

Determining Selectivity and Optimum Mesh Size to Harvest Three Commercially Important Mid-Atlantic Species

Applicants

Emerson Hasbrouck-Principal Investigator
 Cornell University Cooperative Extension
 Marine Program
 423 Griffing Ave
 Riverhead, NY 11901
ech@cornell.edu
 631-727-7850 ext. 319
 Educational Institution
 FEIN#11-6081424
 ASMFC Commissioner for NY

Jonathan Knight- Co-Principal Investigator
 Superior Trawl Inc.
 55 State Street
 Narragansett, Rhode Island
superiortrawl@aol.com
 401-782-1171
 Private-Fishing Industry

Collaborators

Long Island Commercial Fishing Association
 LICFA
 Bonnie Brady- Executive Director
 P.O. Box 191
 Montauk, NY 11954
greenfluke@optonline.net
 1-516-527-3099
 Non-profit

MAFMC Research Area Being Addressed

Priority # 5 Determine mesh selectivity for summer flounder and/or black sea bass to quantify selectivity at a range of mesh sizes, shapes, and configurations.

Proposed Start Date

April 30, 2016

Proposed End Date

April 30, 2017

Amount being requested under this proposal is \$158,687

Addendum Amount	\$ 32,000
-----------------	-----------

Amount Awarded	\$190,687
----------------	-----------

Determining Selectivity and Optimum Mesh Size to Harvest Three Commercially Important Mid-Atlantic Species

Executive Summary

Research Area Being Addressed

The Cornell University Cooperative Extension Marine Program (CCE) in collaboration with Jonathan Knight from Superior Trawl and members of the commercial fishing industry of the Mid-Atlantic region propose an at-sea research project aboard a commercial fishing vessel involved in the directed summer flounder, black sea bass (BSB) and scup fisheries of the Mid-Atlantic to address the MAFMC research priority # 5: Determine mesh selectivity for summer flounder and/or black sea bass to quantify selectivity at a range of mesh sizes, shapes, and configurations.

This priority has been selected by CCE based on review of the history of the scientific studies (or lack there-of) that form the basis of the minimum mesh size requirement for these species and input from the commercial fishing industry. We have decided to evaluate an additional species, scup, which is also a commercially important species to the MAFMC. All three of these species are managed with different mesh requirements. The regulations that have been implemented and data used to develop the management plans for all these species is approximately 20 years old. Additional and current research is needed to determine the selectivity for summer flounder, black sea bass and scup to evaluate the possibility of a common optimal mesh size for harvest of all 3 species as per discussions at recent MAFMC meetings. This would increase efficiency and streamline regulations as well as of improve and simplify fishing operations.

Brief Overview of Methods

The project goal is to analyze the selectivity of multiple codend mesh sizes relative to summer flounder, black sea bass and scup retention. Upon doing this we will recommend a possible management and implementation solution to sustain the state of the resources and to reduce the impact of the fishery on the ecosystem. Reducing the capture of undersized marketable species, which only influences fishing mortality without yielding economic benefit, could help the fishery by minimizing the handling and sorting time of catches and improving the quality of landings.

This study will compare the catch composition, commercial yield, retention efficiency, discards, and size selectivity parameters of 4 different codends in the commercial bottom trawl fishery in the Mid-Atlantic region. The methods proposed are to evaluate the selectivity of summer flounder, black sea bass and scup with the following codends of 4.5" diamond, 5" diamond, 5.5" diamond and 6" square mesh¹.

A single vessel will be used during this research to tow a specially constructed trouser trawl. The trouser trawl design, a single trawl net with two separate sections and individual codends, allows a control codend to be compared with an experimental codend on the exact same course during each tow. Therefore, each individual tow made by the vessel will be in of itself a replicate tow due to the inherent nature of the trouser trawl net design. CCE has used this trouser trawl net in previous studies and has found it to be an effective and proficient study method.

We propose conducting 20 tows per treatment for a total of 80 tows for the project. The trouser trawl allows us to perform a direct comparison to the control every tow therefore maximizing the efficiency of the study. Fourteen research days will be needed to complete all 80 tows. Fishermen and CCE staff will aim to perform 6 one-hour tows per day.

Experimental sampling will occur from August –November 2016, in order to take

¹ Addendum added May 2016 to add one additional mesh (6" diamond) to sampling regime.

advantage of optimum conditions in the summer flounder, black sea bass and scup fisheries. The study vessel, F/V Caitlin & Mairead, owned and captained by David Aripotch, from Montauk, is an active participant in directed fisheries of summer flounder, scup and black sea bass. We will plan research trip depending on reported concentrations of summer flounder, black sea bass and scup collected from industry. Steaming time to the grounds will typically be a couple of hours or less. Research fishing will occur from south and east of Block Island to south of Long Island according to fish movements and intensity. These areas are located in NMFS statistical areas 539,613, 612 and 611. We have selected the project time period because these species currently mix at these locations before and during their fall migration offshore. Fourteen days of experimental fishing will occur between August and November.

To assist in project development and implementation CCE will establish a Program Advisory Committee (PAC). The PAC will be formed to define final specific overall at-sea research design of the project. The PAC will have input on tow locations, monitor project activities and results, and provide real-time adaptive recommendations.

Measurable Outcomes

This project will provide timely, accurate and comprehensive data to be used for science based management strategies that protect and rebuild fisheries resources while minimizing impacts to fishing communities. The objective of collaborative efforts with industry is to achieve both the sustainability of the fishery resources important to the Mid-Atlantic and the sustainability of the livelihoods and economic well-being of the harvesters and coastal communities that depend on these resources. Results of this study can be directly incorporated into the management of these three species through a FMP Amendment/ Framework/ Addendum process.

CCE will quantify the selectivity of each experimental codend tested and make all catch data available to the funding agency. CCE will provide a description of project accomplishments and progress towards objectives and performance measures in progress reports and in the final report. CCE will conduct outreach and education on these 3 commercially important species. Industry collaboration and results will be posted to the CCE website and social media. This collaboration is a proactive effort focused on increasing the knowledge of mesh selectivity and protecting the resource for sustained future harvest.

Main Proposal

Introduction/background

Knowledge of gear selectivity is crucial to good fisheries management. Its improvement contributes to minimizing the capture of juveniles by regulating the size at first capture, increasing the yield per recruit of targeted species, and reduces discards and hence the impact of fishing on ecosystems (Armstrong et al., 1990; MacLennan, 1992; Knuckey et al, 2008; Dixon et al, 2013). This project proposes to evaluate the selectivity of current regulation mesh sizes of 3 important Mid-Atlantic species; summer flounder, black sea bass (BSB) and scup. Currently all three of these species have different mesh size requirements. We propose to comparatively evaluate the mesh selectivity for these 3 species. The minimum mesh sizes for these 3 species are based on old (or non-existing) studies that have inherent weaknesses in their design and their results may be inadequate as detailed below and in the Appendix. As such this study will re-affirm these mesh sizes relative to current fish minimum retention size or propose new options for management. In testing the multiple mesh sizes in current regulation for all of these species we may offer the possibility of one common mesh size to be used.

Summer flounder, scup and black sea bass are managed under the same Fishery Management Plan (FMP). The original FMP was developed in 1988 focusing on summer flounder (fluke). Scup and BSB were added in 1996. An important component to fisheries management is the designation of a minimum mesh size. Currently the minimum fish size for fluke, scup and BSB are 14", 9" and 11" respectively. The fluke minimum mesh requirement is 5.5" diamond or 6" square mesh, scup is 5" diamond mesh and BSB is 4.5" diamond mesh. The research used to determine these regulations was performed decades ago. A current study is needed and requested to comprehensively re-examine mesh selectivity for these 3 species. Additionally results may provide a basis for 1 or 2 common mesh sizes to provide the required selectivity for these species rather than requiring 4 different mesh sizes. Standardizing the mesh size for all these species has been suggested but not researched. MAFMC's Monitoring Committee (MC) and ASFMC's Technical Committee (TC) reviewed the summer flounder, scup and BSB management measures in 2015. One Advisory Panel (AP) member noted that these commercial fisheries are mixed fisheries (i.e., the three species are often caught together), but they have different minimum mesh regulations. This AP member thought a 5" minimum mesh size could be used for all three species during the winter when juveniles of all 3 species are found inshore but the commercial fishery mostly operates offshore (MAFMC, 2015).

Fisheries and fish change over time, scientific methods vary and improve. New fish biology information has become available that suggests new trends in age and growth (MAFMC, 2015). The study used to base the fluke minimum mesh size, Anderson et al., 1983, was performed over 20 years ago and the mesh size of the experimental codends were different per vessel due to material type. Also statistical analysis methods have advanced since that time. The mesh selectivity studies used to inform scup management were conducted by DeAlteris and Riefsteck in 1992 and were simulations of commercial fishing activity in flume tanks using rod and reel caught fish. The codend in the tank was attached to a towing sled and was constructed with a covered codend to which may have affected the already flawed and simulated results. In developing the BSB minimum mesh regulation there was a lack of mesh selectivity information (which still holds true today) so data was used from a Weber and Briggs (1983) lobster trap study that determined a mesh size estimate based on a relationship between body depth and length. Due to proposal format constraints the studies that have quantified codend selectivity for these 3 species are further described in Appendix A. With all due respect to these studies at-sea research is difficult to perform due to many uncontrolled variables but CCE has a successful track record for collaborating with industry and successfully performing at-sea research.

Goals and Objectives

The project goal is to determine the selectivity of multiple codend mesh sizes and shapes relative to summer flounder, black sea bass and scup retention.

Objectives related to this goal are:

- Effectively determine the selectivity of 4.5" diamond, 5" diamond, 5.5" diamond and 6" square mesh codends for all 3 species
- To determine if one or more of these mesh sizes effectively reduces the catch of juvenile summer flounder, black sea bass and scup
- To evaluate the current mesh size regulations relative to current minimum retention size of each of these 3 species
- To demonstrate what the potential is for a possible successful common mesh size to reduce discards in the Mid-Atlantic fisheries
- To complete an applied experiment across a wide range of strata and conditions including: areas, depths, bottom type, and reflective of the summer flounder, black sea bass and scup fisheries.
- Validate these results for fishery managers and fishermen.

These objectives respond directly to the stated research priority to determine mesh selectivity for summer flounder and/or black sea bass to quantify selectivity at a range of mesh sizes, shapes, and configurations.

Methods

This study will compare the catch composition, commercial yield, retention efficiency, discards, and size selectivity parameters of 4 different codends in the commercial, bottom trawl fishery in the Mid-Atlantic region. The methods proposed are to evaluate the selectivity of summer flounder, black sea bass and scup with the following codends: 4.5" diamond, 5" diamond, 5.5" diamond and 6" square mesh (see footnote 1).

Data will be collected onboard a commercial fishing vessel targeting summer flounder, black sea bass and scup. Tows will be conducted using a trouser trawl already constructed for use in this study. A single vessel will be used during this research to tow a trouser trawl. The trouser trawl design, a single trawl net with two separate sections and individual codends, allows a control codend to be compared with an experimental codend on the exact same course during each tow. Therefore, each individual tow made by the vessel will be in of itself a replicate tow due to the inherent nature of the trouser trawl net design. Replicate tows are defined to mean a comparison of sequentially exact tows using control and experimental gear. The trouser trawl was created by removing the back end of a typical trawl (420 x 16 cm, 4 seam) used in the mixed fish bottom trawl fishery by vessels with similar parameters to the vessel used during this research. The trawl was cut off 2.5 meshes behind the fishing circle for the entire circle of the trawl. The removed back end was replaced with a two-legged back end creating a "trouser". The "trouser" itself was constructed from 16 cm, 12 cm and 6 cm webbing. The legs of the "trouser" were then completed with a control codend consisting of a 6.5-inch diamond mesh strengthener and a control liner (2 1/8") on one side. The other side or leg of the "trouser" will be outfitted with the experimental codends we propose to evaluate; 4.5" diamond, 5" diamond, 5.5" diamond and 6" square. The codends will be ringed to facilitate switching them between the legs. We will switch the trawl leg on which the control and experimental cod ends are placed every 2 tows to randomize any possible " side" effect of the trawl. In Appendix C is the schematic of the actual net to be used during this project as supplied by Jon Knight of Superior Trawl. Jon Knight is a

partner on this project and has already constructed the trouser trawl minus the experimental codends. This net design has proven to be functional and effective in the scientific realm of at-sea research. Since the “trouser split” occurs at the front of the net, once fish are in the net they cannot move to the other side in reaction to different back pressures caused by different cod end mesh sizes. CCE in coordination with Commercial Fisheries Research Foundation, Sea Freeze Ltd and Northeast Cooperative Research Program (NCRP) have used this trouser trawl to successfully perform the evaluation of butterfish codend selectivity (Hasbrouck et al., in preparation). Jon Knight and CCE are offering this net as match to this proposed project. (See Budget Narrative in Appendix D)

Depths, locations and gear deployment methodology will otherwise be standard for the fishery. Starting and hauling depths, positions, times and tow warp length will be recorded for each tow. Tow speeds, tow cable scope and tow cable length will be maintained consistently across all tows. We propose conducting 20 tows per treatment for a total of 80 tows for the project. The trouser trawl allows us to perform a direct comparison to the control every tow therefore maximizing the efficiency of the study. Fourteen research days will be needed to complete all 80 tows. Fishermen and CCE staff will aim to perform 6 one-hour tows per day. The onboard catch processing will follow standard NMFS survey methods. However, our targets are summer flounder, black sea bass and scup relative to quantifying differences in retention and size distribution between control and experimental codends. As such, total summer flounder, black sea bass and scup for each tow will be accurately weighed. Summer flounder, black sea bass and scup will also be sampled for length frequency. The goal will be minimally 200 random length measurements of each species per tow. If fewer individuals are caught, all will be measured. The total weight of all species in each tow will also be obtained either by direct weighing of the total catch, or for large catches, the entire catch will be placed in baskets and a sub-sample of the baskets weighed.

The vessel to be used in this project is the F/V Caitlin & Mairead, homeport Montauk, New York. The F/V Caitlin & Mairead is a 65-foot, 83 gross tonnage steel stern trawler built in 1993. The vessel has 700 H.P., two hydraulic net reels and an ITI Trawl Monitoring System (door mounted sensors that report net spread). Net spread will be recorded for each tow and will aim to be consistent among tows. Codend mesh measurements will be taken at the beginning and end of each of each research day for each codend used.

For this project we will look at the selectivity patterns for the four experimental codends. For statistical analysis we will follow the method used by Hendrickson (2011) to look at selectivity of butterfish and other species in the longfin squid fishery. Hendrickson used the SELECT logistic model (Share Each Length’s Catch Total) based on Millar (1992) and Millar and Walsh (1992) as well as the “tfit” function in the “Trawlfunctions” programs for R (Millar et al., 2004). The model uses a maximum likelihood estimation based on the expected proportion of catch in the experimental codend relative to the total catch in both nets for each length interval. The combined hauls approach will be used to account for between haul variability. The results of the SELECT logistic model will provide the best fit of the data. See Appendix E for more detail on the SELECT model. Dr. Patrick Sullivan of Cornell University will perform the data analysis. Dr. Sullivan is accomplished in fisheries statistics and research design.

Time & Area

In order to take advantage of optimum conditions in the summer flounder, black sea bass and scup fisheries, experimental sampling will occur from August -November. The study vessel,

F/V Caitlin & Mairead, owned and captained by David Aripotch, from Montauk, is an active participant in directed fisheries of summer flounder, scup and black sea bass. We will plan research trip depending on reported concentrations of summer flounder, black sea bass and scup collected from industry. Steaming time to the grounds will typically be a couple of hours or less. Research fishing will occur south of Block Island and south of Long Island. These areas are located in NMFS statistical areas 539, 613, 612 and 611. We have selected this time because these species currently mix at these locations before and during their fall migration offshore. Fourteen days of experimental fishing will occur between August and November. See detailed timeline in Appendix B.

Permits

An application for an Exempted Fishing Permit (EFP) will be submitted upon funding notification. An EFP will be needed for this research to be performed because small mesh (2 1/8") will be used in the control codend. We will need an exemption from the minimum mesh size to fish for fluke, scup and BSB not only using the small mesh control net but also to use the 4.5" mesh and 5" mesh for fluke. And the 4.5" mesh for scup. To minimize discard due to research we are working with a vessel licensed for fluke, scup and BSB in NJ and NY. Due to the inability to use Mid-Atlantic Research Set Aside (RSA) quota for these 3 species, we hope to reduce dead discards from being thrown overboard by landing in multiple states. This is also why the vessel has offered a reduced charter fee (See Budget Narrative in Appendix D). CCE will also apply for any state licenses that may be needed to collect and possess fish for sampling purposes. CCE is experienced in the permit application process and has been issued EFP's and state permits to perform all previous studies.

Specific Results Expected

This project will provide up-to-date mesh selectivity parameters of 4 different mesh sizes for each of our target species: summer flounder, scup and black sea bass. These selectivity parameters will be based on a project that is of sound scientific design conducted at-sea aboard a commercial trawler using current net material and utilizing current acceptable data analysis methods for selectivity studies. This project will provide timely, accurate and comprehensive data to be used for science based management strategies that protect and rebuild fisheries resources while minimizing impacts to fishing communities. This study will provide data that could be used to determine a trawl mesh size that is more efficient and environmentally effective at sustaining conservation goals. This project will recommend a possible management and implementation solution to sustain the state of the resources and to reduce the impact of the fishery on the ecosystem. Reducing the capture of undersized marketable species, which only influences fishing mortality without yielding economic benefit, could help the fishery by minimizing the handling and sorting time of catches and improving the quality of landings. The objective of collaborative efforts with industry is to achieve both the sustainability of the fishery resources important to the Mid-Atlantic and the sustainability of the livelihoods and economic well-being of the harvesters and coastal communities that depend on these resources. CCE will quantify the effectiveness of each experimental codend tested and make all catch data available to the funding agency. CCE will provide a description of project accomplishments and progress towards objectives and performance measures in progress reports and in the final report.

Collaboration

As is shown by the partners and collaborators that will be involved in the project, there is significant collaboration and stakeholder involvement. The project is a partnership between academia (CCE and Cornell Main Campus), a net maker, a commercial fisherman and a commercial fishermen's association. All project partners bring a specialized expertise to the table to provide for a well-rounded project with a high likelihood of success.

Another component of collaboration proposed by this project is the development of a Program Advisory Committee (PAC). The PAC is a successful method that CCE has implemented on almost all research projects. The PAC consists of multiple commercial industry partners, net builders, scientists and fisheries managers. The PAC will be convened after notification of funding and prior to the performance of at-sea research and will be updated throughout the project. The PAC will finalize experimental trip parameters based upon optimum conditions relative to the season and fishing grounds with focus on tow plots, fishing gear deployment, and overall experimental fishing plan. The PAC will also use its expertise and knowledge to overview ongoing field research activities with the purpose of trouble shooting any problems encountered. Long Island Commercial Fishing Association (LICFA) members will participate on the PAC. LICFA will also assist with outreach and dissemination of results to industry.

Formation and expansion of partnerships between commercial fishermen and scientists is a positive outcome of the project. Enabling fishermen to participate in cooperative research will result in the development of improved gear solutions. This project will bring fishermen's information, experience, and expertise into the scientific framework needed for fisheries management. By using commercial fishing vessels as research platforms it will produce tools that are industry-tested, acceptable and more readily adopted as a bycatch solution.

Budget Table- (See Budget Narrative in Appendix D) **Modified Budget Reflecting Addendum**

<u>Item</u>	<u>Project Cost for additional mesh size</u>	<u>Total Project Cost to MAFMC w/o Match</u>	<u>Other Funding Full Project Match</u>
<u>Personnel (Salary)</u>			
<u>Project Coordination(P.I.) .8 month total</u>	<u>\$750</u>	<u>\$5,250</u>	
<u>Fishery Specialist 2 2 people-7 months total</u>	<u>\$5,300</u>	<u>\$43,300</u>	
<u>Fishery Technician 1 2 people-6 months total</u>	<u>\$3,000</u>	<u>\$13,000</u>	
<u>Secretarial .5 month total</u>	<u>\$0</u>	<u>\$1,500</u>	
<u>Unemployment Insurance</u>	<u>\$100</u>	<u>\$590</u>	
<u>Workers Compensation</u>	<u>\$100</u>	<u>\$580</u>	
<u>Fringe Benefits on all CCE Salaries</u>			<u>\$33,782</u>
<u>Total Personnel</u>	<u>\$9,250</u>	<u>\$64,220</u>	
<u>Non-Personnel</u>			
<u>Travel -Local travel</u>	<u>\$200</u>	<u>\$1,700</u>	
<u>Equipment-Scientific Scales, Computers, etc</u>	<u>\$0</u>	<u>\$0</u>	<u>\$20,000</u>
<u>Supplies -Scientific Sampling & Safety Gear</u>	<u>\$0</u>	<u>\$2,500</u>	
<u>At-Sea Provisions</u>	<u>\$300</u>	<u>\$3,100</u>	
<u>Special Insurance Needs</u>	<u>\$300</u>	<u>\$3,300</u>	
<u>Communication/Outreach</u>	<u>\$0</u>	<u>\$2,000</u>	
<u>Contractual</u>			
<u>Jonathan Knight Superior Trawl-Gear</u>	<u>\$1,500</u>	<u>\$11,500</u>	<u>\$15,000</u>
<u>Dr. Patrick Sullivan (Cornell University) - statistical analysis</u>	<u>\$0</u>	<u>\$5,000</u>	
<u>F/V Caitlin & Mairead Vessel Charter Fee 18 days total</u>	<u>\$18,000</u>	<u>\$81,000</u>	<u>\$18,000</u>
<u>CCE Admin Fee (15% on CCE costs)</u>	<u>\$1508</u>	<u>\$11,523</u>	
<u>CCE Admin Fee 5% on contractual</u>	<u>\$975</u>	<u>\$4875</u>	
<u>Totals</u>	<u>\$32,033</u>	<u>\$190,718</u>	<u>\$86,782</u>

Statement of Qualifications & Staffing Plan

To date, CCE has been awarded multiple research projects involving collaboration with the commercial fishing industry including four MAFMC Research Set-Aside projects, a Monkfish RSA project, two Northeast Cooperative Research Program (NCRP) projects, two SNECRI projects, Commercial Fisheries Research Foundation (CFRF) funded projects, Bycatch Reduction Engineering Program (BREP) projects, NOAA Marine Debris projects, etc. All research projects conducted by CCE were successfully completed and included extensive cooperation and collaboration with the fishing industry. CCE staff has successfully completed numerous at-sea research projects. All progress and final reports for all projects were completed and submitted on time and have been accepted and approved by NMFS. CCE has a successful history and proven track record of developing and implementing at-sea research projects in cooperation with the industry. The results of many of these projects have been directly incorporated into stock assessments and management measures. For example: 2 RSA projects verified and updated the discard mortality of summer flounder in the trawl fisheries (Hasbrouck et al., 2008; Hasbrouck et al., 2012) 2 NCRP projects that have resulted in the designation by NMFS of the large mesh belly panel as an approved gear for small mesh fisheries when their accountability measure is triggered for Georges Bank yellowtail flounder (Hasbrouck et al, 2014; Hasbrouck et al., 2015).

This project is collaboration between Cornell University Cooperative Extension Marine Program (CCE), Gear designer Jonathan Knight, fisherman David Aripotch and Dr. Patrick Sullivan of Cornell University (CU). CCE is the lead entity on the project. CCE will provide full fiscal oversight and accountability. CCE will coordinate the mesh selectivity initiative. CCE will provide personnel for at-sea project activities. Specific duties of the participating collaborators and scientists include the following:

Emerson Hasbrouck (CCE) will serve as the principal investigator and project leader. Hasbrouck will be responsible for the design of the field program, report writing and publication of results and fiscal oversight.

Fisheries Specialists (CCE) will be responsible for assisting with project design, implementation, and industry interaction, coordinating at-sea sampling activities, website communication, outreach, data analysis, and final report writing.

Fisheries Technicians (CCE) will participate in the scientific party at sea, handle cruise mobilization duties, conduct at-sea catch sampling, and complete data entry.

Dr. Patrick Sullivan (CU) will be responsible for overall statistical project design and statistical analysis of all data collected.

Jonathan Knight of Superior Trawl will be responsible for technical gear oversight, codend configuration and construction, net installation.

Captain David Aripotch of the Caitlin & Mairead will be responsible for contributing commercial fishing knowledge and fishing vessel operation.

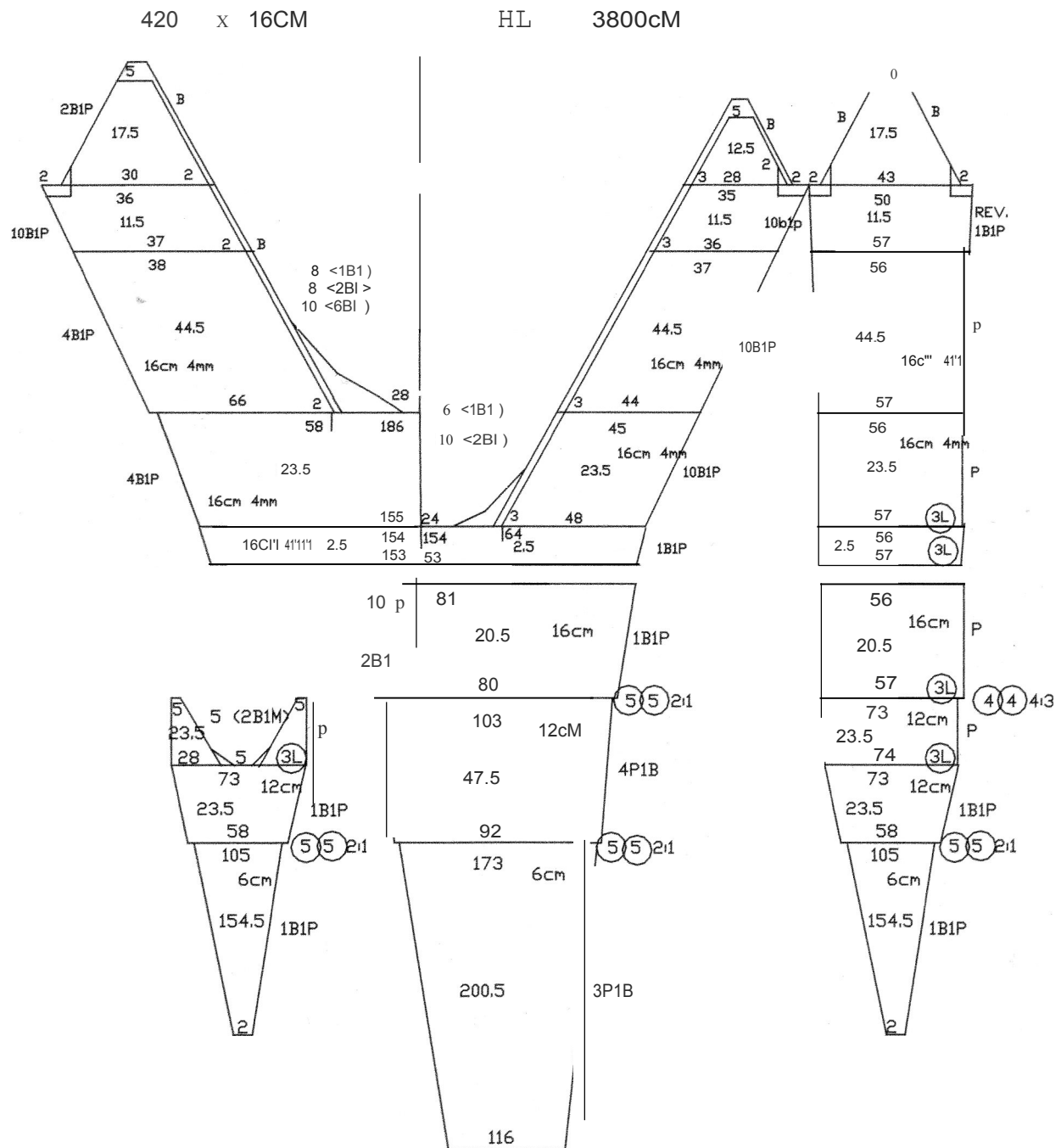
Long Island Commercial Fishing Association (LICFA) will participate on the PAC and assist with outreach and dissemination of results.

Appendix A Background Material Removed

B. Project Timeline

Activities (month)	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan 2017	Feb	March	April
Project Roll out & Permit Application	X	X	X										
Gear Work & Installation				X	X								
At-sea research					X	X	X	X					
Data entry/audit						X	X	X	X				
Data Analysis									X	X			
Outreach/ed ucation	X	X	X	X	X	X	X	X	X	X	X	X	X
Report prep (progress & final)						X						X	X

C. Trouser Trawl Net Plan



D. Budget Narrative

Project Coordinator/Principle Investigator (\$4500) - .5 month-Emerson Hasbrouck will lead the project and be responsible for oversight and implementation of the proposed project, fiscal oversight, report writing and publication of results.

Fisheries Specialist 2 (\$38,000)-2 people- 6 months- Fisheries Specialist 2 will be responsible for assistance with project design, coordination of, and participating in, all at-sea activities, project oversight, permit application, website communication, outreach, data auditing and report writing.

Fisheries Technician 1(\$10,000)-2 people- 4 months- will participate in the scientific party at-sea, handle cruise mobilization duties, conduct catch sampling and complete data entry.

Secretarial (\$1500) -.5 month- Marine Program Administrative Asst. will participate in secretarial duties specifically mailings, report revisions and communications assistance.

Unemployment Ins/Workers Compensation (\$971.02) Required by Cornell.

Fringe Benefits Package (\$27,962.18) *Match* - on all CCE Salaries is provided as matching funds for this project.

Travel (\$1500) - is for local mileage, and travel expenses to meetings as needed.

Equipment (\$20,000) *Match*- 2 Marel Motion Compensated scales, Panasonic Toughbook Laptop, Go Pro Camera, GPS and associated scientific equipment and software are offered as match for this project.

Supplies (\$2,500) - Sampling Supplies and Safety Gear (measuring boards, baskets, waterproof paper, notebooks, foul weather gear, boots, gloves), safety equipment (life raft service, survival suits, personal EPIRBS, life jackets, etc.), will all be needed to be purchased or serviced to conduct the 14 sea days for the at-sea component of the proposed project.

At-Sea Provisions (\$2800) – includes food, drink and additional provisions for at-sea days at ~\$200/day for 3-4 people.

Special Insurance Needs (\$3000)- Maritime Employers Liability, Protection and Indemnity and General Liability are all needed to cover liability of the scientific crew and vessel.

Communication/Outreach (\$2000) -covers landline and cell phone charges related to the project. Mobile Internet and data usage charges will be covered under this budget line. Also covers outreach materials such as flyers, mailings, website, and presentation materials.

Jonathan Knight- Superior Trawl Inc. (\$10,000) will be responsible for all needed gear. 4 experimental codends will be constructed and installed on the trouser trawl. The body of the trouser trawl is being offered as match to this project. (\$15,000)

Dr. Patrick Sullivan (\$5,000)-Cornell University will be responsible for all statistical analysis of project data.

F/V Caitlin & Mairead (\$63,000) The vessel charter fee is based on \$4500.00 per fishing day at sea and includes vessel costs, captain, crew and fuel. Budget is based on 14 total fishing days. This agreed upon rate is a discounted rate provided by the vessel owner/captain David Aripotch. A \$1,000/day rate of match has been provided for this project (\$14,000).

Administrative Overhead - CCE charges 15% on direct costs (\$10,015.65) and 5% on subcontracts (\$3,900) for: accounts receivable, accounts payable, purchase order processing,

grant accounting, other bookkeeping and financial services, external audit, insurance, administration, internet access, IT support, payroll, human resources, photocopying, etc.

a Limnoterra digital measuring board connected to a laptop computer. Fork length (FL) was recorded for butterflyfish and silver hake and dorsal mantle length (DML) was recorded for the two squid species.

For each tow and net, species-specific catch numbers-at-length were computed as the subsampled numbers-at-length multiplied by the species-specific ratio of catch weight to subsample weight. Catch numbers per tow were computed for each net as the sum of the expanded numbers-at-length of each species. The catch rates of each net were standardized for the area swept by the trawl during each tow. Swept area was computed as the product of the average doorspread, between net touchdown and lift-off, and tow distance. Tow distance was computed as the sum of the GPS tow distance measurements recorded between net touchdown and lift-off.

2.2. Comparison of experimental and Loligo fleet towing regimes and codend mesh sizes

Data collected by fishery observers from the Northeast Fisheries Observer Program (NEFOP), during 1997–2008, were summarized to compare tow duration and towing speed, as well as codend and strengthener mesh characteristics of the Loligo fleet, with those used in the study. NEFOP observers collected ten random mesh size measurements of the codend strengthener and one to four measurements of the codend (inside stretched) measured to the nearest mm with vernier calipers. The means of these mesh size measurements were used in the analysis. The Loligo fleet was defined using the regulatory definition of a directed trip which includes vessels landing greater than 1134 kg of Loligo per trip. Loligo catches from these trips were graphed as proportions, by 2 mm and 5 mm mesh size intervals, to characterize codend and strengthener mesh size characteristics of the fleet, respectively. The codend mesh size composition of the fleet was also compared to the codend mesh size composition of all bottom trawl trips in the NEFOP database which caught butterflyfish during 1997–2008.

2.3. Estimation of selectivity parameters

The SELECT model (Share Each Length's Catch Total) was used to estimate selectivity parameters and the relative fishing intensity of the experimental net (Millar, 1992; Millar and Walsh, 1992). The model uses a maximum likelihood estimation approach where the expected proportion of the total catch (in both nets), for length class l , that was caught in the experimental codend, $<l(l)$, is modeled as a function of the parameters a , b , α , and the relative fishing efficiency (p) of the gear (often called the “split” parameter) such that:

$$<l(l) = \frac{r \cdot p \cdot \exp(a + b) \cdot l^{1/\alpha}}{(1 - p) + \exp(a + b)} \quad (1)$$

where the parameter α quantifies the amount of asymmetry and is equal to 1 for a logistic curve.

Selectivity parameter estimates were obtained by fitting the SELECT model to the combined hauls catch-at-length data, binned as the midpoint of 5 mm intervals, with the use of the “*ttfit*” function in the “*Trawlfunctions*” programs for R (Millar et al., 2004). Model fits were assessed using model deviances and degrees of freedom calculated using length classes with expected catches greater than three in each net and from examination of the deviance residuals plotted by length class.

The combined hauls approach was used to account for between haul variability and to estimate the standard errors of the selectivity parameter estimates. The model was fit, using the “*Rep.ttfit*” function in the “*Trawlfunctions*” programs (Millar et al., 2004), to the stacked haul data to calculate a replication estimate of overdispersion called REP, computed as the Pearson chi-square statistic from the model divided by the degrees of freedom (McCullagh

and Nelder, 1989). When present, between-haul variation was accounted for by multiplying the standard errors of the parameter estimates by $\sqrt{\text{REP}}$ (Millar et al., 2004). Other methods can also be used to account for between-haul variability (Millar and Fryer, 1999). Nonlinear mixed-effects models similar to those described in Millar et al. (2004) were investigated but are not presented here because of convergence problems. This difficulty has been noted by others (Millar et al., 2004; Millar, 2010). In cases where mixed-effects models could be fit, standard errors of the selectivity parameter estimates were slightly lower, but the parameter estimates were similar to those from the combined hauls approach. In view of these problems, and because the final estimates were robust to the modeling approach, the combined hauls method was used in the subject study. The combined hauls approach was robust to the variability in the data, allowed weighting of individual hauls by the size of the catch, and satisfied the study objective of estimating a mean contact–selectivity curve that relates to the Loligo fishery (Millar and Fryer, 1999; Millar, 2010).

2.4. Evaluation of catch rate differences

Paired-comparisons t-tests were conducted using PROC TTEST in SAS (SAS Institute Inc., 1999) to determine whether the mean differences in standardized catch rates, between the control and experimental codends, were significantly different from zero for each of the four species. Catch rates were standardized for area swept by the trawl then log-transformed prior to analysis. In addition, Wilcoxon signed rank tests for paired differences were also conducted using the *Wilcox.test* function in R. For species that exhibited reductions in bycatch, the effectiveness of the codend mesh size increase was evaluated in terms of the percent reductions at sizes above and below the median length at maturity for females; 120 mm for butterflyfish and 232 mm for the southern stock of silver hake, respectively (O'Brien et al., 1993).

Three additional analyses were conducted to evaluate potential impacts of the codend mesh size increase on the Loligo fishery. The analyses utilized data from the study as well as Loligo landings and length data obtained from the Commercial Fisheries Database System maintained by the Northeast Fisheries Science Center of the National Marine Fisheries Service. The analyses included data for 1997–2008 because reporting of Loligo landings and purchase prices (i.e., ex-vessel value) were mandatory during this period. As described in Section 2.2, the Loligo fleet was defined using the regulatory definition of a directed trip. Throughout the year, field staffs from the National Marine Fisheries Service randomly sample the length composition of Loligo landings by market size category. Samples consist of at least 100 squid per market size category and averaged one sample per 98 mt during the 1997–2008 study period. Dorsal mantle lengths were measured to the nearest cm. Although there is some overlap in the length ranges of market size categories, Loligo frozen at sea are generally classified by squid dealers as: #6 (<8 cm), #5 (8–12 cm), #4 (12–16 cm), #3 (16–20 cm) and #2 (>20 cm). Taking into account market size categories and the predominant size range of Loligo discarded by the directed fishery, individuals <10 cm DML, the loss of Loligo catch was evaluated based on the following length bins: <10 cm, 10–12 cm, 13–16 cm, 17–20 cm and >20 cm. Length samples which were not classified by market size category were prorated to assign a market category, using a Loligo length–weight equation derived from the Northeast Fisheries Science Center (NEFSC) autumn bottom trawl surveys (Lange and Johnson, 1981).

The first of the three analyses to determine the effects of the codend mesh size increase on the Loligo fishery involved quantification of Loligo catch loss, by market size category, using data from the study. Loligo catch weights from the study were converted to weight-at-length data using the Lange and Johnson (1981)

Literature Cited

- Anderson, E.D., J.M. Mason, A.M.T Lange, and C.J. Byrne 1983. Codend mesh selectivity in the Long Island spring trawl fishery for summer flounder and associated species. Ref. Doc. 83-33, Woods Hole Lab., Natl. Mar. Fish. Serv., NOAA, Woods Hole, MA 02543, 65 p.
- Armstrong, D. W., Ferro, R. S. T., MacLennan, D. N., and Reeves, S. A. 1990. Gear selectivity and the conservation of fish. *Journal of Fish Biology*, 37A: 261e262.
- Beutel, D., L. Skrobe, R. Sykes, K. Ketchan, C. Brown, and B. Knight. 2004. Effect of increasing mesh size in the summer flounder fishery in the Southern New England and inshore Rhode Island waters. University of Rhode Island, URI Fisheries Center Technical Report, Wakefield, RI 28p.
- Bochenek, E.A., E.N. Powell, A.J. Bonner and S.E. Banta. 2001. Scup mesh-selectivity study of the otter trawl fishery in the Mid-Atlantic. Final Report. NFI Scientific Monitoring Committee. 34p.
- Bochenek, E.A., E.N. Powell, A.J. Bonner, and S.E. Banta. 2005. An assessment of Scup (*Stenotomus chrysops*) and black sea bass (*Centropristis striata*) discards in the directed otter trawl fisheries in the Mid-Atlantic Bight. *Fishery Bulletin* 103:1-14.
- Cooper, C. and W. Hickey. 1989. Selectivity experiments with square mesh codends of 130, 140, and 155 mm. In *Proceedings world symposium on fishing gear and fishing vessel design*. Marine Institute. St. John's, Newfoundland. 54-57.
- DeAlteris, J.T. and D. Riefsteck. 1992. Escapement and survival of fish from the codend of a trawl. *Fish Behavior in Relation to Fishing Operations*. ICES Marine Science Symposium. Vol. 196, pp.128-136.
- DeAlteris, J.T., and K.J. La Valley. 1999. Physiological response of scup, *Stenotomus chrysops*, to a simulated trawl capture and escape event. *Marine Technology Society Journal* 33:25-34
- DeAlteris, J., L. Skrobe, G. Hovermale, and D. Beutel. 1999. Results of a size selectivity study for 15.2cm (6.0 in) diamond-shaped and 16.5cm (6.5 in) square-shaped codends capturing flatfish in New England waters. University of Rhode Island, URI Fisheries Center Technical Report, Wakefield, RI 29p.
- DeAlteris, J. T. and N. Lazar. 2004. Scup stock assessment 2004. A report from DeAlteris Associates Inc. to Mid-Atlantic Fishery Management Council. 92p.
- DeAlteris, J. and D. Chosid. 2004. Effects of codend mesh size on the multispecies yield and spawning stock biomass in the western Georges Bank trawl fishery. URI Technical Report No.1, Kingston, RI.
- Dixon, C., Raptis, J., Gorman, D., Roberts, S., Hooper, G., Bicknell, N., Sorokin, S., Newman, R., Noell, C., Benediktsson, T., Saint, J. and Hill, Wallace. (2013). A collaborative approach to novel by-catch research for rapid development, extension and adoption into a commercial trawl fishery. South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2012/000250-1. SARDI Research Report Series No. 643. 47pp.
- Gillikin, J.W., Jr., B.F. Holland, Jr., and Capt. R.O. Guthrie. 1981. Net mesh selectivity in North Carolina's winter trawl fishery. North Carolina Department of Natural Resources and Commercial Development, Division of Marine Fisheries, Special Scientific Report Number 37, Morehead City, NC 64p.
- Glass, C.W., B. Sarno, H.O. Milliken, G.D. Morris, and H.A. Carr. 1999. Bycatch reduction in Massachusetts inshore squid (*Loligo pealei*) trawl fisheries. *Marine Technology Society Journal* 33: 35-42.
- Glass, C.W., H.A. Carr, B. Sarno, Morris, G.D., Y. Matsushita, T. Feehan, and M.V. Pol. 2001.

- Mid-Atlantic small-mesh research project - draft final report. Mid-Atlantic Fisheries Management Council. 13 pp.
- Hasbrouck, E., T. Froehlich, K. Gerbino, J. Scotti, E. Powell, E. Bochenek, J. Morson. 2008. Summer Flounder Discard Mortality in the Inshore Bottom Trawl Fishery. Final Report for RSA Grant NA07NMF4540017. NOAA – NMFS.
- Hasbrouck, E., T. Froehlich, K. Gerbino, J. Scotti, E. Powell, E. Bochenek, J. Morson. 2012. Summer Flounder Discard Mortality in the Offshore Bottom Trawl Fishery. Final Report - RSA Grant. NOAA - NMFS.
- Hasbrouck, Emerson C., J. Scotti, T. Froehlich, K. Gerbino, J. Costanzo, P. Sullivan. 2014. Evaluation of the Large Mesh Belly Panel in Small Mesh Fisheries as a Method to Reduce Yellowtail Flounder Bycatch on Southeast Georges Bank. Final report Submitted to the Northeast Cooperative Research Foundation. July 2014
- Hasbrouck, Emerson C., J. Scotti, T. Froehlich, K. Gerbino, J. Costanzo, P. Sullivan. 2015. Evaluation of the Large Mesh Belly Panel in Small Mesh Fisheries as a Method to Reduce Yellowtail Flounder Bycatch on Cultivator Shoals. Draft report to the Northeast Cooperative Research Foundation. February 2015
- Hendrickson, L.C. 2011. Effects of a codend mesh size increase on size selectivity and catch rates in a small-mesh bottom trawl fishery for longfin inshore squid, *Loligo pealeii*. Fisheries Research 108 (2011) 42–51
- Knuckey I, Hudson R, Koopman M, Skoljarev S, Moore J (2008) Trials of T-90 mesh configuration in the Great Australian Bight Trawl Fishery, Report to the Fisheries Research and Development Corporation In, Book Project 2007/063
- Lange, A.M.T. 1984. Long-term effects of change in mesh size on yield of summer flounder. Wood's Hole Laboratory Reference Document 84-04, Wood's Hole, MA 14p.
- MacLennan, D. N. (Ed.). 1992. Fishing gear selectivity. Fisheries Research, 13: 201e352.
- Mayo, R.K. 1982. An assessment of the scup, *Stenotomus chrysops* (L.), population in the Southern New England and Middle Atlantic regions. National Marine Fisheries Service, Northeast Fisheries Center, Woods Hole Lab Reference Document No. 82-46, 60 pp.
- Mid-Atlantic Fisheries Management Council (MAFMC). 2015. Summer Flounder, Scup, and Black Sea Bass Commercial Management Measures Review. 26p.
- Kennelly, S.J. 1999. Areas, depths, and times of high discard rates of scup, *Stenotomus chrysops*, during demersal fish trawling off the northeastern United States. Fishery Bulletin 97:185-192.
- Pol, M.V. 2001. Effects of trawl net modifications during the 2000 Nantucket Sound squid fishery (draft). Mass. Div. Mar. Fish. Cons. Eng. Rep. 21 pp.
- Powell, E.N., A.J. Bonner, and E.A. Bochenek. 2003. Scup discarding in the fisheries of the Mid-Atlantic Bight, Final Report to the New Jersey Fisheries Information and Development Center, Final Report to the Mid-Atlantic Fisheries Management Council Research Set-Aside Program, Project #NA16FM2268, 59p.
- McKiernan, D.J., and D.E. Pierce. 1995. Loligo squid fishery in Nantucket and Vineyard Sounds. Massachusetts Division of Fisheries Publication 17648-75-200-1/95-3.47-CR, 62p.
- Millar, R.B., 1992. Estimating the size-selectivity of fishing gear by conditioning on the total catch. J. Am. Stat. Assoc. 87 (420), 962-968
- Millar, R.B., Walsh, S.J., 1992. Analysis of trawl selectivity studies with an application to trouser trawls. Fish. Res. 13, 205-220.
- Millar, R.B., Broadhurst, K.M., Macbeth, W.G., 2004. Modeling between-haul variability in the size selectivity of trawls. Fish. Res. 67, 171-181.
- New England Fishery Management Council (NEFMC) . 1990. Draft amendment 4 to the fishery

- management plan for the northeast multispecies fisheries. Saugus, MA. 33 p.
- NEFSC (Northeast Fisheries Science Center). 2013. 57th Northeast Regional Stock Assessment Workshop (57th SAW) Assessment Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 13-16; 967 p. Available online at <http://nefsc.noaa.gov/publications/>.
- NEFSC (Northeast Fisheries Science Center). 2015. 60th Northeast Regional Stock Assessment (60th SAW) Assessment Report. [Northeast Fisheries Science Center Reference Document 15-08](#); 870 p.
- Powell, E.N., A.J. Bonner, B. Muller, and E.A. Bochenek. 2004. Assessment of the effectiveness of scup bycatch-reduction regulation in the Loligo squid fishery. *Journal of Environmental Management* 71: 155-167.
- Pol, M.V. and H.A. Carr. 2000. Effect of a dark tunnel on scup and squid catch in Nantucket Sound. Massachusetts Division of Marine Fisheries Conservation Engineering Report, 12p.
- Pol, M.V, H.A. Carr, and C. Glass. 2002. Scup bycatch reduction in Loligo squid fishery. NOAA/NMFS Marine Fisheries Initiative NA16FL1215, Final Report, 17p.
- Simpson, D. G. 1989. Codend selection on winter flounder *Pseudopleuronectes americanus*. NOAA Tech. Rep. NMFS 75. 10 p.
- Smith, W.G. and J.J Norcross. 1968. The status of the scup (*Stenotomus chrysops*) in winter trawl fishery. *Ches. Sci.* 9: 207-216.
- Terceiro, M. 2015. SARC 60 Working Paper- TOR 2 & 3 Biological Data for Scup. Northeast Fisheries Science Center. Woods Hole, MA. 47p.
- Weber, A.M. and P.T. Briggs. 1983. Retention of black sea bass in vented and un-vented lobster traps. *NY Fish and Game J.* 30(1):67-77

EMERSON CHARLES HASBROUCK, JR.

Cornell University Cooperative Extension of Suffolk County Marine Program
423 Griffing Avenue, Suite 100
Riverhead, NY 11901
631-727-7850 x 319
ech12@cornell.edu

EDUCATION

Master of Science Degree in Marine Environmental Sciences, State University of NY/Stony Brook
Bachelor of Science Degree in Marine Science, Southampton College, Long Island University

PROFESSIONAL EXPERIENCE Atlantic

States Marine Fisheries Commission
Governor's Appointee Commissioner for NY
2014 - Present

Cornell University Cooperative Extension of Suffolk County Marine Program
Riverhead, NY

Marine Program Director
2009 – 2013

Responsible for all administrative, fiscal and program components of the Cornell Marine Program. Supervise over 35 professional and support employees located at five separate facilities throughout Suffolk County. Responsible for providing in-depth program leadership for the planning, coordination, implementation, management and evaluation for the entire CCE Marine Program. Responsible for effective management of resources available to the Marine Program and for assuring that accountability and affirmative action requirements are met. Responsible for fiscal management of the Marine Program budgets, totaling over \$2.5 million annually, and provide leadership in obtaining grant funding for the Marine Program. Represent the Association before the public, community leaders, government officials, and Cornell University in conjunction with program and leadership responsibilities. Familiar with the funding and budget process of the Suffolk County Government and routinely appear before the Suffolk County Legislature and interact with individual legislators.

Supervise a large and diverse professional staff that conducts research and provides educational opportunities regarding fisheries resources, habitat restoration water quality protection, pollution control and environmental preservation in support of the vital marine related industries and natural resources of Long Island. This diverse staff addresses environmental and water quality issues throughout Long Island.

Senior Natural Resources Specialist
1988 – 2008 and 2013- Present

Plan, develop and implement an extension program relative to fisheries data, fisheries management and fisheries economic development for NY's commercial and recreational fishing industries. Plan, develop and implement effective fishery data and biological sampling programs to satisfy regulatory requirements and to quantify NY and regional fisheries and harvested resources. Provide fishermen with information

necessary to positively interact with local, state, regional, national and international regulatory regimes. Assist fishermen in organizational development and in understanding fisheries management principles and goals. Plan, develop and implement economic development programs for the fishing industry to improve profitability and competitiveness. Conduct applied research and implementation programs and demonstration projects that help address critical fisheries and natural resource issues.

Plan, develop and implement a wide range of programs to help ensure effective utilization of NY marine and natural resources. Conduct applied environmental and natural resource research on methods to address coastal biological problems and issues. Communicate research results and implementation strategies to local government officials and private citizens. Conduct implementation programs and demonstration projects that solve coastal environmental and natural resource problems. Through public education, increase public awareness and understanding of biological resources and the coastal environment.

Work with private citizens, volunteers, community groups, advocacy groups, government and non-government organizations, elected officials and various departments of local, county, state and federal governments on natural resource programs in the general areas of habitat, wetlands, SAV, fisheries and nonpoint source pollution. Programs include investigation, remediation, restoration and implementation.

Secure funding sources for extension programming activities. Develop, oversee and manage budgets. Recruit and supervise full-time, part-time and seasonal employees at the scientific and technical levels. I have had extensive supervisory and EEO training.

QUALIFICATIONS

I have been involved in fisheries issues in the Mid-Atlantic and New England regions for well over 35 years. I have a thorough working knowledge of fisheries throughout these regions as well as an understanding of the problems, issues, dynamics and politics of the fisheries and their underlying fishery resources. My work has been with commercial and recreational fisheries and I have earned the respect and cooperation of both groups with the goal of sustainable harvest and management of our marine resources. I have developed close relationships with fishermen and fishery managers from NC to ME and have often assisted these groups to seek common ground and interact with each other. I have earned both the respect and trust of these groups over the years. I have considerable experience working with fisheries agencies such as: the NY Dept. of Environmental Conservation; the Mid-Atlantic and New England Fishery Management Councils; The Atlantic States Marine Fisheries Commission; The Atlantic Coastal Cooperative Statistics Program. I serve on several ACCSP and MAFMC Committees/Panels.

SELECT PUBLICATIONS

- Hasbrouck, E., T. Froehlich, K. Gerbino, J. Scotti, J. Costanzo, P. Sullivan. 2012. A Method to Reduce Winter Flounder Retention Through the Use of Avoidance Gear Adaptations in the Small Mesh Trawl Fishery Within the SNE/MA Winter Flounder Stock Area. Final report to CFRF. NOAA Award NA09NMF4720414
- Hasbrouck, E., T. Froehlich, K. Gerbino, J. Scotti, J. Costanzo, P. Sullivan. 2013. An Evaluation Of The Avoidance Gear 12" Drop Chain Sweep As A Method To Reduce Winter Flounder Retention In The Small Mesh Squid Trawl Fishery Within The SNE/MA Winter Flounder Stock Area. Final report to the Commercial Fisheries Research Foundation. NOAA Award NA09NMF4720414
- Hasbrouck, E., T. Froehlich, K. Gerbino, J. Scotti, E. Powell, E. Bochenek, J. Morson. 2008. Summer Flounder Discard Mortality in the Inshore Bottom Trawl Fishery. Final Report for RSA Grant NA07NMF4540017. NOAA – NMFS.
- Hasbrouck, E., T. Froehlich, K. Gerbino, J. Scotti, E. Powell, E. Bochenek, J. Morson. 2008. Summer Flounder Discard Mortality in the Inshore Bottom Trawl Fishery. Working Paper 2. 47th Northeast Regional Stock Assessment Workshop (47th SAW). NOAA-NMFS. NEFSC Reference Document 08-12.

JONATHAN KNIGHT

**74 Table Rock Road
Wakefield, RI 02879**

EDUCATION:

Narragansett High School – 1978

University of Rhode Island – 1980
Associates Degree – Fisheries & Marine Tech

University of Rhode Island - 1994
B.S. Mechanical Engineering

EMPLOYMENT:

Deck Hand – 1979
Spirit of '76
Capt. Bruce Knight

Deck Hand – 5/80 – 8/82
Grandville Davis
Capt. Chris Brown

Captain - 8/82 – 5/84
John & Felicia

Trawlmaker – 5/84 – 11/84
Jamestown Trawl
Owned by: Robin Lis and David Beutel

Deck Hand & Mate 11/84 – 11/85
Barbara Joan
Capt. John Riemer

Supervised trawl making and design 11/85 – 12/95
Trawlworks
Owned by: Robert Taber

Founder & Owner of Superior Trawl 1/96 – Present

PUBLICATIONS:

Beutel, Skrobe, Castro, Ruhle Sr., Ruhle Jr., O'Grady & Knight, 2008 Bycatch reduction in the Northeast USA directed haddock bottom trawl fishery. Fisheries Research 94: 190-198.

AWARDS:

2007 WWF Smart Gear Contest – 1st Place Winner.

Patrick J. Sullivan

Department of Natural Resources
Cornell University, Ithaca, NY 14853-3001
Office: (607) 255-8213, Email: pjs31@cornell.edu

1978 – B.S. Biological Science, University of California, Davis, CA
1985 – M.S. Fisheries Science, University of Washington, Seattle, WA
1988 – Ph.D. Biostatistics/Biomathematics, University of Washington, Seattle, WA

1987-1988, Statistician, National Marine Fisheries Service, Seattle, WA
1988-1998, Population Dynamicist, International Pacific Halibut Com., Seattle, WA
1998-Present, Associate Professor, Dept. of Natural Resources, Cornell, Ithaca, NY

2010. Wilkins, K. A., R. A. Malecki, P. J. Sullivan, J. C. Fuller, J. P. Dunn, L. J. Hindman, G. R. Costanzo, and D. Luszc. Migration routes and bird conservation regions used by Eastern Population Tundra Swans *Cygnus cloumbianus columbianus* in NA Wildfowl 60:20-37.

2009. DeWan, A., Lembo, A., Sullivan, P., Smith, C., Lassoie, J., and Richmond, M. Using occupancy models to identify high priority regions for bird conservation. *Biological Conservation* 142: 982 – 991.

2009. Laba, M., B. Blair, R. Downs, B. Monger, W. Philpot, S. Smith, P. Sullivan and P. C. Baveye. Use of textural measurements to map invasive wetland plants in the Hudson River National Estuarine Research Reserve with IKONOS satellite imagery. *Remote Sensing of Environment*
[doi:10.1016/j.rse.2009.12.002](https://doi.org/10.1016/j.rse.2009.12.002) .

2009. Rudstam, L. G., S. L. Parker-Stetter, P. J. Sullivan, and D. M. Warner. Towards a standard operating procedure for fishery acoustic surveys in the Laurentian Great Lakes, North America. *ICES Journal of Marine Science* 66: 1391–1397.

2008. Gardner, B., P. J. Sullivan, S. J. Morreale, and S. Epperly. Spatial and temporal statistical analysis of bycatch data: patterns of sea turtle bycatch in the North Atlantic. *Can. J. Fish. Aquat. Sci.* **65**: 2461–2470.

2008. Zipkin, E. F., P. J. Sullivan, E. G. Cooch, C. E. Kraft, B. J. Shuter, and B. C. Weidel. Overcompensatory response of a smallmouth bass population to harvest: release from competition? *Can. J. Fish. and Aquat. Sci.* 65:2279-2292.

2007. Laba, M., P. Sullivan, W. Philpot, and P. Baveye. Influence of wavelet type on the classification of marsh vegetation from satellite imagery using a combination of wavelet texture and statistical component analyses. *Canadian Journal of Remote Sensing*, 33(4): 260-265

JOHN SCOTTI

Cornell Cooperative Extension
Marine Program
423 Griffing Avenue, Suite 100
Riverhead, NY 11901
631-727-7850 x223
Jns8@cornell.edu

PROFESSIONAL & RELATED EXPERIENCE

2009-2010

Senior Resource Education: Fisheries Specialist CCE

Provide leadership in the development and acquisition of outside funding support for implementing identified extension educational programs and applied research. See Attachment: 2010 Project Summaries.

1997 – 2001 V.P of Operations Long Island Seafood Export, Greenport, NY and Long Island Fish Exchange (Fulton Market) NYC.

Responsible for oversight and management of fully integrated commercial fisheries operation including harvesting processing and domestic/export marketing of locally captured seafood. Annual sales \$10 million. 40-60 employees, fleet management of 5-10 cooperating commercial fishing vessels, coordination of export documentation and air shipment of 10 million pounds of product to Europe.

1980-1995

Marine Program Leader

Cornell University Cooperative Extension of Suffolk County

Provide leadership for Marine Program with emphasis on overall program development to meet broadening needs of Suffolk County coastal communities. Plan, develop and implement an extension program relative to fishery economics and utilization for the NY Commercial Fishing Industry. Plan, develop and implement economic development programs for the fishing industry to improve profitability and competitiveness. Accomplishments include program expansion to six agent subject specialist with program assistants and the acquisition and establishment of the Suffolk County Marine Environmental Learning Center (SCMELC), Southold, NY.

1977-1980

New York Sea Grant Regional Extension Specialist
Commercial Fisheries Business Management

QUALIFICATIONS

Thorough working knowledge of fishery issues and challenges to our coastal communities. Proven leadership and ability to work with impacted audiences to identify problem solving solutions to fisherman problems and marshal needed support for extension program based solutions.

EDUCATION

B.S. Business Administration: Husson College, Bangor, Maine, 1964

MA Extension Education: University of Rhode Island, Kingston, RI 1976

PUBLICATIONS AND REPORTS

Hasbrouck, E., T. Froehlich, K. Gerbino, J. Scotti, E. Powell, E. Bochenek, J. Morson. 2008. Summer Flounder Discard Mortality in the Inshore Bottom Trawl Fishery. Preliminary Final Report for RSA Grant NA07NMF4540017. NOAA – NMFS.

Hasbrouck, E., T. Froehlich, K. Gerbino, J. Scotti, E. Powell, E. Bochenek, J. Morson. 2008. Summer Flounder Discard Mortality in the Inshore Bottom Trawl Fishery. Working Paper 2. 47th Northeast Regional Stock Assessment Workshop (47th SAW). NOAA-NMFS. Northeast Fisheries Science Center Reference Document 08-12.

Scotti, J., E. Hasbrouck, K. Gerbino, T. Froehlich. Commercial Fish Pier Feasibility Study Report on market potential – New Fulton Fish Market – prepared for New York City Economic Development Corporation 2010.

Scotti, J., E. Hasbrouck, K. Gerbino, T. Froehlich. Frozen Storage and Seafood Processing Feasibility Study Market Potential – New Fulton Fish Market. Draft report prepared for the Bronx office on Economic Development 2010.

Scotti, J., E. Hasbrouck, K. Gerbino, T. Froehlich. Fact Sheet – Summer Flounder Discard Mortality Perspective 2009.

Scott Curatolo-Wagemann

Experience

1999-Present Cornell Cooperative Extension of Suffolk Riverhead, NY
County

Association Resource Educator-Stormwater Specialist/Laboratory Manager

Stormwater Specialist

5/11 to Present

- Ø Implementing various components of the Suffolk County's Stormwater Management Program by conducting educational outreach and providing technical expertise on subject areas such as water quality monitoring.
- Ø Managing the Geographic Information Systems (GIS) database for the Suffolk County stormwater management program.
- Ø Work as a team member with existing Cornell Cooperative Extension staff including stormwater managers, specialists, educators and technicians.
- Ø Assist with the supervision of Field Technicians and laboratory technicians.
- Ø On issues related to stormwater management and water quality monitoring; provide technical support for the staff of Suffolk County, Cornell Cooperative Extension, and the general public.
- Ø Manage the water quality laboratory located at the Suffolk County Marine Environmental Learning Center; responsible for processing coliform enumeration and bacterial source tracking samples for various projects.

Accomplishments:

Responsible for Suffolk County's compliance with both the Environmental Protection Agency and the New York State Department of Environmental Conservation's stormwater Municipal Separate Storm Sewer Systems (MS4) permits.

Coordinated and planned a conference and expo on green infrastructure aimed at municipal officials, planners, consultants, property owners, developers, and others with the tools they need to implement the latest innovations in water resource protection.

Laboratory manager for water quality lab responsible for water sample analysis. Analysis includes bacterial enumeration and the use of DNA technology for bacterial source tracking.

Co-authored study for the Town of Southold for Coliform Enumeration and DNA Bacterial Source Tracking for Goldsmith Inlet.

Fisheries Management

6/99 to Present

- Ø Assisted on various Long Island marine fisheries projects
- Ø Projects included biological sampling from commercial fishermen, evaluation of summer flounder discard mortality, and a method to reduce winter flounder retention through the use of avoidance gear adaptations in the small mesh trawl fishery.

DNA Bacterial Source Tracking

6/99 to 5/11

- Ø Technician on DNA Project to identify nonpoint sources of pollution.
- Ø Development of quality assurance and quality control practices for lab.

- Ø Field collection of water and source samples.
- Ø Obtaining coliform enumeration of water samples.
- Ø Helped develop and maintain the DNA database to which water samples are compared.

Accomplishments:

Co-authored study for the Environmental Protection Agency on the use of bacterial source tracking for identification of *E. coli* for the use in Total Maximum Daily Load Calculations.

Education

12/2010	State University of New York Stony Brook	Stony Brook, NY
---------	--	-----------------

Masters of Professional Studies-Environmental Management

05/1994	Long Island University-Southampton College	Southampton, NY
---------	--	-----------------

Bachelors of Science-Marine Science Biology

References

References are available on request.

Tara Froehlich

Cornell University Cooperative Extension of Suffolk County,
Marine Program 423 Griffing Ave., Suite 100 Riverhead, NY11901
631-727-7850 x317 taf4@cornell.edu

Research Experience

Fisheries Specialist, Cornell University Cooperative Extension

2012-2015 - Butterfish/River Herring Bycatch Avoidance Network – NFWF/BREP

2012 - Coastwide Stock Structure of Monkfish Using Microsatellite DNA –Monkfish RSA

Project 2010/2011 –Sex ratio study of commercial and recreationally landed summer flounder

2010/2011 - A Method to Reduce Butterfish Retention in the Offshore Directed Loligo Squid Fishery Through the Use of a Bycatch Reduction Device (BRD) Adapted to Pre-Existing Gear

2010/2011 – A Method to Reduce Winter Flounder Retention Through the Use of an Avoidance Gear Adaptation in the Small Mesh Trawl Fishery Within the Southern New England/Mid-Atlantic Area

2010/2011- A Method to Reduce Winter Flounder Retention by Minimizing Variability in Drop Chain

Performance in the Inshore Loligo Small Mesh Trawl Fishery Off LI, NY Within the Winter Flounder Stock Area

2007-2009 – Evaluation of Summer Flounder Discard Mortality in the Bottom Trawl Fishery Part I: A Study of the Offshore Winter Fishery and Part II: A Study of the Inshore Summer Fishery

- Project oversight and coordination, staffing of fishing trips, permitting (federal and state), shore-side coordination, data entry/analysis, outreach production and distribution, progress and final reports, collection of biological samples

Work Experience

Fisheries Coordinator, Marine Program Extension Community Educator

1997 – Present Cornell University Cooperative Extension

- Conduct field applied research projects for the NYS Department of Environmental Conservation, as well as NMFS

- Provide direct responsibility and oversight of biological sampling and data processing for state and federal fisheries programs

- Provide direct responsibility and oversight for field operations of fisheries research demonstration projects

- Developed and implemented a biological sampling program in Fulton Fish Market, NY.

- Provide dockside educational opportunities to the fishing industry on topics such as: fisheries management; life history of important species; gear modification and selectivity; changes in regulations, permits, exemptions, etc.

- Provide direct responsibility and oversight of commercial fisheries data collection and processing

- Assist in NYSDEC and NMFS commercial fisheries data collection and processing.

- Participation in NYSDEC/NMFS fish tagging projects.

- Attend organizational meetings with NYSDEC, NMFS, ASMFC, ACCSP and other government agencies to make sure that educational and contractual goals are attained.

- Coordination and interaction with The Long Island Commercial Fisherman's Association (LICFA) and other fishing industry organizations educational program delivery.

Education

1991-1995 Southampton College of Long Island University, Southampton, New York

- Bachelor of Science – Biology / Psychology

Publications

Hasbrouck, E., T. Froehlich, K. Gerbino, J. Scotti, E. Powell, E. Bochenek, J. Morson. 2012. A Method to Reduce Butterfish Retention in the Offshore Directed Longfin Squid Fishery Through the Use of a Bycatch Reduction Device Adapted to Pre-Existing Gear. Final Report for RSA Grant. NA10NMF4540020 NOAA – NMFS.

Hasbrouck, E., T. Froehlich, K. Gerbino, J. Scotti, E. Powell, E. Bochenek, J. Morson. 2008. Summer Flounder Discard Mortality in the Inshore Bottom Trawl Fishery. Final Report for RSA Grant NA07NMF4540017. NOAA – NMFS.

- Hasbrouck, E., T. Froehlich, K. Gerbino, J. Scotti, E. Powell, E. Bochenek, J. Morson. 2008. Summer Flounder Discard Mortality in the Inshore Bottom Trawl Fishery. Working Paper 2. 47th Northeast Regional Stock Assessment Workshop (47th SAW). NOAA-NMFS. NEFSC Reference Document 08-12.
- Scotti, J., E. Hasbrouck, K. Gerbino, T. Froehlich. Commercial Fish Pier Feasibility Study Report on market potential – New Fulton Fish Market – prepared for NYC Economic Development Corporation 2010.

KRISTIN GERBINO
Cornell University Cooperative Extension Marine Program
423 Griffing Avenue, Riverhead NY 11901
631-727-7850 x 315 kk335@cornell.edu

EDUCATION

Bachelor of Science in Marine Science-Biology

Southampton College of Long Island University, Southampton, NY

Date of Graduation: December 1999

RESEARCH EXPERIENCE

Fisheries Specialist, Cornell University Cooperative Extension 2004-present

- Real-time Fleet Communication Systems Bycatch Avoidance
- An Evaluation Of The Avoidance Gear 12" Drop Chain Sweep As A Method To Reduce Winter Flounder Retention In The Small Mesh Squid Trawl Fishery Within The SNE/MA Winter Flounder Stock Area
- A Method to Reduce Winter Flounder Retention Through the Use of Avoidance Gear Adaptations (Large Mesh Belly Panel) in the Small Mesh Trawl Fishery Within the SNE/MA and Cultivator Shoals Winter Flounder Stock Area
- Coastwide Stock Structure of Monkfish Using Microsatellite DNA
- Sex ratio study of commercial and recreationally landed summer flounder
- A Method to Reduce Butterfish Retention in the Offshore Directed *Loligo* Squid Fishery Through the Use of a Bycatch Reduction Device Adapted to Pre-Existing Gear
- A Method to Reduce Winter Flounder Retention Through the Use of an Avoidance Gear Adaptation in the Small Mesh Trawl Fishery Within the Southern New England/Mid-Atlantic Area
- Evaluation of Summer Flounder Discard Mortality in the Bottom Trawl Fishery Part I: A Study of the Offshore Winter Fishery and Part II: A Study of the Inshore Summer Fishery
- § □Project oversight and coordination, staffing of fishing trips, shore-side coordination, data entry/analysis, outreach production and distribution, progress and final reports, collection of biological samples

WORK EXPERIENCE

Fisheries Specialist, Marine Program Extension Community Educator

Cornell University Cooperative Extension 2004 – Present

- Gained extensive knowledge of local marine species, New York's commercial fishing industry & fishery dependent data needs of resource stock assessments
- Worked closely with fishermen on dockside and at-sea biological sampling procedures of commercial fishing catch
- Gained working knowledge of fisheries data entry & management programs including Cygnet, Modew, BSM, SAFIS, etc.
- Responsible for collection, processing, coding, & computer entry of commercial fishing data
- Familiar with dealer electronic reporting systems - SAFIS & Fed Trip Ticket System
- Created Access databases to organize & analyze data
- Conducted outreach programs for the commercial fishing industry on topics such as fisheries management, life history of important species, etc.
- Attended organizational meetings with NYS DEC, NMFS, ASMFC, ACCSP & other government agencies

PUBLICATIONS

- Hasbrouck, Emerson C., J. Scotti, T. Froehlich, K. Gerbino, J. Costanzo, P. Sullivan. 2014. Evaluation of the Large Mesh Belly Panel in Small Mesh Fisheries as a Method to Reduce Yellowtail Flounder Bycatch on Southeast Georges Bank. Final report Submitted to the Northeast Cooperative Research Foundation. July 2014
- Hasbrouck, Emerson C., J. Scotti, T. Froehlich, K. Gerbino, J. Costanzo, P. Sullivan. 2015. Evaluation of the Large Mesh Belly Panel in Small Mesh Fisheries as a Method to Reduce Yellowtail Flounder Bycatch on Cultivator Shoals. Draft report to the Northeast Cooperative Research Foundation. February 2015
- Hasbrouck, E., T. Froehlich, K. Gerbino, J. Scotti, J. Costanzo, P. Sullivan. 2013. An Evaluation Of The Avoidance Gear 12" Drop Chain Sweep As A Method To Reduce Winter Flounder Retention In The Small Mesh Squid Trawl Fishery Within The SNE/MA Winter Flounder Stock Area. Final report to the Commercial Fisheries Research Foundation. NOAA Award NA09NMF4720414
- Hasbrouck, E., T. Froehlich, K. Gerbino, J. Scotti, J. Costanzo, P. Sullivan. 2012. A Method to Reduce Winter Flounder Retention Through the Use of Avoidance Gear Adaptations in the Small Mesh Trawl Fishery Within the SNE/MA Winter Flounder Stock Area. Final report to CFRF. NOAA Award NA09NMF4720414
- Hasbrouck, E., T. Froehlich, K. Gerbino, J. Scotti, E. Powell, E. Bochenek, J. Morson. 2008. Summer Flounder Discard Mortality in the Inshore Bottom Trawl Fishery. Final Report for RSA Grant NA07NMF4540017. NOAA – NMFS.
- Hasbrouck, E., T. Froehlich, K. Gerbino, J. Scotti, E. Powell, E. Bochenek, J. Morson. 2008. Summer Flounder Discard Mortality in the Inshore Bottom Trawl Fishery. Working Paper 2. 47th Northeast Regional Stock Assessment Workshop (47th SAW). NOAA-NMFS. NEFSC Reference Document 08-12.
- Scotti, J., E. Hasbrouck, K. Gerbino, T. Froehlich. Fact Sheet-Summer Flounder Discard Mortality Perspective 2009

Jacqueline Wilson

Cornell University Cooperative Extension
Marine Program
423 Griffing Avenue, Suite 100
Riverhead, NY 11901
631-727-7850 x 305
js443@cornell.edu

EDUCATION

Master of Business Administration, Western Governor University, School of Business (2017)
Bachelor of Science Degree in Biology, Southampton College, Long Island University (2001)
Associates Degree in Biology, Orange County Community College, Middletown, NY (1998)

PROFESSIONAL EXPERIENCE

Community Fisheries Specialist

Cornell University Cooperative Extension of Suffolk County
Marine Program
2003 – Present
Riverhead, NY

Key Responsibilities:

- General program support for various programs conducted by the Marine Program
- Team Member and Crew Leader to set-up and assist with contract responsibilities for conducting applied research education projects
- Assisting Marine Extension Educators in conducting field applied research education projects
- Developing and assisting of grant proposals for funding
- Collecting, processing, coding, & computer entry of commercial fishing data
- Conducting outreach programs with the commercial fishing industry and community members on the importance of fisheries research

Marine Program Community Educator

Cornell Cooperative Extension, Riverhead, NY, Sept. 2010 - Present

Derelict Lobster Gear Assesment, Removal & Prevention

- Project oversight and coordination
- Staffing of fishing trips
- Conducted comprehensive surveys of the lobster industry within the study areas
- Gathered and removed derelict lobster gear with experienced commercial lobstermen
- Catalogued all derelict lobster gear and species found in the gear
- Recycled collected derelict lobster gear through the Fishing for Energy Partnership
- Conducted industry and public outreach

RESEARCH PROJECTS
RELATED EXPERIENCE

Cornell University Cooperative Extension of Suffolk County
Marine Program

- Derelict Lobster Gear Assessment, Removal and Prevention
- Derelict Lobster Gear Assessment, Removal and Prevention II
- Removing Ghost Fishing Gear to Restore the Sound for Long Island Fisheries (NY)
- Long Island Sound Derelict Lobster Gear Assessment, Removal and Prevention
- Rhode Island Commercial Fisheries and Seafood Industries – The Development of an Industry Profile
- Evaluation of the Effect of Vent Size and Shape on Black Sea Bass Behavior and Escapement from Pot Gear
- Summer Flounder Discard Mortality in the Inshore Bottom Trawl Fishery
- Commercial Fish Pier Feasibility Study Report on market potential – New Fulton Fish
- A Method to Reduce Winter Flounder Retention Through the Use of Avoidance Gear Adaptations in the Small Mesh Trawl Fishery Within the Southern New England/Mid-Atlantic Winter Flounder Stock Area
- A Method to Reduce Winter Flounder Retention By Minimizing Variability in Drop Chain Performance in the Inshore *Loligo* Small Mesh Trawl Fishery Off Long Island, NY Within the Winter Flounder Stock Area
- Southern New England and Georges Bank Windowpane and Yellowtail Bycatch Avoidance Network
- Bycatch Avoidance Communication Network Expansion
- Small Mesh Fishery Bycatch in The Southern New England Windowpane
- Advanced Bycatch Avoidance Network for River Herring/Butterfish

CERTIFICATIONS

- PADI certified Open Water Scuba Diver
- Certified in U.S. Coast Guard vessel safety
- Certified Emergency Responder in CPR/AED/First Aid

Joseph M. Costanzo
11 Senix Ave. Center Moriches, NY 11934
(631) - 874 - 7660
Jc2282@cornell.edu

Education

- Associate of Arts Degree - Farmingdale State College - Farmingdale, NY
- Bachelor of Science Degree in Biology – Southampton College of Long Island University - Southampton, NY

Profile

- Marine Educator/Fisheries Technician - Cornell Cooperative Extension of Suffolk County Riverhead, NY April 2008 – Present
Carpenter - Hallock Builders Incorporated South Jamesport, NY January 1999 - March 2008

Related Experience

- Fisheries Technician - Derelict Lobster Gear Assessment, Removal & Prevention
- Collected derelict lobster gear with commercial lobstermen
- Collected and enter lobster derelict gear data
- Conducted outreach with the commercial lobster industry

Fisheries Technician – Evaluation of Summer Flounder Discard Mortality in the Inshore and Offshore Bottom Trawl Fishery

- Staffed research trips
- Collected and entered data
- Monitored fish held at aquaculture facility during offshore aspect
- Developed and constructed the onboard live holding system for the offshore aspect
- Oversight and maintenance of all necessary materials and equipment

Certifications

- PADI certified Open Water Scuba Diver
- PADI certified Emergency Oxygen Provider
- Certified Emergency Responder in CPR/AED/First Aid

Christopher Mazzeo
424 Midwood Ave. Bellmore, NY 11710
(516) 395-4518

Education:

B.A. in Environmental Studies with a minor in Biology
SUNY Potsdam, Potsdam, NY Fall 2010 – spring 2013

Nassau Community College, Garden City, NY
Spring 2009- Spring 2010

Kean University, Union, NJ
Fall 2008

Relevant Experience:

Cornell Cooperative Extension

Fisheries Technician, February 2014- Present

- Entry of VTR data into SAFIS system
- Yellowtail Flounder Bycatch Reduction Gear Trials
- State commercial catch Biological Sampling
- Butterfish/River Herring Avoidance Network At Sea Observer

Marine Technician, October 2013- February 2014

- Entry of VTR data into SAFIS system
- Derelict Lobster Trap Removal Project
- Winter Flounder Avoidance Gear Trials
- State Commercial catch Biological Sampling

Assistant Program Manager, Gold Star Beach, Huntington June 2013- October 2013

- Fabrication and maintenance of FLUPSY system
- Sorting, counting and regular cleaning of Clam and Oyster
- Supervision of intern

Department of Environmental Conservation

Inland Fisheries Education and Outreach Intern, Summer 2012

- Assisted in warm water and cold water surveying
- Participated in invasive Ludwigia removal
- Assisted in collection of fish for disease monitoring
- Carried out I FISH NY programs

Daniel Kuehn

Cornell University Cooperative Extension
Marine Program
423 Griffing Ave., Suite 100
Riverhead, NY 11901
631-727-7850 x 327
dk536@cornell.edu

EDUCATION

Bachelors of Arts Degree in Business Management, SUNY Stony Brook, Stony Brook, NY
(expected 2019)

Associates Degree in Business Administration, Suffolk County Community College, Selden, NY
(2016)

EMPLOYMENT

Old Cove Yacht Club, New Suffolk, NY (2004 - 2012)

Developed lesson plans for sailing instruction of children between the ages of five and sixteen.

Coached OCYC sailors at interclub regional regattas

Supervised and mentored instructors in training

Successfully established and managed adult learn-to-sail program generating over \$12,000 in revenue

Responsible for the maintenance of OCYC's fleet of 42 dinghies, two keelboats and 6 powerboats, including parts purchases, inventory, maintenance and outside services

Cornell Cooperative Extension of Suffolk County, Riverhead, New York (2008 – Present)

Shellfish Restoration Technician (April – July 2008)

Part of the field crew responsible for the restoration of the scallop population in Peconic Bay and surrounding waters using aquaculture and shellfish farming techniques.

Horseshoe Crab Site Coordinator (May – July 2011)

Responsible for organizing groups of volunteers in the census, collecting of scientific data, and tagging of horseshoe crab populations at various Long Island Beaches

Stormwater Technician (September 2012 - Present)

Part of the field crew responsible for locating, gathering data on and mapping all storm drain conveyance systems in the Town of Brookhaven.

Responsible for locating and determining status of all outfall location around the Forge River Watershed.

Responsible for field work, including on-site sampling, lab work and GIS geo-referencing of Suffolk County wide Stormwater Management Program

Fisheries Technician (August 2011 - Present)

Part of the field crew responsible for gathering data regarding various bycatch reduction methods for commercial fishermen in Southern New England

Part of the field crew responsible for removal of derelict lobster gear from Long Island Sound

Mattituck Jr/Sr High School, Mattituck, New York (March 2012 – Present)

Co-Founder and Program Director of Sailing Team

Responsible for recruiting team members and coaches, organizing effective practices within a short timeframe, implementing safe boating practices and organizing trips to various regattas during the season

CERTIFICATIONS

CPR and First Aid Certified, AED certified

US Sailing Instructor Level 1 and Coach Level 2 certification

Coast Guard OUPV License

David Aripotch

Old Squaw Fisheries
PO Box 1036
Montauk, NY 11954
1-516-318-3333

Commercial Fisherman – Captain of F/V Caitlin & Mairead
65’ steel hull commercial fishing vessel
Homeport – Montauk, NY

Captain – Over 40 years experience as operator of various commercial fishing vessels

Cooperative Research Experience

Evaluation of a Topless Trawl Design With a 160 Foot Headrope for Fish Capture

2013

The primary goal of the project was to evaluate the ability of the topless trawl design with a 160 foot headrope to catch finfish. The project was a collaborative effort between DeAlteris Associates Inc. (DAI), Cornell University Cooperative Extension (CCE) and National Marine Fisheries Service, Northeast Fisheries Science Center (NMFS, NEFSC). CCE had funds remaining from a previous project that were used to compensate the commercial fishing vessels for the charter time, and CCE provided field sampling crew. NMFS, NEFSC provided a single field crew, underwater camera gear, and provided oversight of the field work. During the third cruise, which was aboard the F/V Caitlin and Mairead home ported in Montauk, Long Island, a total of 24 paired tows (48 tows) were successfully completed during the period 24-31 July 2012.

Pacific States Marine Fisheries Electronic Vessel Trip Reporting (EVTR) Participant

2013-Present

Reports electronic VTR information to NMFS. Uses FLDRS software to collect catch and effort data.

Cornell Bycatch Avoidance Network Participant

2012-Present

Active network participant in reporting bycatch interactions with butterfish, river herring, yellowtail flounder and windowpane flounder.

Gear Trials Program – Reduction of Winter Flounder Bycatch Participant

2012-2014

Participated in Conservation Gear Technology Financial Assistance Program.
Reported in survey format on function and efficiency of 12” drop chain sweep and large mesh belly panel.

A Method to Reduce Winter Flounder Retention By Minimizing Variability in Drop Chain Performance in the Inshore Loligo Small Mesh Trawl Fishery off Long Island, NY Within The Winter Flounder Stock Area

2010

In an attempt to reduce fishing mortality and bycatch of winter flounder as well as contribute to the rebuilding of the overfished stock, Cornell Cooperative Extension (CCE) completed four days of experimental fishing aboard the F/V Caitlin Mairead, using a standard small mesh squid net fitted with a 12” drop chain sweep. During the experiment, the head rope slack was adjusted by 6” increments from zero slack to 36” slack. Twenty-two successful hour long tows were conducted during this proof of concept project. Experimental fishing was conducted in the SNE Mid-Atlantic proposed small mesh drop chain area. The specific area of gear testing was performed along the southern coast of Long Island between Moriches and Shinnecock Inlet where an active commercial squid fishery was occurring.

Through this project we tested an alternative gear strategy to reduce winter flounder bycatch at the head of the net. This strategy included the use of a 12 inch drop chain sweep coupled with headrope adjustments of 6”, 12”, 18”, 24”, 30” and 36”. Two replicate tows were performed for each increment. The objective of this proof of concept study was to develop a fishing gear strategy to maximize drop chain performance to reduce winter flounder bycatch in the inshore squid fishery while maintaining squid catch efficiency.

February 9, 2016

To Whom it May Concern,

This Letter of Agreement is an acknowledgement of my participation and support of the following project, "Determining Selectivity and Optimum Mesh Size to Harvest Three Commercially Important Mid-Atlantic Species". I am committed to working together with the project participants to accomplish the objectives of the developed proposal submitted by Cornell Cooperative Extension Marine Program.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jonathan Knight', with a stylized flourish at the end.

Jonathan Knight
Superior Trawl



Long Island Commercial Fishing Association

P.O. Box 191 ~ Montauk, N.Y. 11954

Phone 516-527-3099 ~ Fax 631-668-7654 ~ E-mail Greenfluke@optonline.net

Sustainable Fisheries and Fishermen for the 21st Century

February 11, 2016

To Whom it May Concern:

This letter acknowledges that the Long Island Commercial Fishing Association is in support of Cornell Cooperative Extension's proposed project "Determining Selectivity and Optimum Mesh Size to Harvest Three Commercially Important Mid- Atlantic Species"

Furthermore, LICFA will provide assistance to the participation on the Program Advisory Committee, outreach, and communication with the fishing industry.

Sincerely,

Bonnie Brady

Executive Director

LICFA