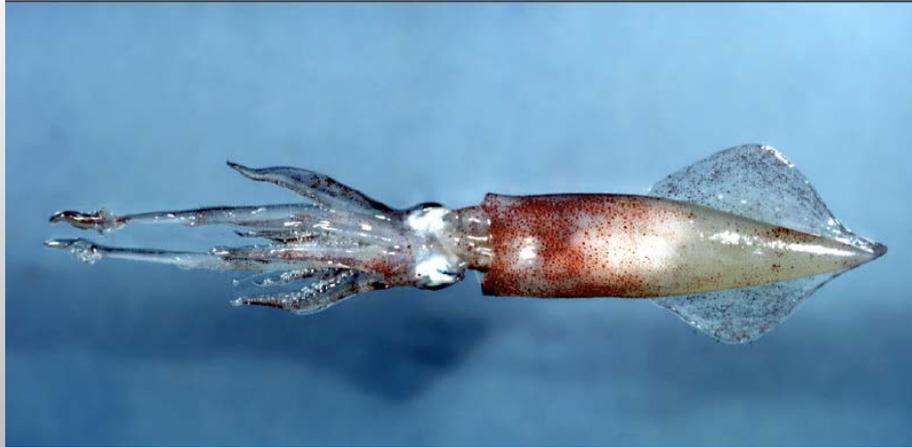


Fishery Performance Report

- Spiny dogfish issues
- Highly Variable
- Regulations limit landings
 - Trimesters, GRAs, Mesh
- Concern about area of catch/spawning
- Real time productivity

ABC

- Staff recommended constant, level ABC (23,400 mt) for 2018-2020, which SSC accepted...



Don Flescher, NEFSC

May 2017 SSC Meeting

ABC Recommendations for Longfin Squid

Uncertainty Category

Although an assessment is available from 2010, it did not contain an OFL.



OFL

Not possible.

No acceptable estimate of OFL is available.



ABC

- The SSC recommends an ABC for a three-year period (2018-2020) equal to the catch in the year of the highest exploitation ratio (1993).
- Thus, the recommended ABC is **23,400 mt**, the same as was previously set for 2012-2017 by the SSC, which occurred during a period of apparent relatively light exploitation (1976-2009) according to the 2010 Longfin Squid assessment.



Most Significant Sources of Scientific Uncertainty

- Surveys cover unknown portion of entire range (variable availability) – the range may extend beyond survey coverage;
- Poor precision of U.S. discard estimates;
- Using a bottom trawl survey gear for a semi-pelagic species;
- Highly variable survey trends;
- Highly variable natural mortality;



Most Significant Sources of Scientific Uncertainty (cont'd)

- Extremely short life-span (less than 1 year), and unknown, but likely high, impact of environmental factors on recruitment;
- Because of its short life span, its high rate of natural mortality, and the delay in collating survey and catch information, there is an inherent lag in information pertaining to the current state of the stock; and



Most Significant Sources of Scientific Uncertainty (cont'd)

- Inability to distinguish between inter-seasonal differences in productivity and inter-seasonal differences in catchability.



Research and Monitoring

- Expand investigations into system productivity and oceanographic correlates with trends in Longfin Squid availability, recruitment, growth, and abundance.
- Continue to monitor the performance of the squid fisheries and related fisheries in relation to the full breadth of regulatory measures with a view towards improving the economics of the fisheries.



Research and Monitoring (cont'd)

- Evaluate approaches to real time management.
- Until real-time assessment is feasible, expand cohort analysis to understand dynamics of Longfin Squid to support stock assessments and the incorporation of seasonal indices.
- Explore alternative approaches to assessment of this species to provide an OFL
- Refine understanding of stock range and structure.



Longfin Specs - MonCom

- Just one change – updated discard information – 2%
- ABC = 23,400 mt;
- IOY = DAH = DAP = 22,932 mt

Longfin Squid

- Questions?
- Motions?

Illex Squid

- No assessment
- Indices show typical variability.

Illex

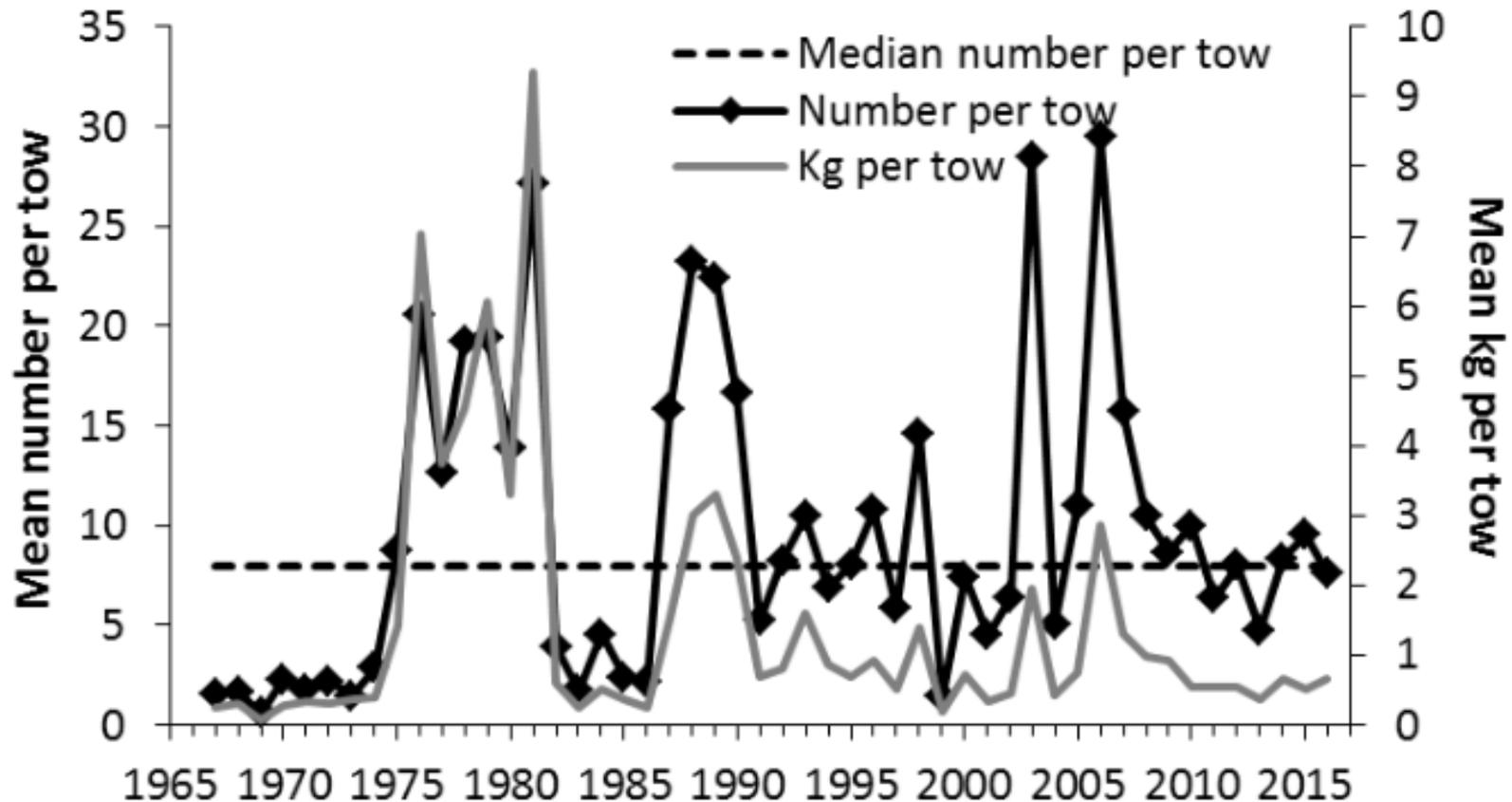


Figure 3.1. *Illex illecebrosus* indices of relative abundance (stratified mean number per tow) and biomass (stratified mean kg per tow) derived from NEFSC fall bottom trawl survey data, 1967-2016.

Illex

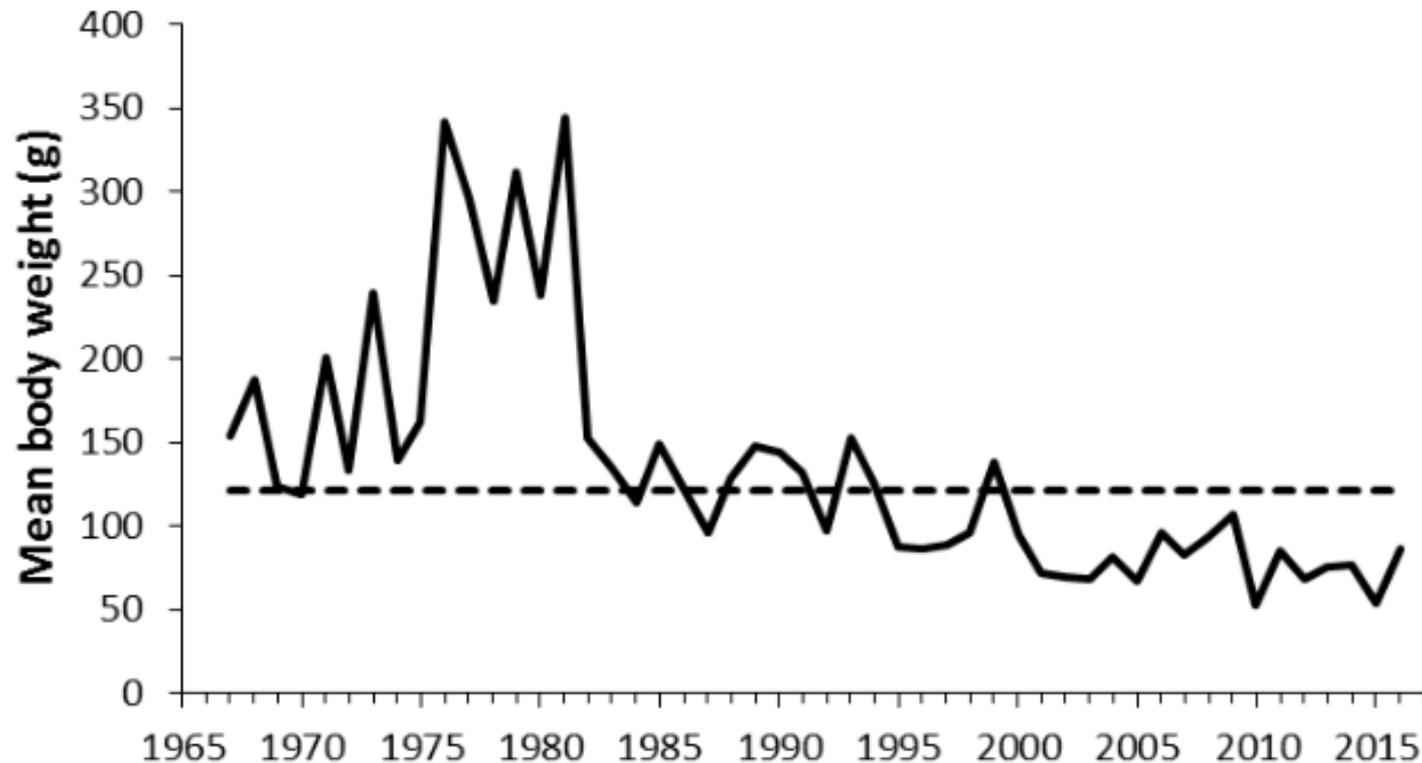
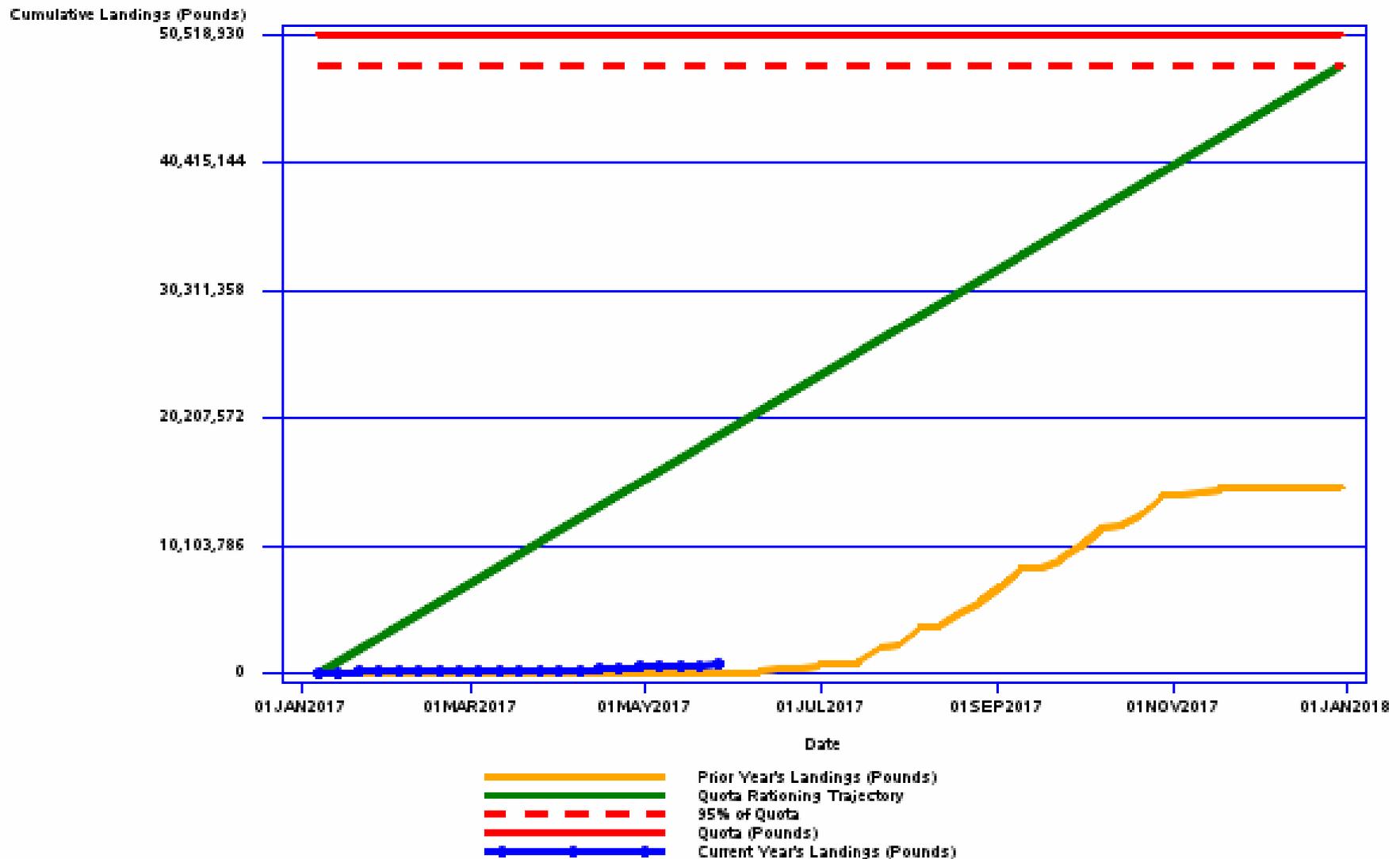


Figure 3.2. Stratified mean body weights of *Illex illecebrosus* (stratified mean kg per tow / stratified mean number per tow) derived from NEFSC fall bottom trawl survey data, 1967-2016. The dashed line represents the 1967-2015 median body weight. Trends in squid mean body weight reflect the combined effects of growth, mortality, emigration and immigration of this sub-annual semelparous species.

Illex – 2017 Blue

Illex Squid Quota Monitoring Report



Fishery Performance Report

- Price and demand dependent on world markets and production
- Highly variable between and within years
- Specialized fishery that needs high volume quickly

ABC

- Staff recommended constant, level ABC (24,000 mt) for 2018-2020, which SSC accepted...



Don Flescher, NEFSC

May 2017 SSC Meeting

ABC Recommendations for *Illex* Squid

Uncertainty Category

- No acceptable estimate of OFL is available.
- The last benchmark assessment for *Illex* was conducted in 2006.



OFL

Not possible.

No acceptable estimate of OFL is available.



ABC

- The SSC recommends a 2015-2017 multi-year ABC specification of **24,000 mt** (the same as was previously set for 2012-2017 by the SSC).
- This is based on the observation that landings of 24,000 - 26,000 mt do not appear to have caused harm to the *Illex* stock, based on indices and landings in years following when landings were in the range of 24,000 mt - 26,000 mt.



ABC (cont'd)

- The method used by the SSC for setting the ABC assumes that the stock has been lightly exploited.
- The SSC recommends that a benchmark assessment or a research track examining the effects of environmental variables on survey trends in *Illex* be undertaken by 2020, which would be 14 years since the last benchmark assessment was conducted.



ABC (cont'd)

- There has been a long-term decline in average size. Causes for the decline in average size remain unknown, but could include:
 - changes in environmental variables,
 - a possible change in the timing of the survey, and/or
 - an increase in an unspecified size-selective source of mortality, such as fishing or natural mortality.



Most Significant Sources of Scientific Uncertainty

- Surveys cover an unknown portion of the entire range (leading to variable availability);
- Poor precision of U.S. discard estimates (but of low magnitude);
- Using a bottom trawl survey gear for a semi-pelagic;
- LPUE values are sensitive to availability;



Most Significant Sources of Scientific Uncertainty (cont'd)

- Highly variable natural mortality;
- Extremely short life-span (less than 1 year), and unknown, but likely high, impact of environmental factors on recruitment and growth; and
- No available estimates of biological reference points (F & B), and no estimates of recent biomass and/or fishing mortality.



Research and Monitoring

- Expand investigations into system productivity and oceanographic correlates with trends in *Illex* availability, recruitment, growth, and abundance.
- Collect demographic information.
- Consider a length-based assessment with a sub-annual time step (cooperative research?).



Research and Monitoring (cont'd)

- Refine the between-vessel survey calibration estimate for *Illex*, and consider a size-based calibration.
- Evaluate the potential to collect real time spatial and temporal data on catch and biological characteristics of the catch to support in season management.



Illex Specs - MonCom

- No changes warranted
- ABC = 24,000 mt;
- IOY = DAH = DAP = 22,915 mt
 - to account for discards (historical average)

Illex Squid

- Questions?
- Motions?