STATE OF CONNECTICUT
DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION

Daniel C. Esty
Commissioner

Bureau of Natural Resources
Marine Fisheries Division
www.ct.gov/deep/fishing

A STUDY OF MARINE RECREATIONAL FISHERIES IN CONNECTICUT

Federal Aid in Sport Fish Restoration
F-54-R-31 Annual Performance Report
March 1, 2011 – February 29, 2012

State of Connecticut
Department of Energy and Environmental Protection
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Federal Aid in Sport Fish Restoration
F-54-R-31
Annual Performance Report

Project Title: ***A Study of Marine Recreational Fisheries in Connecticut***

Period Covered: March 1, 2011 - February 29, 2012

Job Title	***Prepared by*:**
Job 1: Marine Angler Survey Part 1: Marine Recreational Fishery Statistics survey Part 2: Volunteer Angler Survey	Roderick E. MacLeod
Job 2: Marine Finfish Survey Part 1: Long Island Sound Trawl Survey	Kurt F. Gottschall Deborah J. Pacileo
Part 2: Estuarine Seine Survey	David R. Molnar
Job 3: Inshore Survey	Jacqueline M. Benway
Job 4: Studies in Conservation Engineering	Inactive
Job 5: Cooperative Interagency Resource Monitoring	Matthew J. Lyman Katie O'Brien-Clayton
Job 6: Public Outreach	David R. Molnar

***Approved by*:**
David G. Simpson, Director
Marine Fisheries Division

Date: August 30, 2012

Cover: A wonderful moment with family… enjoying a great catch of summer flounder (fluke).

EXECUTIVE SUMMARY

Project: A Study of Marine Recreational Fisheries in Connecticut
Federal Aid Project: F54R-31 (Federal Aid in Sport Fish Restoration)
Annual Progress Report: March 1, 2011 – February 29, 2012

Purpose of the Project

The purpose of this project is to collect information needed for management of the marine recreational fishery. This information includes angler participation, effort, catch, and harvest; the relative abundance of finfish and specific population parameters for important selected species, water quality and habitat parameters, and assessment of fishery related issues such as hook and release mortality. The project also includes an outreach component to inform the public, and increase understanding and support for management programs and regulations.

The project is comprised of six jobs: 1) Marine Angler Survey, Part 1: Marine Recreational Fishery Statistics Survey, and Part 2: Volunteer Angler Survey, 2) Marine Finfish Survey, Part 1: Long Island Sound Trawl Survey, and Part 2: Estuarine Seine Survey, 3) Inshore Survey, 4) Fishing Gear Studies (Inactive), 5) Cooperative Interagency Resource Monitoring, 6) Public Outreach. Job 4 has been inactive since 2000.

Information on marine angler activity is collected from intercept interviews conducted by DEEP Marine Fisheries staff and through a telephone survey conducted by a National Marine Fisheries Service contractor as part of the coastwide Marine Recreational Fisheries Statistics Survey (MRFSS). The relative abundance of 40 species and more detailed population information on selected finfish and invertebrates are obtained from an annual Long Island Sound Trawl Survey. The relative abundance of young-of-year winter flounder and nearshore finfish species is obtained from fall seine sampling conducted at eight sites. Fishing gear and fishing practices are evaluated by conducting studies of hook and release mortality rates and through sampling catches of commercial fishing vessels taking species of recreational interest. Marine habitat is monitored and evaluated monthly through cooperative interagency sampling of water quality parameters (temperature, salinity, dissolved oxygen) at 20 to 25 fixed sites throughout the Sound. Public outreach is performed through speaking engagements at schools, with civic organizations and fishing clubs as well as through displays in the Marine Headquarters lobby. Marine Program displays and staffing at various fishing shows also is conducted under public outreach. Project staff also keep the Fisheries Advisory Council informed on project activities and frequent media contacts provide broad newspaper coverage of project activities and findings.

JOB 1: MARINE ANGLER SURVEY
PART 1: MARINE RECREATIONAL FISHERY STATISTICS SURVEY

OBJECTIVES (Summary)

- To estimate the number of marine anglers, fishing trips, fish caught, and the number and weight of fish creeled.

KEY FINDINGS:

- Marine recreational fishery statistics estimates are continuously updated over time. Estimates of participants, trip effort, and catch can be queried by region, sub-region, and state by visiting the National Oceanic and Atmospheric Administration (NOAA Fisheries/National Marine Fisheries Service/Marine Recreational Fishery Statistics Survey (MRFSS)) web site at http://www.st.nmfs.gov/st1/recreational/queries/index.html. For this reason, this report will not include MRFSS statistics. However, intercept survey work completed by Connecticut is available in the Results and Discussion section of this report.

CONCLUSIONS:

- Coastwide fishery management plans are resulting in increases in several fish populations and good catches of many primary recreational species.

RECOMMENDATIONS:

- Continue obtain catch and harvest information and angler participation rates through the Marine Recreational Fishery Statistics Survey in order the status of the recreational fishery.

JOB 1: MARINE ANGLER SURVEY
PART 2: VOLUNTEER ANGLER SURVEY

OBJECTIVES (Summary)

- To characterize the size composition of both kept and released fish observed by volunteer anglers.

KEY FINDINGS:

- A total of 40 anglers participated in the survey and made 830 trips in 2011. Volunteers including anglers involved in a fishing party made a total of 1,666 trips. With multiple species taken per trip anglers reported 752 trips targeting bluefish, 1,114 trips for striped bass, 360 trips for summer flounder, 29 trips for winter flounder, 140 trips for scup, and 153 trips for tautog.

- Volunteer anglers measured 923 bluefish measuring > 12 inches in length, 941 striped bass, 1,456 summer flounder, 35 winter flounder, 1,007 scup and 613 tautog. Collecting length measurements on released fish provides valuable data not available through the Marine Recreational Information Program except for the headboat at sea sampling survey.

CONCLUSIONS:

- Volunteer anglers provide a tremendous amount of data on the size and catch composition of popular recreational species in Connecticut, supplying several stock assessments with scarce length information on released fish.

RECOMMENDATIONS:

- Maintain the Volunteer Angler Survey as an effective means of characterizing angler behavior and particularly in collecting length data on released fish that are not available from the Marine Recreational Fishery Statistics Survey.

JOB 2 PART 1: LONG ISLAND SOUND TRAWL SURVEY (LISTS)
OBJECTIVES (Summary)

- Provide an annual index of numbers and biomass per standard tow for 40 common species and age specific indices of abundance for scup, tautog, winter flounder, and summer flounder, and recruitment indices for bluefish (age 0) and weakfish (age 0).
- Provide annual totals counts for all finfish species taken, total biomass for all finfish and invertebrate species taken, as well as, a species list for all species caught in LIS Trawl Survey sampling.

KEY FINDINGS:

- A total of 127,956 finfish, lobster and squid weighing 16,633 kg were collected in 2011.

- Sixty-five (65) finfish species and forty one (41) invertebrate species (or taxa) were collected from 172 tows conducted in 2011. The total fish species count (65) is 13% higher than the previous 27-year average of 57.4 species per year (1984-2010). Sixty-five species is also the third highest since the survey began. The Long Island Sound Trawl Survey has collected one hundred and two (102) finfish species since 1984 with two new species; silver perch (*Bairdiella chrysoura*) and white mullet (*Mugil curema*) being observed in 2011.

- Springtime adult scup abundance remains high relative to 1984-1999 levels; the 2011 spring index of age 2+ fish was the sixth highest in the time-series at 34.2 fish/tow. Although the fall scup index is usually the preferred index of abundance from the trawl survey, even the springtime scup indices have been above the time-series average for six of the past twelve years. The fall index of age 2+ was also high (third highest), in fact, there were age 10+ scup in the fall survey for the first time in 2011. The record 1999 year class (498 fish/tow) has spanned out to record age class strength each year since, and is now included in the age 10+ group.

- During the spring survey two finfish species were at record high levels of abundance, smooth dogfish and summer flounder, while red hake were at record low levels of abundance. Of the species where the spring index is the preferred index of abundance for the trawl survey, an additional three species had indices above the time-series mean; black sea bass, ocean pout and spiny dogfish.

- During the fall survey, two species had record high indices of abundance, spotted hake and northern kingfish. Conversely, two species had record low indices of abundance, bluefish and butterfish. The tropical storms that impacted the Long Island Sound area during the latter part of August and the beginning of September may have been a contributing factor in displacing many species outside the survey area. Even so, of the species where the fall index is the preferred index, an additional eleven (11) species had indices above the time-series mean; smooth dogfish, summer flounder, spotted hake, hogchoker, northern kingfish, Atlantic menhaden, moonfish, rough scad, scup, striped searobin, and clearnose skate.

- Although the striped bass abundance in spring 2011 fell below the mean for the second time in the past 16 years, the current index of 0.48 fish per tow remains well above the average for the first eight years of the time series.

- The fluke index for spring 2011 (3.85 fish per tow) is more than triple the time-series average. The spring survey index for tautog has remained low and below the time-series average for 18 of the past 19 years. Winter flounder springtime abundance has been low and declining for the past thirteen years, with 2006 being the lowest index for the time-series and 2007-2011 indices being approximately one-third the time series average. The weakfish age 1+ index for the fall survey (0.68 fish/tow) show the highest abundance of older weakfish since the peak years in the mid 1990's.

- Relative indices of abundance (geometric mean number per tow) of American lobster were at record low levels for both spring and fall surveys in 2011. This continues the decreasing trend begun in the late 1990's. Current springtime abundance has seen more than a 95% drop since the peak abundance of 18.52 lobsters per tow in 1998. Fall lobster abundance has fallen more than 98% since the high of 19.6 lobsters/tow observed in 1997.

CONCLUSIONS:

- The abundance of some recreationally important species in Long Island Sound remains moderate to high including scup, striped bass, summer flounder and black sea bass. However, some recreational species like winter flounder and tautog have gone through a protracted period of declining abundance and this is cause for concern. Additionally, several species not typically targeted by recreational fishermen have undergone changes in abundance in trawl survey catches that may indicate shifts in species assemblages within Long Island Sound associated with broad scale increasing temperature trends in the northwest Atlantic.

RECOMMENDATIONS:

- C
ontinue monitoring through LIS Trawl Survey to provide information for stock assessment purposes, to evaluate management measures and to maintain the continuity of this long-standing time-series.

JOB 2 PART 2: ESTUARINE SEINE SURVEY

OBJECTIVES (summary)

- To provide an annual index of recruitment for young-of-year winter flounder and all finfish and crab species taken.

KEY FINDINGS:

- The 2011 annual index of recruitment for young-of-year winter flounder (1.1) fish/haul) ranked third lowest (22nd) out of 24 annual indices, following the 2009 record low.

- Mean catch of all finfish (186 fish/haul) ranked sixth out of 24 annual indices and was just above the series average of 145 fish/haul (Figure 2.2).

- The forage fish index for 2011 (127 forage fish/haul) was the seventh highest of the time series.

CONCLUSIONS:

- Another decrease in abundance of the winter flounder young of year index for 2011, followed by fairly low indices since 2000 and the absence of a strong year class since 1996 (relatively high in 2004) is not expected to change the disappointing short term outlook for the stock.

- The inshore forage fish abundance index primarily reflects the abundance of Atlantic silversides, followed by striped killifish, mummichog and sheepshead minnow, the dominant forage species taken in the survey.

RECOMMENDATIONS:

- Continue to monitor young-of-year winter flounder and inshore forage species abundance through the September seine survey.

JOB 3: INSHORE SURVEY

OBJECTIVES (Summary)

- Provide information on the adult American shad spawning population: length, age structure and sex ratio.

- Provide annual indices of relative abundance for juvenile shad, blueback herring and common nearshore marine species.

KEY FINDINGS:

- The 2011 adult American shad run experienced an increase of 33% at the Holyoke Lift; This is the first time the lift count has surpassed 200,000 shad since 2003. The sex ratio indicates that the majority of the fish lifted are males (70%).

- The age structure in 2011 for adult American shad is consistent with recent years. Age structure for males ranged from ages 3-6 and ages 4-6 for females. The majority of female fish were 4 years old (47%) as well as the majority of male fish (42%). The percentage of repeat spawners continues to be low with 6.4% for females and 10.3% for males.

- The 2011 CT River seine survey completed 83 seine hauls. Over 20,000 fish comprised of 32 different species or taxonomic groups were collected. Sampling in 2011 was impacted by Tropical Storm Irene, which elevated river height levels to nearly 64 times above average.

- The 2011 CT River juvenile shad index (3.08) ranks as the 5th lowest value in the 34 year time series and is approximately half of the average (6.09) CPUE.

- The 2011 juvenile blueback herring index value (21.87) ranks as the 12^{th} lowest value in the 34 year time series and is a little more than half (41.16) of the average CPUE.

- The Thames River seine survey completed 56 seine hauls. Catches were comprised of 28 different species or taxonomic groups. The 2011 Atlantic menhaden juvenile index in the Thames River (0.58) ranked as 3^{rd} lowest in the 14 year time series.

CONCLUSIONS:

- Abundance of Adult shad appears to have increased, but did not result in an increase in recruitment. Age structure for adults is comparable to recent years, as is the repeat spawning rate.
- Year classes of both American shad and blueback herring are below average in the Connecticut River for 2011.

RECOMMENDATIONS:

- Continue to monitor the Connecticut and Thames Rivers to maintain the long term time series on juvenile American shad and blueback herring. Adult age structure and juvenile

indices contribute to alosine stock assessments as well as a management plan under ASMFC that monitors sustainability of the American shad fishery.

JOB 4 FISHING GEAR SELECTIVITY – <u>INACTIVE THIS SEGMENT</u>

JOB 5: COOPERATIVE INTERAGENCY RESOURCE MONITORING

OBJECTIVES

- Provide monthly monitoring of water quality parameters important in the development of summer hypoxia in Long Island Sound including temperature, salinity, and dissolved oxygen.
- Provide indicators of hypoxia impacts on living resources.

KEY FINDINGS:

- Hypoxia first developed on or about July 6, 2011, and persisted for 54 days ending on or about August 28, 2011.
- Thirty-five mi^2 (90.6 km^2) were affected by severe hypoxia (<2.0 mg/l dissolved oxygen) in 2011.
- Hypoxia (<=3.0 mg/l dissolved oxygen) extended over a maximum area of 130.3 mi^2 (337.4 km^2) during 2011.
- The Biomass Area-Day Depletion Index (BADD) index for 2011 was the sixth lowest at approximately 4,727 area-days (average=6,850). The BADD index is a gross measure of seasonal habitat loss associated with hypoxia.

CONCLUSIONS:

- Hypoxia was about average in 2011, persisting for 54 days (mean= 55 d).

RECOMMENDATIONS:

- Continue conducting the water quality monitoring program to provide information needed to evaluate the effectiveness of measures to reduce nutrient loading to LIS and the impact of water quality improvements on marine life.

JOB 6: PUBLIC OUTREACH

OBJECTIVES

- Increase public awareness among anglers and the general public that information provided through this project contributes to state and federal efforts to enhance recreational fisheries conservation and that the majority of marine fisheries research and monitoring activities in Connecticut are funded through the Federal Aid in Sportfish Restoration Program.

KEY FINDINGS:

- A total of 25,733 outdoor and environmental writers, marine anglers and boaters, marina operators, fishing tackle retailers, Fisheries Advisory Council (FAC) members, and members of the general public attended outreach events. The two largest event were the "CMTA Boat Show" attended by 9,872 fishermen and hunters, followed by "Northeast Hunting and Fishing Expo" at the Hartford Convention Center which had an attendance of 14,667.

CONCLUSIONS:

- Large numbers of anglers and members of the general public are provided information about Marine Fisheries programs through participation in outdoor fishing & hunting shows, Science and Career Days, public speaking engagements and displays at the Marine Fisheries Office.

RECOMMENDATIONS:

- Continue outreach efforts.