Northeast Trawl Advisory Panel meeting summary 12/16/2015 9 am – 5 pm
Radisson Hotel Providence Airport, Warwick, RI

Members attending:
Rick Robins (Co-chair)
Terry Stockwell (Co-chair)
Sally Sherman
Jim Gartland
Robert Ruhle
Pingguo He
Mike Pol
Michael Martin
Jon Knight
Chris Roebuck
David Goethel
Frank Mirarchi
Steve Eayrs
Terry Alexander
Jeff Kaelin

Members absent:
Jeff Eustler
Hank Lackner
Tim Miller

Introductions

- Rick Robins introduction: Very clear gulf between perceptions of fishing community and the management of fisheries. Very clear we have to attack this head on. Surveys are an important part of this distrust and this is an opportunity to move forward. Grateful that we have support of Dr. Karp and great panel representing fishing community, scientists, gear manufacturers and academic community. Hope that we can get better understanding of inputs to the assessments.
- Terry Stockwell introduction: Many thanks for presentations at last meeting. Sustainable fisheries in Silver Spring is very supportive.
Review of agenda

Review of revisions to charter

- Added explicit improvement to survey to mission statement.
- Added more accurate descriptions of other surveys.
- Ensure survey estimates are robust to changes in environmental conditions including climate change.
- Usage of Study Fleet data will have separate review by NEFSC – may be later engagement for NTAP on this issue. Opinion expressed that Study Fleet data can help groundtruth survey efforts and help explain differences between survey results and fisherman observations.
- Questions/Comments
  - What does “robust to changes in spatial and temporal changes in environmental conditions” mean. As environmental conditions change, the desire is for the survey to be able to accurately estimate populations and track changes in populations size.
  - Quorum requirements relaxed but still requires representation from both councils and the NEFSC and ensure that panel work could continue to be get done.

NEAMAP Mid-Atlantic Southern New England survey – Jim Gartland

- History of Survey
  - NEAMAP program not just three surveys, but an overall program.
  - NEAMAP late 1990’s ASMFC organized to coordinate among existing surveys, identified areas where additional coverage needed, try to accumulate data in single user-accessible format/place to improve usage of data.
  - Quickly identified need for increased effort for nearshore Mid-Atlantic Bite and Southern New England waters.
  - No money available at first when Albatross was still being used.
  - When Bigelow came on line, need for increased sampling became essential due to inability of Bigelow to sample in shallow water.
  - 2006 pilot survey
  - 2007-present full survey (8 ½ year time series)
  - 2008 full peer-review
- Survey design
  - Cape Hatteras – Martha’s Vineyard
  - Montauk-Cape Hatteras - inside 60 ft contour (abuts NEFSC survey area)
  - Rhode Island/Block Island Sound depths extend to 120 ft., overlap with NEFSC surveys
  - Spring survey – south to north (3rd week of April to end of May)
  - Fall survey - north to south (3rd week of September until end of October)
  - 150 sites/trip (300/year) = 1 tow/30 nm²
  - Stratified random survey design
  - 17 regions (subdivided by depth) = good coverage
  - 1.5x1.5 nm grid box
  - 20 minute tows at 3 knots with optimal gear configuration
  - Basically same net as NEFSC surveys
    - Differences include:
- 3” cookie
- Thyboron doors
- Didn’t add 3rd top and bottom bellies
- Different Floats
  - Acceptable tows
    - Wing Spread 12.3-14.7
    - Headline Height 4.7-5.8
  - Collaboration with Darana R and Jimmy and Bobby Ruhle over entire survey has been integral to success
  - GPS, vessel speed, net mensuration (door spread, wing spread, headline height), current speed, wire out (measured before trip and after hang), bottom contact used on 34 tows/trip (no indication of any problems), water depth, air temperature, wind speed direction, barometric pressure, sea state, PAR (light levels), (Hydrolab unit - depth, water temperature, dissolved oxygen, salinity)
  - Everything sorted to species and size class
  - Aggregate weight, individual lengths
  - Subsample individual lengths, weight, sex, maturity, hard parts for ageing, stomach samples (81,000 to date)
  - Additional data also collected for commercially important invertebrates (longfin squid, horseshoe crab, American lobster, and blue crab)

- Outreach
  - Dock side and at sea demonstrations (New Bedford, Point Judith, Montauk, Cape May, Hampton). Between 250-300 guests so far.

- Use of data in assessments
  - Refer to tables in presentation for full details.
  - In general, the farther north, less data are used in assessments.
  - Data also used extensively by states.

- Trawl video presentation
  - Not usual conditions – video presented is to highlight potential issues in gear performance.
  - Technology changes have recently allowed video such as this to be collected – weren’t available when survey started.
  - Sweep immediately below fishing line – substantial gap between sweep and footrope – allows fish to escape.
  - Sweep has tendency to bounce or fly for brief period when transitioning from soft to hard bottom.
  - “Any survey that doesn’t have problems isn’t looking for them.”
  - Changes could be made to address these problems as experimental evidence outside of survey has shown. Relatively small changes in sweep (4 links) appeared to make big difference in efficiency.
  - Some side-by-side work shows substantial difference between industry boat and survey trawl for horseshoe crab.
  - Another issue is escapement through the mesh of smaller fish – can’t be addressed with gear modification.
• Appear to be density-dependent and length-dependent catchability differences – much harder calibration problem if changes are made to gear.

• Questions/Comments
  o Question about 20 minute tow length – is this sufficient time to catch strong-swimming and larger fish? May be a problem for bluefish, but concerns about increase in volume for other species and effects on scientific data collection. Primary reason for this length was to be the same as the NEFSC survey. More research on optimal tow length would be useful. Cod and pollock in Gulf of Maine could definitely be problematic as well. SMAST study on tow duration showed differences in catch rates for some species. Maybe considered different survey techniques where longer tow times are indicated.
  o Fixed gear question – species of interest populations are doing worse, so less fixed gear than earlier. Also captains have personal relationships with fishermen and can ask that gear be moved or find ways to work around fixed gear.
  o Cameras may be better for illuminating problem than for situations where data are required. Turning video into data is time-consuming and expensive. Light is required for deeper depths
  o There is a tradeoff between value of time series and changes to survey gear that increase efficiency of survey gear. This will be a central question for this panel going forward.

State of Massachusetts Bottom Trawl Survey – Mike Pol

• History of Survey
  o Gloria Michelle – NMFS owned vessel, staffed by NOAA Corps officers (first 4 years Francis Elizabeth – commercial vessel).
  o Mission of survey priority is designed to assess finfish and invertebrates within state territorial water – ancillary use for stock assessments.
  o Survey conducted the same way with very few changes since 1978.

• Survey Design
  o See survey map in presentation for survey area.
  o Some areas with hard bottom are not available to survey.
  o Stratified random survey design
  o 23 strata defined by depth (20 - 210 nm²)
  o 2-11 stations per stratum (total 103 stations)
  o 1 station/19 nm²
  o “Fall” survey in September
  o Some overlap with NEFSC survey.
  o 5 geographic zones, 6 depths (0-30, 31-60, 61-90, 91-120, 121-180, 181+)
  o Tows during daytime only.
  o Fixed gear issues are important.
  o 20 minutes tow duration target
  o Tow speed 2.5 knots
  o To be acceptable, tow must be at least 13 minutes. Catch expanded to 20 minute standard
o No net mensuration equipment (fiscal issues plus don’t want to inadvertently introduce changes to survey)
o Follow NEFSC biological sampling protocols.
o Uses FSCS 1.6
o Nylon net, wooden doors (get details from presentation)
o Trends for several species were discussed – see presentation.
o Data stored in NEFSC database – analysts can access data directly.

- Other State of Massachusetts surveys
  o YOY winter flounder Seine Survey since 1975
  o Ventless Trap Survey since 2005 (lobster recruitment, tautog, black sea bass in future)
  o Eel trap and river herring count
  o Cod IBS survey coming back on line next year

- Ways to improve trawl survey
  o Increasing sample size
  o Fixed gear problems (outreach limited effectiveness so far)
  o Sidescan sonar gear performance research planned – would allow gear performance to be assessed.
  o Plan to use Gloria Michelle as long as possible.
  o If a change to the survey proves absolutely necessary, is it worth it to calibrate? This should be considered in a regional context – don’t want to break two contiguous surveys simultaneously.

- Question/Comments
  o Has fraction of stations affected by fixed gear changed over time? No.
  o Concern expressed that fast swimming and large fish are not being represented. Could this be due to tow speed and duration?
  o There was some discussion over the proposed replacement of the deck gear aboard the Gloria Michelle (specifically the winches) and the status of these proposed improvements. Vessel also used for annual shrimp survey. There may be cheaper private options that may provide bigger bang for the buck.
  o Has any consideration been given to adding gear mensuration or video? If survey were to be broken, then yes this would be considered. The survey has been very conservative in making changes and the weight and drag of a net mensuration system is a serious concern. There is also some question if fish perceive the frequencies involved and if this affects their behavior. This is a cost-benefit analysis that is done with very little information available as to the “cost”. There was concern expressed that by not utilizing net mensuration technology there are many potential gear issues that are not known and these could be serious problems. The tradeoff between the value of the time series and the best available information came into focus again.
  o Should surveys have a defined lifespan that would allow for systematic and well-planned technological changes over time?

NEAMAP Maine-New Hampshire Inshore Trawl Survey – Sally Sherman
• History of Survey
  o Developed jointly by states of ME and NH and TR Fish
  o Fill information gap for survey indices
  o Long-term indices
  o Establish cooperative research with fishing industry
  o Started with help from Cooperative Research Program
  o Robert Michael out of Portland currently used exclusively (Tera Lynn (another almost identical vessel) used early on as well)

• Survey Design
  o 5 geographic regions/4 depth strata = 20 strata
  o Outer survey boundary roughly based on 12 m limit
  o Survey began in 2000
  o Depth strata 3-20 fm, 21-35 fm, 36-55 fm, 55+ fm (some quite deep)
  o Originally both fixed and random stratified. Fixed stations recently dropped in favor of additional random stations
  o 1 nm² grid = stations
  o 2x/year – five weeks (spring - 1st week of May – 1st week of June; end of September – end of October).
  o 20 minutes at 2.5 knots
  o Tows in straight line aligned with current when possible.
  o 4-6 tows/day
  o Tows performed during daylight only.
  o See presentation for gear details.
  o Survey “somewhat technologically challenged” – mix of digital and pencil/paper.
  o Net mensuration (door spread, wing spread, headline height) – addition not used to change setting/hauling protocols per peer review.
  o Use bottom contact sensor
  o 29 m door spread, 10.5 m net spread, 3.5 vertical opening
  o Seabird CTD cast after each tow.
  o Catch handling similar to other surveys with intense focus on processing lobsters first.
  o Structures collected for ageing – different species sets in spring/fall.

• Fixed Gear/Lobster Issues
  o Lots of fixed gear and untrawlable bottom. Untrawlable area and big depth change areas are not included in effort allocation.
  o Lobster fishermen asked to move gear from proposed tow by by ¼ nm. Request sent by mail.
  o Lots of outreach to move gear, but also use Maine Marine patrol to move gear when necessary.
  o Moved a lot of gear at beginning of survey – lots of concern by fishermen as to legality.
  o Current policy allows up to 25 pieces of gear to be moved maximum. This is a time issue. If > 25 pieces, nearby alternates are chosen.
- Flume tank used in design stages for optimal configuration effect of catching lobster traps – one or two no effect.
- Video work demonstrated that few lobsters are injured by doors.
- Considering sub-sampling lobsters in future due to increased numbers in recent years.

- Use in Stock Assessments
  - Winter flounder, yellowtail, lobster data used in models.
  - Other species data used for sensitivity runs etc.

- Questions/Comments
  - Outreach efforts are extensive. Captain of vessel has personal relationships with many others in fishery – helps considerably in industry cooperation.
  - Always tow with the current to maintain consistent geometry and bottom contact.
  - Fixed gear problems worse in fall – right in middle of lobster season. More cooperation in spring. Has always been a problem, but doesn’t seem to have gotten worse over time and data over time are thought to be comparable.

Overview of other state surveys not previously discussed – Jim Gartland

- 6 surveys
- Rhode Island Coastal Trawl Survey
  - Vessel John H. Chaffee – 50 ft Wesmac
  - Rhode Island/Block Island Sound seasonally (spring, fall) – began in 1979 – 44 sites
  - Narragansett Bay monthly – current time series began 1990 -13 sites most months, 26 during Sound surveys
  - Inside 3 miles
  - 2 bridle 2 seam trawl
  - 20 minutes tow duration
- Connecticut - Long Island Sound Trawl Survey
  - R/V John Dempsey used for entire time series.
  - Spring and fall 40 sites 5 times per year (April, May, June, September, October).
  - Survey stratified according to region and bottom type.
  - 30 minute tow duration
- New Jersey – Ocean Trawl Survey
  - Survey done on contracted commercial vessels at beginning.
  - For many years survey done on R/V Seawolf - 80 stern trawler owned by SUNY
  - Year-round survey inside 28 meter contour 5x per year (1x in winter and spring, 2x in summer and fall) – 40 sites per cruise.
  - 2 seam/2 bridles trawl
  - Stratified random survey design – strata based on region and depth
  - 20 minute tow duration
- Delaware
  - Two separate surveys for adults and juveniles
  - Adult survey
- Seasonal – Delaware portion of Delaware Bay monthly March – December
  - 9 fixed sites – fixed sites chosen due to obstacles – randomly chosen would result in a lot of lost gear due to obstacles
    - Juvenile survey – began in 1980 – 40 samples per cruise
      - Samples further up rivers
      - Monthly April - October

- Virginia
  - Two surveys administered by VIMS
    - Juvenile Fish and Blue Crab survey
      - 43 ft. Millenium just transitioned from 29 ft. boat – full year of calibration just completed.
      - Chesapeake Bay and 3 major rivers started in 1955
      - Every month – 100 sites
      - Stratified random in bay, combination of random and fixed sites in rivers.
      - ¼ size of NEAMAP MA/SNE trawl
      - 5 minute tows
  - CHESMMAP survey
    - 65 ft aluminum boat
    - Currently main stem of Chesapeake Bay only
    - Began in 2002
    - March, May, July, September, November
    - Later juvenile/adult
    - 80 sites per cruise
    - Stratified random survey design, strata based on latitude, depth.
    - 4 seam/2 bridle – essentially modified southern-style shrimp net.
    - Intend to transition to ½ size NEAMAP MA/SNE trawl.
    - 20 minutes tow duration

- Questions/Comments
  - Every state survey voiced that they do not know how data are being used. The consequence of no feedback is that data may be excluded from assessments for reasons that could be improved for future surveys. There needs to be better communication between surveys and stock assessment authors.
  - Suggestion to use NEAMAP structure as clearinghouse for feedback to surveys from stock assessment authors to improve communication.
  - Strong recommendation to NEAMAP board to send state representatives to all data workshops so they can see where data are being used and understand why data aren’t being used. Sometimes even this level of interaction is insufficient – need to advocate for data use at every step.
  - Suggestion that a centralized data storage location might be a good solution to increase data sharing.
    - Some concern that data can be used inappropriately by naïve users
  - Is net mensuration used on these surveys? Net mensuration consistently used only on CHESMMAP survey, New Jersey and Rhode Island surveys.
- Towing speeds not included in presentation – Jim will check with survey leads will include this information. Some surveys use RPM instead of speed.
- Comment that data can only be included at benchmark and not at updates – this is a problem for species with infrequent benchmarks because lots of good data are excluded.

**Study Fleet Data – John Hoey**

- Goal is fine scale spatial data from commercial industry partners.
- Previous reporting requirements resulted in inaccurate location information.
- GPS polling every 30 seconds.
- Star-Oddy sensor - temperature/depths every 30 seconds. These data are combined to better define duration and effort.
- Currently 37 participating vessels in Study Fleet.
- New wireless TD probe – lithium batteries and frequent calibration pose logistical problems. Now fishermen can see their own temperature data.
- Working more closely with Oceanography and Habitat portions of NEFSC.
- Working on more rapid movement of data after collection.
- 33 or 34 of vessels are trawlers.
- Working with other partners, more than 40 additional boats have been added.
- 2014 – covered ~65 percent of trawl effort, now in the high 80’s.
- Very good correspondence between captain’s estimates of catch and observer estimates.
  - ~85% of estimates are less than 10-12 lbs different
- Seasonal differences in catch patterns can be used to study the effects of regulations
- 37,000 trawl tows.
- Data binned in 1 min lat/long and 1 hour and can be fed into oceanographic models in real time. Look at thermal patterns and species preferences and how this relates to survey catches. Has already had impact on butterfish assessments.
- Data can be used to avoid bycatch as well and estimated discards based on finer spatial scale.
- Biological sampling has been used to fill in the gaps between fall and spring surveys and used in benchmark assessments.
- Use Bigelow survey data to estimate preferred thermal habitat.
- Use commercial vessel to sample in real-time habitat to verify models.
- Efficiency of sampling in thermal habitat can be used to adjust assessments.
- Seasonal and regional biases in sampling can be detected.
- Temp/depth statistics for every tow is given to each vessel along with quality measures.
- 96% of all EVTR records currently provided through Study Fleet program.
- Discussion currently around refining estimates of discards and estimates of abundance through use of these data.
- Concentration is on better ways to move large data set off boat automatically and quick data turn around for participants and working out bugs in current software. Sending data via Boatracs not feasible due to expense.
- Working with NEFSC leadership, GARFO, and Observer program on ways to improve data and figure out best way to utilize data in future.
• Questions
  o Dynamic data allow other data to be collected: state requirements, different units etc.
  o Can river herring bycatch problem be addressed using these data without overwhelming Boatracs? 18 characters/hour can be sent via Boatracs to provide sufficient info to update oceanographic model. Rest of data downloaded at end of trip. This can provide something like 5 day forecasts for separation between river and Atlantic herring. Currently testing this model by sampling the predictive gradients.
  o Interactive exploratory model development sessions using collaboration between modelers and fishermen.
  o What is the cost of the program? 1.3 – 1.4 million, about an order of magnitude less than NEFOP
  o Center is working on ways to improve on traditional single-species assessments and these data can help provide a basis for thinking about ways to do this. The data in fact complement observer coverage well.

Discussion on increasing coordination between state/federal surveys and assessments

• Need to close the feedback loop of data that goes into assessments as discussed before.
• Increased use of Study Fleet data to help inform assessments. This would enhance the buy-in of the fishing community.
• Need to recommend a policy to deal with fixed gear consistent across all surveys.
• Ideal length of survey tows – is a consistent time necessary – dome-shaped selectivity issues. (Stokesbury footage of cod swimming in and out of trawl - maybe we can get for future meeting?)
• Probably can’t standardize trawls across surveys, but need to ensure consistency within surveys over time. Panel should explore this issue in more detail.
• Need ability to estimate catchability for individual surveys.
• How do we deal with surveys and changes in technology over time?
• Surveys typically start on calendar dates, but fish probably perceive a thermal date. How can we adjust surveys to account for this?
• Light level is also an important variable for many species. In multi-species surveys, trying to optimize for a variety of species is extraordinarily difficult.
• NEAMAP Operations Committee can’t force any surveys to change, but can make forceful recommendations. This could help address consistency issues over time.
• Survey leads seem generally more open to change than perhaps in the past.
• Have stock assessment authors looked at Study Fleet when considering the data for their assessments? Yes, there have been some examples of this. Data needs and gaps can also help Study Fleet to plan what vessels to equip etc.
• CPUE indices from commercial vessels should be encouraged for use in stock assessments.
• Example of cod moving deeper in GOM. Study Fleet data were used to show cod moving deeper. How do surveys respond? Can restratification deal with fish moving deeper in response to water temperature?
• Need to involve stock assessment earlier in both survey and cooperative research efforts. Part of the Strategic Planning process at the NEFSC is designed to address this.
• Data integration and standardization is another area where we could improve. Centralized data efforts should be considered.
• Need more survey effort during winter because a lot is going on for a number of species when they move to deeper water. It was a mistake to drop winter survey.
• Surveys are a small part of the assessment process. Goal for survey is to be as consistent as possible. Catchability changes considerably with depth, particularly for flatfish. As fish move deeper, these changes in catchability with depth affect the way that changes in population are perceived.
• Fishery dependent survey could provide better changes in seasonal distribution and complement or supplement fishery-independent survey information.
• Stock assessment documents often include a discussion of the data sources used and what surveys were included, but often not.

Fish Tank Workshop Wrapup – Alexa Dayton

• Fish Tank Port Series
• Purpose was to listen to industry concerns and drive the dialog forward to productive outcomes and enable action.
• NEFSC was a partner and was very open to this process.
• Desire to increase dialog around stock assessment and allow fishermen's observations and concerns to be heard in a neutral forum.
• Hopefully will lead to cooperative research efforts.
• Started over a year ago, seven port meetings (five focused on commercial fishing, 2 on recreational).
• Good level and variety of participation.
• One resounding area of concern – the Bigelow. Disconnect between what industry is seeing and what the science is saying.
• Other topics of concern included fishery-dependent data, environmental factors, stock structure, and real-time data management.
• Trawl survey – improve capacity and accuracy. How can we complement or supplement without corrupting time series.
• New technologies should be used when possible.
• Need to examine finer scale trends both spatially and temporally.
• Environmental conditions should be used to determine survey start dates rather than calendar dates.
• Need more info on new species that are showing up – e.g. black sea bass.
• Trust is broken.
• Consider year round 20 minute tows on industry vessels as in Norway.
• RSA programs for inshore observations.
• Can we supplement survey with industry collected data?
• Can we do a better job linking datasets?
• Regular meetings between industry and scientists.
• Are management units aligned with biological stock structure.
• Desire for real-time electronic data collection, more frequent assessment updates.
• Better and more timely data dissemination.
• Better accounting for recreational removals and better quality information.
• Collaborative research projects – mostly recreational fishing related.
• Fishery dependent data and CPUE
• Project definition – pre-proposals
  - Trawl-related
    - Fishermen aboard the Bigelow – increases trust.
    - Underwater camera to observe gear performance.
    - Improve confidence in the survey.
    - Minimal cost.
  - Video or Trawl
    - Increase spatial/temporal coverage.
    - Vessel(s) calibrated to Bigelow.
    - Improve accuracy and precision.
    - Scoping process – might be costly.
• Moving forward - $30,000 currently available.
• Goal is to fund all 6 projects.
• Questions/Comments
  - Age-length keys effect on assessments.
  - First thing that’s needed is to fix the Bigelow net or survey which many believe to be broken.
  - If fishermen can’t make recommendations or changes, then this is a waste of time
  - If stock assessments magically increased by a factor of 10, we wouldn’t all be sitting here. This is driven by a sense of crises. Stock numbers are so low that we can’t separate the signal from the noise. What is the inherent noise in a stock assessment?
  - Did the group discuss putting a team of fishermen aboard the vessel simultaneously? No opposition to this, but logistically might be difficult
  - Fishing and surveying are different activities and these differences might drive fishermen aboard the Bigelow crazy.
  - A big problem is scaling Bigelow to Albatross units during assessment. NEAMAP is not combined with Bigelow survey, but is considered a different survey. Inshore sector is not being adequately surveyed. What is the true value of a time series or an individual survey? Are we better off starting fresh or calibrating to old survey?
  - In terms of camera work – how do we do effective camera work when external lighting required. This is a big problem because lighting changes behavior. Also need to cover all depths for both species availability and changes in catchability with depth. Currently no good solutions.
  - Video is good for identifying problems, but turning video into data is a difficult and time-consuming process.
  - We probably will always be dealing with relative abundance, so is it worthwhile to put a lot of effort into trying to get to absolute abundance?
  - We need to at least put bounds on catchability.
No net can effectively catch all species, this is why fishermen use different gear to catch different species. Problems arise when abundances are really low, a small difference in catch results in a large percentage difference in catch.

Video is most valuable in understanding variability in catchability and trying to minimize it.

Value of fishermen aboard the boat may be the transparency involved with this activity. This can help increase trust.

Transparency is useful, but doesn’t fully address the problem. If recommendations are made and not implemented, this will not work out well and we would find ourselves in a situation that increases distrust. Controlling expectations is very important.

There have been comparisons between Coonamesset Farms dredge samples and nearby Bigelow tows and for the most part the catches appear to be representative, although there appears to be a problem with Bigelow windowpane flounder catches. There would be great value in having a commercial vessel tow alongside the Bigelow to understand if there are species for which the Bigelow does not capture a representative sample. Bigelow may not overlap with gray sole in time and space.

The Bigelow trawl is a catch-all net that doesn’t catch anything particularly well, but does catch a representative sample for most species. We have measured nets and everything is perfect and built to spec. Trying to make changes to the gear, the boat or putting fishermen on the boat is a waste of time. The problem is in how the samples are interpreted through the assessment. The kind of experimental work that is being done on catch efficiency is useful to figure out what species may not be adequately sampled by the current survey and this coupled with supplemental efforts are more likely to be a better solution than trying to change the current gear or survey.

How do distributional changes of fish affect survey results?

There was a lot of good information presented at the last meeting and many of us learned that several of the issues raised are being addressed. A lot of fisherman aren’t aware of much of this work and information and we should make it readily available to the public.

The NEFSC is considering ways to enhance outreach to the public and commercial fishermen in particular, perhaps through regularly scheduled meetings.

**Comparison between Alaska Fisheries Science Center and Northeast Fisheries Science Center trawl surveys – Michael Martin**

- At the AFSC, all trawl surveys are done aboard chartered commercial fishing vessels and NOAA ships are used primarily for acoustic and ichthyoplankton surveys.
- Five surveys at the AFSC – Bering Sea shelf, Gulf of Alaska, Aleutian Islands, Bering Sea slope, northern Bering Sea
- Advantages of performing surveys on a commercial platform:
  - Generally knowledgeable and experienced captain and crew
  - More flexibility
  - Less expensive
  - More interaction with fishing industry
- Disadvantages:
- Standardization issues (multiple vessels that change over time)
- Setup and breakdown time, effort and expense (everything must be shipped)
- Less data available
- Government contracting
- Potential for conflict of interest

- Long-term charters allowed captain and crew to better understand how surveys work and the differences between fishing and surveying. This also forces those involved in the survey to constantly think about how things are done on the survey and ways of perhaps doing things better.

- See tables for details on survey differences

- Questions/Comments
  - With no bottom contact sensor, how does the Bigelow detect when the net leaves bottom? With the trawleye we can detect when the net leaves the bottom more than 5 cm in theory. This is probably about the same resolution as the bottom contact sensors used in Alaska. We can detect when the net truly leaves the bottom, but fishing light on the bottom is very difficult to detect with any method aside from video.
  - Were the vessels calibrated when they changed to another vessel? Early on, a fishing power correction was calculated, but this was not reliable. Surveys recognize the value of calibration, but the number of vessels and rate of change made cost prohibitive. The strategy to mitigate non-calibration is to have longer-term contracts and measure as many variables as possible. Winches are probably the biggest difference between vessels.
  - Have there been efforts to understand the efficiencies of the gears used? Yes, for both primary nets had extensive gear efficiency studies.
  - Aren’t acoustic data being routinely collected from fishing vessels? Yes, there is a program to collect calibrated single beam acoustics from many vessels.
  - It appears you have 11 people doing the work of 38 on the Bigelow, correct? Not really because the Bigelow operates 24 hours per day and is able to do more tows per day and collect more data.
  - Can we suggest that the Bigelow do oceanographic work only and have the survey done on industry platforms? In the short term probably not, but we could perhaps think about this transition for the long term. The money from the Bigelow cannot currently be reallocated to the NEFSC to do industry-based surveys.

**Fixed gear interaction discussion**

- See table for interaction by year and area
- Take home message is the NEFSC trawl surveys encounter fixed gear frequently, particularly in the Gulf of Maine, but they generally don’t affect what is caught and very few tows are considered non-representative due to interaction with fixed gear.
- The biggest issue is that it prevents us from sampling in many areas and the Bigelow spends a lot of time looking for places to tow, especially in the Gulf of Maine. The survey has not historically collected data on when stations are moved due to the presence of fixed gear, but this will change beginning in the spring survey.
Assume that most of the fixed gear encountered is in shallower strata. There is concern that not only does the Bigelow not cover the shallowest strata any more, but is also unable to adequately sample shallower strata due to fixed gear interaction. The effect is really to change where in the strata samples are taken from, all strata are sampled as planned. There is a relationship between presence of gear and habitat, so this is worrisome.

On Albatross in some areas, there were so few places to tow in some strata, that we always went back to the same tow year after year.

Priority items for next meeting

- Just completed work aboard Karen Elizabeth comparing chain and rockhopper sweeps in a twin trawl configuration. We didn’t have any input from stock assessment as to relative species importance. Assumed windowpane and yellowtail were the most pressing issues and targeted these species.
- There are 15 days available for research as the discretion of this AP. It would be helpful if we could decide as soon as possible how to use these days so that this can be scheduled and the permitting process begun. We will need input from stock assessment so that we can ensure that we can focus on research that will definitely influence the stock assessment and we can use the time most efficiently.
- Perhaps an interim meeting in February would allow us to gather information from stock assessment that would allow necessary information.
- RFP to be released in a couple of weeks that is related to the topics here that could augment the money available.
- Identify complementary or supplementary surveys that could best help stock assessment.
- Major priority of this panel should be the establishment of a separate industry-based survey and this should be started as soon as possible.
- The Massachusetts DMF cod industry-based survey is being reinstated. Analytically the idea is to compare results from 2004-2006 to samples to be collected now and see if the results match the survey results. Discussion is currently centered around how best to do this statistically. Maybe we can take a similar approach for yellowtail using the earlier IBS yellowtail survey results.
- If focus is Georges Bank yellowtail, we have to include the Canadian side as well.
- Stratification will be a large area of discussion. Can we make some progress on alternative stratification before the next meeting? Discussed this issue with Paul Rago and he suggested that the first cut at this should be to combine strata. What is the range of alternatives that this panel would like to consider? This will help drive the analysis of alternative stratification. It is a much simpler problem to estimate the effects of combining strata than completely redrawing strata. Need to make sure that whatever stratification we come up with will be robust to changes in fish distribution over time. Perhaps first cut is to start with combining strata and see where that gets us. Then we can evaluate if we want to consider other options.