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2014-15

Connecticut Inland Fisheries

Stream Angler Surveys

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State of Connecticut
Department of Energy and Environmental Protection
Bureau of Natural Resources
Inland Fisheries Division

Grant Title: Inland Fisheries Research and Management
Study 1: Coldwater Fisheries Program
Project: Coldwater Management
Job 2: Stream Angler Survey

Period Covered: April 1, 2014 to March 31, 2015

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Cover photo: Small stream brook trout fishing, photo by Tom Sheffield.

Summary

A single set of Rapid Assessments were used to gauge angler activity and success on Opening Day of trout fishing season. Anecdotal angler comments and observations indicated lower than usual participation and lower than expected trout catch rates at many locations.

Background

Sound fisheries management of streams relies upon a combination of angler survey and biological data. This job provides a coordinated and standardized means of assessing recreational fishing on Connecticut's streams using accepted methodology. Angler surveys conducted under this job will expand our knowledge of the State's stream fisheries resources, and help to determine the effectiveness of current fishing regulations and trout stocking regimes. Improved fishing quality and angler satisfaction, resulting from informed management decisions, may lead to greater angler interest and participation in river and stream fishing. In the case of the State's trout stocking program, current angler effort/catch information on stocked rivers/streams should help optimize the limited trout production from state fish hatcheries. By providing a central depository for data storage and guidance in creating statistically valid, standardized survey methods, this job will increase efficiencies for other fisheries management jobs requiring stream angler survey data.

Angler surveys can be used to collect economic information for a fishery that includes the cost to go fishing, the impact of purchases related to fishing trips on local economies and the willingness of anglers to pay for their recreation opportunities. A significant body of baseline fisheries economic data has been collected during several past studies in Connecticut: the Farmington River (Hyatt, 1986), the Housatonic River (Barry 1988), and for 60 streams across the state during the 1988-1994 stream survey (Hagstrom et al., 1996). Economic information helps managers make informed decisions. It can be used to evaluate a particular fisheries value to anglers, compare the cost-benefit of various management options and place monetary values on the deeded fishing rights of a specific waterbody. This report covers work performed during April 1, 2014 to March 31, 2015.

Objectives

- Develop and implement standard survey methods.
- Coordinate implementation for angler surveys (assessing catch, effort and angler attitudes) on requested stream resources.

- ♦ Maintain stream angler survey databases and archive all raw data. Provide technical support to management projects.
- ♦ Provide economic information to support fisheries management decision making.

Approach

Three different types of angler surveys are typically used for streams and rivers to gather quantitative estimates of angler effort (hours of fishing), catch (numbers of fish caught), harvest (number of fish taken), and catch rates (the total number of fish caught per hour) for all fish species.

- Roving angler surveys with a stratified, random design (Malvestuto et al. 1978) are best suited for streams with many access points that are easy to walk or drive between.
- Bus stop angler surveys (Pollack et al. 1994) are useful for larger rivers that have many well defined, but widely dispersed access points.
- Rapid assessments (Orciari et al. 2011) are useful when rough estimates of fishing are desired from many places, or when staff is not available to survey for the whole season (e.g., the period immediately following Opening Day). This survey method allows only a relative comparison of fishing pressure between streams where data were collected during a similar time period.

For collecting data away from stream-side, alternative survey methods such as phone, mail, and canvas surveys will be evaluated for their usefulness in collecting non-resource specific or off-site resource specific angler attitudes.

Roving Angler Survey Methods:

Stratification and Seasons: The typical angler survey design used on CT streams is divided into six survey seasons: *Winter* - Jan. 1st-Feb. 28th; *Early Spring* - March 1st – third Saturday in April (Opening of Trout Season; this is the normal closure period for most trout streams); *Spring* - Opening Day to June 15th; *Summer* - June 16th to Labor Day; *Fall* -Labor day to Oct. 31st; *Late Fall* - November 1st to December 31st. Within each season, different time periods are treated as separate "strata", or time periods within which angling activity is expected to be different than during other time periods. Samples are taken within each strata, and these samples are used to determine averages for each strata. Strata averages are then averaged to come up with survey season averages. Typically three strata are commonly used with most of the stream angler surveys: (Weekday early (sunrise until 2pm), Weekday late (3pm until sunset) and

Weekend/Holiday). Due to the unique angling effort created by the Opening Day of trout season, it is treated as a separate stratum within the Spring Season.

Bus Stop Angler Survey Methods:

A Bus Stop survey is an access point design that uses predetermined wait times at each access point. This is appropriate to use where there is significant angler effort away from the access site. For example, a river fished primarily by boat with limited access points. This design has been used for surveys of the Connecticut River (Davis et al. 2011) and would be useful for the Quinebaug River, a river with widely scattered access points and heavy canoe usage. Estimate calculation, expansion values and design limitation are discussed in Davis et al. 2011.

Rapid Assessments

The rapid assessment method is a series of counts at locations where only a relative index of angler usage is needed (Oriari et al. 2011). These data are used to assess whether stocking rates for specific streams or stocking locations match current angler usage. Generally no individual angler interviews are done with this method.

For all methods, information collected during individual angler interviews can include: angler effort, catch, expenditures, home town and angler opinions related to management activities and resource values. Depending on project needs, this information can be used to generate economic impact, and service areas (the towns that a specific resource draws anglers from). Economic impact is the monetary value that a fishery adds to local business. The Service Area is an analysis used to determine the towns that anglers travel from to utilize an individual resource or particular management area. Annual catch and effort statistics are presented in this report with more detailed analysis in individual job reports. All job specific opinion questions will be summarized in that project's report.

Economic Evaluation-Consumer surplus:

Consumer surplus is the value anglers place on a fishing resource, above and beyond what they had to pay to participate. Generating this type of economic information typically requires numerous questions, some of which involve financial information about the individual angler. A methodology for using Distance Travel (DT) data to compute anglers' consumer surplus value for a discrete resource was investigated. This method only requires that the angler provide the town from which he or she traveled to start their fishing trip. This information is commonly available in many past surveys and does not require additional questions or information from anglers. The web site http://www.ecosystemvaluation.org/travel costs.htm presents detailed instructions and examples of the approach. This method can be used with town of origin or zip code information.

Past Angler Surveys:

Historic angler surveys continue to be inventoried and compiled. Hardcopy files are being converted to electronic formats and all databases and results are being centralized, where they will be more readily available to staff.

Study Area

Single count Rapid Assessments were conducted on Opening Day (4/19/14) of trout season. See Figure 1 for the spatial distributions of locations.

Key Findings and Discussion

An evaluation of trout stocking locations is being conducted as part of the Trout Stocking Job. To determine the angler usage and value of some of these sites, rapid assessments of selected stocked streams and small ponds were conducted on Opening Day of trout fishing season in 2014. A total of 47 streams and 10 lakes and ponds were visited this year. In addition, angler counts were conducted at three Trout Management Areas and six Trout Parks as part of long term usage trend evaluations. These data will be analyzed and any trends will be presented in the Job's Final Report

Table 1.- Rapid assessment sites surveyed during Opening Day of Trout Season April 19,2014.

Water body Type	**Number of sites surveyed***
Community Lakes	1
Lakes	7
In stream Ponds	3
Rivers	47
Trout Management Areas	3
Trout parks	6

* Not included in other Lake and Pond Angler surveys

Anecdotal angler comments indicate that trout catch rates were lower than usual at many locations, and that the numbers of anglers present at many sites were also lower than in years past. Late winter-early spring 2014 air temperatures were colder than normal; February 5.5^{o}F below normal, March 6.6^{o}F below normal, and April 0.6^{o}F below normal (National Climate Data Center 2014). These cold temperatures may have negatively affected angler participation behavior as well as the trout movement in rivers/streams and susceptibility to catch.

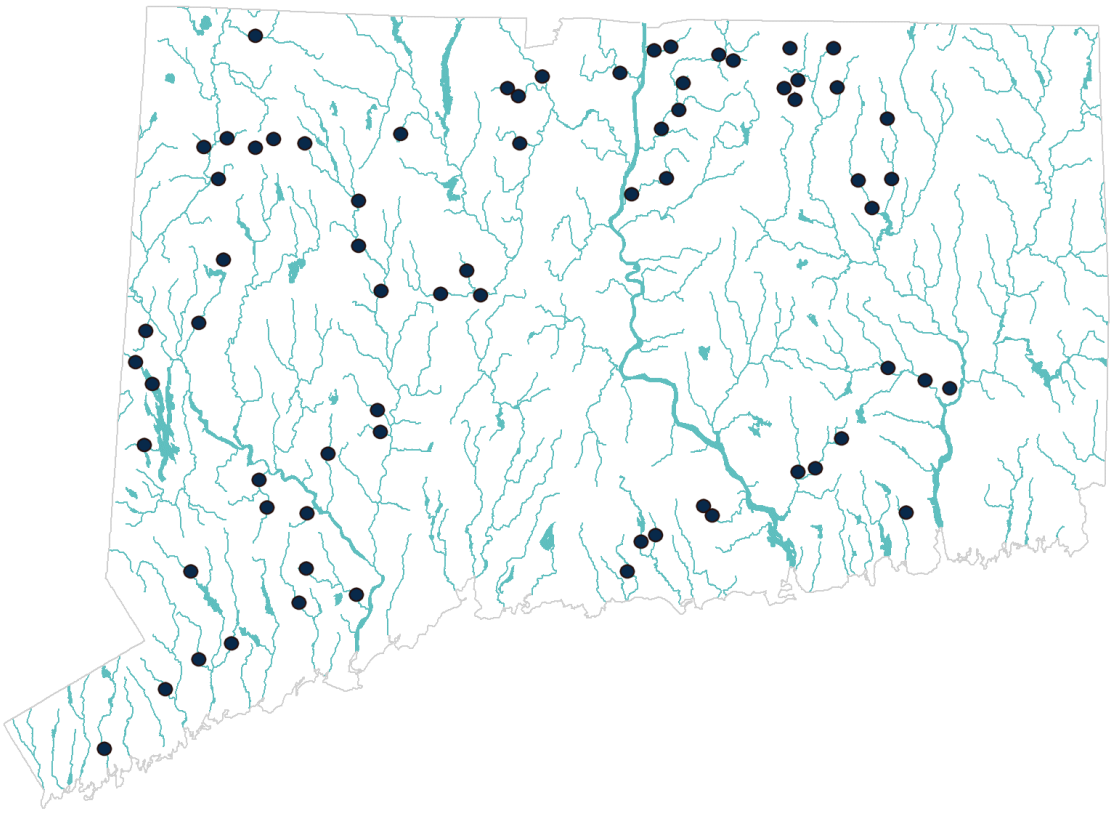

Figure 1. Distribution of Opening Day Angler Survey locations for 2014.

Past Angler Surveys:

Many angler surveys were done in the past by CT DEEP Inland Fisheries Division (IFD) biologists for specific resource evaluations. Work continues to convert data from historic surveys to electronic form. Compiling historic survey data in a centralized, electronic archive will ensure preservation of the data and allow future access. Additionally, this centralized database will allow IFD to make the best use of this valuable data to assess long-term trends and changes in resource usage and value.

Future improvements in methodology:

The human resources required to conduct timely creel surveys has always been high. Historic creel survey methods have not kept pace with advances in technology. As technological changes advance rapidly, there are several remote survey tools that may be useful to investigate. These technological tools could compensate for potential future reductions in human resources and ultimately make real-time creel surveys more cost effective. As an example, voluntary reporting via website in remote locations using QR code links would expand our information on low use streams with minimal man-power usage. Angler counts using trail

cameras may be a way to get estimates of angler usage in hard to survey areas without having to have direct angler contact. Remote control drones with cameras could allow rapid visual surveys in hard to reach stream sections. However, this last tool could require special considerations of privacy and aeronautical issues that would need to be fully explored.

Recommendations

As resources permit, it is recommended that areas with little or no angler usage information or which have upcoming regulation changes be considered for angler surveys. These areas include the Quinebaug River, Mill River (Fairfield) TMA, and Shepaug River. Additional locations may be recommended by other Jobs.

Consider new alternative technologies for angler surveys. Pricing, ethics and effectiveness of these methods need to be evaluated. Contacting other agencies for information on similar non-traditional survey efforts would be a cost effective first step.

Expenditures

Total Cost:	$???,???
Federal Share:	$??,???
State Share:	$??,???

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