

Portside Sampling and River Herring Bycatch Avoidance in the Atlantic Herring and Mackerel Fishery



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Midwater Trawl Vessels



Rhode Island Bottom Trawl Vessels

With funding from:



Presentation Overview

Portside Sampling:

1. Fleet and Fishery Background
2. Sampling Design
3. Data Gathered
4. Data Utility



River Herring Bycatch Avoidance:

1. Overview of Methods
2. Communication Improvements
3. Preliminary Evaluation Results
4. Future Direction



Portside Sampling

Herring/Mackerel Fleet and Fishery Background

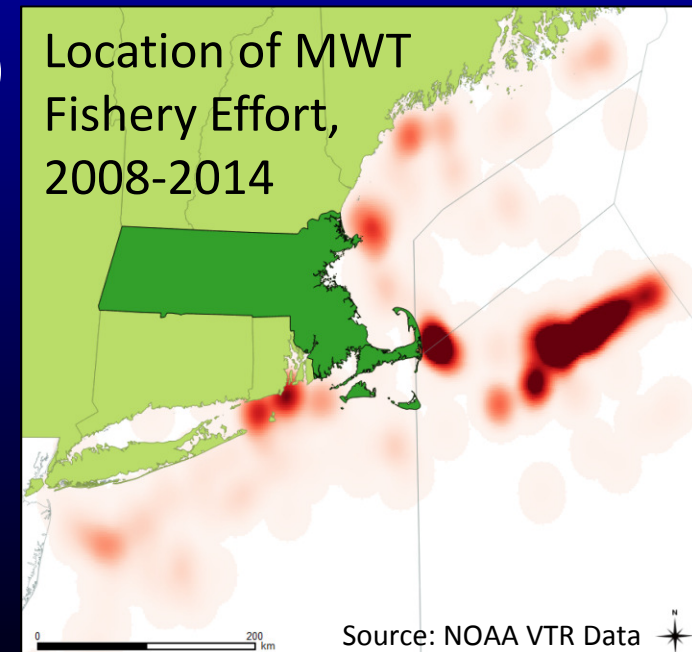
Mid-water Trawl (MWT) Fleet

- 8-12 Pair and Single MWT Vessels
- 100-165 feet long
- 120-450 metric ton (mt) capacity
- Crews of 3-6
- Vessels make 20-60 trips/year

MWT Herring/Mackerel Fishery

- Landings AVG ~61,000mt/year, from NJ to ME (primary ports: Gloucester, New Bedford, Portland)
- 4 Herring Management Areas with indiv. quotas
- 1 coast-wide Mackerel quota
- 2-5 hauls/trip
- Pump fish from net into RSW tanks
- Traditionally fish SNE/CC in winter/spring, GB in summer/fall, GOM in fall

* NFWF, TNC, NOAA Herring RSA funded



Portside Sampling

Herring/Mackerel Fleet and Fishery Background

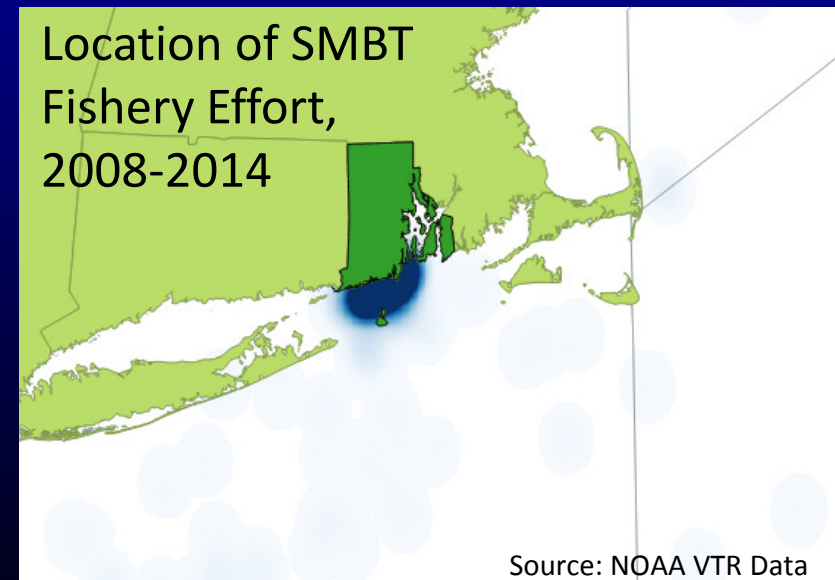
Small-mesh Bottom Trawl (SMBT) Fleet

- 8-12 SMBT Vessels
- 45-100 feet long
- 20-100 metric ton (mt) capacity
- Crews of 3-4
- Vessels make 20-80 trips/year

SMBT Herring/Mackerel Fishery

- Landings AVG ~4,500mt/year, almost exclusively from RI ports (Point Judith, North Kingstown, Newport)
- Usually conduct day trips
- 2-5 hauls/trip
- Lift a few tons at a time into 'wet holds'
- Traditionally fish SNE in winter/spring

* TNC funded



Portside Sampling

Sampling Design

Systematic Subsample – Based on NEFOP HVF Protocols

Collect basket subsample (20-30kg) of UNSORTED fish at set intervals (~every 5 minutes)



Sort fish by species, weigh all bycatch, length all priority spp.

Sample from beginning to end of offload, breaks permitted

Expand spp. Proportions to trip haul



Portside Sampling

Data Gathered

Species Composition – Trip Level Expansion

- Basket subsample species weights → trip level bycatch estimates

Length Frequencies – Target and Priority Species

- 100 target species (Atl. Herring and/or Mackerel)
- Every priority species (alewife, blueback herring, Am. shad, groundfish, etc...)

Fish/Sample Collection – Internal and External Requests

- River herring collected and frozen
- Atl. herring and mackerel commercial samples frozen and saved for NEFSC PopDy Stock Assessments

Fisheries Effort Data – Informs RHBA, Understanding of Fishery

- Captains report via DMF-created Tow and Trip reports on laptops, and/or NOAA Cooperative Research eVTR/FLDRS
- As part of RHBA, MA DMF has BTConnect® account for *all* MWT vessels

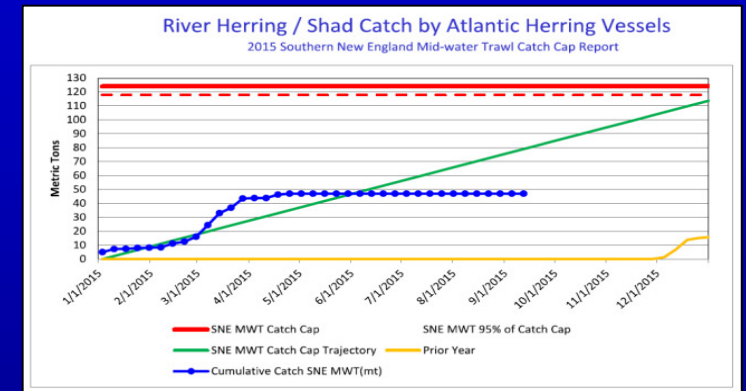


Portside Sampling

Data Utility

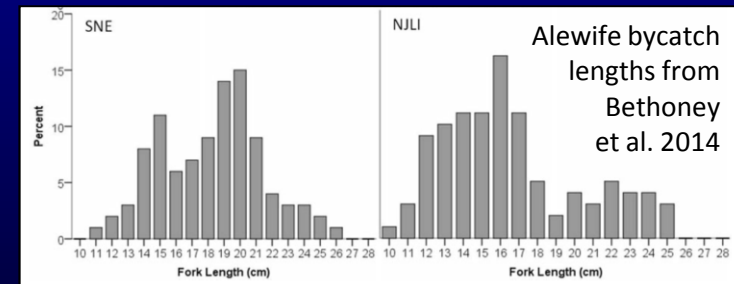
Inform Management– Increase Data Available for Decision Making

- Portside data used in developing RH Caps
- RH bycatch data included in ASMFC RH Compliance reports
- Utility for RH/S Catch Cap monitoring?
- Outreach/presentations to captains, fisheries managers, public stakeholders



Advancing Fisheries Research– Quantify and Characterize Catch

- Collaborative research: 2 publications (*Bethoney et al 2013 and 2014*), 2 manuscripts ongoing
 - Bycatch avoidance methods and efficacy
 - Bycatch characterization (age, size, maturity and spatial distribution)
 - Genetic makeup of RH bycatch
- External data requests are considered and filled



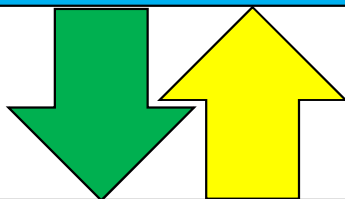
Inform River Herring Bycatch Avoidance Programs– MWT + SMBT fisheries

River herring/Shad Bycatch Avoidance

Program Methods: Rapid Communication of sampled bycatch events

- Data sources: MA DMF portside sampling
 - Incorporate NEFOP (10%), NOAA Study Fleet (3%), Maine DMR portside (2%)
- Increase at-sea communication and accountability
 - BTConnect access and a Responsible Fishing Agreement
 - Laptops, BTVessel program and BT Forms

Participating Vessels
Tow Information Daily
with
NEFOP Observers
River herring catch estimates



Advisories
when
necessary

MA DMF and SMAST
Sample Unobserved Trips (≈
50%)
Aggregate data
Classify Tows/Trips

Tow Report
Vessel: ssBradScho Date: 10/14/2015
Fill out ONE Tow Report for each tow

Vessel receiving fish: ssBradScho

Tow #
of tow (by pair), on current trip: 2

Latitude (DD) (MM.mm): 43° 18'

Longitude (DD) (MM.mm): -70° 18'

Bycatch: Gulf of Maine C3 as of 10/9/2015

Tow Start Date: 10/09/2015

Tow Start Time (0000 - 23:59) (H) (M): 19 : 00

Tow Duration (H) (M): 1 : 50

Tow Hail Weight: 50

Calculated Hail Weight (in kg): 50000.0 kg

Hail Weight Units: Pounds Metric Tons Trucks

Tow observed? Yes No

Total River Herring Proportion: 4-digit decimal, calculated by Observer. (ALE + BBACK + SHAD = RH proportion) .0150

Calculated RH Weight: 0.8 Metric Tons 750.0 kg

Trip Report
Vessel: ssbradscho Date: 04/30/2014
Complete ONE Report for Each Vessel's Trip
Submit as soon as you are headed for port. Thank you!

Trip Report for FV: Vessel1

Date Sailed: 04/27/2014

Date Landed: 04/30/2014

Estimated Time of Arrival: 2200 (HH-MM) (HH=00-23)
Example: 22:30

VTR #: 12347890

Landing Port:
 Gloucester, MA
 New Bedford, MA
 Portland, ME
 Rockland, ME
 Pt. Judith, RI
 Other Boston

Pumpout Location
Write in your intended pumpout facility (ie. State Pier, Plant, DW Box...)
dock

Observer Onboard? Yes No

Observer Trip ID (Ask Observer): D50007
Example: D50007

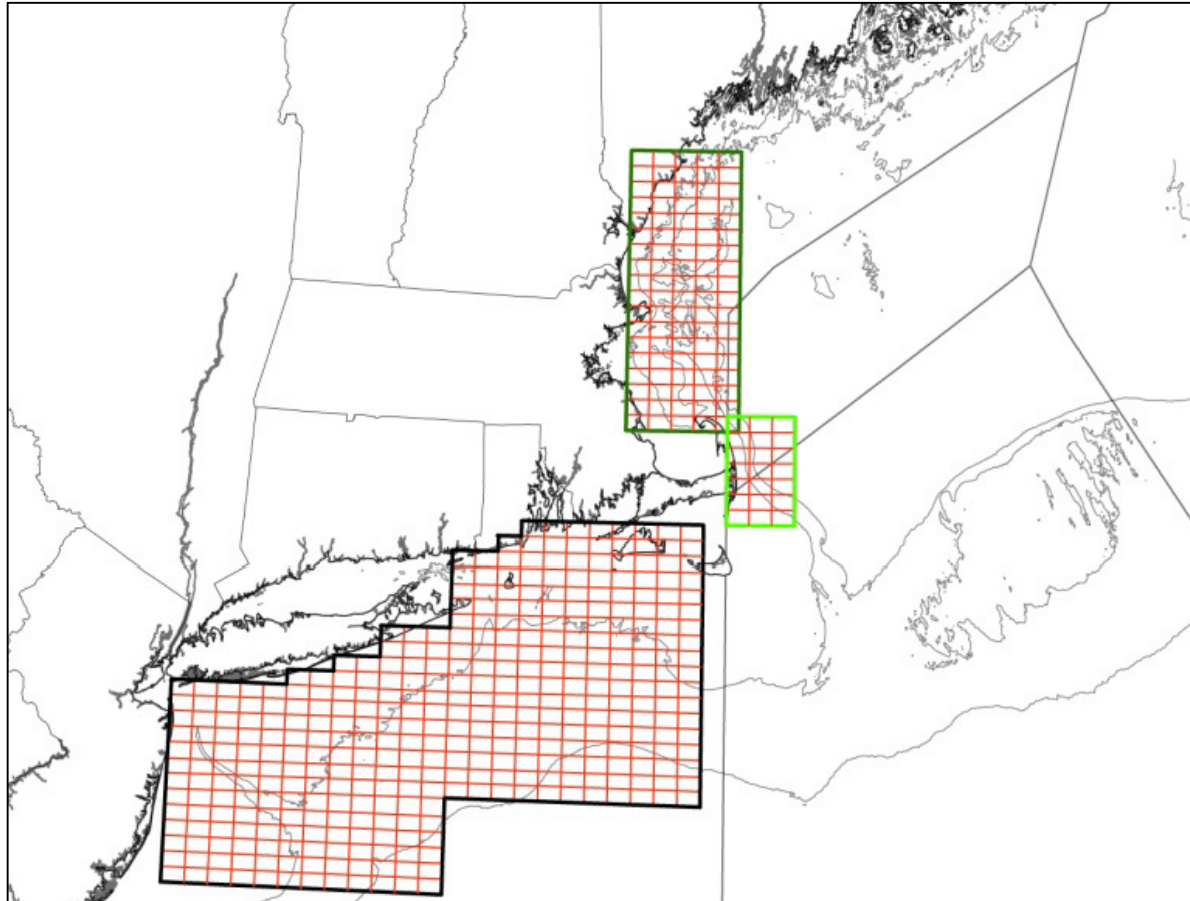
Trip Hail Weight: 30

Calculated Hail Weight (in kg): 600000.0 kg

Hail Weight Units: Pounds Metric Tons Trucks

River herring/Shad Bycatch Avoidance

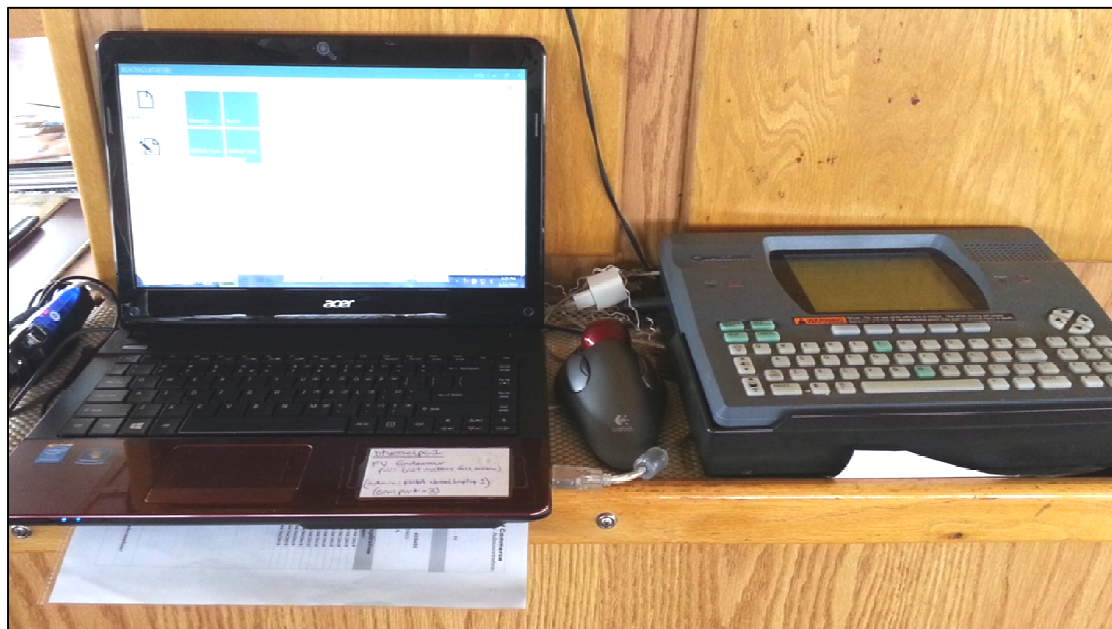
Advisories



RHS Bycatch Thresholds	Gulf of Maine	CapeCod/521	Area2/SNE MWT	Area2/SNE SMBT
HIGH	>1.00%	>0.25%	>0.60%	>1.00%
Moderate	1.00-0.30%	0.25-0.15%	0.60-0.20%	1.00-0.50%
Low	<0.30%	<0.15%	<0.20%	<0.50%

River herring/Shad Bycatch Avoidance

Sending Advisories



To: MWT Herring Fleet

From: Sea.herring@state.ma.us

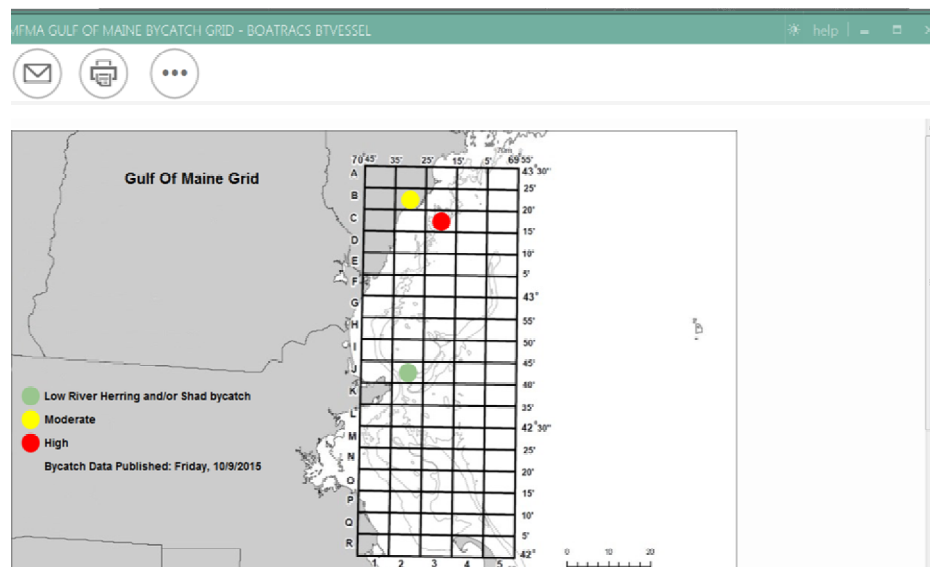
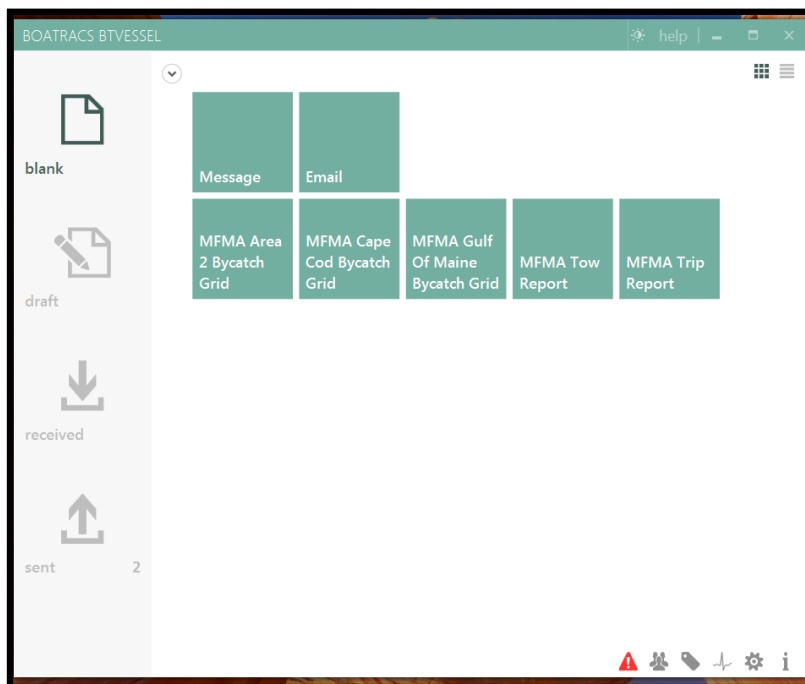
Immediate Bycatch Alerts

“Recent sampling has indicated HIGH bycatch (>0.6%) in Area2 grid cells J14, J15. Please be advised “

OR

Weekly Sampling Summaries

“For week ending 2/14/15- 7 trips sampled, avg RHS= 0.15% in Area2 grid. [Your vessel] had 2 trips sampled, avg RHS=0.35% “



River herring/Shad Bycatch Avoidance

Program Milestones

2012- ALL boats participating

2013- 1st Publication: *Developing a fine scale system to address river herring and American Shad bycatch in the U.S. northwest Atlantic mid-water trawl fishery*

Bethoney, N. D., B. P. Schondelmeier, K. D. E. Stokesbury, and W. S. Hoffman. 2013b. Developing a fine scale system to address river herring (*Alosa pseudoharengus*, *A. aestivalis*) and American Shad (*A. sapidissima*) bycatch in the U.S. northwest Atlantic mid-water trawl fishery. *Fisheries Research* 141:79–87

NEFMC endorses DMF/SMAST/SFC RHBA in Amendment 5,
Atlantic Herring Research Set-Aside (2014-2015) Awarded by NOAA

2014- 2nd Publication: *Characterization of River Herring Bycatch in the Northwest Atlantic Midwater Trawl Fisheries*

N. David Bethoney, Kevin D. E. Stokesbury, Bradley P. Schondelmeier, William S. Hoffman & Michael P. Armstrong (2014) *Characterization of River Herring Bycatch in the Northwest Atlantic Midwater Trawl Fisheries*, *North American Journal of Fisheries Management*, 34:4, 828-838

ALL boats reporting (and receiving bycatch reports) **electronically** via onboard laptops (TNC or SFleet) running BTVessel

River herring/Shad Bycatch Avoidance

Results

- Increased communication/awareness
 - Over 100 bycatch advisories sent
 - » Weekly and Immediate (for high events)
 - » Evidence of behavior changes
 - » Limited Entry into areas classified as high bycatch areas
 - Over 350 communications sent by vessels each year
 - Over 200 BTVessel Tow Reports sent so far

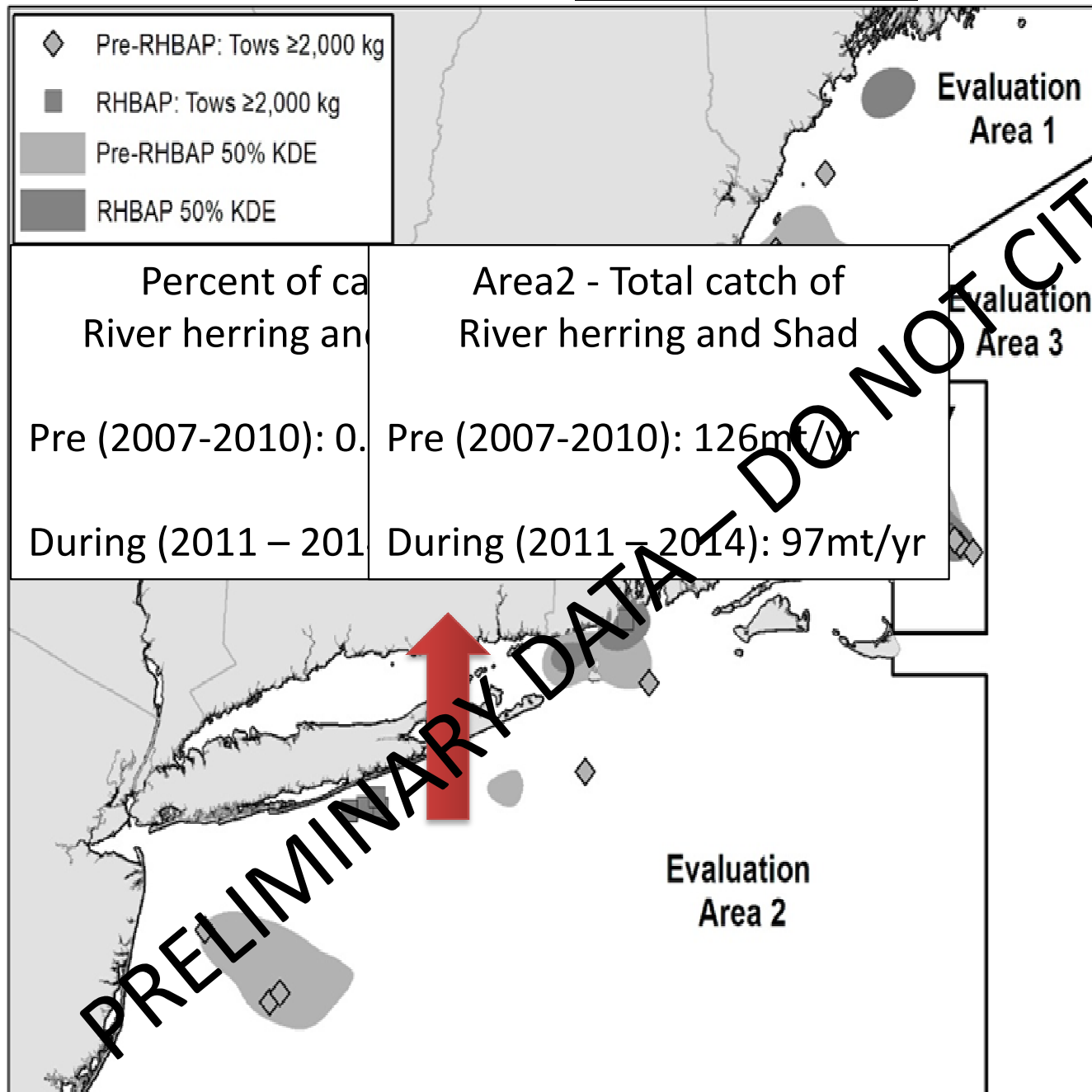
- Sustained Participation
 - All mid-water trawl vessels participating (**9/9** vessels report NEFOP data from at sea)

 - Majority of Rhode Island bottom trawl vessels participating (**6/8** that had >100mt last 2 yrs)

- Bycatch Reduction?
 - Exploitable time/space patterns
 - Numerical Evidence
 - Not designed as experiment
 - Total bycatch

River herring/Shad Bycatch Avoidance

Area 2 Results



Bycatch Rate?



Total Bycatch?



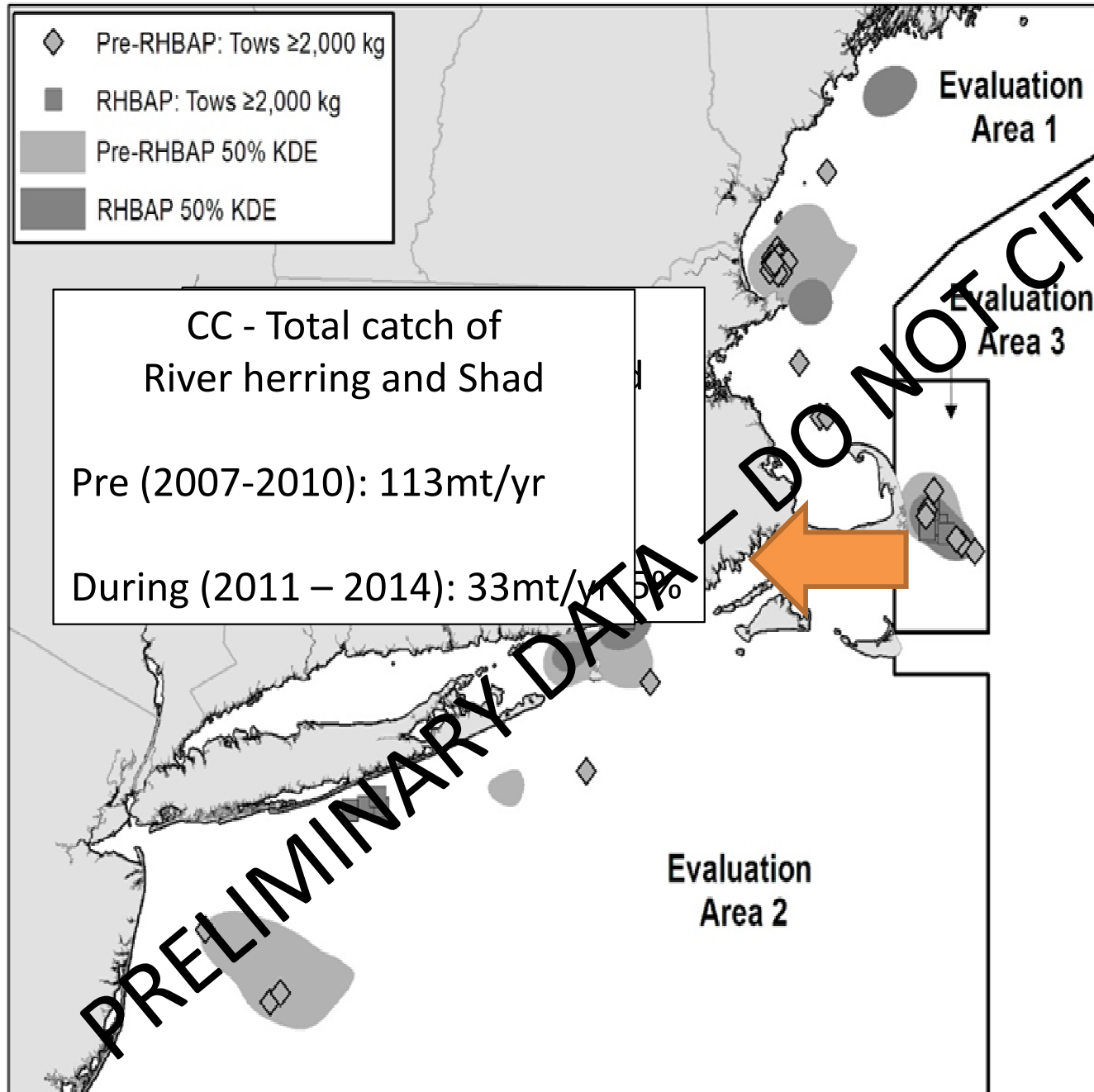
Methods Used:

1)RH Bycatch Advisories

2)Effort shift

River herring/Shad Bycatch Avoidance

Cape Cod/521 Results



Bycatch Rate?



Total Bycatch?



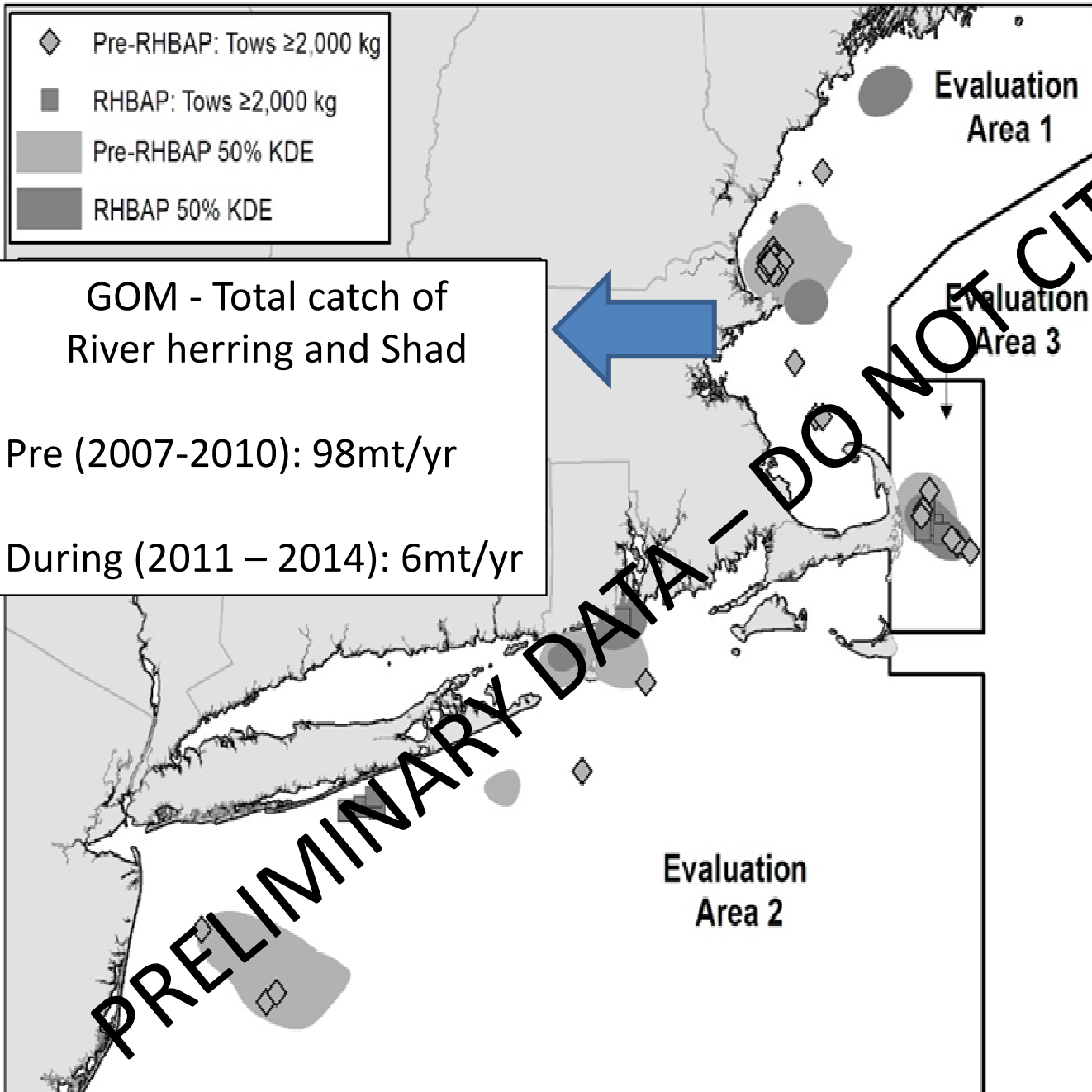
Methods Used:

1) RH Bycatch Advisories

2) Temporal understanding of RH migrations (RH not as abundant in migration corridor June-Oct)

River herring/Shad Bycatch Avoidance

Gulf of Maine Results



Bycatch Rate?



Total Bycatch?



Methods Used:

1) RH Bycatch Advisories

2) Spatial understanding:
RH and Atl Herring can use different depth contours in inshore GOM
(RH unlikely >40 fm)

River herring/Shad Bycatch Avoidance

Future Research Ideas

2016-2018 Herring Research Set-Aside (RSA)

1. Portside sample at least 50% of mid-water trawl trips landed in Massachusetts
2. Continue the river herring avoidance program with mid-water trawlers
3. Advance the avoidance program through incorporation of habitat forecasts (collaboration w/ MADMF and NOAA CR)
4. Comprehensive evaluation of program
 1. Total river herring and shad bycatch
 2. Bycatch rates
 3. Frequency of high bycatch events
 4. Fishing patterns
 5. Context of target species and river herring abundance, distribution, and catchability (in relation to the environment and regulations)

Other Ideas? Electronic Monitoring, Increased Portside Sampling, ...

Acknowledgements

Mid-water trawl

FVs: Western Venture, Osprey, Endeavour, Challenger, Enterprise, Retriever, Sunlight, Starlight, Providian, Voyager, Jean McCausland, Isabel Taylor, Nordic Explorer, Dona Martita

Numerous Industry members: Owners, managers, captains, shoreside personnel

Small mesh bottom trawl

FVs: Heather Lynn, Ocean State, Sea Breeze Too, Darana R, Prevail, Lightning Bay, Elizabeth&Katherine, Tiger Jo

Numerous Industry members: Owners, captains, shoreside personnel

Funding Sources



Atlantic Herring
Research Set
Aside Program
(NOAA
Cooperative
Research)

Collaborators

Northeast Fisheries Observer Program

Maine Dept. of Marine Resources

NOAA Study Fleet

A.I.S., Inc

P. Moore & D. Georgianna (project initiators)



NOAA FISHERIES
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION