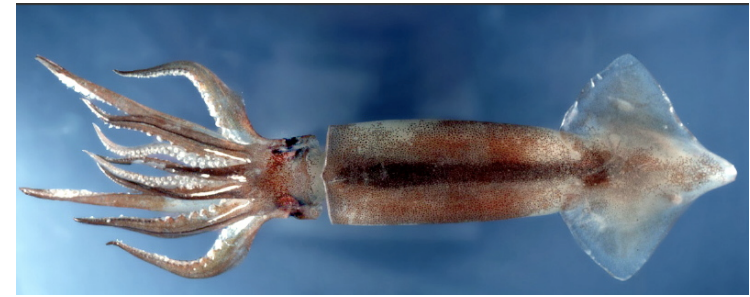


Don Flescher, NEFSC

May 2020 SSC Meeting Summary

ABC Recommendations for *Illex* Squid



Illex—A Model Resistant Species

- No currently accepted stock assessment model
- Oceanic species with broad distribution—Florida to Labrador
- Availability—Fraction of population on shelf, oceanography effects
- Short life span
- High natural mortality
- Fast growth
- Multiple cohorts
- Incomplete understanding of life history, especially reproduction
- Worldwide—often rely on real-time management

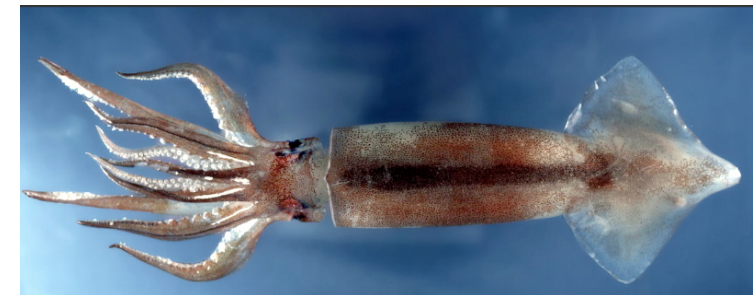
Previous Conclusions of SSC

- “Lightly exploited” per 2017 recommendation for ABC
- “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 24,000-26,000 mt.”



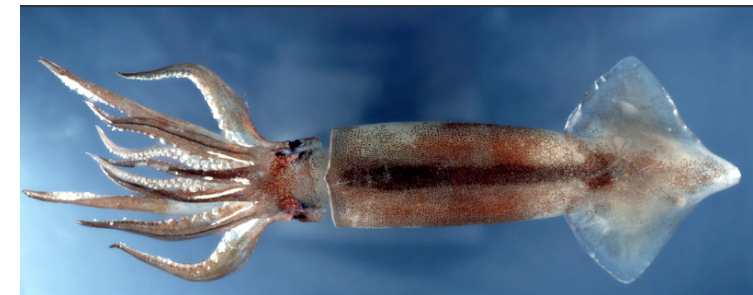
Meeting Overview: May 12-13 Webinar

- Extensive review of products of Illex Working Group
 - 16 Papers, including results of Industry Summit
 - 12 presentations
 - Extensive Discussion
 - Public comment
- Extensive use of industry data
 - Study fleet
 - VTR
 - VMS
 - Weekly weights in fishery
 - Summit recommendations
- ABC Terms of Reference (TOR)



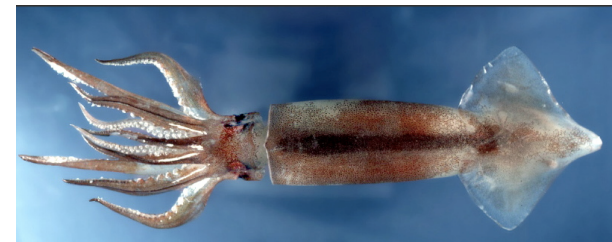
Key Lines of Evidence

- **Overlap Analyses**
 - Multiple Surveys → estimate probability of occurrence over space
 - Vessel Trip Reports
 - Spatial Information on Landings → spatial distribution
- **Envelope**
 - NEFSC Fall Bottom Trawl Survey AND Landings
 - Assumed range of catchability, availability, fishing mortality
- **VMS—2017-2019**
 - Hourly polling of vessel position and speed
 - Filtered to fishing activity 2.6 to 3.3 knots
 - Binned by 3 minute squares
- **Depletion Analyses**
 - Vessel Trip Reports for various measure of CPUE
 - Ave weight in catch by week



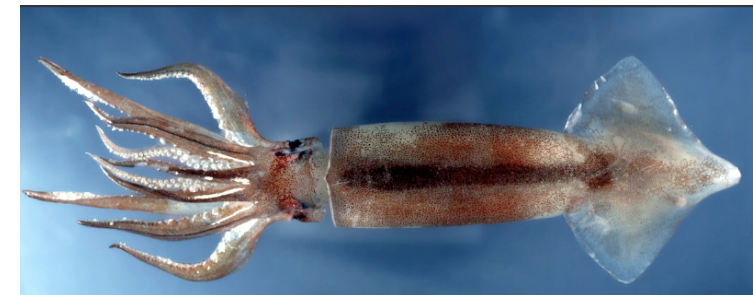
TOR 1. Review current ABC and determine if ABC adjustment warranted.

- **Clear evidence to adjust 2020 ABC upwards from 26,000 mt to 30,000 mt**
 - Overlap Analyses → 2-10% fishing overlap with shelf habitat (excludes offshelf)
 - Envelope Method → $F \ll$ published biological reference points, even if 30,000 had been harvested over entire time series
 - VMS → high concentration of effort in small areas but $F < 0.1$ overall most likely
 - Depletion Analyses → low or indeterminate F , indicating lack of depletion
- Real-time management measures promising but not ready for prime time.
- Urged continued research, esp. fishery-dependent data



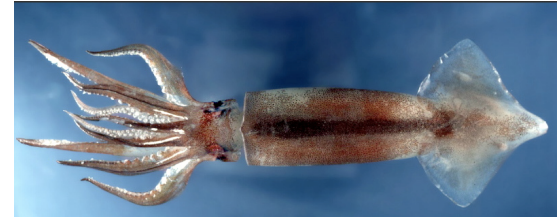
TOR 2. Specify 2021 ABC

- **SSC recommends ABC = 30,000 mt**
- Did NOT recommend any specific metric to trigger adjustment of ABC
- Supports continued development of control rules and evaluation of management procedures for future years.
- If feasible, then recommend specific data needs, pilot study to flesh out details



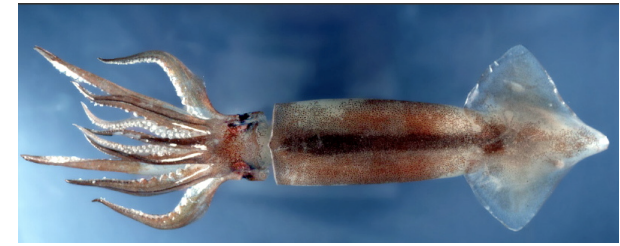
TOR 5. Sources of Information

TOR 6. Certification

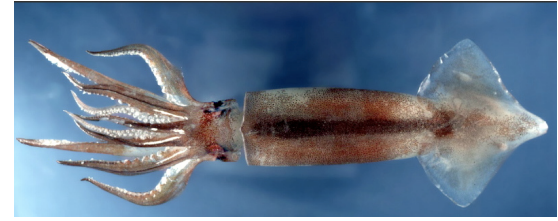


- TOR 5.
 - 16 Documents
 - 12 presentation
- TOR 6.
 - Decision was based on Best Scientific Information Available
- Uncertainty and Research TORs described in report.

TOR 3. Sources of Uncertainty



- Lack of accepted stock assessment model and associated OFL
- Incomplete understanding of Illex life history
- Incomplete fishery independent data in fished and unfished areas of distribution
- Limited understanding of factors controlling availability to fishery
- Environmental and climate effects on population dynamics
- Interplay of global squid supply, price and fishing effort
- Within season feedbacks on distribution and level of fishing effort
- Impacts of fishery closures



TOR 4. Research Recommendations

- Sub-annual time step models and cooperation with fishing industry
- Demographic information
- Evaluate potential of real-time information
- Undertake fishery independent data on distribution in both fished and unfished areas
- More work on factors controlling availability, esp. oceanography
- Evaluate potential benefits of post season industry run survey
- Improve understanding of market factors on fleet activity and relation to squid abundance
- Protocols for using Real-Time Management
- Simulation methods for use of in-season management procedures