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ILLINOIS NATURAL HISTORY SURVEY

DATABASE MANAGEMENT AND ANALYSIS OF FISHERIES IN ILLINOIS LAKES

VOLUME 1

1 March 1998 - 28 February 1999

F-69-R
Final Report Segments 10-12
Division of Fisheries
Illinois Department of Natural Resources

Center for Aquatic Ecology

Pacifico J. Perea, David P. Philipp, Todd Kassler, Robert A. Illyes, Ralf Riedel, and Timothy W. Edison

April 1999

Aquatic Ecology Technical Report 99/2

This technical report is the final report of Project F-69-R Segments 10-12, Database Management and Analysis of Fisheries in Illinois Lakes. Which was conducted under the memorandum of understanding between the Illinois Department of Natural Resources and the Board of Trustees of the University of Illinois. The actual work was performed by the Illinois Natural History Survey, a division of the Illinois Department of Natural Resources. The project was supported through Federal Aid in Sport Fish Restoration (Dingell-Johnson) by the U.S. Fish and Wildlife Service, the Illinois Department of Natural Resources Division of Fisheries, and the Illinois Natural History Survey. The for, content, and data interpretation are the responsibility of the University of Illinois and the Illinois Natural History Survey, and not that of the Illinois Department of Natural Resources Division of Fisheries.

Illinois Natural History Survey
Aquatic Ecology Technical Report 99/2

DATABASE MANAGEMENT AND ANALYSIS OF FISHERIES IN ILLINOIS LAKES: OPTIMIZING FISHERIES MANAGEMENT

(F-69-R)
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Executive Summary

Since 1987, F-69-R, has developed useful resources to meet the needs of fishery managers and researchers. Segments 10-12 met these needs by expanding the fisheries databases for the Illinois Department of Natural Resources Division of Fisheries, obtaining data for researchers at the Illinois Natural History Survey Center for Aquatic Ecology, collaborating with other projects to meet overlapping needs and improving the analysis software used by stream and lake fisheries managers.

Job 101.1 Creel Surveys

Since 1987 the creel portion of F-69-R, accounted for 227 completed creel surveys on Illinois Lakes and three river basin surveys. Segment 12 the creel portion of F-69-R, accounted for 16 total surveys (Appendix A). These sixteen creels were composed of sixteen day creels on fifteen lakes, (Shelbyville Main Lake and Tailwater counts as two).

The creel project also coordinated with the bluegill project on seven lakes. Along with the standard creel on the bluegill lakes, creel clerks distributed angler attitude surveys. These surveys were developed to gauge the response of anglers to proposed bluegill management regulations.

Predictive models of boat angler counts were also re-examined for accuracy and utilized during point access creels on Newton Lake. Newton lake is part of a study funded by Central Illinois Power Company (CIPS) to examine the environmental effects of high thermal discharges on the biotic community.

Data from creels on Segments 10-12 provided important short-term information to IDNR fishery

biologists for evaluating the stocking success for cool-water species of sport fish such as walleye, sauger , muskellunge, tiger muskies, striped bass and hybrid striped bass. The creels also provided IDNR biologists some insights on long-term trends of individual lakes in their district.

Angling pressure and nesting success of smallmouth bass were again examined on Jordan Creek, Vermilion County Illinois. Private landowners cooperated with biologists in identifying angling pressure and nesting habitat.

Job 101.2 Fisheries Database Enhancement

Streams and lakes support activities were limited to FISHTAB, which required a minor revision and several investigations of actual and suspected bugs.

FAS Creel

Segment 12 was devoted almost entirely to the completion of the creel software rewrite and database, which is documented in the final report. Minor revisions and software support will continue into segment 13.

Job 101.3 Management History and Historical Fish Population Survey Data

Management history and historical fish population survey data on 148 state-managed lakes were verified during 1998, bringing verification for all lakes to completion. Data verification for management history, fish population surveys, and fishing regulations were completed during the second half of 1998. Analyses evaluating fisheries management activities in Illinois lakes were concluded in mid 1998.

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Banner Marsh, Evergreen Lake Jones State Lake, Lake Mendota , McCullom Lake, Newton Lake, Sangchris Lake Shelbyville Main Lake and Tailwater.

1.1 Long-term Lakes

Dolan Lake and Jones State Lake were the only core group of 11 long-term research lakes surveyed in Segment 12. Dolan Lake was chosen to monitor long-term fish population trends, assess earlier stockings of walleye and provide further baseline data for the bluegill project. Jones State Lake was surveyed to monitor long-term fish population trends and continue assessment of a slot limit for largemouth bass established in 1996.

1.2 Bluegill Lakes

The seven bluegill lakes that were surveyed including: Dolan Lake, Lake of the Woods, Wampum Lake, Bullfrog Lake, Paradise Lake, Lake Kakusha and Tampier Lake. These lakes were surveyed with standard creels to provide baseline information for the Bluegill Project. In addition angler attitude surveys were collected on Lake of the Woods, Wampum Lake, Bullfrog Lake, Paradise Lake and Lake Kakusha.

1.3 Other Cree l Lakes

The other eight creels were Banner Marsh, Evergreen Lake Lake Mendota , McCullom Lake, Newton Lake, Sangchris Lake Shelbyville Main Lake and Tailwater. Banner Marsh, Evergreen Lake, Lake Mendota , McCullom Lake, Sangchris Lake Shelbyville Main Lake and Tailwater were creeled to monitor recent stocking of cool-water and warm-water gamefish and evaluate recent management activities.

Newton Lake was surveyed to evaluate predictive models of boat angler counts using

1998 parking lot and on water data along with data collected on past creels. Newton lake was also surveyed as part of a study funded by Central Illinois Power Company. The study is examining the biotic effects of sustained thermal discharges above the Illinois State Environmental Protection Agencies thermal discharge limit. The creel data will be used to monitor any changes that occur as a result of these actions.

1.4. Angler Attitudes Towards Harvest Regulations for Bluegill Sunfish and Angler Harvest Selection

1.4.1 Introduction

Bluegill (*Lepomis macrochirus*)is the most often angled and harvested fish species in Illinois (IDNR 1997). There appears to be an ever increasing demand for quality bluegill populations by anglers (Claussen et al 1997). Management of bluegill has been limited in most areas with the imposition of only liberal creel limits on a very few lakes. Biologists must be able to manage lakes to provide quality bluegill fishing and to eliminate or reduce the problem of stunting to ensure the satisfaction of angler needs (Beard et al. 1997).

1.4.2 Factors Associated with Stunted Bluegill

Currently there are four hypotheses for the cause of stunting in bluegill: 1) overpopulation of bluegill, 2) social influences on age at maturity, 3) overabundance of cuckolders, and 4) overexploitation of large bluegill (Jennings et al. 1997, Claussen et al. 1997). Overpopulation of bluegill results in stunted populations due to density dependant growth limitations such as insufficient food resources or low predator densities (Santucci and Wahl 1993, Mittelbach and Osenberg 1993). Social influences consist of the presence of large dominant adults whose presence causes smaller males to invest more energy in growth than in

reproduction (Jennings et al. 1997). Overabundance of cuckolders may cause a lake to be stunted and is presumed a result of increased fishing effort (Drake et al. 1997). Overexploitation of bluegill resulting in stunting of a lake has been shown to be a result of fishermen showing size selective exploitation (Coble 1988, Drake 1997, and Jennings 1997). Although there is a lack of knowledge on whether anglers specifically target a portion of a bluegill population, it is speculated that angler harvest is male biased.

1.4.3 Regulations

There have been many attempts to use regulations in an attempt to reduce excessive harvest and to improve fisheries (Redmond 1986). Harvest regulations may include creel limits, closed seasons, size limits, and partial closure of water bodies to fishing.

Creel limits reduce the number of fish that a angler may harvest or keep to prevent the exploitation of a fishery (Creamer 1993, Hess 1991, Redmond 1986). The use of a creel limit allows fisheries managers to regulate the harvest of fish from a water body and prevent rapid overexploitation (Redmond 1974). A creel limit could potentially lead to overexploitation if it is viewed by some anglers as a goal (Chipman and Helfrich 1988). Goal oriented anglers may harvest a greater amount of fish than would have been harvested without the creel limit, since in many instances creel limits are not met.

Size limits can also be used to control the harvest of a fishery (Creamer 1993, Kokel 1991, Paragamian 1984). Size limit restrictions may be put on a fishery in three possible ways; maximum size limit, minimum size limit, and slot limits. Maximum size limits prevent harvest of fish either over a certain size or a reduced number greater than a certain size, usually the size

at which fish successfully reproduce. In the case of a minimum size limit, anglers are not able to harvest fish below a certain size (Petering et al. 1995). Reasoning behind a minimum size limit is to protect young fish ensuring that they will be able to reach reproductive age. Size limits can have an effect on growth and recruitment of fish populations by affecting food availability and predation (Ney 1993). Alternately minimum size limits may be used to control populations of forage fish which the selected species preys upon (Farabee 1974). The third type of size limitation which may be put upon a fishery is a slot limit. Slot limits allow the harvest of selected sizes of fish to protect size classes from over harvest. Size limit restrictions for bluegill will be minimum size limits, keeping anglers from harvesting fish under a certain size.

Seasonal restrictions or closures are another way of limiting the harvest of a fish species (Redmond 1974). The restrictions are often imposed during a time period when spawning is occurring and fish are most vulnerable to over harvest (Redmond 1986). Two factors which affect the survival of fish during this time as well as when any harvest regulations are used are hooking mortality and illegal harvest (Muoneke 1992). Hooking mortality occurs when a fish is caught by an angler and then dies. The mortality may result from either handling stress or hook wounds (Creamer 1993, Muoneke 1992).

Illegal harvest can also be a problem resulting in the inability to properly manage a fishery (Austen 1988, Giggliotti and Taylor 1990). Illegal harvest may be the result of either anglers not knowing the current regulations at a particular fishery or it may be the result of anglers knowingly disobeying the regulations (Matlock and Bryan 1986). Illegal harvest can have either a large effect or minimal impact upon a fishery (Giggliotti and Taylor 1990).

Unknown impacts will cause potential problems in the proper management of the fishery (Creamer 1993, Kokel 1991).

1.4.4 Angler Attitudes

Angler attitudes towards regulations can affect levels of compliance (Glass and Maughan 1984). Anglers who believe a regulation is not helping a fishery may be less likely to comply with a regulation than an angler who believes a regulation is positively benefitting the fishery (Glass and Maughan 1984). Anglers who understand the reasoning behind a regulation may be more willing to support that regulation believing that it will improve a fishery (Petering et al. 1995). Increasing positive angler attitudes will lead to an increase in angling hours, thereby resulting in positive economic benefits as well as increased license sales (Aas 1995).

1.4.5 Surveys

Anglers are not a homogenous group, they posses different values and different levels of specialization in their sport (Bryan 1977 and Fisher 1997). Through the use of angler surveys it is possible to identify what proportion of an angling population is at the advanced, beginner, or intermediate level. Each of these levels of specialization result in different values (Kuentzel and Heberlein 1992). In addition past experience in an activity has been shown to influence attitudes towards leisure activities (Kuentzel and McDonald 1992). Knowledge of angler level and values obtained through surveys can provide managers with information on what regulations or restrictions anglers will accept on a fishery. In addition surveys will provide an idea of what opposition may come with the imposition of certain regulations and to what level

illegal harvest may occur.

1.4.5.1 Objectives

1. Determine angler opinion to various changes in regulations for bluegill (*Lepomis macrochirus*).
2. Compare angler attitudes at lakes categorized as stunted with lakes categorized as quality.
3. Determine the proportion of anglers that would be affected by changes in regulations for bluegill.
4. Determine the effects of angler harvest on the sex/age/size structure of bluegill populations.

1.4.5.2 Approach

This study will evaluate angler attitudes towards regulations pertaining to bluegill (*Lepomis macrochirus).* A five point scale will assess at what level anglers strongly support or strongly oppose regulation changes for catch and release bluegill fishing, presence of no fishing zones within a lake, daily bag limits for bluegill, and minimum size limits for bluegill.

Size structure of the bluegill population in a lake will be determined by surveying existing population databases through the use of FAS (F-69-R) and by supplementary sampling as part of a project determining potential for quality management of bluegill that will determine age/size structure (Claussen et al 1997). Lakes will be categorized as containing either stunted (with a bluegill population which is mainly <150mm), or quality populations of fish (most mature fish at or above 170mm total length) (Claussen et al. 1997). Once a lake has been classified, angler attitudes towards the various regulation changes will be compared among

these lake types.

Through the use of creel data it also will be possible to examine who will be affected by the proposed regulations. The percent of the bluegill harvest that is affected by reduced creel limits, size limits, partial lake closure, and catch and release bluegill fishing will be determined. The proportion of fishermen that the regulations will affect will be estimated with the use of creel data. Creel data will also allow assessment of changes in harvest that might result due to regulation changes at these lakes.

Sampling of harvested bluegill will show what anglers are actually taking from the population. Collection of scale samples, length, sex and maturity data will occur throughout the pre-spawn, spawning, and post-spawn periods from several lakes with stunted and quality bluegill populations. This data will then be compared to electrofishing sampling done through the bluegill project. The comparison of sex ratios and size structure of the fish population between anglers and standardized sampling will reveal how selective anglers are in their harvest.

1.4.5.3 Methods and Materials

Angler opinion survey distributed by INHS creel clerks, will determine angler preference for various regulations (Appendix A). Creel survey data will estimate the angling frequency for the given lakes in the study, distance traveled, type of fishing (shore or boat), and the species which the angler is pursuing. Following this initial information, questions will be asked about angler preferences for (*Lepomis macrochirus)* bluegill fishing. These questions will pertain to the size and number of bluegill caught. Anglers will be introduced to potential regulations

which may be imposed to help improve bluegill fishing.

Anglers will be asked their opinions about four categories of regulations. The first category of questions will be those pertaining to season closures. Anglers will be asked how they feel about closing all bluegill fishing (only catch and release bluegill fishing) during the entire year and how they feel about closing bluegill fishing only during the spawning season (May 1-July 15). The second category of questions will deal with the closure of a portion of the lake. Anglers will be asked how they feel about closing part of a lake (25% and 50%) during the full spawning season and closing part of a lake (25% and 50%) during the spawning season (May 1-July 15). The third category of questions will deal with angler opinion in the area of creel limits. Anglers will be asked how they feel about allowing anglers to keep a total of 10 bluegill and how they feel about allowing anglers to keep a total of 25 bluegill. The fourth category of questions will be related to the size of the fish harvested. Anglers will be asked how they feel about imposing minimum size limits of 6, 7, and 8 inches on bluegill.

After reading about the possible regulations anglers will be asked how they feel about each by ranking them on a 1 through 5 scale from strongly support, support, neutral, oppose, and strongly oppose (Matlock et al. 1991, Petering 1995). Angler opinions will be recorded and seven human dimension questions will be asked pertaining to age, how often the angler fishes, gender, income, employment status, size of town, and highest level of education.

The survey will be distributed on six lakes that are part of a larger bluegill bluegill study (Claussen et al 1997). As part of this study the lakes will be sampled with boat electroshockers during the spawning season and bluegill populations will be categorized as being stunted or

quality. The basis of this calculation will be most of the mature bluegill in the population less than 150mm (stunted), and most of the mature fish above 170mm (quality).

The survey will be given out by INHS creel clerks as part of their normal interview procedure (Bayley et al. 1991). Creel clerks will be instructed to give the survey to each angler that they encounter one time during the season which lasts from April 1-Oct 31. Upon the distribution of the survey the creel clerk will inform the angler that this is an opinion survey and that the response they indicate to any regulation will not mean that it will be imposed. Angler comments on the survey will be allowed on the back of the survey. Supplemental interviews will be given at lakes where fishing pressure is low and creel clerks do not obtain sufficient numbers of interviews in their workday. Distribution of the survey will be done for a period of one year in order to obtain an accurate sample of all the angling groups at the lake.

1.4.6 Bluegill Lakes

Lake Paradise, Ridge Lake, and Walnut Point will constitute the quality lakes on which the surveys will be distributed. The stunted lakes will consist of Lake of the Woods, Wampum, and Bullfrog. The lakes range in size from 25-138 acres and are distributed within north and central Illinois. Five of the six lakes will have a creel survey done on them during the 1998 year, only Walnut point will be without a creel. A creel was done during the 1997 year at Walnut Point and data will be used from that year. Questionnaire distribution will be done throughout the year to obtain a random sample encompassing the entire angling population from all six lakes. Number of surveys to be distributed will allow to estimates of angler preferences to be within 10% of the actual mean.

The INHS creel survey database will be used to obtain the percentage of anglers which have caught and harvested bluegill at the given lake. Using this information the percentage of the angling population which potentially could be effected by each regulation will be determined (Colvin 1991). This data will be used to obtain estimates of the illegal harvest which could occur on each lake under each of the potential regulations. Only the regulation of establishing no fishing zones will not be able to be analyzed through the creel data because location of anglers is not recorded by creel clerks.

Using year periods that are predetermined by the creel survey, the year will be divided into pre spawn, spawning, and post spawn periods. During these periods a sample of bluegill harvested by anglers will have scale samples taken from them to determine age, length will be recorded, and the fish will be sexed and noted whether they are mature or immature (Jearld 1983). Three lakes will be emphasized for this sampling, they will be Lake of the Woods, which has a stunted population and Walnut Point and Ridge Lake which have quality populations. The population of angler harvested fish sampled will then be compared to bluegill project estimates for sex-ratio, age, and size of the bluegill population within the lake. Through the use of the creel data estimates of the total harvest can be used to determine what effects angler harvest is having on each of the lakes bluegill population.

1.4.7 Data Analysis and Expected Results

Angler attitudes towards potential bluegill regulations will be compared between lakes categorized as quality and stunted. The null hypothesis is anglers fishing at both quality and stunted lakes will have similar feelings towards regulations. Differences between stunted and

quality lakes will be tested using ANOVA with quality and stunted treatments and individual lakes as replicates.

It is expected that anglers at both quality and stunted lakes will have similar feelings toward potential bluegill regulations. Angler fishing practices may show lake to lake variation which would affect angler response to regulations. Individual background may also be an important factor affecting angler response to regulations. Differences that exist between lakes in angler fishing practices and angler personal background may cause lake to lake variation in angler feelings towards potential bluegill regulations.

Creel survey data will determine the proportion of anglers that would be affected by regulations. Bluegill harvest in terms of numbers and size will be estimated through the creel survey for both the entire year and the spawning season (May 1-July 15). Harvest data will be used to estimate how the angling populations will be affected by regulation changes.

Anglers at quality lakes are expected to harvest a greater number of bluegill than anglers at stunted lakes. Bluegill harvested at quality lakes are also expected to be larger on average than those harvested at stunted lakes. Therefore regulations pertaining to catch and release bluegill fishing and bluegill bag limits are expected to have a greater impact on quality lakes. These regulations can be expected to reduce harvest during certain periods, such as the spawning season at quality lakes. Bluegill minimum size limits are expected to have a greater affect on stunted lakes if the harvest of bluegill is the reason for stunting. Minimum size limits would prevent undersized fish from being harvested, which would be most of the population in stunted lakes. No fishing zones may offer a decrease in bluegill harvest by creating a refuge and

protecting some nesting areas during the spawning season.

Angler harvested bluegill will be compared between the pre-spawn, spawn, and post-spawn through the use of a repeated measures ANOVA. A chi square can be used to compare within lake variation during the three seasonal periods.

Angler harvest of bluegill during the pre-spawn and the post-spawn are expected to be similar to the sex structure of the population. Alternatively, spawning season harvest will likely yield a male bias due to anglers selectively harvesting spawning males from their nests. Size structure of angler harvest is expected to be similar to that of the harvestable fish in the population. Harvestable fish in the population are expected to be all fish over four inches. Age of each fish harvested should be correlated with abundance of that year class once fish reach harvestable size.

1.4.8 Significance of Research

During a period when total angling days, licensed anglers, and total anglers are declining nationwide, ways to change public interest in fishing is becoming increasingly important (IDNR 1996, IDNR 1996, Williamson 1996). One way to do this is to provide an improved fishery where many fish as well as quality fish may be caught and to decrease illegally harvested fish (Aas 1995).

Public opinion of a fishery and fishery regulations are also important in maintaining interest in fishing (Hardin et al. 1987, Knuth and McMullin 1996). The use of this public opinion survey will allow fishery managers to more directly address the concerns and desires of fishermen seeking bluegill. This survey will also allow anglers to voice their opinion on

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was only used during early season (December-March) when fishing is the only boating activity on the lake. Recreational boating that occurred after March required on water instantaneous counts.

On lakes where a significant amount of recreational boating, the model proved to be inaccurate. Inaccuracies were primarily due to the clerk's inability to determine whether a trailer represented an angler or recreational boater.

The current predictive model was developed in 1990. It is a combination of data collected from the 1990 and 1995 creels on Powerton Lake. The model is based on the equation:

Number of Boat Anglers = (-0.35297) +(1.7085)* Number of vehicles with trailers.

The correlation is quite robust with a R^2=0.935 with n=196. Roughly 1.71 boat anglers are accounted by each trailer.

During the 1998 creel season additional counts were done on Newton Lake. This was to see how closely the current model reflected the angling population at Newton Lake. The 1998 counts and model revealed the following equation:

Number of Boat Anglers = (-2.0577) +(1.8688)* Number of vehicles with trailers.

Roughly 1.87 boat anglers are accounted by each trailer. The trailer to angler relationship is also very strong with an R^2=0.986 with n=52. The newer data approximates the current model very closely with variations only occurring at a fractional level.

Combining the two models produces the following relationship:

Number of Boat Anglers = (-1.2342) +(1.7891)* Number of vehicles with trailers.

Roughly 1.79 boat anglers are accounted by each trailer. The combined model provides a

slightly improved R^2=0.961 with n=248. This updated model will be used during the 1999 season for trailer counts on Newton Lake..

1.5 Factors affecting Smallmouth Bass Spawning Success

Objective one was to determine the angling pressure on nesting fish on Jordan Creek.. Private landowners were queried to determine if anyone was fishing the creek during evening hours when biologists were not present. Some of the landowners had a few friends or family members who would fish, but they all indicated there was not much fishing and all fishing was catch and release only. No anglers were observed fishing during nesting success monitoring. Therefore angling pressure was not a major factor in nesting success during the 1998 spawning season.

Objective two was to monitor nesting success of smallmouth bass males in Jordan Creek. Observations of nesting smallmouth in mid April and saw the first eggs in a nest on April 24, 1998 (only 2 days earlier than what we observed in 1997). A total of 19 nests were found during the first spawning event, however, they were all abandoned by May 1. Three more spawning events occurred with only 1 nest per event. The second spawning event occurred on May 18, but that nest was abandoned on May 21. The third event occurred on June 23 and lasted until July 6. We observed fry in that nest prior to July 6, but heavy rains increased flow and turbidity in the creek. We checked the nest after July 6 and could not find any of the fry and concluded the fry had been washed out of the creek during the high flow. The final spawning event occurred on July 10 and lasted until July 22 when the fry were free swimming and had dispersed away from the nest. In summary, a total of 22 nests were observed with only 1

successful nest recorded.

Comparing the spawning events of 1997 to 1998 we saw 16 successful nests in 1997 versus 1in 1998. The prolonged heavy rain in 1998 resulted in fast turbid current that continued to destroy eggs or fry, while in 1997 the rains subsided in June and the smallmouth bass were able to nest successfully. We will continue to monitor nesting success and angling pressure in 1999 to determine how each plays a part in recruitment of smallmouth bass in Jordan Creek.

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Table 1. 1998 Lakes Surveyed and Sampling Periods

Lake	Start Date	End Date
Sangchris	01-Jan	31-Dec
Newton	01-Feb	31-Dec
Dolan	15-Mar	31-Oct
Evergreen	15-Mar	31-Oct
Jones	15-Mar	31-Oct
Banner Marsh	15-Mar	31-Oct
Shelbyville Main	15-Mar	31-Oct
Shelbyville Tailwater	15-Mar	31-Oct
Paradise	15-Mar	31-Oct
Bullfrog	01-Apr	31-Oct
Mendota	01-Apr	31-Oct
Kakusha	01-Apr	31-Oct
Lake of the Woods	01-Apr	31-Oct
McCullom	01-Apr	31-Oct
Tampier	01-Apr	31-Oct
Wampum	01-Apr	31-Oct

Year	Lake Name	County
1996	Baldwin Lake	Randolph
	Braidwood Lake	Will
	East Fork Lake	Richland
	Jones Lake	Saline
	Lake Bloomington	McLean
	Lake Carroll	Carroll
	Lake Storey	Knox
	LaSalle Lake	LaSalle
	Lincoln Trail Lake	Clark
	McCullom Lake	McHenry
	Monee Reservoir	Will
	Pittsfield Lake	Pike
	Ramsey Lake	Fayette
	Rend Lake	Jefferson, Franklin
	Spring Lake South	Tazewell
	Weldon Springs	DeWitt
1997	Carlyle Lake	Bond, Clinton, Fayette
	Carlyle Tailwater	Clinton
	Heidecke Lake	Grundy
	Jones Lake	Saline
	Lake Vermillion	Vermillion
	Mermet Lake	Massac
	Otter Lake	Macoupin
	Randolph Co. Lake	Randolph
	Sam Parr Lake	Jasper
	Shabbona Lake	Dekalb
	Siloam Springs Lake	Adams
	Snakeden Hollow	Knox
	Turner Lake	Lake
	Walnut Point	Douglas
1998	Banner Marsh	Fulton, Peoria
	Bullfrog Lake	Cook
	Dolan State Lake	Hamilton
	Evergreen Lake	McLean,Woodford
	Jones State Lake	Saline
	Lake Kakusha	LaSalle
	Lake Mendota	LaSalle
	Lake of the Woods	Champaign
	Lake Paradise	Coles
	Lake Sangchris	Christian
	Lake Shelbyville	Shelby, Moultrie
	Lake Shelbyville Tailwater	Shelby
	McCullom Lake	McHenry
	Newton Lake	Jasper
	Tampier Lake	Cook
	Wampum Lake	Cook

Table 2. Creel Lakes Surveyed During Segments 10-12

Job 101.2 fisheries Database Enhancements

Project Objective: Support the Fisheries Analysis System(FAS), including the streams database and their associated applications. Develop the creel data base on Paradox and rewrite creel software for this platform.

Segment 12 Objectives: Continue support the Fisheries Analysis System(FAS), lakes and streams database. Finish creel database for PC including file transfer, data entry, analysis and graphics applications for Paradox PC platform.

2.1 Summary of 1998 Activities

This segment was devoted almost entirely to the completion of the creel software rewrite and database.

2.1.1 Support for Streams and Lakes FAS (Fisheries Analysis System)

FISHTAB (the analysis program for Streams and Lakes) was greatly improved and extended. A full description of this and also to the current Streams data entry can be found in the FAS-Streams manual(1). Selection features were added to the Streams data entry program interface with graphics and FISHTAB, and a new habitat data structure was introduced.
A Unix data decompression compression for some historical data was developed. Both databases were evaluated for possible Y2K problems. No serious problems were found, but a few cosmetic problems should be addressed in the next segment. Routine support including adaptation of FISHTAB and data entry to Windows 95.

2.1.2 FAS Graphics for all FAS Databases on the PC

An enhanced version of the Apple FAS graphics was written for the PC.

2.1.3 Creel Software and Database for the PC

A database structure for PC Creel was designed, and is discussed below. A detailed users guide can be found in Appendices A-2 to A-5. The Creel analysis suite is like that of the Apple][, which is documented in the Creel Survey Manual(2). The PC data entry program is quite different from that of the Apple][, and is discussed below.

Apple][to PC transfer programs were developed (using the serial ports with handshaking and parity) and used to transfer the Apple databases.

2.1.4 Database Design

The Apple][Creel database uses the General Manager hierarchical database which runs under Apple DOS 3.3 using an extend Applesoft BASIC as the database language. This program uses volume numbers to create databases that can span many diskettes. This disk format is unreadable by both the PC and the Macintosh.

The serial port was therefore used for the transfer of the data to the PC. Because there is a large historical database in existence, a fundamental redesign of the database structure was not possible, and it was necessary to design Paradox data structures that reflected the hierarchy. The parent-child links that define the General Manager hierarchy are invisible to the user. With Paradox, explicit link fields must be defined. In the case of the four length-frequency tables and the interview table, these links are ID, SECTION, DATE, and INTERVIEW NUMBER. For the remaining tables, ID is the only link. The full data structure is shown in Appendix A-2 in the form of a Paradox script.

Paradox carries dates internally in a Julian form that is Y2K compliant. All GM date information was translated into Paradox date fields. Julian fields from GM were excluded because they are redundant in Paradox. During data entry, a year of 01 is converted to 2001, etc. The program will have to be modified after 2079 if this feature is to continue being used. Dates with the full year may always be entered, and all dates are displayed showing the full year.

The ID field consists of a lake code (see Appendix A-3 for a complete list) and the last 2 digits of the year. For correct working of the database, any arbitrary code that was unique for each lake-year combination would work as well. This particular code was chosen because it is meaningful as well as functional. It will have to be expanded to a 4-digit year after 2079.

Lakes and Streams use data entry programs and database generators written in PAL (Paradox Application Language) scripts. These programs cannot be trivially converted to Paradox for Windows, because Borland elected to change the database language to ObjectPAL. In an effort to reduce such dependency on a specific database product, Creel data entry is written for the 32-bit BDE (Borland Database Engine) used by Paradox for Windows and which will work with any Paradox table and with a number of other databases as well. This should permit a change in database use with little or no change in the data entry program. In addition, data entry is written in C++ utilizing only the simplest low-level parts of the BDE, so that conversion of data entry from the BDE to some other product would be as simple as possible should the BDE become obsolete. The analysis programs for all FAS databases are written in C, C++, and Forth, making them completely portable and unaffected by database technologies.

In order for the BDE to restrict access to portions of the database that match the link fields and for it to find a record matching a set of criteria, the table must be keyed on all fields

that are used for links or other criteria. Since a keyed table must have only a single record that matches each unique key, the key fields of the length-frequency tables must include the first length field, lest there be duplicate records at key level.

2.1.5 Graphics

Graphics for the PC is written in the Forth computer language, as is the case with the Apple. There are several improvements over Apple FAS graphics:

1) Graphics data is passed in files TEMP.LWA and TEMP.RLF and includes data for all species rather than just one. The auxiliary memory commands used on the Apple are no longer necessary. The SPECIES command then selects the species to be graphed, and locates the a and b parameters and the common name in the file SPECIES.TXT, an ASCII-delimited subset of the standard Fisheries table SPECIES.DB.

2) Printing can be to an Epson LQ or an HP ink-jet or laser printer. The HP printer driver uses HP PCL (Printer Control Language). Because HP laser printers can understand PCL, the Postscript driver is no longer needed.

3) The line defined by the Kn or Wr parameters can be plotted on top of any length-weight scattergram.

4) A list of commands and a more detailed help text (included in appendix 3) are available for viewing from Forth during a graphics session.

5) An estimated biomass vs. length histogram has been added.

Note that there is no length-weight-age information in the Creel data. Therefore graphics commands that need individual weights or ages cannot be used with Creel data.

Instructions for using graphics are included in the FAS-Streams manual(1).

2.1.6 Data Entry

The data entry program allows the user to enter new data and edit old data. It also includes access to Forth graphics for the selected data. The user must select the ID, section, and date in order to enter or edit data. The link fields are then automatically inserted into new data records. The user is not allowed to edit link fields from the data entry program, because typographical errors in these fields would cause that part of the data to either be assigned to the wrong data set or to be assigned to no data set at all. These fields can, of course, be edited by Paradox. Data browsing and graphics are permitted without full link selection, since they change nothing.

Species information (common name and a and b parameters) is taken from the standard Fisheries SPECIES.DB table. Species not relevant to Creel are removed from the version of the table used in data entry, and a search of this table is used to verify that the user is typing in a valid species code. Data entry is menu driven, with a help function available in each menu. Appendix 5 contains a description of the various options available during data entry and instructions for their use.

2.1.7 References

(1) Illinois Streams Database (FAS Streams) Database Structure, Data Entry and Output Programs, Version 2.0, April 29, 1997

(2) Creel Survey Manual for the District Fisheries Analysis System (FAS): A Package for Fisheries Management and Research, CAE Technical Report 90/10

Job 101.3 Management History and Historical Fish Population Survey Data

Project Objective: Evaluate and select existing historical management data and input these data from approximately twenty lakes into FAS. Evaluate, select, an input historical fish population data into FAS on at least ten lakes for long-term trend analysis. Analyze effectiveness of past management actions and environmental changes on largemouth bass populations

Segment 12 Objectives: Verify management history and historical fish population survey data on remaining lakes. Complete verification on fish regulations data and analyze fishery management activities.

101.3 1998 Activities

Management history and historical fish population survey data on 148 state-managed lakes were verified during 1998, bringing verification for all lakes to completion. Data verification for management history, fish population surveys, and fishing regulations were completed during the second half of 1998. Analyses evaluating fisheries management activities in Illinois lakes were concluded in mid 1998.

A more detailed report on Job 101.3 is available on volume II of this report.

Appendix A

Appendix A-1. Angler Survey Questionnaire used to assess potential angler acceptance of potential bluegill regulations

Please help the Illinois Natural History Survey (INHS) a division within the Illinois Department of Natural Resources to improve the bluegill fishery in the state of Illinois by taking a few moments to fill out this questionnaire. As part of a study to determine what causes stunted and quality bluegill populations the INHS is conducting a survey of anglers.

Questions to describe your fishing practices:

1. How many days a year do you go fishing?_____
2. How often do you fish at this lake in a year? _____
3. How many different lakes do you fish in a year?_____
4. How far did you drive to get to this lake? _____miles
5. Today, have you been fishing from boat or shore? _____
6. What species (type) of fish are you fishing for today? _____
7. Do you ever fish for bluegill specifically in this lake? _____ at other lakes? _____
8. If so, how often do you fish for bluegill in this lake? _____ at other lakes?_____
9. In your opinion how many bluegill should anglers be allowed to keep each day?_____
10. What is the minimum length bluegill that you would keep?_____
11. Would you prefer to fish lakes that are managed for larger but fewer bluegill?_____
12. Are you fishing for food or sport?_____

We are considering a variety of experimental regulations to impose on a small number of lakes in Illinois with the purpose of increasing the number of bluegill 6 inches or larger. What is your opinion of the following regulations?

Proposed regulations for a 2-3 year period	**Strongly Support**	**Support**	**Neutral**	**Oppose**	**Strongly Oppose**
1. Only catch and release bluegill fishing					
For entire year	5	4	3	2	1
For spawning season (May 1-July 15)	5	4	3	2	1
2. Establishing no fishing zones within each lake (all species)					
1/4 of lake all year	5	4	3	2	1
1/4 of lake May 1-July 15	5	4	3	2	1
½ of lake all year	5	4	3	2	1
½ of lake May 1-July 15	5	4	3	2	1
3. Imposing a daily bag limit for bluegill					
10 fish per day	5	4	3	2	1
25 fish per day	5	4	3	2	1
4. Imposing minimum size limits for bluegill of					
6 inches	5	4	3	2	1
7 inches	5	4	3	2	1
8 inches	5	4	3	2	1

Questions to describe your personal background

How old are you? _____years old

How many years have you been fishing? _____

Gender? Male Female

Are you employed? Yes No

What is your individual yearly income? Under 10,000 10,000-19,999 20,000-29,999 30,000-49,999 50,000-74,999 75,000+

Circle highest level of education completed. Grade School Jr. High High School 2 Year college 4 Year college Graduate

What size town do you come from? Under 5000 5000-20,000 20,001-50,000 50,001-100,000 100,001+

Appendix A-2. Creel Table Structures

Automatic fields cannot be changed from the data entry program.
Sticky fields are automatically filled with the last-entered value.

```
CREATE "CREEL"              ; Source screen(s)
                            ; ----------------
    "ID"         : "A8*" , ; 2, 3, 4  (Automatic field)
    "REGION"     : "S"   , ; 1
    "DISTRICT"   : "S"   , ; 1
    "YEAR"       : "S"   , ; 3
    "LAKE"       : "A21" , ; 2
    "ACRES"      : "N"   , ; 2
    "LENGTH"     : "N"   , ; 2
    "DEPTH"      : "N"   , ; 2
    "COMMENT 1"  : "A29" , ; 2 For pre-90, will be the district biologist.
    "COMMENT 2"  : "A38" , ; 2 From here on missing in pre-90.
    "COMMENT 3"  : "A38" , ; 2
    "COMMENT 4"  : "A38" , ; 2
    "COMMENT 5"  : "A38" , ; 2
    "CLERK 1"    : "A19" , ; 1
    "INITIALS 1" : "A3"  , ; 1
    "CLERK 2"    : "A19" , ; 1
    "INITIALS 2" : "A3"  , ; 1
    "CLERK 3"    : "A19" , ; 1
    "INITIALS 3" : "A3"  , ; 1
    "CLERK 4"    : "A19" , ; 1
    "INITIALS 4" : "A3"  , ; 1
    "CLERK 5"    : "A19" , ; 1
    "INITIALS 5" : "A3"  , ; 1
    "CLERK 6"    : "A19" , ; 1
    "INITIALS 6" : "A3"  , ; 1
    "CLERK 7"    : "A19" , ; 1
    "INITIALS 7" : "A3"  ; 1

CREATE "STRATA"             ; Screen 4
                            ; Pre-90 description
    "ID"         : "A8*" , ; ----------------
    "STRATUM"    : "S*"  , ; (Automatic field)
    "SECTION"    : "S*"  ,
    "FIRST"      : "D"   ,
```

```
    "LAST"          : "D"  ,
    "SHIFTS/WEEK"     : "S"  , ; Sampled days/week
    "FISHABLE HRS/DAY" : "N"  ,
    "MEAN HRS/SHIFT"   : "N"  , ; Creeled hours/day
    "PERIOD 1 START"   : "A6" ,
    "EFFECTIVE HRS 1"  : "N"  , ; Instantaneous count 1
    "PERIOD 2 START"   : "A6" ,
    "EFFECTIVE HRS 2"  : "N"  , ; Instantaneous count 2
    "PERIOD 3 START"   : "A6" ,
    "EFFECTIVE HRS 3"  : "N"  , ; Instantaneous count 3
    "SECTION DESCRIP"  : "A38",
    "ACREAGE"        : "N"  ,
    "COMMENTS"       : "A29", ; Creel clerk
    "HOLIDAY/WEEKEND #" : "S";
CREATE "INSTANT"                ; Screens 5 & 6

    "ID"            : "A8*", ; Automatic field
    "SECTION"         : "S*" , ;      "
    "DATE"          : "D*" , ;      "
    "STRATUM"         : "S*"  ; Calculated field
    "DAY PERIOD"      : "A1*", ;      "
    "HOLIDAY/WEEKDAY"   : "A1*", ;      "
    "TIME"          : "A6*", ; Data entry start
    "BOATS"           : "S"  ,
    "BOAT ANGLERS"     : "S"  ,
    "SHORE ANGLERS"    : "S"  ,
    "AIR TEMP (C)"     : "S"  ,
    "WATER TEMP (C)"   : "S"  ,
    "SECCI DISK (FT)"  : "N"  ,
    "WIND CONDITION"   : "A1" ,
    "WEATHER  CONDITION" : "A1" ,
    "WATER LEVEL"      : "A1" ,
    "CLERK INITIALS"   : "A3"   ; Missing before 1990. Sticky field

CREATE "INTRVIEW"               ; Screens 7 & 12

    "ID"            : "A8*", ; Automatic field
    "SECTION"         : "S*" , ;      "
    "DATE"          : "D*" , ;      "
    "INTERVIEW NUMBER"  : "S*" , ;      "
    "STRATUM"         : "S"  , ; Calculated field
    "DAY PERIOD"      : "A1" , ;      "
    "HOLIDAY/WEEKDAY"   : "A1" , ;      "
```

```
    "FISHOFF/TOURNEY"   : "A1" , ; Data entry start
    "TIME"              : "A6" ,
    "BOAT/SHORE"        : "A1" ,
    "COMPLETE/INC/SPLIT" : "A2" ,
    "PARTY SIZE"        : "S" ,
    "SPECIES SOUGHT"    : "A3" ,
    "HOURS FISHED"      : "N" ,
    "MILES TRAVELED"    : "S" ,
    "SUCCESS RATING"    : "S" ,
    "ILLEGAL"           : "A1" ,
    "CLERK INITIALS"    : "A3"  ; Missing before 1990. Sticky field;
CREATE "HARVEST"                ; Screen 8

    "ID"              : "A8*", ; Automatic field for all following
    "SECTION"         : "S*" , ;      "
    "DATE"            : "D*" , ;      "
    "INTERVIEW NUMBER" : "S*" , ;     "
    "SPECIES"         : "A3*", ; Data entry start for all following
    "LENGTH"          : "S*" ,
    "SAMPLE FREQUENCY" : "S" ,
    "TOTAL FREQUENCY" : "S"

CREATE "RELEASE"                ; Screen 9

    "ID"              : "A8*",
    "SECTION"         : "S*" ,
    "DATE"            : "D*" ,
    "INTERVIEW NUMBER" : "S*" ,
    "SPECIES"         : "A3*",
    "LENGTH"          : "S*" ,
    "SAMPLE FREQUENCY" : "S" ,
    "TOTAL FREQUENCY" : "S"

CREATE "GHARVEST"               ; Screen 10

    "ID"              : "A8*",
    "SECTION"         : "S*" ,
    "DATE"            : "D*" ,
    "INTERVIEW NUMBER" : "S*" ,
    "SPECIES"         : "A3*",
    "LOWER LENGTH"    : "S*" ,
    "UPPER LENGTH"    : "S" ,
    "FREQUENCY"       : "S"
```

```
CREATE "GRELEASE"              ; Screen 11

    "ID"              : "A8*",
    "SECTION"         : "S*" ,
    "DATE"            : "D*" ,
    "INTERVIEW NUMBER" : "S*" ,
    "SPECIES"         : "A3*",
    "LOWER LENGTH"    : "S*" ,
    "UPPER LENGTH"    : "S" ,
    "FREQUENCY"       : "S"
```

Appendix A-3 . Lake Abbreviations

This is a 5 character abbreviation. "Lake" is shortened to "L" and ignored if not the first word of the name. The next 4 or 5 characters of the lake name (with blanks removed) are used to fill out the name code. If the last word is TAILWATER, the last character of the name code is replaced by a "W". Only Spring Lake South requires special handling.

The full ID for 1988 Argyle Lake night creel would be "ARGYL88N". This is used as a link field in the Paradox database, and also as the filename for the Apple-PC transfer file, with extension indicating the destination table. Data will be considered night creel if the section description field of screen 4 starts with the characters "NIGHT".

ARGYL Argyle Lake
BEAVE Beaver Dam Lake
BALDW Baldwin Lake
BRAID Braidwood Lake
BUSSE Busse Lake
CARLY Carlyle Lake
CARLW Carlyle Lake Tailwater
CEDAR Cedar Lake
CHARL Charleston Side Channel Lake
CITIZ Citizen's Lake South
CLINT Clinton Lake
CLINW Clinton Lake Tailwater
COFFE Coffeen Lake
DAWSS Dawson Lake
DEVIL Devil's Kitchen
DOLAN Dolan Lake
DUTCH Dutchman Lake
EASTF East Fork Lake
FORBE Forbes Lake
FOXCH Fox Chain O'Lakes
FRANK Frank Holten Lake
GILLE Gillespie New City Lake
GREEN Greenville New City
HEIDE Heidecke Lake
HORSE Horseshoe Lake
JOHNS Johnson Lake (Banner Marsh)
JONES Jones Lake
KICKA Kickapoo State Park (Clear Lake and Long Lake)

KINCA Kincaid Lake
LBLOO Lake Bloomington
LCARL Lake Carlton
LCARO Lake Caroll
LDECA Lake Decatur
LGEOG Lake George
LJACK Lake Jacksonville
LLE-A Lake Le-Aqua-Na
LMING Lake Mingo
LMURP Lake Murphysboro
LPARI Lake Paridise
LSANG Lake Sangchris
LSARA Lake Sara
LSHEL Lake Shelbyville
LSHEW Lake Shelbyville Tailwater
LSPRI Lake Springfield
LSTOR Lake Storey
LVERM Lake Vermillion
LVERW Lake Vermillion Tailwater
LASAL LaSalle Lake
LINCO Lincoln Trail Lake
MCCOL McCullom Lake
MERME Mermet Lake
MILLC Mill Creek Lake
MONEE Monee Reservoir
NEWTO Newton Lake
OTTER Otter Lake
PIERC Pierce Lake
PITTS Pittsfield Lake
POWER Powerton Lake
RAMSE Ramsey Lake
RANDO Randolph Co. Lake
REDHI Red Hills
RENDL Rend Lake
SAMPA Sam Parr Lake
SAUKT Sauk Trail Lake
SHABB Shabbona Lake
SHUY- Shuy-Rush Lake
SILOA Siloam Springs Lake
SKOKI Skokie Lagoons
SNAKE Snakeden Hollow
SPRIN Spring Lake North
SPRIS Spring Lake South

STERL Sterling Lake
TAMPI Tampier Lake
TURNE Turner
WALNU Walnut Point Lake
WASHI Washington Co. Lake
WELDO Weldon Springs
WOLFL Wolf Lake

Appendix A-4. The FAS Graphics Help File

All Graphics commands must be entered in UPPER case.

GRAPHS

HISTO Length-frequency histogram. The number of fish (corrected for for subsampling) within each length interval is displayed.

L/WT Length-Weight scattergram of individually measured fish. Scales are logarithmic with length in mm and weight in grams.

AGE/L Individual Length at Age scattergram. Lengths of individual fish are displayed against fish age.

AGE/ML Mean Length at Age plot. Plots mean age of fish within length classes as set by the GROUP command.

KN LeCren's Condition Factor Plot. Mean Kn values are plotted for each length interval, along with 95% confidence intervals.

WR Standard Weight Condition Factor Plot. Mean Wr values and 95% confidence intervals are plotted for each length interval.

BIOMASS Length-total weight histogram. Displays total weight in grams, using length to weight conversion of fish in each length group.

GRAPH SCALE

<#> HIGH Set the upper limit of the Y-axis (e.g., 20 HIGH).

<#> WIDE Set the upper limit of the X-axis (e.g., 100 WIDE).

MOUSE With L/WT only, activate the mouse. The length and weight values at the mouse cursor are displayed.

GRAPH ADDITIONS

AGE Display individual fish ages above lengths for histograms and condition plots.

WRLINE Display a standard species length-weight regression line using the currently selected Wr parameters.

KNLINE The Kn equivalent of WRLINE.

A & B PARAMETERS

SPECIES <species code> Specify the species to be plotted.
AB Calculate a length-weight regression for the selected data.
The new a and b parameters may then be used with Kn plots.
AB? Display a and b parameters currently used for Kn or Wr plots.
<a> <b> KN! Replace Kn a and b values with user-entered values.

DATA GROUPINGS FOR HISTOGRAMS AND CONDITION PLOTS

ONE TWO THREE FOUR FIVE Set grouping integrals to the stated number of centimeters.
GROUP <name> Create user-defined length groups.
SEE Display the current length group settings.

AGE TYPE FOR AGE, AGE/L AND AGE/ML PLOTS

SCALE Specify that only SCALE age data are to be used.
This is the default setting.
OTOLITH Specify that only OTOLITH data are to be used.

PRINTING AND MISC.

PRINT Print the graph being displayed, or a group table if no graph.
Any text following the command is used as a legend for the printout.
FILE <filename> Send the next graph or table printed to the named file.
LQ Set the printer type to an Epson LQ. This is the default.
HP Set the printer type to Hewlett Packard (uses PCL).
BIG Like HP, but makes a wider plot taking much more time.
FORMFEED Advance the printer to a new page.
TXT Changes the screen display from graphics to text only.
SAVE Permanently saves the current settings for printer and age type (scale or ototlith) as well as any user-defined length groups created with the GROUP command.
BYE EXIT Graphics and return to Data Entry or DOS/Windows.

FORTH Graphics may be started from the DOS command line by typing "GRAPH TEMP" or with your graphics filename rather than TEMP.

Appendix A-5. Data Entry Instructions

The following illustrates the main menu fully selected for a particular creel:

CREEL FAS (FISHERIES ANALYSIS) SYSTEM MAIN MENU

Esc leave program
F1 help
I ID selection: JONES92
S section selection: 1
D date selection: 07/16/1992 Thursday W
E enter new creel data
G run graphics on selected data

1 edit creel table 1 records selected
2 edit stratum design 11 records selected
3 edit instantaneous count data 2 records selected
4 edit interviews 9 records selected
HI edit harvested individuals 20 records selected
RI edit released individuals 1 records selected
HG edit harvested groups
RG edit released groups

Enter your choice:

You may enter your choice in either upper or lower case for the alphabetic characters. The program capitalizes all keyboard entries before using them.

In order to enter or edit data, the ID, section, and date must be specified. You will be presented with a list of all IDs or of all sections or dates available before you select which you want. If you make a selection for which no data has been entered, you will be shown no records selected for all tables except for creel and stratum. The ID and section must be selected before the date can be selected. Any errors that you make in the selection process (or at any other point in data entry) will cause an explanation of the error to appear in red text at the bottom of the window and the bell to be rung.

TABLE EDITING

You may browse through the records of all tables using any of the edit choices, but you must be fully selected in order to use any keyboard command associated with changing data. If you try, you will get the standard red warning.

If you are fully selected, you may change or delete any selected record and create new records. ID, section, date, and interview number fields will be automatically filled for any new record created. None of these fields can be changed by the user (the cursor cannot be moved to these fields).

Entering edit via the main menu is meant to be used for correcting errors in data already entered, although it can be used for data entry. New data should be entered through the E (enter new data) command. It is important to understand editing before entering new data because parts of the E command utilize it. You are in table editing mode whenever the window has the word EDIT at the top left.

When fully selected, you may use all of the following single key commands. The first group work even if you are not fully selected.

Esc Leave table editing mode
F1 Show help text
Home View the first selected record of the table
PageUp View the prior selected record of the table
PageDown View the next selected record of the table
End View the last selected record of the table

UpArrow Move the cursor to the field above
DownArrow Move the cursor to the field below
LeftArrow Move the cursor to the prior field
RightArrow Move the cursor to the next field
Enter Move the cursor to the next field
Alt-Delete Delete the current record (hold down Alt, press Delete)
Insert Add a new record
Alt-U Undo the most recent entry (hold down Alt, press U)

The up and down cursor keys wrap. If you go off one end of the record you will come back in at the other. The field on which the cursor is place will be green, while all other fields will be blue.

To enter data in the field the cursor is on, just start typing. Any alphanumeric input will cause the field to turn red. When you have finished typing that field, press the Enter key. The field will become blue and the cursor will advance to the next field.

When you are through editing, press the Esc key. This will return you to the menu or other process from which you entered edit.

ENTERING NEW DATA

When you select E (enter new data), you will be asked to enter instantaneous data if it hasn't already been entered. Enter as many records as you need, using the Insert key to add new records as necessary. If you later discover that you have more than two instantaneous counts, you can use selection 3 (edit instantaneous count data) of the main menu to add the new records.

When you have entered all of the instantaneous data, press the Esc key. You will then be shown an interview form. The interview number will be automatically entered and cannot be changed, although you can delete the interview with Alt-Delete if you start to enter an interview and then discover that there is no interview data.

Note that the first field the cursor is on is a new one: fishoff/tourney. This corresponds to the first item on the interview form. Also note that the initials are a "sticky" field. Once you have typed initials into either an interview or an instantaneous count record, the initials will be automatically inserted. You need only change them when you have new initials. Fill out all fields of the form starting with fishoff/tourney and press the Esc key.

You will then see the following menu:

ENTER NEW CREEL DATA

Esc return to main menu
F1 help
S select the species code
H enter harvested fish
R enter released fish
A additional interview
V view length-frequency record just entered

Enter you selection or length data

If you have no harvested or released fish for this interview, proceed to the next interview by pressing the A key. If you are finished with this creel, press the Esc key.

If you do have harvested or released fish, you must select a species by pressing the S key. If you then type in an allowed species code, the common name will appear in blue on the menu. If it is not an allowed species code, the bell will ring and you will see a red warning message. You may still use the code to enter data, but almost certainly should not since it is most likely in error.

The menu always starts in harvested mode, since this is first on the data sheet. You may switch back and forth between harvested and released mode by pressing the R or H key. You selection will appear in blue on the menu. If you make a mistake and put harvested into released or vice-versa, you must use Alt-Delete to remove the mistakes. Usually this must be done from the main menu, because the new data menu only allows you to edit the table that you have most recently entered data into via the V (view) command. This sort of cleanup is a nuisance, so try to avoid this error.

Length data is entered in the same form as on the data sheet. All of the following lines of data are valid:

33-38
25
44,42,42,48
44 42 42 48

If the first non-numeric character is a minus sign, the data is placed in a grouped table and you are asked for the number of fish. Otherwise, the lengths are assumed to be individually measured fish, and the program automatically counts and creates records for them. Do not mix grouped and individually measured fish on the same line.

Appendix A-6. 1998 Creel Reports