Attendees

**Team Members**

**State Resources Agencies:** Michael Greco (DE), Erin Burke (MA), Angel Willey (MD), Erin Wilkinson (ME), Barbie Byrd (NC), Cheri Patterson (NH), Stacy VanMorter (NJ), Meghan Rickard (NY), Scott Olszewski (RI), Somers Smott (VA)

**Federal Resource Managers:** Dennis Heinemann (MMC), Colleen Coogan (NMFS-GARFO), Kristy Long (NMFS-OPR)

**Fishery Management Organizations:** Toni Kerns (ASMFC), Colleen Coogan (MAFMC), Robin Frede (NEFMC)

**Academic/Scientists:** Damon Gannon (UGA), Bill McLellan (UNC-W), Sue Barco (VAQS)

**Gear Researchers:** Ron Smolowitz (Coonamessett Farms), Pingguo He (UMass-Dartmouth)

**Conservation/Environmental Groups:** Kristen Monsell (CBD), Jane Davenport (DOW), Regina Asmutis-Silvia (WDC)

**Gillnet Fishermen:** Doug Feeney, Ernie Bowden, Jamie Hayward, Greg DiDomenico, Jackie Odell, Chris Rainone (Alt for Rick Marks), Daniel Salerno (Alt for Jamie Hayward)

**NOAA Staff:** Kristin Precoda (Integrated Statistics), Debi Palka, Chris Orphanides, Mike Asaro, David Morin, Alicia Shuler, Kara Shervanick, Jackie Taylor, Julie Williams, Danielle Palmer, Crystal Franco, Marisa Trego, Chao Zou, Jeff Ray, Jean Higgins, Bennett Brooks (CBI)

**Public:** Chris Kellogg (NEFMC), Zack Klyver (Blue Planet Strategy), Melissa Sanderson (Cape Cod Commercial Fishermen's Alliance), Megan Ware (ME DMR)

**Presenters**

Dr. Debra Palka, Research Fishery Biologist, NEFSC

Dr. Chris Orphanides, Research Zoologist, NEFSC

Dr. Kristin Precoda, Fisheries Biologist, Integrated Statistics/NEFSC

Register to watch the recorded Webinar

**2022 Team Membership Updates**

- Jennifer Goebel replaced Colleen Coogan as the Greater Atlantic Region’s Marine Mammal Take Reduction Team Coordinator.

**The following are pending official membership letters:**

- Somers Smott replaces Sarah Blachman for the Virginia Marine Resources Commission
- Meghan Rickard replaces Lisa Bonacci for the New York Dept. of Environmental Conservation; Lisa will be an alternate.
- Erin Wilkinson replaces Meredith Mendelson for the Maine Dept. of Marine Resources; Meredith will be an alternate.
- Stacy VanMorter replaces Russ Allen for the New Jersey Division of Fish, Game, and Wildlife.
- Barbie Byrd replaces Red Mundren for the North Carolina Division of Marine Fisheries.
• Dennis Heinemann fills the vacant seat for the Marine Mammal Commission.
• Karson Coutre replaces Kiley Dancy for the Mid-Atlantic Fishery Management Council.
• Toni Kerns replaces Megan Ware for the Atlantic States Marine Fisheries Commission.
• Robin Frede fills the vacant seat for the New England Fishery Management Council.
• Renee Zobel will be added as an alternate for Cheri Patterson representing NH Fish and Game Dept.
• Jared Bennet, a gillnet fisherman from South Chatham, MA has resigned.
• Chris Rainone will be added as an alternate for gillnetter Rick Marks.
• Dan Salerno will be added as an alternate for gillnetter Jamie Hayward.

Presentations

**Brief Introduction to Harbor Porpoises and the Take Reduction Plan (Goebel, Palka)**

Harbor porpoises are small cetaceans—about 5-5.5 feet as adults—that weigh between 120-170 pounds and usually live 8-12 years, though they can live up to 24 years. They feed on small schooling fish and squid, and are widely dispersed in small groups. Most commonly bycaught in Northeast Sink Gillnet, Mid-Atlantic Gillnet, and Northeast Bottom Trawl fisheries. We are responsible for the Gulf of Maine/Bay of Fundy (GOM/BOF) stock.

Stock structure across the North Atlantic is being examined to see if there are changes. In summer, most of the GOM/BOF stock is in the northern GOM/BOF area. In spring and fall, they disperse between NC and GOM, in slightly lower density. In winter, we have the smallest number of animals in our waters from NC to GOM.

The [Harbor Porpoise Take Reduction Plan (HPTRP)](https://www.mprotocols.fisheries.ca/npm/tech文档/HPTRP) is divided into two sections, New England and Mid-Atlantic. In New England, the Plan calls for closures and pingers in seasonal areas, while in the Mid-Atlantic the plan calls for gear modifications and closures in seasonal areas.

**Current Abundance and Trends**

**Dr. Debra Palka, NEFSC**

**Calculating Abundance and PBR**

- Review of how PBR is calculated—PBR = N\text{min} \times \frac{1}{2} R_{\text{max}} \times F_{\text{R}}
- 2021 draft population estimate: 80,005 (CV=0.53) resulting in a minimum estimate (N\text{min}) of 52,623
- R_{\text{max}} (net productivity rate): 4% assumed, 2008 study says a little higher—4.6%
- F_{\text{R}}—default recovery factor is 0.5 for depleted and threatened stocks, and is what we use for harbor porpoises, incorporates uncertainty
- Using the draft population estimate the draft PBR is slightly less than in the past: 605 (down from 2016 PBR, which was 844)
- 2021 summer surveys from planes and vessels found harbor porpoise mostly in Northern GOM and lower BOF.
Calculating abundance is subject to perception and availability biases, for which NEFSC calculates correction factors.

Draft abundance estimate for 2021 is 80,005 with CV of 0.54.

**Trends in Abundance**

- Previously investigated trends of summer abundance estimates from 1992 to 2016 data that were used in the PBR calculations
- This analysis used standardized abundance estimates because of differences in surveys over time, corrected for biases.
- Used MARSS (Multivariate Autoregressive State Space) models and habitat covariates -- covariates include Atlantic Multidecadal Oscillation index, North Atlantic Oscillation Index, Gulf Stream north wall location index, sea surface temperature, bottom temperature, zooplankton density, planning to use fish density in future.
- MARSS can help explain observation errors if there is a summer of bad weather influencing sightings of animals, as there was in summer 2021.
- Zooplankton tracks very well with harbor porpoise abundance, even though not eaten by harbor porpoise, but they are apparently a good proxy for habitat
- To look at interannual variability used data from Atlantic Marine Assessment Program for Protected Species (AMAPPS) project using data collected all year round.
- Important to look at a variety of habitat characteristics to help explain where harbor porpoises are at any time of the year.
- Number of animals in U.S. waters appears to be decreasing over time.
- The distribution appears to be shifting. In 2010, winter abundance center was around Cape Cod, but by 2017 winter abundance center had shifted to Nova Scotia, Canada.

**Works in Progress**

1. Finalize summer 2021 abundance estimate (then calculate PBR)
2. Collaborate with Canadians to describe harbor porpoise abundance and distribution in Canadian Gulf of Maine and Scotian shelf waters
3. Update stock structure analyses using recent samples
4. Complete population dynamic trends analysis using abundance data up to 2021 and using more covariates, such as fish spatiotemporal densities
5. Using 2018–2021 AMAPPS seasonal abundance survey data, develop updated habitat-density models and maps for all months
6. Due to 900 ft tall wind turbines, started pilot study to investigate flying at 1500 ft with cameras in the belly window port of NOAA Twin Otters and using artificial intelligence and deep learning methods to develop algorithms to automatically identify species from images.

**2018-20 Bycatch and Compliance**

Kristin Precoda, Integrated Statistics/NEFSC

Dr. Chris Orphanides, NEFSC
Observer Coverage

- Coverage is observed landings of total landings reported on VTRs, adjusted if necessary to match dealer records
- Observer coverage of 8-10% or higher is considered pretty good. From 2017-2019, coverage was pretty good. However from 2020 coverage declined due to pandemic
- New England
  - 2018-2019: 42 observed takes, 26 in GOM, 16 in SNE; only one outside HPTRP management areas
  - Estimated total bycatch = observed bycatch rate * total landings
  - NE total bycatch for 2018: 9 observed/92.37 estimated (95% confidence interval 39-312) -- 2nd lowest since 1990; and is 11% of PBR (close to ZMRG of 10%)
  - NE draft total bycatch for 2019: 33 observed/195.15 estimated (95% confidence interval 120-306; about 23% PBR)
  - More observed takes took place in the summer of 2019, whereas none in 2018.
- Mid-Atlantic
  - 2018-2019: 2 observed takes, 1 in Waters off NJ, 1 in Southern Mid-Atlantic
- Total
  - Bycatch in 2020 not calculated yet, but very low and non-random observer coverage, working on ways to estimate with incomplete information.
  - Total take numbers for 2017, 2018 and draft 2019 are well below PBR.
  - Smaller twine size associated with higher bycatch rates

Longer Term Effort and Bycatch Trends

- Combined winter and fall New England landings in 2019 are 25% lower than in 2014 and 35% lower than in 2008
- More long-term reduction in effort in the fall than in winter
- Mid-Atlantic—Waters off New Jersey: Decline in large mesh effort, but don’t see a strong relationship between bycatch and total effort. Bycatch has declined significantly since 2011.

Compliance Trends

- New England—only reflects presence of pingers, not whether they were working
  - 2018-20—71% have all the required pingers.
- Mid-Atlantic—below 70% since 2017
  - Total Small Mesh Compliance in 2018-20 = 71% (mostly SMA)
  - Total Large Mesh Compliance in 2018-20 = 46% (mostly WNJ)
  - Most non-compliance in large mesh - too many nets
  - Most non-compliance in small mesh - nets too long, twine size too small

Bycatch Summary

- Bycatch continues to be well under PBR. Majority of take from NE Sink Gillnet, with some from Mid-Atlantic Gillnet and Northeast Bottom Trawl
- Five-year bycatch estimates are the lowest since estimation began in 1994
Most bycatch occurred in the winter, with more occurring in the Gulf of Maine than in the recent past.
- Mid-Atlantic bycatch was very low.
- New England gillnet effort (landings) has decreased about a third in the last 10 years.
- NE pinger compliance is 68% in 2018-19.
  - Southern New England pinger use is particularly low: 53% in 2018-19.
- Mid-Atlantic compliance with TRP is 63% in 2018-19.
- Bycatch so far looks like it might be higher in 2021, but still low by historical standards.

Question from Chris Rainone (ALT): A lot of compliance issues, is there a causal connection between takes and compliance?
Kristin Precoda: Hard to say; there are few takes in Mid-Atlantic, where there is low compliance, but that could also mean that the animals have just moved farther north. We are unsure of the recent effectiveness of the Mid-Atlantic HPTRP measures because of limited and variable densities of harbor porpoise in that region.
Colleen Coogan (GARFO): We have been concentrating enforcement efforts on right whale protections; however enforcement training this year has also covered HPTRP requirements in New England. As resources are available, we will amplify compliance messaging in the Mid-Atlantic as well.

Jackie Odell (Member): Observer data is ASM and NEFOP?
Kristin Precoda: Yes
Jackie: How are you defining effort? Effort looks more stable than I would assume.
Kristin: Effort is landings recorded on the VTRs, bumped up to match dealer records; my early info is that effort has decreased a lot in 2021, not sure about 2020.
Chris Orphanides: Note that effort is defined as landings, there could be some efficiency changes that could be happening, as well; it’s not trips or numbers of vessels. Kristin also noted in her presentation that New England landings had dropped 25% since 2014, with more of a drop in the fall versus the winter.

Updates on Special Projects
Kristin Precoda, Integrated Statistics/NEFSC
Dr. Chris Orphanides, NEFSC

Relationship between Observer Protocol and Observed Bycatch Rate
- Animals can fall out of the net on their own or could have been removed.
- Two observer protocols within the Northeast Fisheries Observer Program. One protocol focuses on marine mammal bycatch and watches the net being hauled so incidental take is more likely to be documented. The other protocol focuses on fish sampling and may not watch the net being hauled because they are focused on processing fish, so bycatch that fell out of the net could have not been observed.
- Anecdotally - fish focus trips may not see some animals that fall from the net.
● Preliminary results: 20 years of data suggests that marine mammal focused observers see more animals that fall from the gear
● Exploring ways to incorporate this data into bycatch data collection, especially as electronic monitoring is adopted; needs more discussion. Example of one simple approach could revise the total 2019 estimate from 195 to 223.

Harbor Porpoise Diet Study in Southern New England
Dr. Chris Orphanides
● Study published in 2020
● Stomach sampling - remove hard parts (otoliths and squid beaks) and determine prey sizes based on length
● Hakes, flatfish, and squids most abundant by number
● Hakes, herring, and squid highest in terms of biomass
● Compared to GOM, this study found roughly \( \frac{1}{2} \) to \( \frac{2}{3} \) less Atlantic herring (22%) biomass
● Previous GOM study had found cod to be prey, but this study in the Southern New England area found a small amount of unidentified gadidae, but no cod
● Squids were a negligible portion of the diet during the summer and fall in the Gulf of Maine
● Silver hake were an important prey item in both regions
● Very little overlap between gillnet catch and stomach contents - harbor porpoise eat smaller fish, eat their fish whole
  ○ Among 25 fish species caught in gillnets that also caught harbor porpoise used in this study, only 4 of the more rarely caught species were found in stomachs of harbor porpoises (1.3% of catch by number).
  ○ Only 1 species, Atlantic mackerel, was found both in the harbor porpoises caught in that net and in the net catch
  ○ No monkfish or skate found in harbor porpoise stomach
● Harbor porpoise eat same things as monkfish and groundfish, likely reason for bycatch in gillnets
● Diet of harbor porpoises in the Southern New England were more diversified than the diet of harbor porpoises in the Gulf of Maine, with less reliance on Atlantic Herring
● Cusk eels and flatfish are common prey items, but contribute little biomass
● Recent shift towards a more diverse prey base of smaller species
● Prey has little to no overlap with observe landed gillnet catch

Other Updates: Electronic/At-Sea Monitoring
● Amendment 23 to NE Multispecies FMP: Would revise groundfish sector monitoring program; sectors could choose human At-Sea Monitors (via ASM program) or Electronic Monitoring (EM).
● Proposed rule out for comment through March 30.
● Under the proposed operational EM program, protected resources bycatch data would not be recorded during primary review. NEFOP observer data on protected resources will still be collected as usual.
● If more vessels choose EM over ASM → decrease in collection of marine mammal bycatch data → decreases precision (wider coefficient of variation (CV)) of the bycatch estimate
● Implications:
  ○ → decrease F, value → decrease PBR
  ○ Increases possibility of bycatch being over- or underestimated relative to PBR.
  ○ If overestimated, can result in unnecessary restrictions to fishery.
  ○ If bycatch underestimated, can result in unsustainable impact to protected stock.

**Stakeholder Assessment for Marine Mammal Deterrents Workshop Planning**

● Greater Atlantic workshop is being planned for May of this year and is expected to focus on seal interactions
● National workshop at the end of May/beginning of June
● Contact Jean Higgins (jean.higgins@noaa.gov) if you’re interested in participating or with referrals to other fishing community members that may be interested in participating

**Questions and Answers:**

Question from Bill McLellan (Member): Noted that population went down to 30K in one of your slides, does that raise cause for concern?
Debi Palka: That’s an average of the summer abundance, not a number we use in PBR. All of the data indicates that there are less harbor porpoises in U.S. waters, numbers started going down in 2010. Why are they going down? Appears that they are moving into Canadian waters.
Canadians did a survey recently. We found 75K in US waters, and an additional 20K in Canadian waters. Canada didn’t do a survey in 2021, but I am working with them to look at distributions. Animals are shifting North and eastward. Fewer harbor porpoises appear to be in the US water, which may also be one of the reasons for the lower recent bycatch estimates. Harbor porpoises are no longer a strategic stock, as bycatch is below PBR, but still not at ZMRG.
Bill: We should expect some dramatic declines in population numbers?
Debi: Yes, we are expecting population numbers to decline as the population shifts. PBR will go down if numbers decline. Not sure if it is considered a dramatic change.

Question from Damon Gannon (Member): Are there plans to do more harbor porpoise diet studies?
Chris Orphanides: Not right now, still possible in our lab, but right now we do not have the capacity. Let us know if you have a student that would like to work on this.

Melissa Sanderson (Public): In the pilot protocol, aren’t they collecting protected resources bycatch info?
Danielle Palmer (GARFO): Yes, but that is changing for implementation. The current proposal is collecting protected resources bycatch information will not be included.
Zack Klyver (Public): Survey science around harbor porpoise, will be looking at connection with menhaden?
Debi Palka: We will be looking at that, now that we have temporal spatial distribution of fish, we will be examining overlap of two species. Offer opportunity to students, anyone interested, let us know, can start looking at otoliths and stomachs.

Resources:
2. AMAPPS Marine Mammal Model Viewer
3. https://marinecadastre.gov/espis/#/search/study/100066