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STRIPED BASS EGG ABUNDANCE AND VIABILITY IN THE ROANOKE RIVER, NORTH CAROLINA, AND YOUNG-OF-YEAR SURVIVORSHIP, FOR 1993

Completion Report to Virginia Power, Innsbrook Technical Center, Glenn Allen, Virginia

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Completion Report to

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EXECUTIVE SUMMARY

Striped bass spawning activity in the Roanoke River, North Carolina, was documented in 1993 by sampling for eggs at Barnhill's Landing (River Mile 117), which is just downstream of the spawning grounds between the towns of Halifax (RM 120) and Weldon (RM 130). Egg sampling was conducted every four hours near the surface and bottom from 16 April to 16 June 1993. Water quality and changes in instream flow caused by water releases from Roanoke Rapids Reservoir at RM 137 also were monitored every four hours. During the summer and fall, age-0 (young-of-year) striped bass were collected by beach seine in western Albemarle Sound, and by trawl surveys in western and central Albemarle Sound. All fish retained in samples were weighed, measured, and aged by counting rings on otoliths. The date of spawn for each fish was backcalculated, and each fish was assigned to a daily cohort for calculations of survival rates relative to daily egg production estimates.

EGG PRODUCTION. Record striped bass egg production in the Roanoke River was observed in 1993: an estimated 23.954 $\pm$ 1.91 billion eggs from a total of 102,649 eggs collected in surface nets. This estimate is low due to missed samples during the peak spawning activity. Spawning prior to 16 April and after 16 June was not monitored. Estimated egg viability for the season was 49.1%, with no seasonal trend in viability evident. Most of the eggs (86%) were less than 10 hours old.

SPAWNING EVENT MILESTONES. The spawning period for 1993 was 52 days, with 32 consecutive days of spawning activity. Eggs first appeared on 21 April and completed by 11 June. Approximately 61% of the yearly egg production was reached on 13 May, nearly 80% complete by 17 May, and over 90% complete by 23 May. Three spawning peaks were observed: 13-14 May (64% of all eggs), 17-18 May (21%), and 23-26 May (11%). The major spawning activity of the season immediately followed a large drop in reservoir releases from flooding conditions (35,000 cfs) to moderate flows (8,000-9,000 cfs), and the immediate rise in water temperatures to 18°C. Instream flow remained stable at moderate levels through the remainder of the spawning season.

YOUNG-OF-YEAR RECRUITMENT, GROWTH AND SURVIVAL. The annual recruitment index for juvenile striped bass in Albemarle Sound was the largest on record (JAI=44.53). Albemarle Sound juveniles grew at a rate of 1.09$\pm$0.157 mm/day. Fish collected from central and eastern Albemarle Sound were on average larger and older than those collected from the western Sound, although growth rates were similar. Juveniles spawned in late May had better than expected survival and comprised a major portion of the recruited individuals. Young-of-year recruitment was best for those fish spawned in the Roanoke River during moderate instream flows.

RECOMMENDATIONS FOR MANAGEMENT. Since the major portion of the year class each year is from late-spawned cohorts, watershed management should include ensuring adequate environmental conditions conducive to larval striped bass survival at the end of the spawning season.

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INTRODUCTION

Striped bass (*Morone saxatilis*) inhabiting Albemarle Sound and its tributaries support important recreational and commercial fisheries in coastal North Carolina (Johnson et al. 1986; USDOI and USDOC 1986). The major spawning area for the Albemarle stock is located in the Roanoke River, which discharges through several channels into the western end of Albemarle Sound (Figure 1).

Studies of egg abundance and viability have been conducted each year since 1959 by Dr. W.W. Hassler and co-workers from North Carolina State University in Raleigh. These studies conducted on a daily basis have been an extremely important source of information for reconstructing the historical spawning record in relation to exploitation, changes in fishing regulations, and man-induced changes in the flow regime and water quality of the lower Roanoke River watershed. Rulifson and students from East Carolina University continued the work beginning in 1988. This report details events of the 1993 spawning season and documents young-of-year (YOY) cohort survival and subsequent recruitment to the 1993 year class in Albemarle Sound.

The volume and timing of water release from dams in this watershed, and the subsequent physiological and behavioral effects on spawning striped bass, has been scrutinized closely at various times since initiation of John H. Kerr Dam construction in 1950. This concern was one of the reasons for forming the Steering Committee for Roanoke River Studies in 1955. The Committee was composed of individuals from state, federal, and private agencies and interests whose objective was to conduct a comprehensive study of the river in order to minimize multiple use conflicts (Hassler and Taylor 1986). The findings of the Committee were discussed in detail by Fish (1959). The cooperative Roanoke-Albemarle Striped Bass Studies were initiated in 1955 as part of the Steering Committee studies. Original support for these efforts was provided by the National Council for Stream Improvement, Weyerhaeuser Company, and Albemarle Paper Manufacturing Company. Weyerhaeuser Company continued its support of the studies after 1958 when the Steering Committee studies were terminated; cooperative field work was resumed in 1975 with the U.S. Fish and Wildlife Service (USFWS) and North Carolina Division of Marine Fisheries (NCDMF) under the auspices of the Anadromous Fish Conservation Act (PL 89-304).

In 1988, an *ad hoc* group was formed to investigate the modification of Roanoke River instream flow below Roanoke Rapids Dam for striped bass and other downstream resources. The Roanoke River Water Flow Committee (Flow Committee) was composed of 20 individuals from state and federal agencies, Virginia Power Company, and university scientists. The purpose of the Flow Committee was to gather information on all resources of the lower watershed and recommend a flow regime that was beneficial to the downstream resources and their users. Striped bass as a resource received the most attention because of its great social and economic importance to the region, and because of the extensive data bases established by Hassler (1955-1987), the NCDMF, and Rulifson (1983-present). Detailed descriptions of the Flow Committee findings were presented elsewhere (Manooch and Rulifson 1989; Rulifson and Manooch 1990a, 1991, 1993).

Also in 1988, a North Carolina Striped Bass Study was authorized by the U.S. Congress in the reauthorization of the Atlantic Striped Bass Conservation Act (PL 100-589), the purpose of which was to identify the factors causing the decline of striped bass in the Albemarle Sound and Roanoke River Basin. A North Carolina Striped Bass Study Management Board was formed in 1989 to undertake biological studies, develop recommendations for short-term and long-term management, and submit the results of the study and recommendations to Congress and states of North Carolina and Virginia (USWFS 1992).

At the present time, the manner in which waters are released from Roanoke Rapids Dam is governed by a tri-party agreement involving the U.S. Army Corps of Engineers (Corps), Virginia Power, and the North Carolina Wildlife Resources Commission (NCWRC). Provisions for minimum flows from the reservoir were established by the Memorandum of Understanding (MOU) signed in 1971. In the original agreement, no guidelines were provided for maximum flows or for the manner in which the average daily discharge is derived. For example, under present guidelines the dam operator can double or cut in half the rate of discharge through the turbines every hour to optimize on-demand hydroelectric generation. A discharge of 5,000 cfs (cubic feet per second) can increase to 10,000 cfs after one hour, then double to 20,000 cfs after two hours. Sudden changes in the instream flow result in dramatic changes in water depth and water temperature on the spawning grounds within several hours. The effects of reservoir discharge on striped bass spawning activity has been documented (Rulifson and Manooch 1990b; Zincone and Rulifson 1991). In 1989, the Corps and Virginia Power agreed to a four-year trial period of modified flows from 1 April to 15 June as per the recommendations of the Flow Committee (Manooch and Rulifson 1989), after which the effects of the modified flow regime on striped bass and other natural resources downstream would be assessed. In addition, Virginia Power agreed to a change of discharge rate not to exceed 1,500 cfs per hour during the spawning season.

The study described herein was undertaken with several objectives: 1) to determine the relationship between striped bass spawning intensity (as measured by egg production) and water releases from the Roanoke Rapids Reservoir; 2) to examine survivorship of YOY striped bass recruited to the forming year class in Albemarle Sound relative to spring spawning activity; and 3) to compare results to the historical data for annual egg deposition patterns and results of the annual YOY striped bass survey in western Albemarle Sound.

STUDY SITE DESCRIPTION

The Roanoke River is a major coastal floodplain river originating in the Appalachian Ridge in Virginia and discharging into the western end of Albemarle Sound in North Carolina (Figure 1). The watershed encompasses 9,666 square miles (25,033 km^2), making it the largest basin of any North Carolina estuary (Giese et al. 1985). Waters descend 2,900 feet from the origin to the estuary, a distance of 410 miles.

Instream flow of the Roanoke River is highly regulated by a number of reservoirs upstream: in Virginia, Smith Mountain Lake, Philpott Lake, Leesville Lake, John H. Kerr Reservoir, and Lake Gaston; and Lake Gaston and Roanoke Rapids Reservoir in North Carolina. Of these, the Roanoke Rapids Reservoir located at River Mile (RM) 137 exerts direct influence on instream flow of the lower river; approximately 87% of the flow to the coastal watershed is provided by its discharge (Giese et al. 1985). Average annual discharge of the river at Roanoke Rapids, North Carolina (USGS gage), is 8,120±8,622 cfs (1912-1990, Rulifson et al. 1992a). The watershed itself contributes approximately 50% of the freshwater input to Albemarle Sound and therefore has a major impact on the coastal habitat of northeastern North Carolina.

The primary spawning ground for Albemarle Sound striped bass is located in the Roanoke River between the towns of Halifax (RM 120) and Weldon (RM 130), North Carolina. Access to the historical spawning grounds farther upstream was blocked by construction of the Roanoke Rapids Dam (RM 137) in 1955 (McCoy 1959). Hassler et al. (1981) described the spawning season as starting in April and ending by mid-June. Once spawned, the fertilized eggs develop to the hatching stage as they are transported downstream by currents. After hatching, the larvae are transported through the distributaries of the delta into the historical nursery grounds of western Albemarle Sound (Rulifson et al. 1992b).

METHODS

Sampling for Striped Bass Eggs

The egg sampling station in 1993 was located at Barnhill's Landing (RM 117), the site of Hassler's sampling efforts during the period from 1975 to 1981 and the 1989-1992 egg studies (Rulifson 1990, Rulifson et al. 1993). This site is situated (Appendix Table A-2) approximately three miles downstream of the historical spawning grounds (Figure 2). Sampling was initiated on 16 April and ended on 16 June 1993. Any spawning activity after 16 June was not documented by field sampling in the river.

Procedures for field sampling and sample workup were similar to those used by Hassler to ensure compatibility of the data sets. Sampling for striped bass eggs (Appendix Table A-3) was conducted six times daily at four-hour intervals (0200, 0600, 1000, 1400, 1800, and 2200 hours) by trailing paired 10-inch diameter nets constructed of 500-um nitex mesh (6:1 tail-to-mouth ratio) from a small aluminum boat anchored in mid-stream. A solid sampling cup attached to the tail of each net retained collected eggs. Two samples of five-minute duration were taken: the first set six inches below the river surface (Hassler's method), and the second set near the bottom. This procedure allowed comparisons of egg density at the surface with the abundance of eggs near the bottom. A flowmeter with slow speed propeller was attached to the bongo frame to estimate the theoretical volume of water filtered. The methodology produced two estimates of egg production: 1) an estimate of egg density per unit of water filtered; and 2) an estimate of total eggs in the cross-sectional area of the river in a five-minute period (Hassler's method). The cross-sectional area of the river at the sampling site (ft^2) was determined for the range of water levels encountered during the study.

Relative change in water depth (river stage), air and water temperatures, dissolved oxygen, conductivity, pH, total dissolved solids, and water velocity were recorded for each sample (Appendix Table A-4). Instruments used to measure environmental parameters were calibrated periodically according to U.S. Environmental Protection Agency (USEPA) standard methods. Secchi visibility depth was recorded for all samples taken during daylight hours.

The unpreserved samples were returned to the shore-side field station for immediate examination. Eggs collected by both nets were enumerated and averaged for each surface tow and each bottom tow (Appendix Table A-5). For each sample, all eggs were examined to determine viability and stage of development. Egg viability was determined as described by Hassler et al. (1981): each was examined to determine the status of the embryo (development), yolk and oil globules (intact), perivitelline space (cloudy or clear), and whether the chorion was broken or intact. Viable eggs were staged under a dissecting microscope using the criteria established by Bonn et al. (1976). Stage 1 eggs included eggs less than 10 hours old. Stage 2 eggs were those 10 to 18 hours old. Stage 3 eggs were 20 to 28 hours old, and Stage 4 eggs were 30 to 38 hours old. Stage 5 was eggs 40 hours and older, and newly-hatched larvae. Stage of development was based on an assumed water temperature of 17°C since this criterion is the only published photographic and written description available. Eggs spawned at water temperatures greater than this value will develop faster and hatch earlier (Shannon 1970).

Data were entered into the mainframe computer at East Carolina University and analyzed using the Statistical Analysis System, Version 5 (SAS 1985). The estimated number of striped bass eggs passing the sampling station was calculated on a daily basis using the equation developed by Hassler:

(1) $$N = 514.29\ XY,$$

where N = the estimated number of striped bass eggs spawned during the 24-hour period; X = the mean number of striped bass eggs collected per surface sample during the 24-hour period (12 samples maximum); and Y = the cross-sectional area of the river in square feet for the mean river stage during the 24-hour period. The constant 514.29 was derived from the number of five-minute intervals in a 24-hour period (288) multiplied by the relationship of 1.0 ft^2 of river area to the mouth opening of the 10-inch diameter egg net (0.56 ft^2, equaling a ratio of 1:1.785714). Only surface samples were used in the daily egg production estimates so that data were comparable to Hassler's estimates (Appendix Table A-6).

Daily egg production also was calculated using river volume and the equation:

(2) $$\text{daily egg production} = \text{sample eggs} \times \frac{(\text{river discharge} \times 24\ \text{hrs} \times 60\ \text{min.} \times 60\ \text{sec})}{(\text{water velocity} \times 0.9) \times \text{net area} \times 300\ \text{sec}}$$

where

river discharge = ft^3/sec, recorded upstream several hours previous to sample collection;
average water velocity = ft/sec x 0.9 (to correct for surface measurement); and
net area = 0.56 ft^2.

The daily estimates derived by this method were for comparative purposes; the original Hassler method was used for the official egg production estimates.

Sampling for Young-of-Year

Young-of-year striped bass were collected in Albemarle Sound by four separate studies: the western Albemarle Sound trawl survey, the central and eastern Albemarle Sound trawl survey, the *Alosa* beach seine survey, and the exploratory beach seine survey. Figure 3 depicts the location of each sampling site; a description of the sites is presented in Appendix Table B-1.

The western Sound trawl survey initiated by Hassler in 1955 is used to determine the relative year class strength, the results of which constitute the annual Juvenile Abundance Index (JAI). The JAI for Albemarle Sound is conducted by the NCDMF at bi-weekly intervals from July through October each year. The sampling area is in western Albemarle Sound extending eastward approximately 12 miles. Seven permanent sampling stations were established in 1955 and are still used (Figure 3, Appendix Table B-1). Samples are collected using a 5.5-m head rope, semi-balloon trawl with a cod end of 6.35-mm stretched mesh webbing. The trawl body was constructed of 19.1-mm stretched mesh webbing (Henry et al. 1991). Samples are taken every two weeks starting in July and ending in October for a total of 56 samples. Each trawl sample is for 15 minutes at a speed of approximately 2.75 miles per hour in waters 6-10 feet deep. Young striped bass are counted and measured for fork length (FL) and total length (TL). The JAI is expressed as the mean number of juvenile striped bass caught per 15-minute tow.

The eastern Sound trawl survey is similar to the western Sound trawl survey in sample design and gear. Twelve fixed stations are sampled bi-weekly during July through October to determine a relative abundance index (CPUE) of juvenile striped bass. Standard tow time for this survey is 10 minutes.

The alosid beach seine survey is primarily for juvenile shad (*Alosa sapidissima*) and river herring (*A. aestivalis* and *A. pseudoharengus*) assessment, but collected YOY striped bass are enumerated. Eleven fixed stations are sampled monthly June through November each year using a 18.5-m bag seine with a 6.4-mm ace mesh bag. One seine haul is considered one unit of effort.

The exploratory beach seine survey is primarily for YOY striped bass. Sampling protocol is similar to the alosid beach seine survey. In past years, a number of locations was sampled to determine habitat utilization by juvenile striped bass. Beginning in 1993, the survey became a fixed-station survey to provide a relative abundance index.

In each survey, all juvenile striped bass from a particular station were enumerated, bagged and labeled by station and date, then frozen for transport to the laboratory. Each fish was numbered individually, measured (FL and TL), and weighed (0.01 g). The head was surgically removed to obtain the otoliths for age analysis.

Aging Striped Bass Young-of-Year

We assigned the age of each young striped bass by counting the number of rings appearing on the sagittal otolith. Each otolith was mounted with the proximal side affixed to a glass microscope slide with a small drop of thermoplastic cement such that the concave surface faced away from the slide. The sagittal plane of each otolith was polished by hand against a wet sheet of number 600 carborundum paper until the nucleus was exposed and the rings became visible. Otoliths were examined using immersion oil at magnifications of 100-400x with transmitted polarized light (Figure 4). Otolith rings were counted only once, since experience indicated that repeated counts resulted in a range of less than five rings from minimum to maximum counts through the ranges of ages in the total sample (Isely and Manooch 1991).

Spawning dates were estimated by assuming that each ring on the otolith represented one day of life (Secor and Dean 1989; Secor et al. 1989, 1990; Kline 1990). A first-ring formation date was calculated for each fish by subtracting the number of rings counted from the date when the fish was collected. The spawning date was determined by subtracting three days from the first-ring formation of the otolith.

Relative survival rates of egg cohorts spawned in the Roanoke River each day were compared to the number of YOY Albemarle fish from each spawning date (YOY cohorts) to determine if differential survival occurred, thus indicating higher than expected success of one particular cohort. The egg data set was the daily egg production estimate adjusted by the daily egg viability estimate. The juvenile data set used fish collected by both trawl surveys and the exploratory beach seine survey. Juveniles were enumerated by estimated spawn date; the resultant number was adjusted to reflect daily mortality. This was accomplished by first subtracting the estimated spawning date from the collection date to determine the fish age (in days). Second, the number of fish in the YOY daily cohort (N_0) was weighted (N_t) by determining the length of time "at large" from a standard 60-day period assuming a daily instantaneous mortality rate (Z) of 0.01. The weighting formula was

$$N_t = N_0 e^{-(60-Age)Z}. \quad (3)$$

For example, the only case in which three fish of the same birth date would represent three fish in the adjusted count would be when all three were 60 days old (i.e., $3e^{-(60-60)0.01} = 3.000$). A single fish for a spawn date that was, for example, 80 days old would be counted as representing 1.220 fish (i.e., $1e^{-(60-80)0.01} = 1.220$). A single fish only 50 days old would be represented as 0.905 in the count. The two adjusted data sets were plotted together to identify mismatches in cohort strength, thus indicating differential mortality.

RESULTS

Sampling Problems

Some of the scheduled samples in 1993 were not collected because of inclement weather or equipment failure. More importantly, during the peak spawning activity several samples could not be examined because the tremendous numbers of eggs per sample exceeded the physical limitations of the field crew. Therefore, the 1993 egg production estimates were lower than expected if all samples had been recorded.

Egg Production and Viability for 1993

The estimated number of striped bass eggs produced in 1993 was more than the total number estimated for all years of record combined. The 1993 estimate was 23.954 billion eggs (n=62 days, S.D. $\pm$ 1.910 billion) from a total of 102,649 eggs collected in surface nets. Samples were first taken on 16 April; the first eggs appeared in Barnhill samples on 21 April (Table 1). Spawning earlier than 16 April was not documented by field sampling. Considering only the field sampling period, spawning activity in 1993 started earlier than 1990 (24 April) but later than that observed in 1989 (16 April), 1991 (17 April), and 1992 (17 April) (Table 2). Spawning activity continued through 11 June. Sampling was terminated on 16 June. The spawning period for 1993 was 52 days, with 32 consecutive days of spawning activity (Table 2).

Three major spawning events were observed in 1993: 13-14 May (64% of total eggs), 17-18 May (21%), and 23-26 May (11%, Figure 5). Approximately 61% of the yearly egg production estimate was reached on 13 May, nearly 80% of the total by 17 May, and over 90% of the total by 23 May (Table 1).

The egg viability estimate for 1993 was 49.1% (Table 2). The viability estimate was within the range (37-73%) of that recorded in other years at the same location (Table 3). No overall seasonal trend in egg viability was evident (Table 4).

Surface egg viability and environmental conditions were analyzed statistically for possible correlations. Surface egg count data were transformed using a natural log (+1) transformation (n=321, skewness = 0.73, kurtosis = 1.29). Count data were then subjected to a correlation analysis to determine those environmental variables significantly related (alpha 0.05) to egg viability; only pH (n=183, r=0.15, p=0.04) and total dissolved solids (n=194, r=0.16, p=0.03) were significantly correlated. Environmental variables and egg viability then were subjected to a weighted least squares analysis, with the analysis weighted by the number of eggs in the sample. Results indicated that dissolved oxygen levels explained 14% of the variability in surface egg viability (df=180, C(p)=12.53, F=29.43, P>F=0.0001). For multiple linear regression, dissolved oxygen and river stage accounted for 18% of the variability in surface egg viability (df=180, C(p)=6.38, F=19.29, P>F=0.0001).

Log-transformed egg counts between replicates at depth, and between the surface and bottom samples, were not significantly different (alpha 0.0001). These results are consistent with those of previous years.

A total of 9,039 eggs was examined throughout the season to determine stage of development, and all were in the early developmental stages. Approximately 86 % of the eggs (7,747) were less than 10 hours old. An additional 14% (1,292) were 10-18 hours old. No eggs older than 10-18 hours, and no post-hatch larvae, were observed in the samples.

Egg abundance and viability were correlated with collection time of day (Table 5). The greatest number of eggs was collected at 1400 hours and the fewest number was collected in late afternoon and early evening samples (1800 and 2200 hours). Late afternoon and early evening collections exhibited the lowest egg viability, and highest viability was observed in eggs collected at 0200 and 0600 hours.

Environmental Conditions for 1993

Greater than normal rainfall in March and April resulted in floodgate releases of reservoir waters at Roanoke Rapids Dam during the first portion of the study (Figure 6). The March basinwide rainfall of 8.37 inches was 4.63 inches above normal (3.74 inches) and 1.34 inches above normal (4.74 inches) in April (Table 6). Lower than normal rainfall in May allowed reservoir discharge to be reduced to about 9,200 cfs on 12 May, after which time major striped bass spawning began. This sudden drop in reservoir discharge, coinciding with water temperatures reaching and exceeding 18^0C (Figure 7), characterized the peak spawning of the season; 61% of the eggs were released at this time. River stage, a relative measurement at the site indicating depth, was significantly and inversely correlated with water temperature ($r = -0.90$).

Most striped bass eggs were collected at a range of water temperatures 18.0-21.9°C, and egg viability was greatest at 16.0-17.9°C (Table 7). Water temperatures were low early in the study (Figure 7) but exhibited an upward trend until reservoir releases dropped below 10,000 cfs on 12 May. Major striped bass spawning activity coincided with water temperatures reaching and stabilizing at 18°C on 13-14 May. The mean water temperature for the study was 18.5 ± 3.7°C (n=344); the minimum temperature recorded was 9.8°C and the maximum was 26.5°C. Water temperature was positively correlated with air temperature r=0.71, Figure 8), and inversely correlated with river stage (-0.90) and water velocity (-0.82), both variables of which are indicative of reservoir discharge rate.

Nearly 99% of all striped bass eggs were collected at surface water velocities of 60.0-79.9 cm/second (Table 8), a phenomenon related to most spawning occurring after reservoir discharges stabilized at about 9,200 cfs (Figure 6). Water velocities exceeded 146 cm/second (4.8 ft/second) during greatest reservoir discharge early in the study, with a minimum of 56 cm/second recorded in late May (Figure 9). The mean water velocity for the study was 85.3 ± 18.7 cm/second (n=296). Water velocity was highly correlated with river stage (r=0.95)

and levels of dissolved oxygen (0.87). Variables inversely correlated with water velocity were secchi disk visibility (-0.75), conductivity (-0.49), and TDS (-0.40).

Dissolved oxygen levels in the water column were high in late April and dropped about 3 mg/L in May at the time that reservoir discharge was reduced (Figure 10). Dissolved oxygen levels then remained above 7 mg/L through mid-June. During the study, dissolved oxygen averaged 9.1 $\pm$1.7 mg/L (n=344) with a low of 6.2 and a high of 12.8 mg/L. Most striped bass eggs were collected at 7.0-8.9 mg/L (Table 9). Dissolved oxygen was positively correlated with river stage (r=0.90) and water velocity (0.87), and negatively correlated with water temperature (-0.91) and air temperature (-0.51).

Surface water pH was variable but remained above 7.0 for most of the study (Figure 11). The pH averaged 7.7 $\pm$0.4 (n=304) and ranged from 6.4 to 8.9. Approximately 96% of all eggs were collected at pH values of 7.0 or greater (Table 10). Surface water pH was not highly correlated with the other environmental variables measured.

Secchi disk visibility was similar to previous years, averaging 60 $\pm$ 14.0 cm in depth (n=242) and ranging from 20 cm to 90 cm. Secchi visibility increased with reduced instream flow in Mid-May (Figure 12); secchi readings increased with lower river stage (r = -0.80) and lower water velocity (-0.75). Secchi visibility was positively correlated with increased water temperatures (0.81).

Recruitment of the 1993 Year Class

The tremendous number of young-of-year striped bass in western and central Albemarle Sound during summer reflected the record number of eggs collected in the Roanoke River in the spring. Striped bass young were abundant along the shoreline in late June and July 1993. The western Sound beach seine survey collected 1,129 individuals in 54 sweeps for a CPUE of 20.9 (Table 11). Western Sound abundance remained high through October. The western trawl survey JAI of 44.53 was the highest on record, with 2,494 juveniles collected in 56 (15-min) tows (Table 12). Young striped bass may have been less abundant in central and eastern Albemarle Sound. The central trawl survey collected 1,043 fish in 84 (10-min) tows for a CPUE of 12.4 (Table 13).

YOY Data Set Adjustments

Only a portion of all young striped bass collected from Albemarle Sound was examined for daily aging analysis. Subsampling of YOY collections in the field was conducted because of the large numbers of striped bass in the samples. Therefore, only 2,730 of 4,666 fish (58.5%) were available for otolith analysis. Further reduction of available fish occurred when some samples were poorly frozen, resulting in the darkening of otoliths making them unreadable.

The resulting YOY data set was trimmed in two ways. A total of 1,632 fish collected by all three surveys were aged using otoliths. Growth (TL/age in days) could be calculated for 1,619 fish. For the first data trim, outliers (n = 52) were determined by identifying those fish with growth rates two standard deviations higher or lower than the mean growth rate of 1.107 $\pm$ 0.200 mm/day. The second data trimming procedure was to eliminate from the analysis all fish with estimated spawn dates after 30 June 1993 (n = 81). This double trimming resulted in 1,486 fish (91.8%) retained in the data set for growth estimates and cohort analysis.

YOY Growth in Albemarle Sound

In 1993, juvenile striped bass grew at a rate of 1.09$\pm$0.157 mm/day (n=1,486); the minimum estimated growth rate was 0.72 mm/day and the maximum was 1.50 mm/day. The weight to length relationship for the population was

$$\text{LnWT} = 3.197\text{LnTL} - 12.488, \quad r^2 = 0.97.$$

The age to length relationship was

$$\text{Age in days} = 0.946\text{TL} + 9.511, \quad r^2 = 0.86.$$

The age to weight relationship was

$$\text{Age in days} = 3.475\text{WT} + 42.413, \quad r^2 = 0.70.$$

These relationships were calculated for fish with size ranges of 24 to 170 mm TL and should not be used to predict the growth of striped bass smaller or larger than these values.

On average, young striped bass collected from central and eastern Albemarle Sound were larger and older than those collected from western Albemarle Sound although the average growth rates were similar (Table 14). Minimum growth rates observed were of YOY striped bass collected by beach seine from western Albemarle Sound.

YOY striped bass were susceptible to capture by beach seine at a younger age and for a briefer period than for trawls. Young were first collected by beach seine at 26 days post-hatch, and young up to 66 days posthatch were collected (Table 14). Western trawls collected fish 28 days posthatch up to 130 days posthatch. Central/eastern trawls first collected fish at 39 days posthatch up to 125 days posthatch. The seasonality of entering and exiting the gear and surveys is evident in Table 15.

YOY Cohort Analysis

Otolith analysis of the 1,486 fish indicated that juvenile striped bass recruited to the 1995 year class were spawned as early as 14 April, but fish spawned in late May had better than expected survival and comprised the major portion of recruited individuals (Table 16).

Relative survivorship of fish spawned in late April and early May was at a rate close to that expected based on egg production and natural mortality (0.0-0.5). The peak spawn occurred on 13 May when an estimated 14.6 billion eggs were released in the river; the relative survivorship of this cohort was over 65% less than expected (Table 16, Figure 13). A similar phenomenon occurred on 17 May when a large spawn resulted in poor cohort survival (about 12% less than expected). After these spawning events, better than expected relative survivorship continued to increase steadily to the end of May.

YOY recruitment was greatest during moderate instream flows. Relative survival was higher than expected, based on egg production, when river flows were 8,000-9,000 cfs (Figure 14).

DISCUSSION

Results of the 1993 egg production and YOY recruitment study exhibited the seasonal non-uniform mortality of striped bass young observed in this system in other years and in other watersheds. A three-year (1990-1902) study of YOY recruitment in Albemarle Sound compared to egg production in the river indicated a high mortality of early life stages and higher than expected survival of fish spawned late in the season (Rulifson et al. 1993). Juvenile cohorts from early and peak spawning events were represented in the population at a rate less than expected based upon egg production and an assumed uniform rate of mortality. This phenomenon has been observed for populations of striped bass in other watersheds, especially Chesapeake Bay (Rutherford and Houde 1995) and the Santee-Cooper system (Bulak et al. 1993).

Interpretation of these otolith studies relies on several assumptions about aging techniques, fish collection procedures, and the likelihood of successful spawning early and late in the season. In addition, the Albemarle Sound studies must consider alternative sources of YOY fish besides those recruiting from the Roanoke River spawning grounds.

Validity of Otolith Daily Rings

The use of hard structures to age bony fish is a common practice, and otoliths appear to be more reliable than other structures for accurate age estimations. Interpretation of the rings is species specific, and the strengths and weaknesses of the method have been described (Secor and Dean 1995). The technique has been used successfully to age juvenile striped bass (Jones and Brothers 1987; Secor and Dean 1989, 1992; Secor et al. 1990, 1991; Kline 1990; Bulak et al. 1993).

We assumed that the rings on each otolith were counted correctly and that spawning occurred three days prior to first ring formation on the otolith. Kline (1990) used four days rather than three to backcalculate the spawning date. Bulak et al. (1993) used a minimum of two independent counts of otoliths rings and found that the precision of ring counts varied among readers. Rutherford and Houde (1995) counted the rings three times, and took the average of the last two counts as the correct number of days. We used a single investigator to

count the rings, and counted them only once, because an earlier study (Isely and Manooch 1991) showed that repeated counts resulted in a counting error of less than five rings from minimum to maximum counts through the range of ages examined. Also, Isely conducted an aging study on young striped bass reared under hatchery conditions and consistently underestimated age by one day. Rutherford and Houde (1995) collapsed their age-count data (n=561 larvae) into three-day cohorts for analysis, but the frequency of our field collections for eggs and juveniles, and the size of the YOY sample (n=1,486) allowed daily cohort analysis.

Regardless of whether the ages are accurate or erroneous by one or two days, the fact remains that higher than expected mortality between egg deposition and recruitment is occurring during peak spawning activity. Additionally, greater than expected survival is occurring late in the season. Causes of this phenomenon are unclear for the Roanoke population, but in Chesapeake Bay a primary cause is water temperature changes (Rutherford and Houde 1995). This pattern of non-uniform mortality also is documented for the Santee-Cooper system (Bulak et al. 1993).

Juvenile Fish Collection

For analysis of relative survival, we assumed that all age-0 striped bass within a specific size range in Albemarle Sound were equally susceptible to the gear; fish of larger cohorts should be caught in greater quantity than those of smaller cohorts. Tables 15 and 16 documented how youngest fish are most susceptible to beach seines, then leave the gear as they reach a size to exhibit movement from the shallows to deeper waters. Thus, the slightly older YOY become susceptible to the trawls starting in July and, with age, leave the gear near the end of the sampling season. Gear escapement should be considered as one factor in interpreting the mortality rates, but a method to compensate for this effect has not been determined.

Spawning Sites and YOY Recruitment

In calculating relative survival of cohorts, we assumed that all age-0 fish collected in Albemarle Sound during the summer of 1993 originated from eggs spawned in the Roanoke River. This is a logical assumption since the primary spawning ground is well documented by Hassler's studies and by the presence of recreational fishermen. Earlier surveys suggested that the Meherrin River, a tributary to the Chowan River, might be a minor spawning ground in some years based on the collection of four eggs and two larvae in 1973 (Street et al. 1975). The spawning site is believed to be in the stretch of river between U.S. Highway 258 bridge at Murfeesboro and the dam at Emporia, Virginia, but any spawning activity would be a minor contribution to the Albemarle Sound population. Striped bass eggs must have flowing waters of at least 30 cm/second to remain in the water column for proper development (Albrecht 1964). In addition, the river reach must be of adequate length to maintain the eggs in suspension until hatching. In most years, few streams and rivers draining into Albemarle Sound meet these criteria.

One alternative source of striped bass larvae might be Pamlico Sound, but any contribution to the Albemarle Population should be minor. Small spawning populations exist in the Tar and Neuse rivers. Tag returns of Phase II striped bass indicate an exchange of Albemarle fish into Pamlico Sound, and vice versa (R.W. Laney, USFWS, personal communication). However, larvae and age-0 striped bass are not considered to migrate long distances so contribution of young from Pamlico Sound should be negligible.

SUMMARY AND CONCLUSIONS

1. Successful recruitment of young to the 1993 year class in Albemarle Sound occurred in a year characterized by high egg production and stable flows. Initial low-level spawning activity was documented during the flooding conditions in the latter half of April through mid-May. Once floodwater discharge was reduced to moderate levels (8,000-9,000 cfs), spawning immediately commenced and continued through late June. As in other years, the critical water temperature of 18°C played a major role in initiating the major spawning activity.

2. Field sampling of egg deposition at Barnhill's Landing (RM 117) documented striped bass spawning activity in the Roanoke River from 21 April to 11 June. The spawning season was 52 days in length, with 32 consecutive days of spawning activity.

3. A record number of eggs was produced in the Roanoke River in 1993: 23.954+1.91 billion from a count of 102,649 eggs collected in surface samples. The estimate is low due to missed samples during peak spawning activity.

4. Seasonal egg production was 50% complete by 13 May, nearly 80% complete by 17 May, and 90% complete by 23 May.

5. Three major spawning events were observed in 1993: 13-14 May (64% of total egg production), 17-18 May (21%), and 23-26 May (11%).

6. Egg viability for 1993 was 49.1%, a value within the range observed at this location in previous investigations.

7. No seasonal trend in egg viability was evident. The variability in egg viability was partly explained (18%) by levels of dissolved oxygen and changes in river depth.

8. Most eggs (86%) passing Barnhill's Landing were less than 10 hours old. An additional 14% were 10-18 hours in development.

9. Water temperatures ranged from 9.8°C to 26.5°C, but 95% of the eggs were collected at water temperatures of 18.0-21.9°C. Egg viability was greatest at 16.0-17.9°C.

10. Surface water velocities ranged from 56 - 146 cm/second, but 99% of the eggs were collected at surface water velocities of 60.0-79.9 cm/second. Water velocity was highly correlated with river depth and reservoir discharge.

11. Dissolved oxygen levels were 6.2-12.8 mg/L, and most eggs were collected at levels of 7.0-8.9 mg/L.

12. Values of pH ranged from 6.4-8.9, and 96% of all eggs were collected at a pH of 7.0 or greater.

13. Secchi disk visibility ranged from 20 to 90 cm, and was negatively correlated with river stage and water velocity.

14. Over half of the YOY sampled from the beach seine and trawl surveys were from cohorts spawned after the major spawning activity in mid-May had passed. Non-uniform mortality was evident as in years past, with best cohort recruitment coming from those fish spawned in late May. This phenomenon has been documented for the Roanoke-Albemarle system (1990-1992) and for populations in Chesapeake Bay and the Santee-Cooper system.

15. Since the major portion of the year class each year is from late-spawned cohorts, watershed management should include ensuring adequate environmental conditions conducive to larval striped bass survival at the end of the spawning season.

ACKNOWLEDGMENTS

The 1993 egg and YOY recruitment study could not have been accomplished without the dedicated field efforts of Lee Paramore and James Polka at Barnhill's Landing. Special thanks go to Mr. Paul Hale, Sr., for use of Barnhill's Landing. Thanks also go to Jeff Gearhart for pitching in during the peak spawning activity. Personnel of the NC Division of Marine Fisheries conducted the YOY sampling and provided specimens: Lynn Henry, Steve Taylor, and Sara Winslow. Marsha E. Shepherd of the Academic Computing Center at East Carolina University was instrumental in writing the programs for computer analyses. John E. Cooper, formerly of the Institute for Coastal and Marine Resources, drew several of the original figures. The record-breaking collection of YOY striped bass was initially processed at ECU with the dedicated efforts of a number of undergraduates. We are deeply grateful to Stephanie Money, Jamie Hart, Patrick Davis, Steve Hammond, Todd Taylor, and others for helping weigh and measure fish. Otoliths were removed and processed for reading at Clemson University by a number of undergraduate students in Dr. Isely's lab. Funding for the study was provided by Virginia Power.

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Figure 14. Daily egg production (adjusted by viability), YOY daily cohort recruitment, and relative survival of YOY relative to the spawning date instream flow (cfs) of the Roanoke River, NC, measured at the USGS gage near Roanoke Rapids, NC, in 1993.

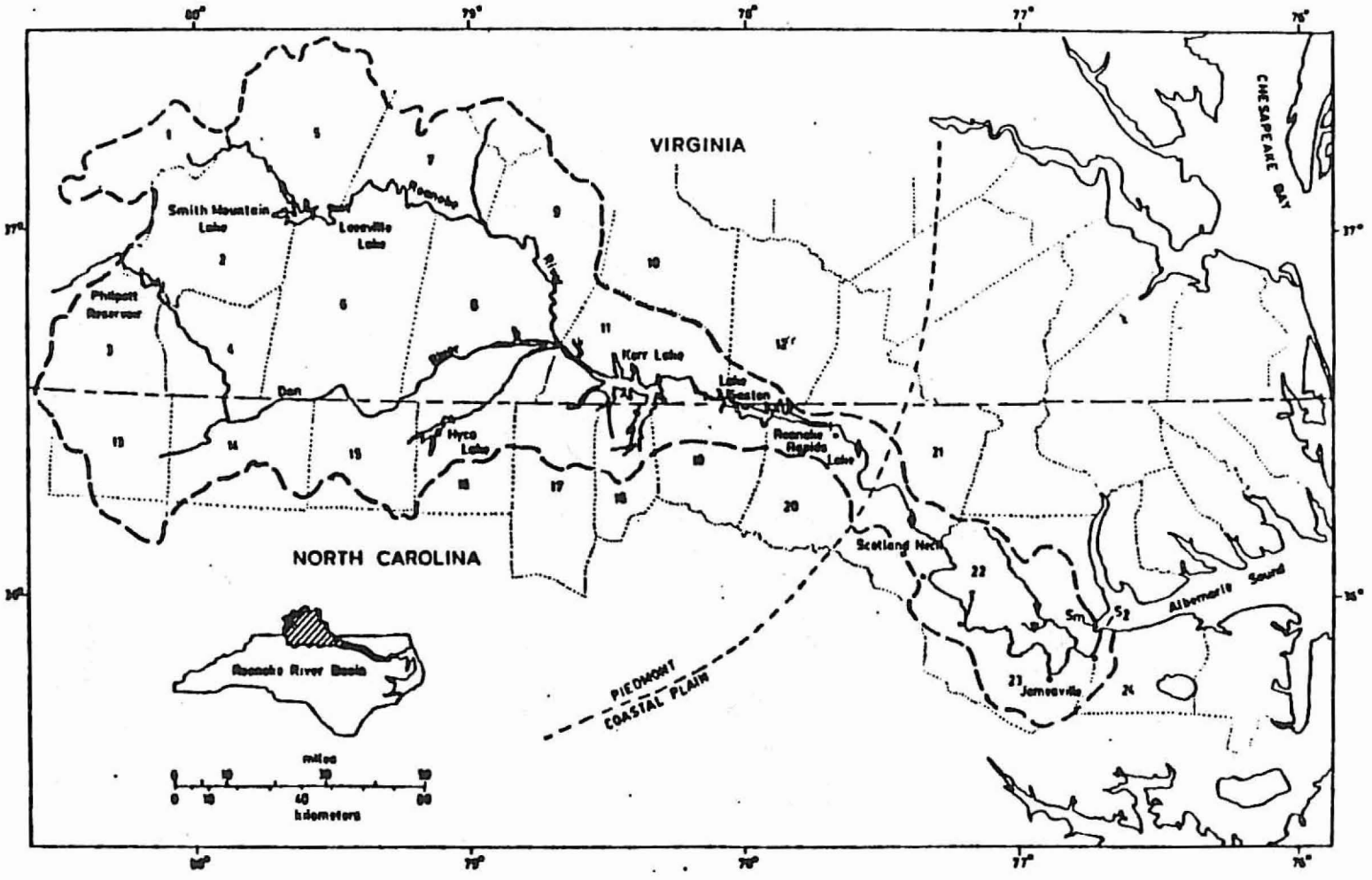

Figure 1. Drainage area of the Roanoke River Basin. Dashed line indicated approximate location of the Fall Line; diamonds=locations of USGS water quality and gaging stations; inverted triangle=USGS water quality station; T=upstream limit of tidal influence; S2=mean upstream intrusion limit of saltwater front (200 mg/L chloride); Sm=maximum upstream intrusion of saltwater front (Giese et al. 1985). Counties containing Roanoke watershed are enumerated and listed in Appendix Table A-1.

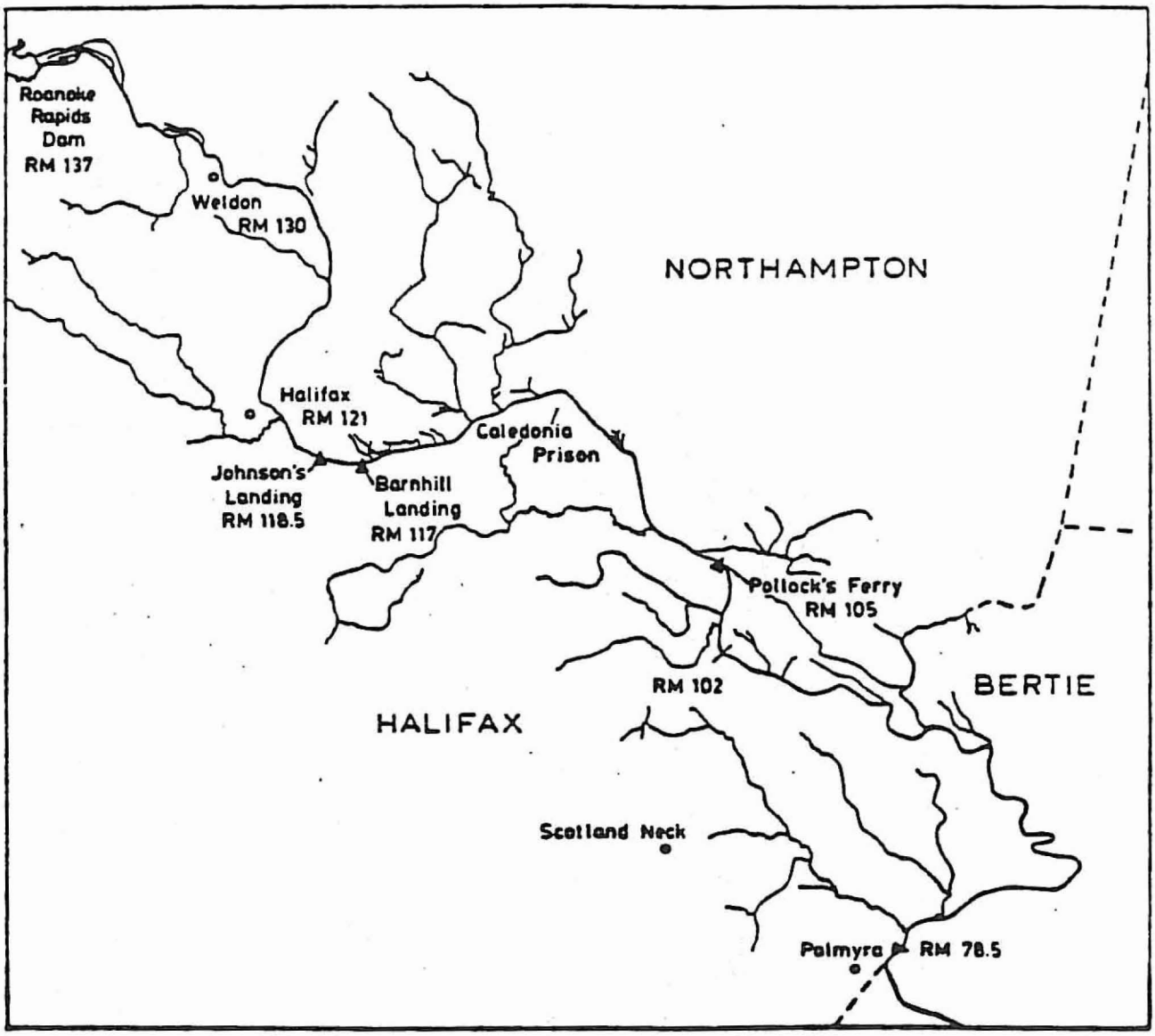

Figure 2. Roanoke River watershed downstream of Roanoke Rapids Reservoir showing the historical sampling station for striped bass eggs: Palmya (1959-1960), Halifax (1961-74), Barnhill's Landing (1975-81, 1989-93), Johnson's Landing (1982-87), and Pollock's Ferry (1988).

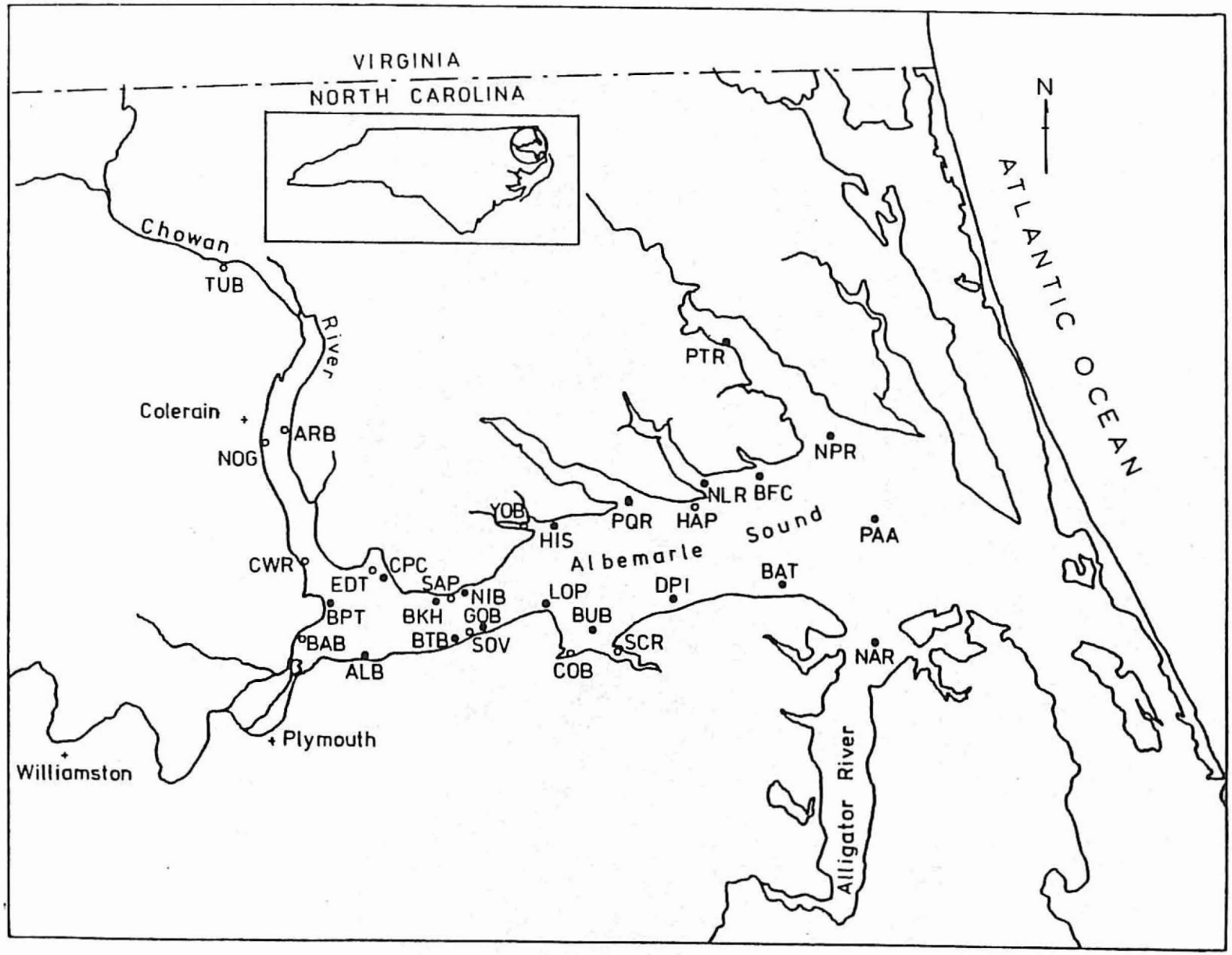

Figure 3. Sampling stations of the NC Division of Marine Fisheries used for the western Sound (Hassler) trawl survey (JAI), the central and eastern trawl survey (EST), the alosid beach seine survey (ALO), and the exploratory beach seine survey (EXP). Written descriptions of each station presented in Appendix Table B-1.

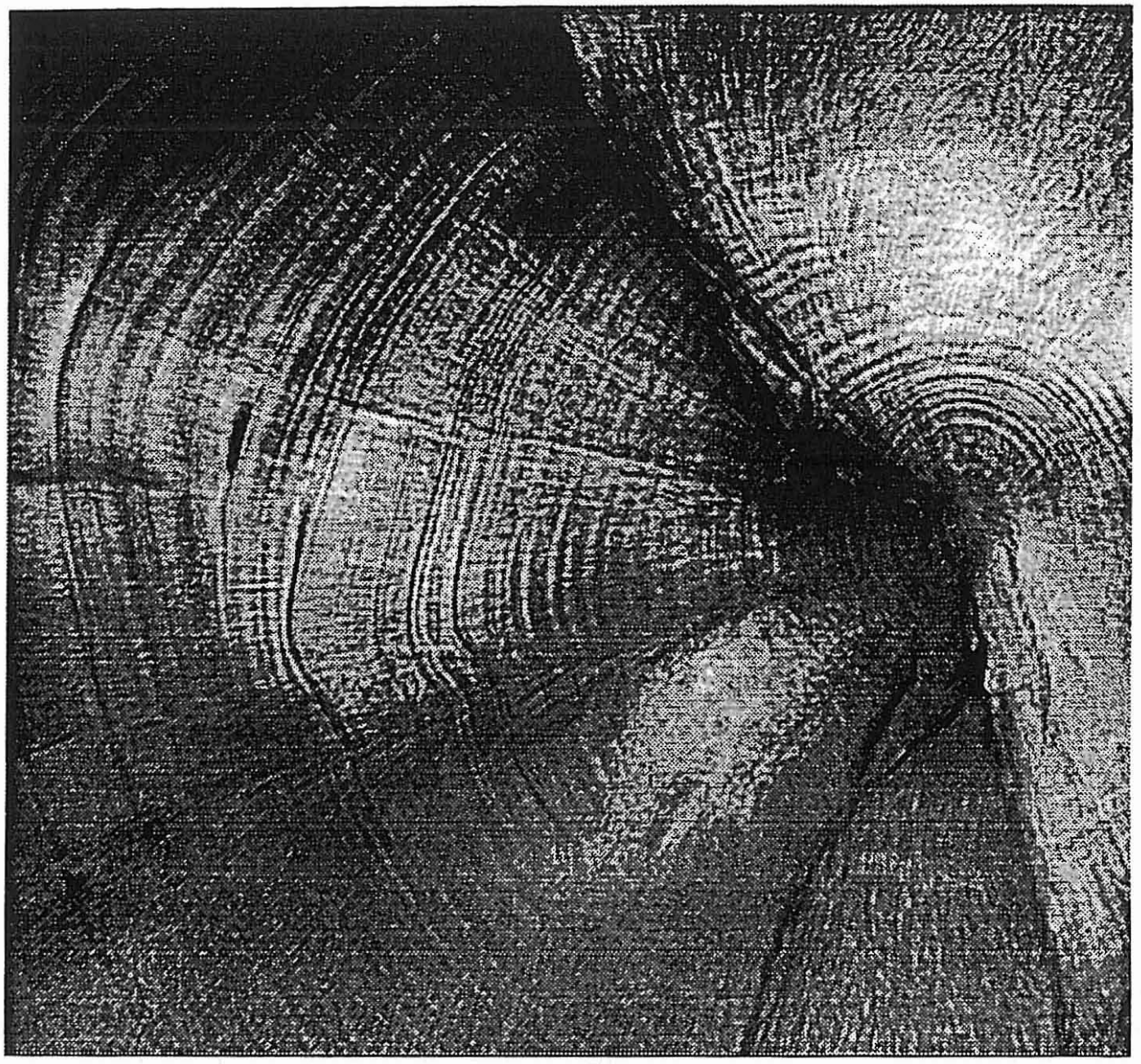

Figure 4. Digitized microphotograph of a young-of-year striped bass sagittal otolith depicting the rings used to backcalculate the spawn date (SB20B, canvas, sharp x 1).

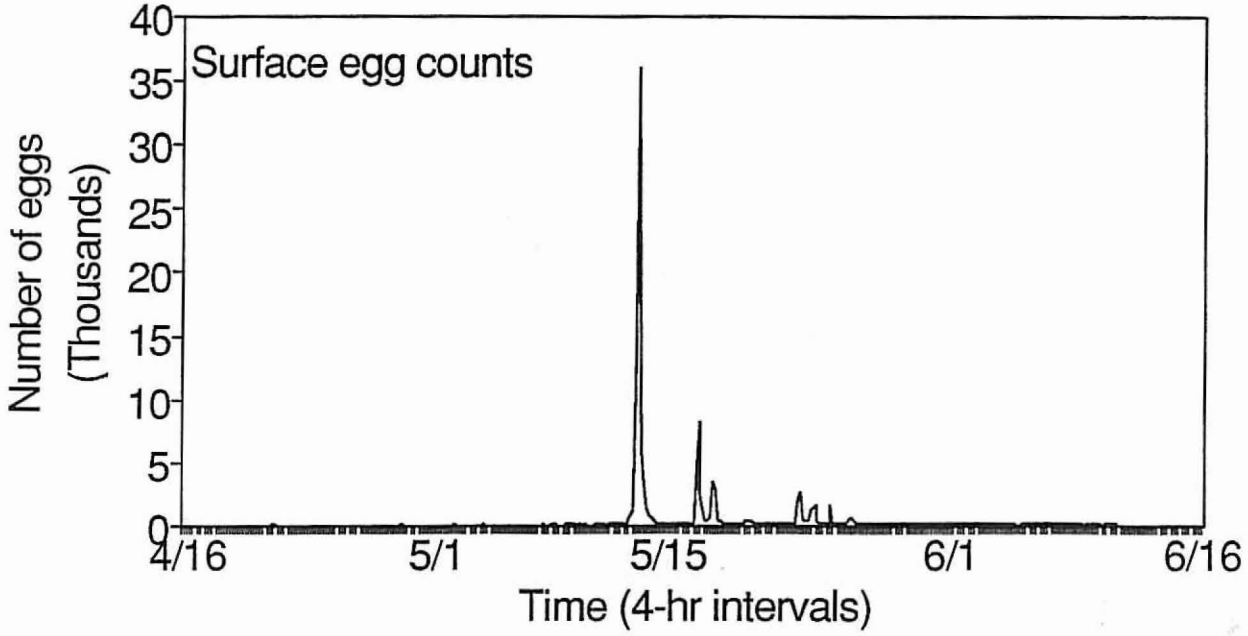

Figure 5. Surface egg counts in samples collected every four hours from the Roanoke River at Barnhill's Landing, NC, for the period 16 April to 16 June 1993.

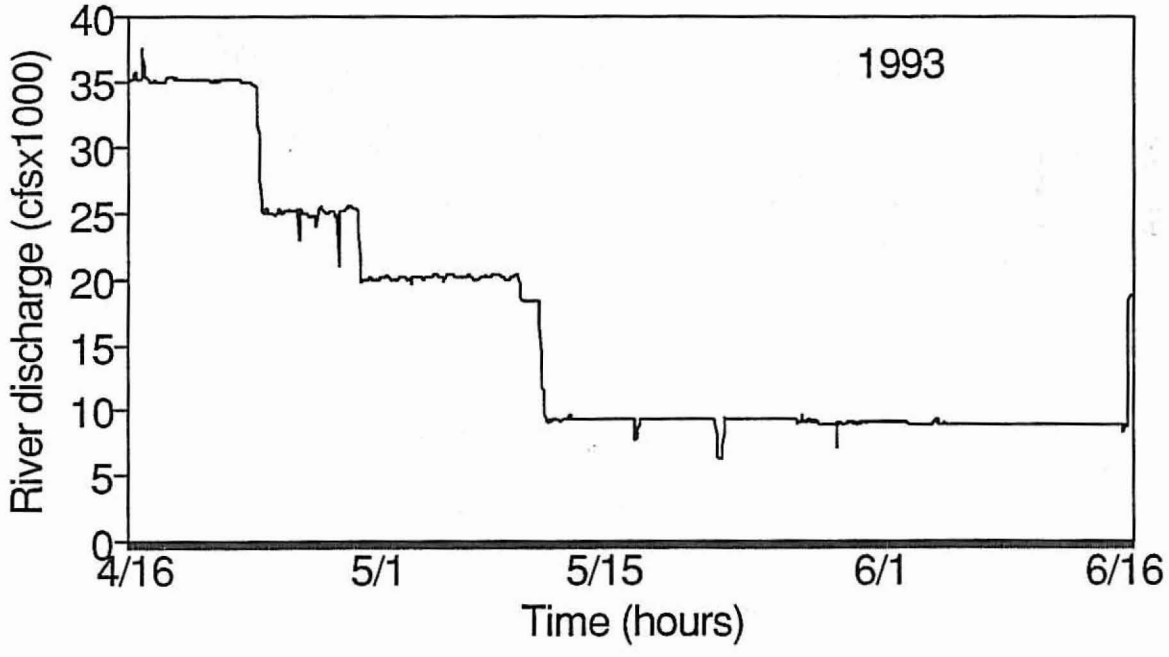

Figure 6. Hourly record of Roanoke River instream flow (CFS) downstream of the Roanoke Rapids Reservoir (USGS data), 16April to 16 June 1993.

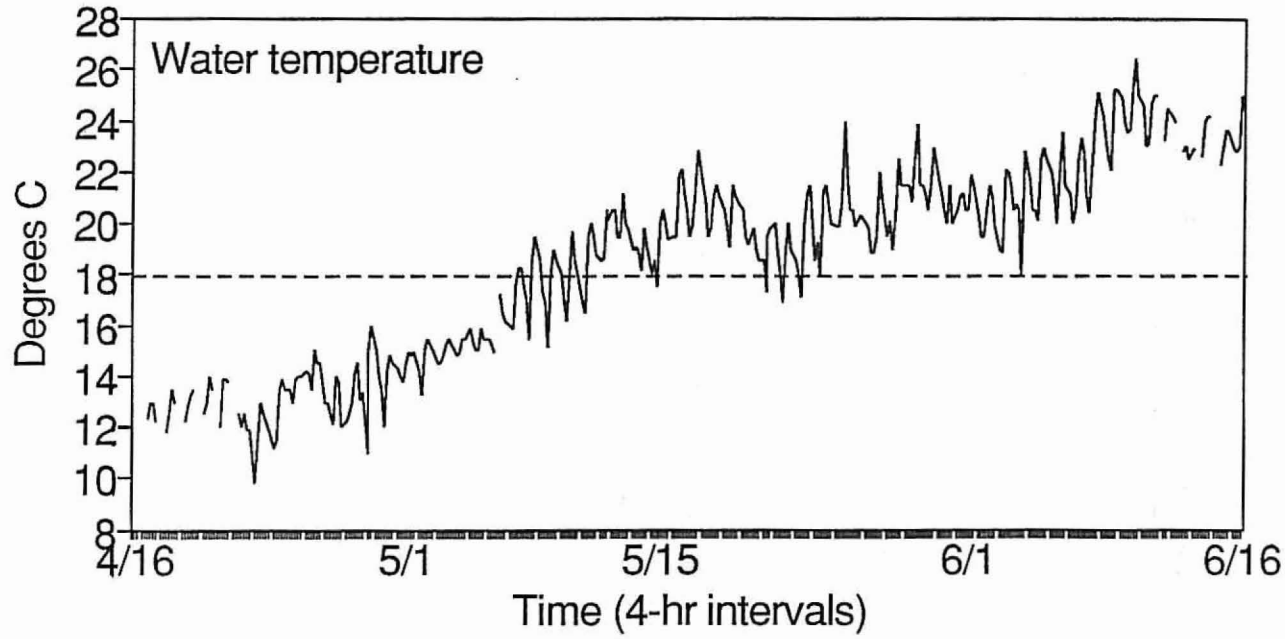

Figure 7. Water temperature (°C) measured at Barnhill's Landing, NC, for the period 16 April to 16 June 1993.

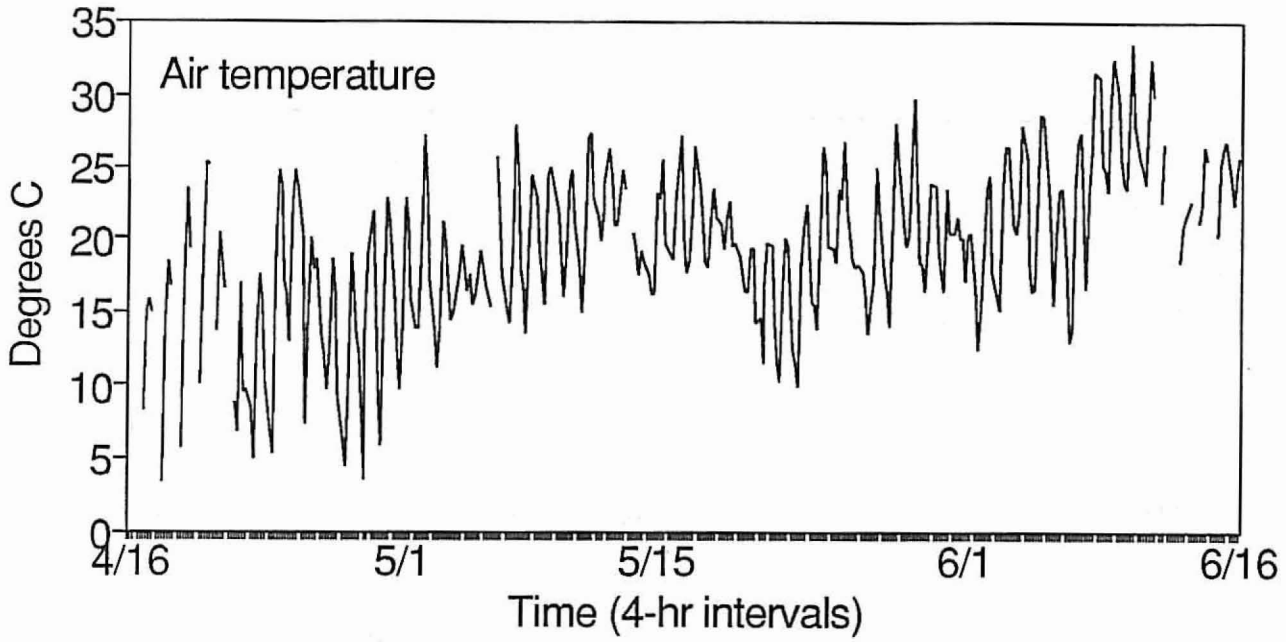

Figure 8. Air temperature (°C) measured at Barnhill's Landing, NC, for the period 16 April to 16 June 1993.

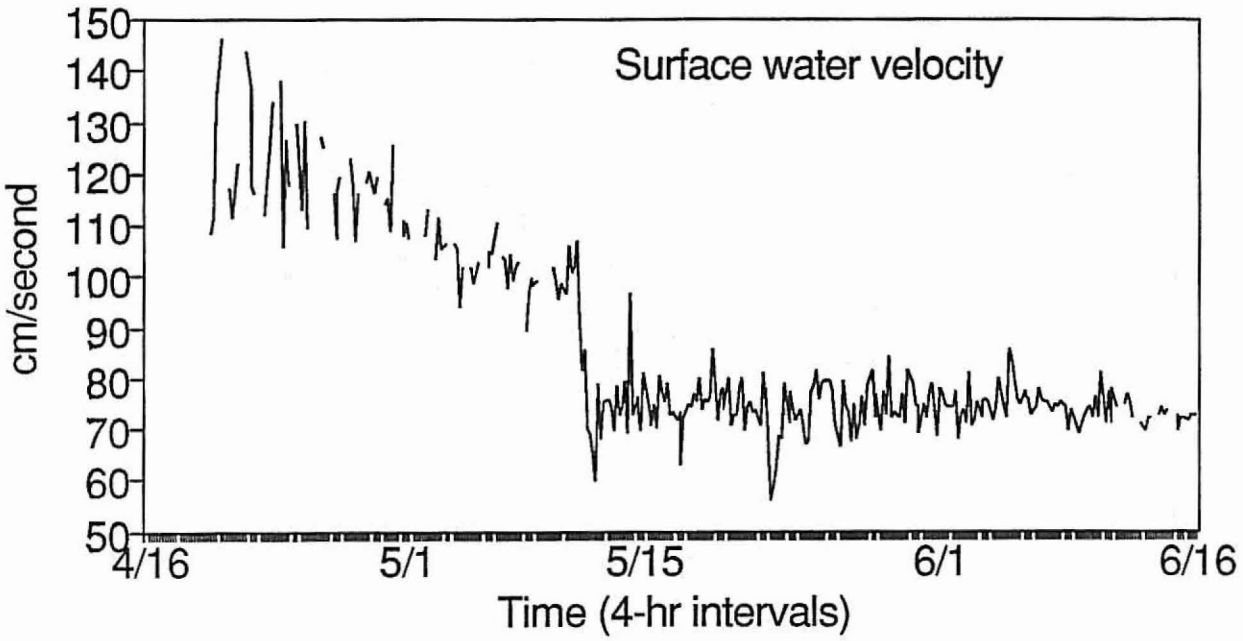

Figure 9. Surface water velocity (cm/second) measured at Barnhill's landing, NC, for the period 16 April to 16 June 1993.

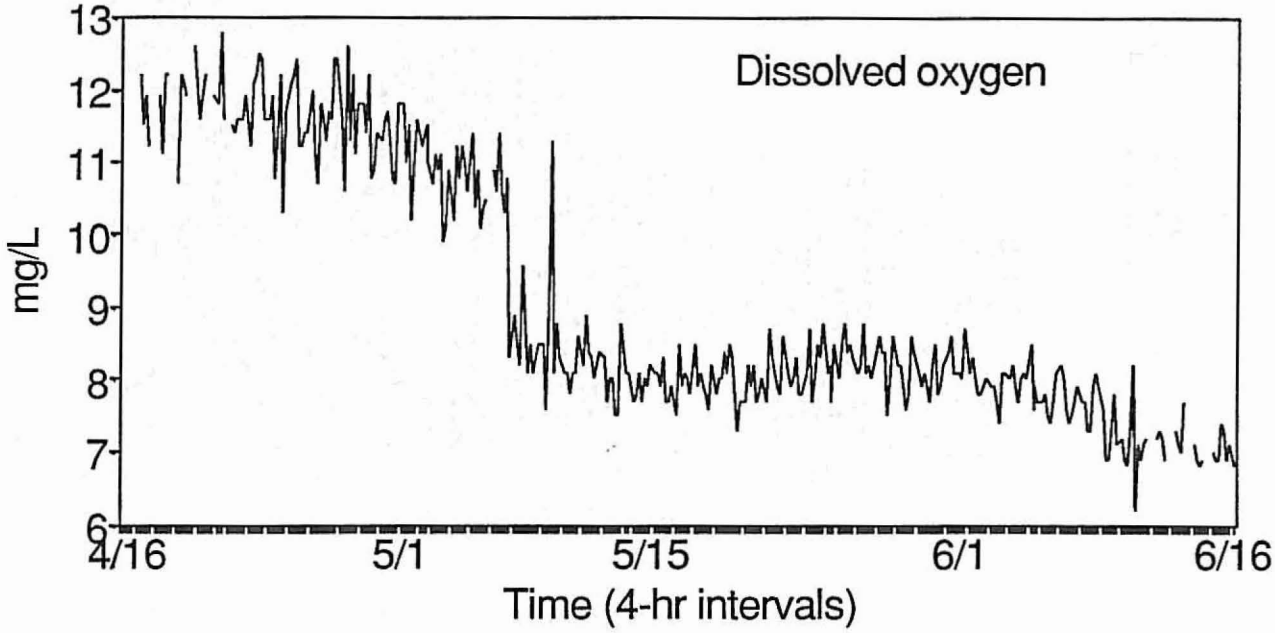

Figure 10. Changes in dissolved oxygen (mg/L) of Roanoke River waters at Barnhill's Landing, NC, for the period 16 April to 16 June 1993.

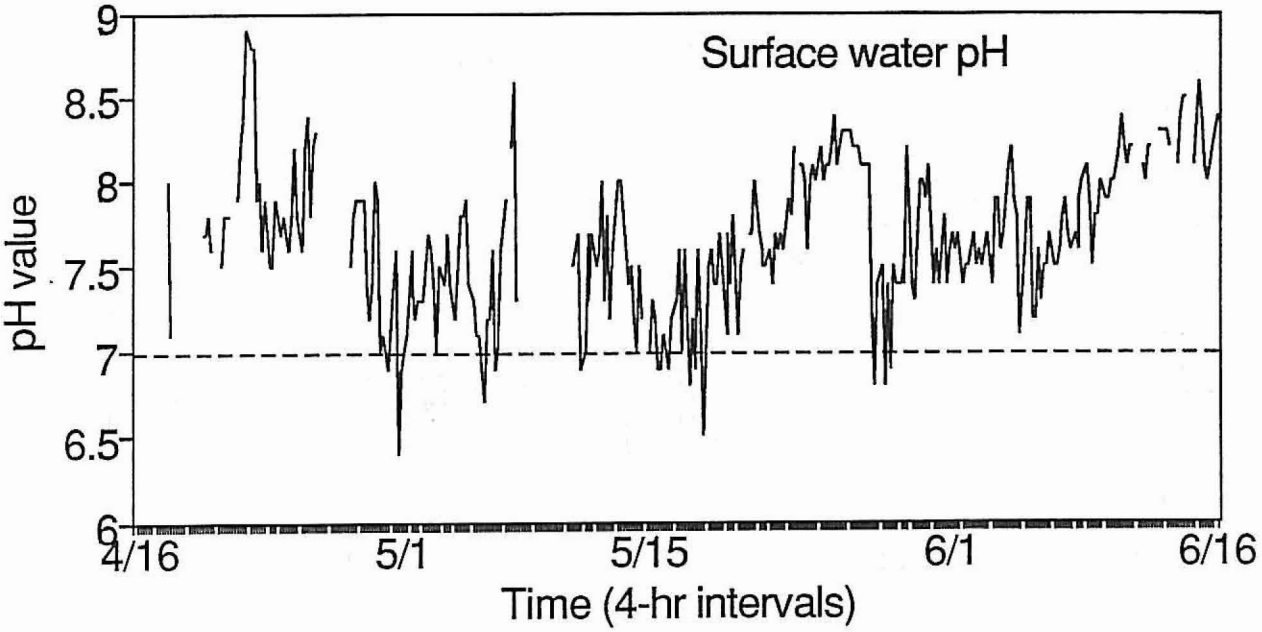

Figure 11. Changes in pH of Roanoke River surface waters at Barnhill's Landing, NC, for the period 16 April to 16 June 1993.

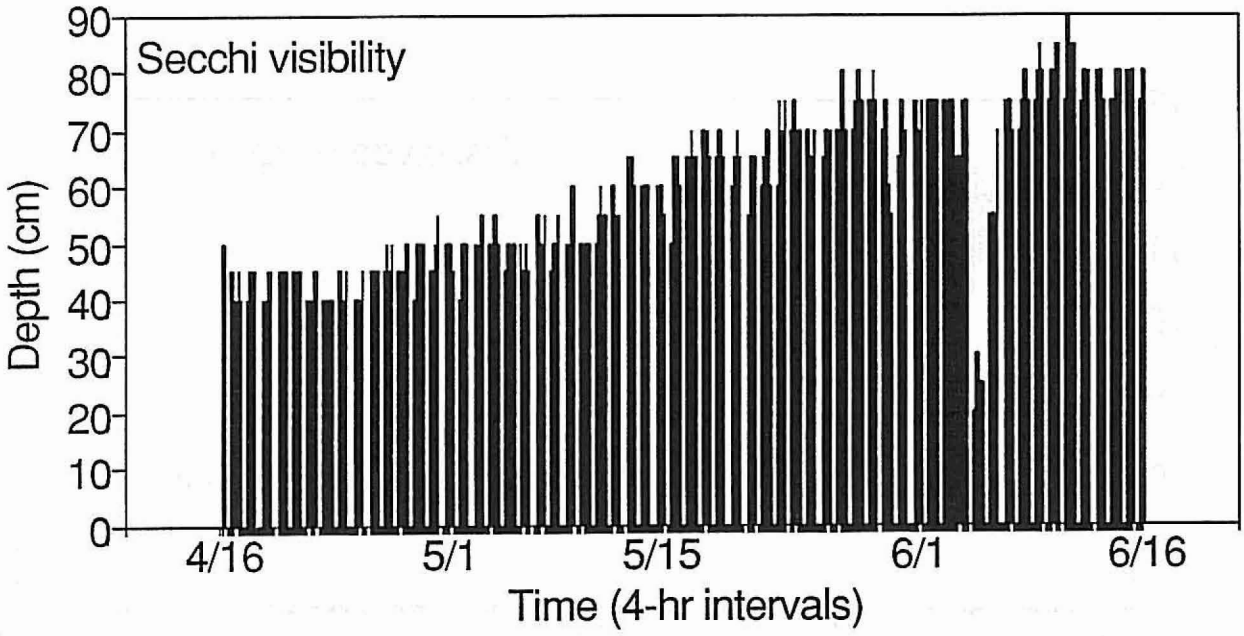

Figure 12. Depth (cm) of secchi disk visibility in the Roanoke River at Barnhill's Landing, NC, for the period 16 April to 16 June 1993.

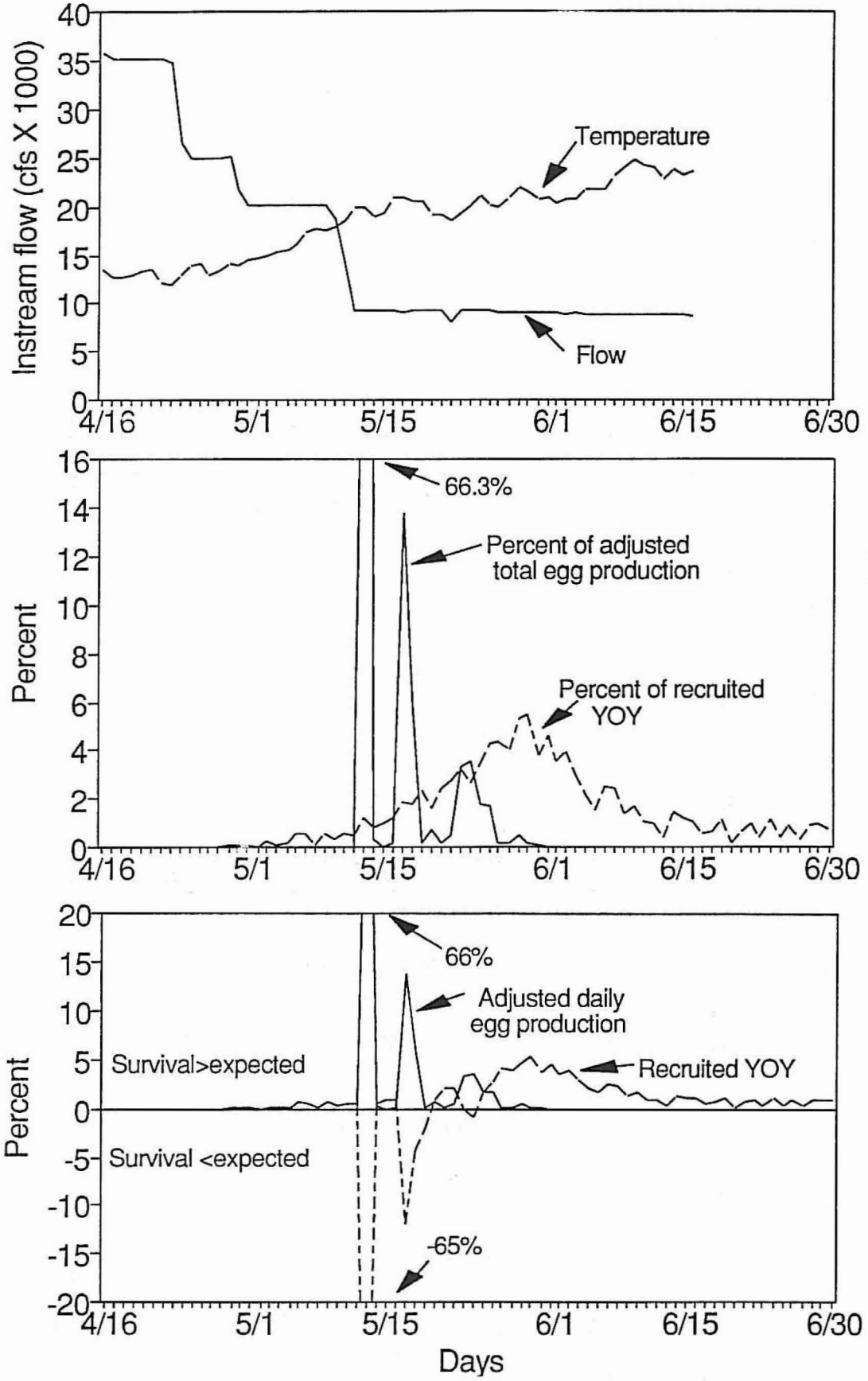

Figure 13. Water temperature (°C) and flow (cfs) of the Roanoke River, adjusted daily egg production and spawn dates of surviving YOY striped bass collected in the Sound, and YOY daily cohort survival relative to egg production in 1993.

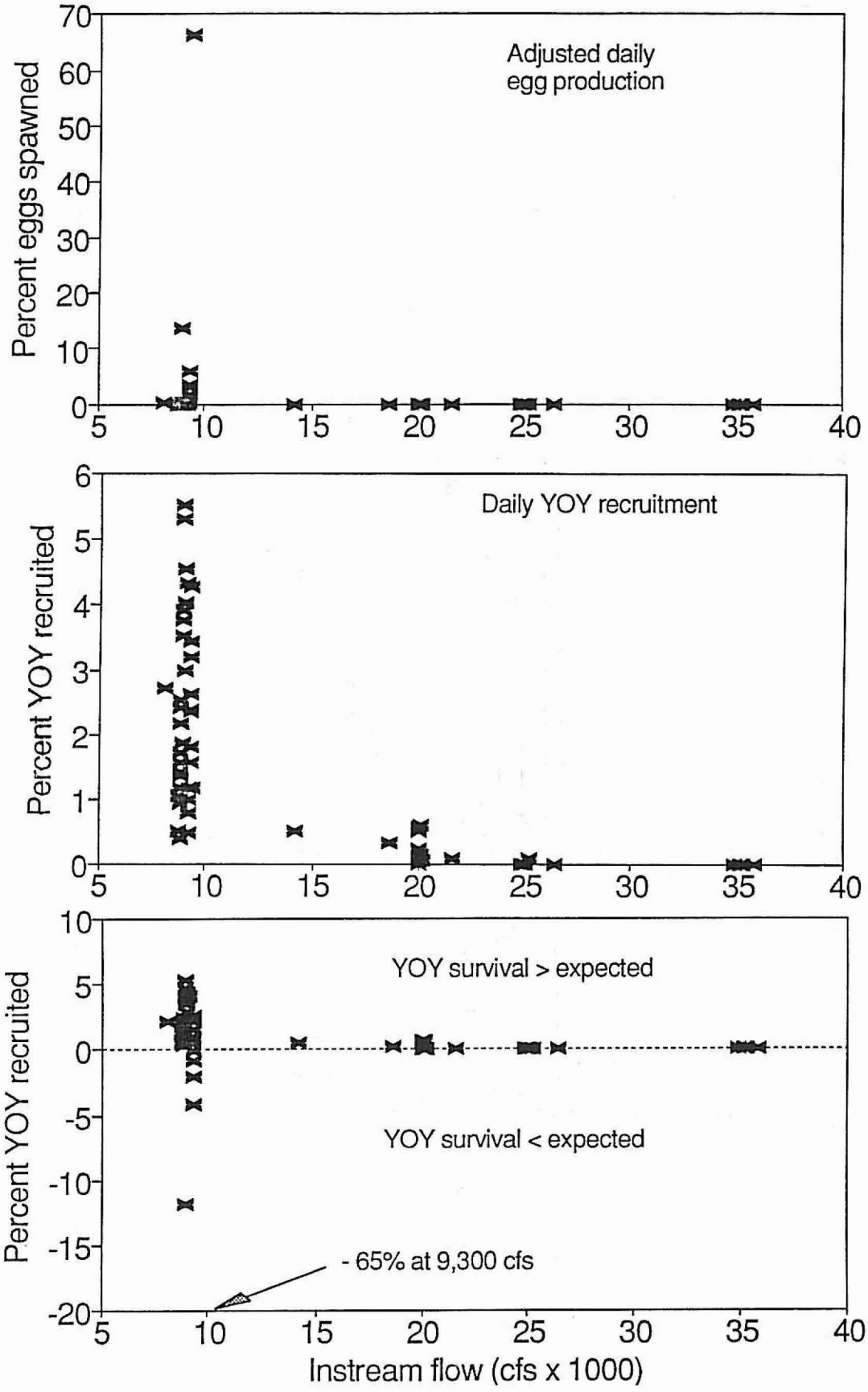

Figure 14. Daily egg production (adjusted by viability), YOY daily cohort recruitment, and relative survival of YOY relative to the spawning date instream flow (cfs) of the Roanoke River, NC, measured at the USGS gage near Roanoke Rapids, NC, in 1993.

Table 1. Striped bass spawning in the Roanoke River, NC, in 1993 estimated by the Hassler method and by river discharge recorded upstream six hours previous (FLOWL6) to sample collection.

Date	No. of samples	Mean river stage (ft.)	Mean surface velocity (ft./sec)	Mean X-section (sq.ft.)	Mean river discharge (cfs)	Mean eggs/ day	Mean volume filtered (cfs)	Total eggs-surface (Hassler)	Total eggs Flowl6 (Hassler)
930416	4	30.0	.	12,827	34,985	0	.	0	.
930417	16	30.0	.	12,827	35,379	0	.	0	.
930418	16	30.0	.	12,815	35,169	0	.	0	.
930419	16	29.9	4.1	12,781	35,219	0	689	0	0
930420	16	29.9	4.1	12,781	35,189	0	690	0	0
930421	16	29.9	3.8	12,781	35,139	0	645	821,623	653,841
930422	18	29.9	4.2	12,781	35,209	0	708	0	0
930423	20	29.9	4.0	12,781	35,039	0	676	0	0
930424	20	29.2	4.0	12,467	28,817	0	673	0	0
930425	20	27.8	4.0	11,832	25,023	0	665	0	0
930426	18	27.1	4.0	11,503	25,248	0	676	0	0
930427	20	26.7	3.8	11,304	24,835	0	634	0	0
930428	20	26.4	3.8	11,197	25,194	0	639	0	0
930429	20	26.3	3.9	11,128	24,490	0	653	715,397	449,794
930430	20	25.8	3.8	10,906	22,888	0	640	0	0
930501	20	24.6	3.6	10,356	20,028	0	602	0	0
930502	20	24.0	3.6	10,065	20,052	0	609	647,038	395,250
930503	22	23.7	3.5	9,920	19,972	0	587	0	0
930504	24	23.5	3.3	9,851	20,075	0	561	422,179	286,419
930505	24	23.4	3.3	9,797	20,148	0	557	0	0
930506	22	23.4	3.5	9,812	20,172	0	580	0	0
930507	24	23.3	3.3	9,751	20,083	0	560	835,833	573,405
930508	24	23.3	3.2	9,751	20,196	0	536	2,089,582	1,506,689
930509	24	23.3	3.3	9,751	20,107	1	554	3,761,247	2,615,346
930510	24	22.9	3.3	9,591	19,160	0	548	1,644,125	1,118,677

Table 1 (continued).

Date	No. of samples	Mean river stage (ft.)	Mean surface velocity (ft./sec)	Mean X-section (sq.ft.)	Mean river discharge (cfs)	Mean eggs/ day	Mean volume filtered (cfs)	Total eggs-surface (Hassler)	Total eggs Flow16 (Hassler)
930511	22	22.3	3.1	9,301	16,531	1	520	3,587,744	2,286,761
930512	22	15.1	2.2	6,168	9,278	2	378	6,608,798	4,913,422
930513	24	14.2	2.4	5,804	9,320	4,905	410	14,641,319,135	10,708,938,715
930514	24	13.1	2.6	5,378	9,244	262	430	724,413,657	541,060,660
930515	24	12.9	2.4	5,323	9,244	5	407	13,687,785	10,895,202
930516	24	12.5	2.5	5,162	9,250	28	418	73,009,337	58,397,707
930517	24	11.9	2.3	4,953	9,001	1,394	393	3,550,283,925	3,066,028,886
930518	24	12.0	2.5	4,977	9,282	582	419	1,489,511,252	1,237,535,447
930519	24	12.0	2.5	4,995	9,304	32	426	82,638,877	67,385,287
930520	24	12.1	2.4	5,026	9,320	95	411	244,272,116	205,783,607
930521	24	12.1	2.4	5,002	9,288	31	410	80,597,077	68,151,774
930522	24	11.7	2.3	4,875	8,292	44	384	110,103,263	91,066,436
930523	24	11.3	2.3	4,743	9,093	462	391	1,127,874,207	1,032,702,068
930524	24	11.8	2.3	4,923	9,293	274	390	693,717,415	626,971,065
930525	24	11.9	2.6	4,947	9,298	175	433	444,385,646	360,128,439
930526	24	11.9	2.5	4,947	9,288	140	413	355,126,888	301,615,538
930527	24	11.9	2.3	4,935	9,288	18	394	44,415,070	39,625,280
930528	24	11.7	2.5	4,881	9,137	17	418	43,719,134	36,526,825
930529	24	11.5	2.5	4,803	8,934	41	412	100,240,045	84,449,047
930530	24	11.4	2.5	4,761	8,640	15	416	37,132,859	30,265,572
930531	24	11.5	2.4	4,803	8,987	6	406	15,437,379	13,282,508
930601	24	11.5	2.5	4,803	8,992	3	414	6,998,278	5,909,124
930602	24	11.5	2.4	4,815	9,003	3	404	7,841,202	6,767,450
930603	24	11.5	2.4	4,803	8,944	3	405	6,792,447	5,830,200
930604	24	11.4	2.5	4,773	8,934	4	415	9,204,409	7,745,482
930605	24	11.8	2.6	4,923	9,025	2	434	4,219,721	3,329,735

Table 1 (continued).

Date	No. of samples	Mean river stage (ft.)	Mean surface velocity (ft./sec)	Mean X-section (sq.ft.)	Mean river discharge (cfs)	Mean eggs/ day	Mean volume filtered (cfs)	Total eggs- surface (Hassler)	Total eggs Flow16 (Hassler)
930606	24	12.0	2.5	4,965	8,860	4	416	9,149,954	7,325,722
930607	24	11.8	2.5	4,893	8,865	3	416	6,500,621	5,279,471
930608	24	11.7	2.4	4,857	8,876	2	406	4,995,659	4,200,243
930609	24	11.6	2.3	4,833	8,860	1	392	2,899,694	2,531,516
930610	24	11.5	2.5	4,803	8,823	1	412	1,646,654	1,370,065
930611	20	11.5	2.4	4,795	8,849	0	410	739,880	622,062
930612	16	11.4	2.5	4,776	8,823	0	413	0	0
930613	16	11.5	2.3	4,785	8,881	0	392	0	0
930614	16	11.4	2.4	4,767	8,860	0	404	0	0
930615	20	11.4	2.3	4,767	8,897	0	394	0	0
930616	12	11.4	2.4	4,767	8,876	0	401	0	0
Estimated total egg production for 1993:								23,954,007,152	18,646,520,735
								+1,910,476,106	+1,448,947,853

Table 2. Summary of striped bass spawning activity in the Roanoke River observed at Barnhill's Landing (RM 117), 1989-1993.

Activity	1989	1990	1991	1992	1993
Number of surface samples examined:	688	698	692	751	642
Number of eggs collected at surface	4,722	5,309	10,467	56,674*	102,649
Hassler egg production estimate (in billions)	0.638	0.965	1.837	9.655*	23.954
Egg viability estimate	41.8%	58.5%	55.4%	46.4%	49.1%
Date of first egg	16 Apr	24 Apr	17 Apr	17 Apr	21 Apr
Date of last egg	9 Jun	12 Jun	12 Jun	after 23 Jun	11 Jun
Days within spawning window	55	50	57	more than 68	52
Number of days of continuous spawning	23	50	41	more than 45	36
Major spawning activity and percent of total eggs collected:					
first peak	23-24 May (27%)	2-3 May (7%)	8-9 May (20%)	15 May (10%)	13-14 May (64%)
second peak	26-27 May (33%)	7 May (15%)	11-12 May (17%)	19-20 May (47%)	17-18 May (21%)
third peak	31 May-1 Jun (26%)	10 May (20%)	14 May (19%)	25-26 May (11%)	23-26 May (11%)
fourth peak				1-3 Jun (9%)	
Date at which egg production was:					
50% complete	26 May	10 May	13 May	20 May*	13 May
75% complete	27 May	14 May	15 May	26 May*	17 May
90% complete	31 May	20 May	25 May	6 Jun*	23 May
Percent of all staged viable eggs (17°C criteria):					
less than 10 hours	77	71	62	64	86
10 to 18 hours	5	29	38	36	14
20 to 28 hours	19	<1	<1	<1	0
30 hours and older	<1	<1	0	<1	0
newly-hatched larvae	0	0	0	0	0

Table 2 (continued).

Activity	1989	1990	1991	1992	1993
Percent of all eggs collected at water temperature (°C):					
12.0-13.9	0	0	0	0	<1
14.0-15.9	<1	0	<1	<1	<1
16.0-17.9	3	<1	2	5	4
18.0-19.9	40	48	22	56	38
20.0-21.9	48	48	36	34	57
22.0-23.9	8	3	36	5	<1
24.0-25.9	<1	0	5	0	<1
26.0+	0	0	<1	0	0
Percent of all eggs collected at surface water pH:					
5.50-5.74	0	0	0	0	0
6.00-6.24	0	0	0	0	0
6.25-6.49	0	0	0	0	0
6.50-6.74	<1	0	<1	0	<1
6.75-6.99	1	1	0	0	4
7.00-7.24	1	12	2	22	11
7.25-7.49	3	24	<1	30	2
7.50-7.74	6	52	12	32	26
7.75-7.99	38	6	52	15	8
8.00+	47	3	33	<1	48
not recorded	3	1	<1	<1	<1
Percent of all eggs collected at surface dissolved oxygen (mg/L):					
5.0-5.9	0	0	<1	0	0
6.0-6.9	0	3	3	0	<1
7.0-7.9	28	47	68	20	61
8.0-8.9	72	46	28	73	39
9.0-9.9	<1	3	<1	6	<1
10.0-10.9	0	0	0	0	<1
11.0-11.9	0	0	0	0	0
not recorded	<1	<1	<1	<1	0

Table 2 (continued).

Activity	1989	1990	1991	1992	1993
Percent of all eggs collected at surface water velocity (cm/second):					
40.0-59.9	7	2	4	3	<1
60.0-79.9	22	66	92	28	99
80.0-99.9	9	26	4	64	1
100.0-119.9	58	7	<1	2	<1
120.0-139.9	5	0	0	<1	<1
not recorded	<1	0	0	3	<1
Percent of all eggs collected at time:					
0200	18	28	23	11	12
0600	28	42	21	32	19
1000	22	12	24	27	20
1400	11	6	9	11	37
1800	6	4	13	7	7
2200	15	7	10	12	5

*Indicates a low estimate caused by several misssed samples during peak spawning activity, and termination of sampling efforts while spawning was still in progress.

Table 3. Estimated number of striped bass eggs spawned in the Roanoke River, NC, and the corresponding egg viability, 1959-1987 (Hassler reports), 1988-1992 (Rulifson reports), and 1993 (this study).

Year	Sampling period	Estimated number of eggs	Egg viability (%)	Site of egg collection
1959		300,000,000	92.88	Palmyra (RM 78.5)
1960	23 Apr-8 Jun	740,000,000	92.88	Palmyra
1961		2,065,232,519	79.74	Halifax (RM 121)
1962		1,088,076,294	86.22	Halifax
1963	18 Apr-8 Jun	918,652,436	79.94	Halifax
1964	24 Apr-27 May	1,285,351,276	95.77	Halifax
1965	21 Apr-28 May	823,522,540	95.91	Halifax
1966	26 Apr-31 May	1,821,385,754	94.51	Halifax
1967	21 Apr-11 Jun	1,333,312,869	96.20	Halifax
1968	24 Apr-4 Jun	1,483,102,338	86.20	Halifax
1969	27 Apr-6 Jun	3,229,715,526	89.86	Halifax
1970	30 Apr-1 Jun	1,464,841,490	89.23	Halifax
1971		2,833,119,620	80.81	Halifax
1972	2 May-28 May	4,932,000,707	90.51	Halifax
1973	29 Apr-3 Jun	1,501,498,887	87.21	Halifax
1974	1 May-2 Jun	2,163,239,468	87.31	Halifax
1975	7 May-2 Jun	2,193,008,096	55.69	Barnhill's (RM 117)
1976	1 May-30 May	1,496,768,659	50.73	Barnhill's Landing
1977	29 Apr-31 May	1,775,957,318	52.72	Barnhill's Landing
1978		1,691,227,585	37.72	Barnhill's Landing
1979	10 May-11 Jun	1,613,382,382	43.62	Barnhill's Landing
1980	1 May-1 Jun	870,322,832	43.39	Barnhill's Landing
1981	29 Apr-29 May	344,364,065	73.70	Barnhill's Landing
1982	3 May-2 Jun	1,698,888,853	71.93	Johnson's (RM 118)
1983	6 May-12 Jun	1,352,611,202	33.29	Johnson's Landing
1984	9 May-9 Jun	703,879,559	22.73	Johnson's Landing
1985	23 Apr-23 May	600,562,645	72.21	Johnson's Landing
1986		2,279,071,483	51.10	Johnson's Landing
1987		1,382,496,006	42.87	Johnson's Landing
1988	10 Apr-7 Jun	2,082,130,728	89.00	Pollock's Ferry (RM 105)
1989	16 Apr-15 Jun	637,919,162	41.80	Barnhill's Landing
1990	16 Apr-15 Jun	964,791,625	58.00	Barnhill's Landing
1991	15 Apr-14 Jun	1,837,208,211	55.36	Barnhill's Landing
	15 Apr-14 Jun	2,068,304,334	69.51	Jacob's Landing (RM 102)
1992	16 Apr-23 Jun	9,655,219,935	46.37	Barnhill's Landing
1993	16 Apr-16 Jun	23,954,007,152	49.10	Barnhill's Landing

Table 4. Daily striped bass egg viability at Barnhill's Landing, Roanoke River, NC, in 1993.

Date	Number samples	Number non-viable eggs	Number viable eggs	Percentage viable eggs
930416	2	0	0	.
930417	8	0	0	.
930418	8	0	0	.
930419	8	0	0	.
930420	8	0	0	.
930421	8	0	1	0.00
930422	8	0	0	.
930423	8	0	0	.
930424	8	0	0	.
930425	8	0	0	.
930426	6	0	0	.
930427	8	0	0	.
930428	8	0	0	.
930429	8	0	1	0.00
930430	8	0	0	.
930501	8	0	0	.
930502	8	0	1	0.00
930503	10	0	0	.
930504	12	1	0	0.00
930505	12	0	0	.
930506	10	0	0	.
930507	12	2	0	0.00
930508	12	0	5	0.00
930509	12	5	4	44.44
930510	12	3	1	25.00
930511	12	2	7	77.78
930512	12	3	22	88.00
930513	12	29,963	28,902	49.10
930514	12	2,992	151	4.80
930515	12	53	7	11.67
930516	12	205	125	37.88
930517	12	7,297	9,427	56.37
930518	12	2,767	4,216	60.38
930519	12	293	93	24.09
930520	12	671	463	40.83
930521	12	251	125	33.24
930522	12	256	271	51.42
930523	12	3,380	2,168	39.08
930524	12	1,292	1,996	60.71
930525	12	1,226	870	41.51
930526	12	978	697	41.61
930527	12	110	100	47.62
930528	12	84	125	59.81
930529	12	179	308	63.24
930530	12	92	90	49.45
930531	12	34	41	54.67
930601	12	19	15	44.12

Table 4 (continued).

DATE	Number samples	Number non-viable eggs	Number viable eggs	Percentage viable eggs
930602	12	19	19	50.00
930603	12	15	18	54.55
930604	12	18	27	60.00
930605	12	4	16	80.00
930606	12	12	31	72.09
930607	12	12	19	61.29
930608	12	7	17	70.83
930609	12	2	12	85.71
930610	12	3	5	62.50
930611	10	3	0	0.00
930612	8	0	0	.
930613	8	0	0	.
930614	8	0	0	.
930615	10	0	0	.
930616	6	0	0	.
Total examined:		52,253	50,396	

Table 5. Striped bass egg viability at Barnhill's Landing, Roanoke River, NC, 1993, relative to time of day.

Time of collection	Number non-viable eggs	Number viable eggs	Percent viable eggs	Percent of all eggs collected
0200	4,623	7,805	62.80	12.107
0600	8,452	11,369	57.36	19.309
1000	11,611	8,538	42.37	19.629
1400	18,775	19,389	50.80	37.179
1800	5,564	1,442	20.58	6.825
2200	3,228	1,853	36.47	4.950
	52,253	50,396		100.000

Table 6. Normal and observed rainfall (inches) for the Roanoke River basin downstream of Kerr Reservoir (RM 178.7), and basinwide, for April-June 1982-1993 (U.S. Army Corps of Engineers data).

	Below Kerr Dam						Basinwide					
	Normal			Observed			Normal			Observed		
Year	Apr	May	Jun	Apr	May	Jun	Apr	May	Jun	Apr	May	Jun
1963	3.37	4.02	3.91	1.55	2.83	2.59						
1964	3.26	4.02	3.91	2.20	1.30	2.45						
1965	3.26	3.77	3.78	2.04	1.98	8.30						
1966	3.16	3.62	4.16	1.49	6.38	3.55						
1967	3.03	3.84	4.11	1.88	3.24	2.39						
1968	2.95	3.79	3.99	3.21	5.20	3.05						
1969	2.95	3.79	3.99	3.05	3.24	4.12						
1970	2.95	3.79	3.99	4.09	2.36	3.12						
1971	2.95	3.79	3.99	2.57	6.36	3.41						
1972	2.95	3.79	3.99	2.32	5.03	4.52						
1973	2.95	3.79	3.99	4.62	4.53	5.95						
1974	2.95	3.79	3.99	2.56	5.68	2.65						
1975	2.95	3.79	3.99	2.23	3.23	2.27						
1976	2.95	3.79	3.99	0.85	3.73	4.39						
1977	2.95	3.79	3.99	2.66	5.44	3.69						
1978	2.90	4.08	3.87	4.94	4.85	5.60						
1979	2.98	4.11	3.94	4.30	6.09	5.87						
1980	2.98	4.11	3.94	3.15	2.85	2.84						
1981	2.98	4.11	3.94	1.41	4.96	3.10						
1982	2.98	4.11	3.94	3.04	2.56	4.83						
1983	2.98	4.11	3.97	5.99[A]	3.99	2.48						
1984	2.98	4.11	3.97	4.59	6.83	2.49						
1985	3.13	4.19	3.88	1.13	3.03	3.32						
1986	3.13	4.19	3.88	1.40	1.98	0.32[B]						
1987	3.13	4.19	3.88	5.53	2.21	3.44						
1988	3.01	4.09	3.75	4.67	3.87	3.68						
1989	3.01	4.09	3.75	6.41	5.16	8.41	3.36	3.89	3.84	4.02	5.76	7.95
1990	3.22	4.06	3.87	3.37	5.83	2.34	3.40	3.87	3.83	3.51	7.55	1.76
1991	3.22	4.06	3.87	2.62	1.46	2.86	3.40	3.87	3.83	2.94	3.08	2.68
1992	3.22	4.06	3.87	1.86	3.11	6.17	3.40	3.87	3.83	4.46	4.51	4.30
1993	3.22	4.06	3.87	4.11	2.85	4.02	3.40	3.87	3.83	4.74	3.00	2.89

[A] Maximum observed April rainfall since 1952.

[B] Record low observed June rainfall.

Table 7. Striped bass egg viability at Barnhill's Landing, Roanoke River, NC, 1993, relative to temperature.

Temperature range (C)	Number non-viable eggs	Number viable eggs	Percent viable eggs	Percent of all eggs collected
missing	0	0	.	0.000
<10	.	.	.	.
10.0-11.9	0	0	.	0.000
12.0-13.9	0	1	0.00	0.001
14.0-15.9	2	2	50.00	0.004
16.0-17.9	1,201	2,635	68.69	3.737
18.0-19.9	20,677	18,450	47.15	38.117
20.0-21.9	29,907	29,046	49.27	57.432
22.0-23.9	462	249	35.02	0.693
24.0-25.9	4	13	76.47	0.017
>=26.0	0	0	.	0.000
	52,253	50,396		100.000

Table 8. Striped bass egg viability at Barnhill's Landing, Roanoke River, NC, 1993, relative to water velocity.

Water velocities (cs/second)	Number non-viable eggs	Number viable eggs	Percent viable eggs	Percent of all eggs collected
missing	4	4	50.00	0.008
40.0-59.9	17	36	67.92	0.052
60.0-79.9	51,402	50,001	49.31	98.786
80.0-99.9	824	345	29.51	1.139
100.0-119.9	6	8	57.14	0.014
120.0-139.9	0	2	0.00	0.002
140.0-159.9	0	0	.	0.000
	52,253	50,396		100.000

Table 9. Striped bass egg viability at Barnhill's Landing, Roanoke River, NC, 1993, relative to dissolved oxygen.

Dissolved oxygen values	Number non-viable eggs	Number viable eggs	Percent viable eggs	Percent of all eggs collected
missing	0	0	.	0.000
6.0-6.9	3	2	40.00	0.005
7.0-7.9	29,229	33,822	53.64	61.424
8.0-8.9	23,019	16,569	41.85	38.566
9.0-9.9	1	0	0.00	0.001
10.0-10.9	1	0	0.00	0.001
11.0-11.9	0	3	0.00	0.003
12.0 OR MORE	0	0	.	0.000
	52,253	50,396		100.000

Table 10. Striped bass egg viability at Barnhill's Landing, Roanoke River, NC, 1993, relative to pH.

Range of pH values	Number non-viable eggs	Number viable eggs	Percent viable eggs	Percent of all eggs collected
missing	204	129	38.74	0.324
6.25-6.49	0	0	.	0.000
6.50-6.74	184	82	30.83	0.259
6.75-6.99	1,465	2,500	63.05	3.863
7.00-7.24	5,178	6,182	54.42	11.067
7.25-7.49	1,376	649	32.05	1.973
7.50-7.74	12,665	13,834	52.21	25.815
7.75-7.99	5,268	3,404	39.25	8.448
8.0 OR MORE	25,913	23,616	47.68	48.251
	52,253	50,396		100.000

Table 11. Number of young-of-year captured by beach seine (EXP) in western Albemarle Sound, NC, by station, June-July 1993, and the number of specimens examined (in parenthesis). Total effort = 54; CPUE = 20.9.

Date	Chowan bridge (CWR)	Black Walnut (BPT)	Avoca Farm (BAF)	Batch-elor Bay (BAB)	Albe-marle Beach (ALB)	Mackeys Creek (WOM)	Bay-liner Plant (OBP)	Cape Colony (CPC)	Edenton Bay (EDT)	Total
930609	0	0	21	0	0	0	0	0	2	23
	(0)	(0)	( )	(0)	(0)	(0)	(0)	(0)	( )	( )
930615	0	0	6	3	0	0	0	0	0	9
	(0)	(0)	( )	( )	(0)	(0)	(0)	(0)	(0)	( )
930623	0	0	7	2	0	13	3	0	0	25
	(0)	(0)	(6)	(2)	(0)	(13)	(3)	(0)	(0)	(24)
930630	1	0	12	5	18	132	11	1	50	230
	(1)	(0)	(12)	(5)	(18)	(132)	(11)	(1)	( )	(180)
930707	13	4	38	31	36	123	8	10	46	309
	(13)	(4)	(38)	(31)	(36)	(115)	(8)	(10)	(44)	(299)
930714	1	2	14	44	15	100	6	321	30	533
	(1)	(2)	(14)	(31)	(14)	(101)	( )	(301)	(26)	(490)
Total	15	6	98	85	69	368	28	332	128	1,129
	(15)	(6)	(70)	(69)	(68)	(361)	(22)	(312)	(70)	(993)

Table 12. Number of young-of-year striped bass captured by semi-balloon trawl in western Albemarle Sound, NC, by station, July-October 1993, and the number of specimens examined from each station-date (in parenthesis). Total number of samples = 56; CPUE = 44.54.

Date	Black Walnut Point 1	Cape Colony 2	Brick-house Point 3	Nixons Beach 4	Georges Beach 5	Batemans Beach 6	Albe-marle Beach 7	Total
930713	1	0	244	15	37	8	136	441
	(1)	(0)	(247)	(15)	(37)	(8)	(130)	(438)
930727	60	15	6	30	19	38	471	639
	(20)	( )	(6)	(7)	(1)	(3)	(46)	(83)
930811	20	18	83	5	2	43	17	188
	(20)	(18)	(56)	(5)	(2)	(21)	(17)	(139)
930823	28	4	38	102	0	11	4	187
	(20)	(4)	(23)	(39)	(0)	(11)	(4)	(101)
930907	13	27	51	60	2	23	7	183
	(13)	(20)	(26)	(20)	(2)	(23)	(7)	(111)
930923	13	14	65	278	2	27	6	405
	(13)	(14)	(20)	(21)	(2)	(21)	(6)	(97)
931005	1	49	84	148	7	11	1	301
	(1)	(20)	(20)	(21)	(7)	(11)	(1)	(81)
931019	3	16	16	24	6	19	66	150
	(3)	(16)	(16)	(20)	(6)	(19)	(20)	(100)
Total	139	143	587	662	75	180	708	2,494
	(91)	(92)	(414)	(148)	(57)	(117)	(231)	(1,150)

Table 13. Number of young-of-year striped bass collected by semi-balloon trawl in central Albemarle Sound (EST), NC by station, July-October, 1993, and the number of specimens examined (in parenthesis). Total number of samples = 84; CPUE = 12.4.

Date	Coast Guard Base	Pasquo-tank R. mouth	Big Flatty Creek	Little R. mouth	Harvey Point	Holiday Isle	Laurel Point	Bull Bay	Dewey Pier	Barge Target	Alliga-tor R.	Total
930720	5	1	7	0	8	4	174	13	124	1	5	342
	(3)	( )	( )	(0)	( )	( )	( )	(5)	(112)	(1)	(5)	(126)
930803					23	5	0	90	16	0	0	134
					(23)	(5)	(0)	(20)	(16)	(0)	(0)	(64)
930804	23	0	2	0								25
	(20)	(0)	(2)	(0)								(22)
930818	19	0	1	2	15	2	18	3	26	0	0	86
	(19)	(0)	(1)	(2)	(15)	(2)	(18)	(3)	(20)	(0)	(0)	(80)
930902	2	0	0	0	12	93	28	0	9	0	0	144
	(2)	(0)	(0)	(0)	(12)	(20)	(20)	(0)	(9)	(0)	(0)	(63)
930914					1	74						75
					(1)	(20)						(21)
930915							9	1	27	0	0	37
							(9)	(1)	(20)	(0)	(0)	(30)
930916	9	0	0	0								9
	(8)	(0)	(0)	(0)								(8)
930928	7	0	0	0	0	1	10	0	29	0	0	47
	(7)	(0)	(0)	(0)	(0)	(1)	( )	(0)	(20)	(0)	(0)	(28)
931014	23	0	0	0	0	70	47	3	1	0	0	144
	(20)	(0)	(0)	(0)	(0)	(20)	(21)	(3)	(1)	(0)	(0)	(65)
Total	88	1	10	2	59	249	286	110	232	1	5	1,043
	(79)	(0)	(3)	(2)	(51)	(68)	(68)	(32)	(198)	(1)	(5)	(507)

Table 14. Mean total length (mm), weight (g), age (days), and growth, by survey type and stations, of YOY striped bass subsampled from collections in Albemarle Sound, North Carolina, in 1993. EST=eastern/central Sound trawl survey; JAI=western Sound trawl survey; EXP=western Sound experimental beach seine survey. Station locations as in Figure 3.

		Total length (mm)				Weight (g)				Age in days				Growth (mm/day)		
Location	N	Mean	Std. Dev.	Min.	Max.	Mean	Std. Dev.	Min.	Max.	Mean	Std. Dev.	Min.	Max.	Mean	Min.	Max.
EST-BAT	1	64.4	.	64	64	3.2	.	3.2	3.2	51	.	51	51	1.34	1.34	1.34
EST-BFC	1	71.0	.	71	71	4.0	.	4.0	4.0	69	.	69	69	1.13	1.13	1.13
EST-BKH	8	112.1	23.4	84	148	16.9	11.2	5.8	36.1	109	9.9	94	121	1.11	0.83	1.34
EST-BTB	1	121.0	.	121	121	17.1	.	17.1	17.1	96	.	96	96	1.36	1.36	1.36
EST-BUB	9	69.3	25.8	37	115	4.6	4.3	0.7	13.9	67	24.9	40	105	1.12	1.00	1.37
EST-CPC	6	111.7	23.4	92	146	17.2	12.4	8.2	37.0	104	8.7	95	119	1.14	0.98	1.36
EST-DPI	102	67.8	18.1	43	111	4.7	3.6	1.0	16.0	63	16.5	39	105	1.16	0.78	1.42
EST-GOB	3	127.0	10.6	119	139	22.3	7.9	14.9	30.6	104	9.0	95	113	1.31	1.30	1.32
EST-HAP	22	79.0	11.2	61	103	6.2	3.1	2.7	13.8	69	9.4	55	84	1.24	1.08	1.39
EST-HIS	29	107.4	13.3	77	130	15.2	4.7	5.4	24.0	92	14.2	62	118	1.27	1.03	1.44
EST-LOP	39	85.2	17.6	60	135	8.1	5.9	2.2	30.1	79	16.1	58	125	1.17	1.01	1.40
EST-NAR	2	57.9	0.6	57	58	2.4	0.0	2.4	2.4	61	0.7	60	61	1.02	1.02	1.03
EST-NLR	1	107.0	.	107	107	16.2	.	16.2	16.2	84	.	84	84	1.37	1.37	1.37
EST-PTR	23	87.2	12.6	60	106	8.1	3.1	2.7	13.6	76	16.3	44	106	1.24	1.03	1.47
EXP-ALB	53	45.7	5.1	35	60	0.9	0.4	0.3	2.1	44	8.0	29	65	1.12	0.74	1.45
EXP-BAB	55	42.6	8.1	24	63	1.0	0.7	0.2	3.3	42	5.8	26	58	1.08	0.78	1.47
EXP-BAF	47	36.7	4.5	25	47	0.5	0.2	0.1	1.1	39	5.7	29	54	1.00	0.75	1.36
EXP-BPT	5	39.2	5.9	34	46	0.5	0.2	0.3	0.8	42	8.0	35	56	0.98	0.86	1.17
EXP-CPC	254	45.8	4.5	36	64	1.0	0.4	0.3	2.9	42	5.4	30	60	1.16	0.82	1.50
EXP-CWR	8	50.1	4.1	44	54	1.2	0.3	0.8	1.7	50	5.9	40	59	1.07	0.95	1.17
EXP-EDT	68	38.8	7.2	27	58	0.5	0.3	0.2	1.9	39	6.3	27	55	1.06	0.76	1.41
EXP-OBP	7	41.4	10.3	26	54	0.8	0.5	0.2	1.4	46	9.5	35	59	0.95	0.72	1.31
EXP-WOM	223	41.1	7.0	26	65	0.6	0.3	0.1	1.7	40	6.5	28	66	1.10	0.72	1.48

Table 14 (continued).

		Total length (mm)				Weight (g)				Age in days				Growth (mm/day)		
Location	N	Mean	Std. Dev.	Min.	Max.	Mean	Std. Dev.	Min.	Max.	Mean	Std. Dev.	Min.	Max.	Mean	Min.	Max.
JAI-ALB	160	42.9	17.6	25	170	1.5	4.9	0.1	58.1	46	16.5	28	130	1.01	0.75	1.49
JAI-BKH	178	45.5	11.0	30	115	1.2	1.8	0.3	18.1	50	9.2	30	95	0.95	0.72	1.44
JAI-BPT	39	56.7	13.1	38	96	2.3	1.8	0.6	9.9	62	15.2	40	95	1.00	0.80	1.23
JAI-BTB	52	74.3	24.2	32	125	5.8	5.0	0.4	20.7	71	23.3	28	122	1.14	0.90	1.49
JAI-CPC	23	82.1	8.5	69	109	6.1	2.2	3.5	13.9	81	11.6	67	112	1.10	0.83	1.35
JAI-GOB	27	44.7	10.2	33	85	1.3	1.1	0.5	6.3	46	13.5	31	93	1.06	0.84	1.31
JAI-NIB	40	80.7	26.6	37	128	8.1	7.0	0.5	24.1	75	22.1	39	115	1.16	0.77	1.43

Table 15. Backcalculated spawn dates of YOY striped bass collected in the Hassler (JAI) trawl survey, the central/eastern trawl survey (EST), and the western Sound experimental beach seine survey (EXP) in Albemarle Sound, North Carolina, in 1993 based on otolith ring counts plus three days. Relative population size is a number weighted by how long the fish has been subjected to daily mortality relative to an age of 60 days post-spawn.

Estimated spawn date	Sampling date: 23-JUN N YOY	30-JUN N YOY	07-JUL N YOY	13-JUL N YOY	14-JUL N YOY	20-JUL N YOY	27-JUL N YOY	11-AUG N YOY	18-AUG N YOY	02-SEP N YOY	07-SEP N YOY	14-SEP N YOY	15-SEP N YOY	16-SEP N YOY	23-SEP N YOY	28-SEP N YOY	05-OCT N YOY	14-OCT N YOY	19-OCT N YOY	TOTAL N YOY	Relative population size	Percent of total
14APR	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	1	1507	0.11
29APR	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1127	0.08
30APR	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1051	0.08
01MAY	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1041	0.07
03MAY	.	.	1	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	3187	0.23
04MAY	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1010	0.07
05MAY	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	2124	0.15
06MAY	.	.	5	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	8	8191	0.59
07MAY	.	.	3	3	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	7	7179	0.52
08MAY	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1030	0.07
09MAY	.	.	3	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8	7983	0.57
10MAY	2	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	4502	0.32
11MAY	.	.	2	2	.	2	1	.	.	.	.	.	.	.	.	.	.	.	.	7	7179	0.52
12MAY	.	.	3	3	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7	6767	0.49
13MAY	1	.	3	5	4	1	1	.	.	1	.	.	.	.	.	.	.	.	.	16	16244	1.17
14MAY	1	3	2	4	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	12	11082	0.80
15MAY	2	1	4	4	1	3	.	.	.	.	.	.	.	.	.	.	.	.	.	15	13941	1.00
16MAY	2	2	7	4	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	17	16472	1.18
17MAY	2	1	8	9	5	2	1	.	.	.	.	.	.	.	.	.	.	.	.	28	25800	1.86
18MAY	1	3	11	9	2	2	.	.	.	.	.	.	.	.	.	.	.	.	.	28	25154	1.81
19MAY	1	6	10	13	1	3	1	.	1	.	.	.	.	.	.	.	.	.	.	36	32601	2.34

Table 15 (continued).

Estimated spawn date	Sampling date: 23-JUN N	23-JUN YOY	30-JUN N	30-JUN YOY	07-JUL N	07-JUL YOY	13-JUL N	13-JUL YOY	14-JUL N	14-JUL YOY	20-JUL N	20-JUL YOY	27-JUL N	27-JUL YOY	11-AUG N	11-AUG YOY	18-AUG N	18-AUG YOY	02-SEP N	02-SEP YOY	07-SEP N	07-SEP YOY	14-SEP N	14-SEP YOY	15-SEP N	15-SEP YOY	16-SEP N	16-SEP YOY	23-SEP N	23-SEP YOY	28-SEP N	28-SEP YOY	05-OCT N	05-OCT YOY	14-OCT N	14-OCT YOY	19-OCT N	19-OCT YOY	TOTAL N	TOTAL YOY	Relative population size	Percent of total
20MAY	.	8	3	5	6	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	24	21807	1.57
21MAY	3	4	14	5	8	1	3	.	.	.	.	.	.	.	.	.	.	.	.	.	38	33259	2.39
22MAY	.	7	9	13	8	2	2	.	.	.	.	1	.	.	.	.	.	.	.	.	42	37648	2.71
23MAY	.	6	19	13	9	2	1	.	1	.	.	.	.	.	.	.	.	.	.	.	51	44329	3.19
24MAY	.	5	9	10	10	5	3	.	.	.	.	.	.	.	.	.	.	.	.	.	42	36687	2.64
25MAY	1	5	11	17	13	7	.	.	.	.	.	.	.	.	.	1	.	.	.	.	55	48042	3.45
26MAY	.	11	12	16	16	10	2	.	1	1	.	.	.	.	.	.	.	.	.	.	69	59600	4.29
27MAY	.	5	9	21	17	6	6	1	1	.	1	1	.	.	.	.	.	.	.	.	68	60308	4.34
28MAY	.	7	16	12	28	2	1	.	.	.	.	.	.	.	1	.	.	.	.	.	67	56396	4.06
29MAY	.	6	9	22	35	2	3	.	7	1	.	.	.	.	.	.	.	.	.	.	85	73830	5.31
30MAY	.	1	7	17	55	1	4	.	1	1	.	.	1	1	.	.	.	.	.	.	89	76583	5.51
31MAY	.	2	13	13	27	3	3	.	2	.	.	.	.	.	.	.	.	.	.	.	63	52240	3.76
01JUN	.	.	6	11	33	4	6	.	4	1	1	1	2	1	.	.	.	.	.	.	70	63152	4.54
02JUN	.	.	6	9	27	4	5	.	4	1	.	.	1	.	.	.	.	.	.	.	57	49161	3.53
03JUN	.	.	3	14	35	4	1	2	3	.	.	.	1	.	.	.	1	.	.	.	64	54666	3.93
04JUN	.	.	2	14	19	.	4	1	3	.	2	.	1	.	1	.	.	.	.	.	47	41506	2.98
05JUN	.	.	1	8	15	.	3	1	3	2	.	.	.	.	.	.	1	.	.	.	34	30238	2.17
06JUN	.	.	3	5	10	1	3	.	.	1	.	1	.	.	1	.	.	.	.	.	25	21625	1.55
07JUN	.	.	.	10	8	2	3	.	6	5	1	.	1	.	1	.	.	.	.	.	37	35348	2.54
08JUN	.	.	.	7	3	1	3	3	4	4	1	.	.	.	2	.	1	1	1	.	31	33505	2.41
09JUN	.	.	.	1	3	.	3	5	1	1	1	1	.	.	1	.	1	.	.	.	18	18902	1.36
10JUN	.	.	.	3	.	.	2	3	7	2	.	1	3	.	.	.	1	.	.	.	22	24119	1.73
11JUN	.	.	.	2	1	.	1	1	3	1	1	1	.	.	1	.	1	.	.	.	13	14274	1.03
12JUN	.	.	.	4	.	.	1	2	1	2	2	.	1	.	.	.	.	.	.	.	13	13060	0.94
13JUN	.	.	.	.	.	.	.	1	.	.	1	.	.	.	1	.	1	.	.	.	4	5362	0.39
14JUN	.	.	.	.	.	.	.	1	4	3	2	1	1	.	2	2	.	.	.	.	16	19765	1.42

Table 15 (continued).

Estimated spawn date	Sampling date																				Relative population size	Percent of total
	23-JUN		30-JUN		07-JUL		13-JUL		14-JUL		20-JUL		27-JUL		11-AUG		18-AUG		02-SEP													
	N	YOY	N	YOY	N	YOY	N	YOY	N	YOY	N	YOY	N	YOY	N	YOY	N	YOY	N	YOY											
15JUN	.	.	.	.	.	.	1	2	5	2	.	1	.	.	1	.	1	1	.	14	16281	1.17
16JUN	.	.	.	.	.	.	.	2	7	1	.	1	.	.	.	.	1	.	1	13	14812	1.07
17JUN	.	.	.	.	.	.	.	1	.	2	1	.	.	.	2	.	.	.	.	6	7271	0.52
18JUN	.	.	.	.	.	.	.	1	1	.	1	.	1	.	2	.	1	.	.	7	8782	0.63
19JUN	.	.	.	.	.	.	.	1	2	1	5	.	.	.	2	.	2	.	.	13	15818	1.14
20JUN	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	.	.	.	2	2648	0.19
21JUN	.	.	.	.	.	.	.	.	1	.	4	.	1	.	2	.	.	.	.	8	9584	0.69
22JUN	.	.	.	.	.	.	.	.	1	2	5	.	.	.	1	1	1	.	.	11	13172	0.95
23JUN	.	.	.	.	.	.	.	.	.	.	2	.	.	.	1	.	.	1	.	4	5263	0.38
24JUN	.	.	.	.	.	.	.	.	.	.	4	.	.	.	5	.	1	1	1	12	15966	1.15
25JUN	.	.	.	.	.	.	.	.	.	.	1	.	.	.	1	.	.	1	1	4	5741	0.41
26JUN	.	.	.	.	.	.	.	.	.	1	5	.	.	.	1	.	1	.	2	10	12700	0.91
27JUN	.	.	.	.	.	.	.	.	.	.	2	.	.	.	1	.	.	1	.	4	5056	0.36
28JUN	.	.	.	.	.	.	.	.	.	.	5	.	.	.	2	.	2	1	.	10	12394	0.89
29JUN	.	.	.	.	.	.	.	.	.	2	3	.	.	.	1	.	3	1	1	11	13959	1.00
30JUN	.	.	.	.	.	.	.	.	.	.	1	.	.	.	3	1	1	1	1	8	10668	0.77
Total	16	84	218	321	402	74	69	28	74	40	52	11	15	2	38	4	21	9	8	1486	1390700	100.00

Table 16. Mean Roanoke River temperature (C), instream flow (cfs), daily striped bass egg production and associated viability, adjusted egg production, and spawn dates of the YOY striped bass collected in Albemarle Sound, in 1993. Number of YOY striped bass adjusted to 60-day standard with z=0.01. Actual numbers collected are in Table 15. Positive relative survivorship = greater number of YOY recruiting than expected based on adjusted egg production.

1993 Date	Mean water temp. (C)	Mean river discharge (cfs)	Mean river stage (ft)	Unadjusted daily egg production	Mean daily viability	Percent of total spawned	Adjusted daily egg production	Percent of adjusted total	Cumulative percent total	Relative number of YOY	Percent of total YOY	Relative survivorship
930414	.	.	.	.	.	.	.	.	.	1507	0.11	0.1
930416	13.5	35,792	30.0	0	.	0.0	0	0.0	0.0	0	0.00	0.0
930417	12.6	35,219	30.0	0	.	0.0	0	0.0	0.0	0	0.00	0.0
930418	12.7	35,189	30.0	0	.	0.0	0	0.0	0.0	0	0.00	0.0
930419	12.9	35,179	29.9	0	.	0.0	0	0.0	0.0	0	0.00	0.0
930420	13.3	35,189	29.9	0	.	0.0	0	0.0	0.0	0	0.00	0.0
930421	13.4	35,119	29.9	821,623	100.0	0.0	821,623	0.0	0.0	0	0.00	0.0
930422	12.2	35,199	29.9	0	.	0.0	0	0.0	0.0	0	0.00	0.0
930423	11.8	34,831	29.9	0	.	0.0	0	0.0	0.0	0	0.00	0.0
930424	12.9	26,449	29.2	0	.	0.0	0	0.0	0.0	0	0.00	0.0
930425	13.8	25,050	27.8	0	.	0.0	0	0.0	0.0	0	0.00	0.0
930426	14.1	24,848	27.1	0	.	0.0	0	0.0	0.0	0	0.00	0.0
930427	12.9	24,952	26.7	0	.	0.0	0	0.0	0.0	0	0.00	0.0
930428	13.2	25,032	26.4	0	.	0.0	0	0.0	0.0	0	0.00	0.0
930429	14.1	25,266	26.3	715,397	100.0	0.0	715,397	0.0	0.0	1127	0.08	0.1
930430	13.9	21,668	25.8	0	.	0.0	0	0.0	0.0	1051	0.08	0.1
930501	14.5	20,036	24.6	0	.	0.0	0	0.0	0.0	1041	0.07	0.1
930502	14.7	20,035	24.0	647,038	100.0	0.0	647,038	0.0	0.0	0	0.00	0.0
930503	15.0	20,067	23.7	0	.	0.0	0	0.0	0.0	3187	0.23	0.2
930504	15.3	20,108	23.5	422,179	0.0	0.0	0	0.0	0.0	1010	0.07	0.1
930505	15.4	20,164	23.4	0	.	0.0	0	0.0	0.0	2124	0.15	0.1
930506	16.0	20,147	23.4	0	.	0.0	0	0.0	0.0	8191	0.59	0.6
930507	17.2	20,075	23.3	835,833	0.0	0.0	0	0.0	0.0	7179	0.52	0.5
930508	17.7	20,212	23.3	2,089,582	100.0	0.0	2,089,582	0.0	0.0	1030	0.07	0.1
930509	17.6	20,091	23.3	3,761,247	31.3	0.0	1,175,390	0.0	0.0	7983	0.57	0.6

Table 16 (continued).

1993 Date	Mean water temp. (C)	Mean river discharge (cfs)	Mean river stage (ft)	Unadjusted daily egg production	Mean daily viability	Percent of total spawned	Adjusted daily egg production	Percent of adjusted total	Cumulative percent total	Relative number of YOY	Percent of total YOY	Relative survivorship
930510	17.9	18,707	22.9	1,644,125	25.0	0.0	411,031	0.0	0.0	4502	0.32	0.3
930511	18.5	14,223	22.3	3,587,744	70.0	0.0	2,511,421	0.0	0.1	7179	0.52	0.5
930512	19.8	9,201	15.1	6,608,798	73.6	0.0	4,864,810	0.0	0.1	6767	0.49	0.5
930513	19.8	9,326	14.2	14,641,319,135	53.8	61.1	7,881,670,352	66.3	66.4	16244	1.17	-65.1
930514	18.8	9,233	13.1	724,413,657	5.2	3.0	37,955,292	0.3	66.7	11082	0.80	0.5
930515	19.3	9,244	12.9	13,687,785	12.4	0.1	1,701,468	0.0	66.8	13941	1.00	1.0
930516	20.8	9,250	12.5	73,009,337	31.7	0.3	23,166,433	0.2	66.9	16472	1.18	1.0
930517	20.9	8,972	11.9	3,550,283,925	46.2	14.8	1,639,852,752	13.8	80.7	25800	1.86	-11.9
930518	20.5	9,282	12.0	1,489,511,252	47.6	6.2	708,746,069	6.0	86.7	25154	1.81	-4.2
930519	20.5	9,320	12.0	82,638,877	24.1	0.3	19,912,957	0.2	86.9	32601	2.34	-2.1
930520	19.2	9,320	12.1	244,272,116	34.3	1.0	83,733,336	0.7	87.6	21807	1.57	0.9
930521	19.0	9,293	12.1	80,597,077	32.8	0.3	26,443,715	0.2	87.8	33259	2.39	2.2
930522	18.5	8,042	11.7	110,103,263	55.0	0.5	60,509,994	0.5	88.3	37648	2.71	2.2
930523	19.4	9,277	11.3	1,127,874,207	34.6	4.7	390,229,240	3.3	91.6	44329	3.19	-0.1
930524	20.1	9,298	11.8	693,717,415	59.8	2.9	414,706,504	3.5	95.1	36687	2.64	-0.9
930525	21.1	9,293	11.9	444,385,646	48.1	1.9	213,743,632	1.8	96.9	48042	3.45	1.6
930526	20.1	9,304	11.9	355,126,888	55.8	1.5	198,038,303	1.7	98.5	59600	4.29	2.6
930527	20.0	9,132	11.9	44,415,070	49.0	0.2	21,769,338	0.2	98.7	60308	4.34	4.1
930528	20.8	9,035	11.7	43,719,134	55.4	0.2	24,198,714	0.2	98.9	56396	4.06	3.9
930529	21.9	8,960	11.5	100,240,045	61.9	0.4	62,095,106	0.5	99.5	73830	5.31	4.8
930530	21.5	8,955	11.4	37,132,859	53.9	0.2	20,009,257	0.2	99.6	76583	5.51	5.3
930531	20.6	8,992	11.5	15,437,379	51.2	0.1	7,898,012	0.1	99.7	52240	3.76	3.7
930601	21.0	9,008	11.5	6,998,278	56.3	0.0	3,936,532	0.0	99.7	63152	4.54	4.5
930602	20.3	8,992	11.5	7,841,202	57.8	0.0	4,530,473	0.0	99.8	49161	3.53	3.5
930603	20.7	8,939	11.5	6,792,447	65.4	0.0	4,440,819	0.0	99.8	54666	3.93	3.9
930604	20.7	9,004	11.4	9,204,409	48.7	0.0	4,483,497	0.0	99.8	41506	2.98	3.0
930605	21.7	8,891	11.8	4,219,721	72.9	0.0	3,076,880	0.0	99.9	30238	2.17	2.2
930606	21.6	8,876	12.0	9,149,954	59.5	0.0	5,444,586	0.0	99.9	21625	1.55	1.6
930607	21.7	8,870	11.8	6,500,621	63.6	0.0	4,135,117	0.0	99.9	35348	2.54	2.5

Table 16 (continued).

1993 Date	Mean water temp. (C)	Mean river discharge (cfs)	Mean river stage (ft)	Unadjusted daily egg production	Mean daily viability	Percent of total spawned	Adjusted daily egg production	Percent of adjusted total	Cumulative percent total	Relative number of YOY	Percent of total YOY	Relative survivorship
930608	23.2	8,876	11.7	4,995,659	68.1	0.0	3,399,823	0.0	100.0	33505	2.41	2.4
930609	24.0	8,854	11.6	2,899,694	89.6	0.0	2,597,643	0.0	100.0	18902	1.36	1.4
930610	24.7	8,849	11.5	1,646,654	66.7	0.0	1,097,769	0.0	100.0	24119	1.73	1.7
930611	24.2	8,844	11.5	739,880	0.0	0.0	0	0.0	100.0	14274	1.03	1.0
930612	24.0	8,828	11.4	0	.	0.0	0	0.0	100.0	13060	0.94	0.9
930613	22.8	8,886	11.5	0	.	0.0	0	0.0	100.0	5362	0.39	0.4
930614	23.7	8,881	11.4	0	.	0.0	0	0.0	100.0	19765	1.42	1.4
930615	23.1	8,891	11.4	0	.	0.0	0	0.0	100.0	16281	1.17	1.2
930616	23.6	8,719	11.4	0	.	0.0	0	0.0	100.0	14812	1.07	1.2
930617										7271	0.52	0.5
930618										8782	0.63	0.6
930619										15818	1.14	1.1
930620										2648	0.19	0.2
930621										9584	0.69	0.7
930622										13172	0.95	1.0
930623										5263	0.38	0.4
930624										15966	1.15	1.2
930625										5741	0.41	0.4
930626										12700	0.91	0.9
930627										5056	0.36	0.4
930628										12394	0.89	0.9
930629										13959	1.00	1.0
930630										10668	0.77	0.8
Totals				23,954,007,152 spawned eggs			11,886,759,905 viable eggs			1390699 adjusted YOY		

APPENDIX A

Table A-1. List of Counties Enumerated in Figure 1.

Virginia	North Carolina
1. Roanoke	13. Stokes
2. Franklin	14. Rockingham
3. Patrick	15. Caswell
4. Henry	16. Person
5. Bedford	17. Granville
6. Pittsylvania	18. Vance
7. Campbell	19. Warren
8. Halifax	20. Halifax
9. Charlotte	21. Northampton
10. Lunenburg	22. Bertie
11. Mecklenburg	23. Martin
12. Brunswick	24. Washington

Table A-2. Location of the historical sampling locations used by W.W. Hassler and co-workers (1959-1987) and Rulifson (1988-present).

Location	River mile	Latitude	Longitude
Halifax	120	77°35'5"E	36°20'6"N
Johnson's Landing	118.5	77°18'23"E	36°33'20"N
Barnhill's Landing	117	77°18'23"E	36°32'15"N
Pollock' Ferry	105	77°24'30"E	36°15'30"N
Palmyra	78.5	77°19'30"E	36°4'32"N

Table A-3. Hourly sample grid for the 1993 striped bass egg study at Barnhill's Landing, Roanoke River, North Carolina.

Day	Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
1	930416	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	.	.	.	.	.	.	4
2	930417	.	.	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	.	.	.	16
3	930418	.	.	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	.	.	.	16
4	930419	.	.	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	.	.	.	16
5	930420	.	.	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	.	.	.	16
6	930421	.	.	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	.	.	.	16
7	930422	.	.	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	.	.	.	16
8	930423	.	.	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	.	.	.	16
9	930424	.	.	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	.	.	.	16
10	930425	.	.	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	.	.	.	16
11	930426	.	.	.	.	.	.	.	.	.	2	.	.	.	2	.	.	.	4	.	.	.	.	.	.	8
12	930427	.	.	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	.	.	.	16
13	930428	.	.	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	.	.	.	16
14	930429	.	.	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	.	.	.	16
15	930430	.	.	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	.	.	.	16
16	930501	.	.	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	.	.	.	16
17	930502	.	.	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	.	.	.	16
18	930503	.	.	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	20
19	930504	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
20	930505	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
21	930506	.	.	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	20
22	930507	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
23	930508	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
24	930509	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
25	930510	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
26	930511	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
27	930512	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
28	930513	.	4	.	.	.	4	.	.	.	3	.	.	.	2	.	.	.	2	.	.	.	2	.	.	17

Table A-3 Continued.

Day	Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
29	930514	.	2	.	.	.	2	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	20
30	930515	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
31	930516	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
32	930517	.	4	.	.	.	2	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	22
33	930518	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
34	930519	.	3	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	23
35	930520	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
36	930521	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
37	930522	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
38	930523	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
39	930524	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
40	930525	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
41	930526	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
42	930527	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
43	930528	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
44	930529	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
45	930530	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
46	930531	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
47	930601	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
48	930602	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
49	930603	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
50	930604	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
51	930605	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
52	930606	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
53	930607	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
54	930608	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
55	930609	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
56	930610	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	24
57	930611	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	.	.	.	20

Table A-3 Continued.

Day	Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
58	930612	.	.	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	.	.	.	16
59	930613	.	.	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	.	.	.	16
60	930614	.	.	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	.	.	.	16
61	930615	.	.	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	.	4	.	.	20
62	930616	.	4	.	.	.	4	.	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	12

Table A-4. Water quality data collected at Barnhill's Landing, Roanoke River, North Carolina, from 16 April to 16 June, 1993.

Page	Date	Time	Atemp	Wtemp	pH	DO	TDS	Secchi	Wvel	Rstage	Xsect	Srevs	Orevs
1	930416	6	.	.	.	.	.	.	.	.	.	.	.
2	930416	10	.	.	.	.	.	.	.	.	.	.	.
3	930416	14	.	.	.	.	.	.	.	.	.	.	.
4	930416	18	21.4	13.5	.	10.2	.	50.0	.	30.0	12827	5511	6988
5	930416	22	.	.	.	.	.	.	.	.	.	.	.
6	930417	2	.	.	.	.	.	.	.	.	.	.	.
7	930417	6	8.3	12.3	.	12.2	4.0	45.0	.	30.0	12827	7072	7207
8	930417	10	15.0	13.0	.	11.5	3.0	40.0	.	30.0	12827	8750	8409
9	930417	14	15.9	12.9	.	11.9	4.0	45.0	.	30.0	12827	8329	3835
10	930417	18	14.9	12.2	.	11.2	4.0	40.0	.	30.0	12827	9903	7063
11	930417	22	.	.	.	.	.	.	.	.	.	.	.
12	930418	2	.	.	.	.	.	.	.	.	.	.	.
13	930418	6	3.3	11.8	8.0	11.9	4.0	40.0	.	30.0	12827	7173	8438
14	930418	10	14.5	12.5	7.1	11.1	3.0	45.0	.	30.0	12827	4834	9174
15	930418	14	18.5	13.5	.	12.2	3.0	45.0	.	30.0	12827	8200	8579
16	930418	18	16.9	13.0	7.1	12.2	4.0	45.0	.	29.9	12781	8484	8491
17	930418	22	.	.	.	.	.	.	.	.	.	.	.
18	930419	2	.	.	.	.	.	.	.	.	.	.	.
19	930419	6	5.8	12.2	7.1	10.7	5.0	40.0	.	29.9	12781	8155	93
20	930419	10	17.5	12.8	.	12.2	4.0	40.0	.	29.9	12781	8397	9057
21	930419	14	23.5	13.2	.	12.1	3.0	45.0	.	29.9	12781	8238	9836
22	930419	18	19.4	13.5	7.3	11.9	7.6	45.0	125.0	29.9	12781	8441	8562
23	930419	22	.	.	.	.	.	.	.	.	.	.	.
24	930420	2	.	.	.	.	.	.	.	.	.	.	.
25	930420	6	10.1	12.5	7.7	12.6	4.0	45.0	108.7	29.9	12781	8464	8923
26	930420	10	19.2	13.0	7.7	11.6	2.0	45.0	111.7	29.9	12781	7629	8280
27	930420	14	25.4	14.0	7.8	11.9	3.0	45.0	134.2	29.9	12781	9605	4582
28	930420	18	25.2	13.5	7.6	12.2	3.0	45.0	146.3	29.9	12781	9235	8451
29	930420	22	.	.	.	.	.	.	.	.	.	.	.
30	930421	2	.	.	.	.	.	.	.	.	.	.	.
31	930421	6	13.8	12.0	7.5	11.9	3.0	45.0	117.4	29.9	12781	8766	8539
32	930421	10	20.5	13.9	7.8	11.8	3.0	45.0	111.9	29.9	12781	8670	8453
33	930421	14	18.5	13.9	7.8	12.8	3.0	45.0	117.0	29.9	12781	8361	8486

Table A-4. Continued.

Page	Date	Time	Atemp	Wtemp	pH	DO	TDS	Secchi	Wvel	Rstage	Xsect	Srevs	Orevs
34	930421	18	16.6	13.8	7.8	11.6	3.0	45.0	121.7	29.9	12781	8975	9186
35	930421	22	.	.	.	.	.	.	.	.	.	.	.
36	930422	2	.	.	.	.	.	.	.	.	.	.	.
37	930422	6	8.8	12.5	7.9	11.5	3.0	40.0	143.5	29.9	12781	9249	9343
38	930422	10	6.8	12.0	8.2	11.4	2.0	40.0	136.4	29.9	12781	10088	7776
39	930422	14	17.0	12.5	8.4	11.6	2.0	45.0	117.7	29.9	12781	8773	9493
40	930422	18	9.5	11.9	8.9	11.6	2.0	45.0	116.5	29.9	12781	9178	9046
41	930422	22	9.8	11.9	8.8	11.6	2.0	.	.	29.9	12781	.	.
42	930423	2	8.5	9.8	8.8	11.9	2.0	.	.	29.9	12781	.	.
43	930423	6	5.0	11.5	7.9	11.2	4.0	40.0	112.2	29.9	12781	9003	8715
44	930423	10	13.8	12.9	8.0	12.1	4.0	40.0	119.3	29.9	12781	9224	9233
45	930423	14	17.5	12.5	7.6	12.2	4.0	40.0	125.5	29.9	12781	9257	8150
46	930423	18	15.5	12.2	7.9	12.5	3.0	40.0	133.6	29.9	12781	10101	9512
47	930423	22	10.2	11.9	7.5	12.4	4.0	.	.	29.9	12781	.	.
48	930424	2	6.9	11.2	7.5	11.6	5.0	.	.	29.9	12781	.	.
49	930424	6	5.4	11.5	7.6	11.6	4.0	45.0	138.3	29.7	12689	8497	8914
50	930424	10	20.1	13.5	7.9	11.9	4.0	40.0	105.6	29.3	12505	7917	7871
51	930424	14	24.9	13.9	7.7	10.8	4.0	40.0	126.9	29.2	12459	8466	8429
52	930424	18	23.8	13.5	7.8	11.4	4.0	45.0	117.9	28.7	12230	8063	7257
53	930424	22	17.2	13.5	7.7	12.2	4.0	.	.	28.5	12138	.	.
54	930425	2	16.2	13.5	7.6	10.3	4.0	.	.	28.5	12138	.	.
55	930425	6	13.1	12.9	7.8	11.7	4.0	40.0	129.6	28.0	11909	8501	8088
56	930425	10	22.5	13.9	8.2	12.1	3.0	40.0	113.4	27.8	11817	7566	4838
57	930425	14	24.9	14.0	7.8	12.2	3.0	40.0	130.4	27.7	11771	7017	6169
58	930425	18	23.5	14.0	7.6	12.4	4.0	45.0	109.5	27.5	11679	7817	7244
59	930425	22	20.0	14.2	8.2	11.2	4.0	.	.	27.5	11679	.	.
60	930426	2	7.4	14.1	8.4	11.2	3.0	.	.	27.5	11679	.	.
61	930426	6	14.8	13.5	7.8	11.4	3.0	.	115.6	27.2	11541	.	.
62	930426	10	20.0	15.0	8.2	11.4	3.0	45.0	.	27.1	11496	8693	.
63	930426	14	18.0	14.5	8.3	12.0	2.0	45.0	127.1	27.1	11496	7430	.
64	930426	18	18.7	14.5	.	11.1	2.0	45.0	125.3	26.9	11404	11125	7640
65	930426	22	13.4	13.0	.	10.7	3.0	.	.	26.9	11404	.	.
66	930427	2	12.1	12.9	.	11.8	2.0	.	.	26.9	11404	.	.
67	930427	6	9.8	12.5	.	11.6	4.0	45.0	116.3	26.7	11312	8147	8144
68	930427	10	12.5	12.1	.	11.3	4.0	50.0	107.5	26.7	11312	7257	7706

Table A-4. Continued.

Page	Date	Time	Atemp	Wtemp	pH	DO	TDS	Secchi	Wvel	Rstage	Xsect	Srevs	Orevs
69	930427	14	18.7	14.0	.	11.7	4.0	45.0	116.7	26.6	11266	10305	7105
70	930427	18	16.4	13.8	.	11.6	4.0	50.0	119.3	26.6	11266	8312	8498
71	930427	22	9.1	12.0	.	12.4	5.0	.	.	26.6	11266	.	.
72	930428	2	6.3	12.2	.	12.4	3.0	.	.	26.5	11220	.	.
73	930428	6	4.5	12.5	.	11.6	3.0	45.0	123.0	26.5	11220	8139	8169
74	930428	10	10.2	13.0	.	10.6	3.0	45.0	117.9	26.5	11220	7557	6970
75	930428	14	19.0	14.1	7.5	12.6	3.0	50.0	106.8	26.4	11174	8224	7308
76	930428	18	16.2	14.5	7.8	11.3	4.0	50.0	116.3	26.4	11174	7667	7183
77	930428	22	13.3	13.1	7.9	12.2	4.0	.	.	26.4	11174	.	.
78	930429	2	12.2	13.4	7.9	11.1	.	.	.	26.4	11174	.	.
79	930429	6	3.5	11.0	7.9	11.8	4.0	40.0	118.3	26.4	11174	7633	3550
80	930429	10	13.5	15.0	7.4	11.8	4.0	50.0	120.5	26.3	11128	7972	7441
81	930429	14	19.0	16.0	7.2	11.4	2.0	50.0	116.1	26.2	11082	8367	7985
82	930429	18	22.0	15.0	7.4	12.2	3.0	50.0	119.3	26.2	11082	8007	7965
83	930429	22	16.0	14.0	8.0	10.8	4.0	.	.	26.3	11128	.	.
84	930430	2	9.9	13.5	7.9	10.9	4.0	.	.	26.3	11128	.	.
85	930430	6	6.0	12.0	7.0	11.4	4.0	45.0	114.3	26.3	11128	8198	7756
86	930430	10	15.2	14.2	7.1	11.3	3.0	45.0	115.4	26.2	11082	8616	7727
87	930430	14	22.9	14.8	7.0	11.6	3.0	50.0	109.3	25.7	10853	7613	8577
88	930430	18	21.2	14.5	6.9	11.7	3.0	55.0	125.8	25.4	10715	6704	7811
89	930430	22	16.2	14.3	7.4	11.3	4.0	.	.	25.0	10532	.	.
90	930501	2	12.5	14.0	7.6	10.8	4.0	.	.	25.0	10532	.	.
91	930501	6	9.8	13.8	6.4	10.7	4.0	50.0	111.3	24.8	10440	8181	7451
92	930501	10	14.0	14.5	6.9	11.8	3.0	50.0	107.7	24.8	10440	7153	6360
93	930501	14	22.9	14.9	7.0	11.8	3.0	50.0	110.7	24.5	10302	6904	6340
94	930501	18	21.2	14.8	7.1	11.0	3.0	45.0	107.1	24.3	10210	7176	6709
95	930501	22	15.9	14.9	7.6	11.5	4.0	.	.	24.3	10210	.	.
96	930502	2	14.0	14.2	7.4	10.2	3.0	.	.	24.3	10210	.	.
97	930502	6	14.0	13.2	7.2	11.0	3.0	40.0	.	24.0	10073	6384	6456
98	930502	10	19.9	15.0	7.3	11.6	2.0	50.0	.	24.0	10073	7537	6829
99	930502	14	27.2	15.5	7.3	11.2	3.0	50.0	107.9	23.9	10027	6564	6836
100	930502	18	23.5	15.2	7.5	11.4	3.0	50.0	113.0	23.9	10027	7705	6094
101	930502	22	17.3	15.0	7.7	11.5	4.0	.	.	23.8	9980.8	.	.
102	930503	2	14.0	14.5	7.6	11.0	4.0	.	.	23.8	9980.8	.	.
103	930503	6	11.2	14.5	7.4	10.7	3.0	50.0	103.3	23.7	9934.9	7758	6530

Table A-4. Continued.

Page	Date	Time	Atemp	Wtemp	pH	DO	TDS	Secchi	Wvel	Rstage	Xsect	Srevs	Orevs
104	930503	10	14.0	14.8	7.0	11.1	4.0	50.0	111.5	23.7	9934.9	7335	7599
105	930503	14	21.2	15.2	7.5	10.9	3.0	55.0	105.1	23.6	9889.0	7352	7072
106	930503	18	19.5	15.5	7.4	11.1	1.0	50.0	106.4	23.6	9889.0	6942	7041
107	930503	22	16.8	15.2	7.6	9.9	1.0	.	.	23.6	9889.0	6545	3421
108	930504	2	14.5	15.0	7.7	10.1	1.0	.	.	23.6	9889.0	6095	6232
109	930504	6	14.9	14.8	7.4	10.9	1.0	50.0	106.6	23.5	9843.1	6243	6677
110	930504	10	16.2	14.9	7.2	10.2	1.0	45.0	105.1	23.5	9843.1	6362	6998
111	930504	14	17.5	15.5	7.5	11.2	1.0	55.0	93.8	23.5	9843.1	5042	7731
112	930504	18	19.5	15.5	7.8	10.8	1.0	50.0	101.5	23.5	9843.1	5716	7388
113	930504	22	16.5	15.8	7.8	11.2	1.0	.	.	23.5	9843.1	6636	7036
114	930505	2	17.5	15.3	7.9	11.0	1.0	.	.	23.5	9843.1	6595	6397
115	930505	6	15.5	15.0	7.4	10.6	1.0	45.0	101.5	23.5	9843.1	6857	6907
116	930505	10	16.0	15.0	7.3	11.4	0.0	50.0	98.9	23.3	9751.3	6297	7061
117	930505	14	17.5	15.8	7.1	10.4	0.0	50.0	100.8	23.3	9751.3	7588	7245
118	930505	18	19.2	15.5	7.1	10.9	0.0	50.0	102.7	23.3	9751.3	7097	7331
119	930505	22	16.9	15.5	6.9	10.1	0.0	.	.	23.5	9843.1	7035	7155
120	930506	2	16.0	15.2	6.7	10.4	0.0	.	.	23.5	9843.1	.	.
121	930506	6	15.3	14.9	7.2	10.5	0.0	50.0	101.5	23.5	9843.1	6547	6524
122	930506	10	.	.	7.2	.	0.0	45.0	104.9	23.4	9797.2	6613	6326
123	930506	14	25.7	17.2	7.6	10.9	1.0	50.0	104.4	23.4	9797.2	7241	7380
124	930506	18	22.0	16.5	6.9	10.6	3.0	45.0	110.3	23.4	9797.2	7092	6662
125	930506	22	17.5	16.2	7.0	11.4	1.0	.	.	23.4	9797.2	7162	6547
126	930507	2	15.2	16.0	7.6	10.6	0.0	.	104.0	23.4	9797.2	5337	6475
127	930507	6	14.2	15.9	7.9	10.3	0.0	55.0	103.5	23.4	9797.2	6235	7555
128	930507	10	19.2	17.6	.	10.8	1.0	55.0	97.6	23.4	9797.2	6910	7203
129	930507	14	28.0	18.2	8.2	8.3	3.0	50.0	104.5	23.3	9751.3	6015	6526
130	930507	18	25.0	18.2	8.6	8.9	4.0	55.0	99.0	23.0	9613.6	6715	4057
131	930507	22	18.0	17.5	7.3	8.5	3.0	.	101.5	23.3	9751.3	7621	7079
132	930508	2	16.8	17.0	.	8.2	1.0	.	102.6	23.3	9751.3	5892	6021
133	930508	6	13.5	15.5	.	9.6	1.0	45.0	.	23.3	9751.3	6878	6951
134	930508	10	19.5	18.5	.	8.8	0.0	50.0	89.3	23.3	9751.3	6954	7494
135	930508	14	24.5	19.5	.	8.1	1.0	50.0	97.1	23.3	9751.3	6671	6700
136	930508	18	22.8	18.5	.	8.5	1.0	55.0	99.5	23.3	9751.3	6969	6545
137	930508	22	19.2	17.3	.	8.1	2.0	.	97.9	23.3	9751.3	7294	6435
138	930509	2	17.5	16.9	.	8.3	2.0	.	99.2	23.3	9751.3	7051	6669

Table A-4. Continued.

Page	Date	Time	Atemp	Wtemp	pH	DO	TDS	Secchi	Wvel	Rstage	Xsect	Srevs	Orevs
139	930509	6	15.5	15.1	.	8.5	2.0	50.0	.	23.3	9751.3	6729	6904
140	930509	10	24.5	18.0	.	8.5	2.0	50.0	.	23.3	9751.3	7421	7509
141	930509	14	25.0	19.0	.	7.6	2.0	60.0	.	23.3	9751.3	7170	7430
142	930509	18	24.0	18.5	.	9.0	2.0	60.0	101.7	23.3	9751.3	7111	7407
143	930509	22	22.0	18.0	.	11.3	2.0	.	.	23.3	9751.3	7954	8398
144	930510	2	19.0	17.0	.	8.1	3.0	.	101.5	23.3	9751.3	7353	7235
145	930510	6	16.0	16.2	.	8.8	3.0	50.0	99.0	23.3	9751.3	7012	7471
146	930510	10	19.0	17.9	.	8.3	3.0	50.0	95.2	23.0	9613.6	7361	6450
147	930510	14	23.9	19.7	.	8.1	2.0	50.0	98.5	22.8	9521.8	6320	6078
148	930510	18	24.9	18.5	.	8.1	2.0	50.0	96.6	22.7	9475.9	6115	6437
149	930510	22	21.2	18.0	.	7.8	2.0	.	105.8	22.6	9430.0	6751	7360
150	930511	2	18.2	16.9	7.5	8.1	3.0	.	100.5	22.5	9384.1	6262	6702
151	930511	6	15.0	16.5	7.6	8.1	3.0	50.0	101.5	22.5	9384.1	6849	7037
152	930511	10	19.9	19.5	7.7	8.6	2.0	55.0	107.0	22.4	9338.2	6855	6646
153	930511	14	27.0	20.0	6.9	8.2	2.0	60.0	90.5	22.1	9200.5	6603	6724
154	930511	18	27.4	19.5	7.0	8.9	2.0	55.0	81.3	22.1	9200.5	5360	8598
155	930511	22	22.9	18.8	7.7	8.4	2.0	.	85.8	.	.	5432	4068
156	930512	2	21.5	18.5	7.3	8.3	3.0	.	69.9	.	.	4218	3942
157	930512	6	19.9	18.7	7.7	8.0	3.0	60.0	68.8	14.8	6042.2	4516	4090
158	930512	10	22.1	20.5	7.5	8.2	2.0	60.0	65.6	14.5	5925.7	3749	1767
159	930512	14	24.0	20.1	7.6	8.4	2.0	55.0	59.9	15.9	6475.2	3248	3525
160	930512	18	26.2	20.5	8.0	8.3	3.0	55.0	79.1	15.4	6277.8	3809	2107
161	930512	22	24.5	20.5	7.3	7.7	3.0	.	67.8	15.0	6119.9	3018	3970
162	930513	2	21.0	19.5	7.8	8.0	3.0	.	75.5	14.8	6042.2	4397	2840
163	930513	6	21.0	19.5	7.2	8.0	3.0	65.0	75.8	14.5	5925.7	3992	3103
164	930513	10	23.1	21.1	7.6	7.5	3.0	60.0	74.3	14.3	5848.0	3873	2959
165	930513	14	24.9	20.0	8.0	7.5	3.0	65.0	69.7	14.1	5770.3	4282	3489
166	930513	18	23.5	19.8	8.0	8.8	3.0	60.0	78.4	13.8	5655.6	4796	.
167	930513	22	.	19.0	7.8	8.1	3.0	.	72.5	13.6	5579.7	4416	.
168	930514	2	20.5	19.1	7.6	8.1	3.0	.	74.1	13.5	5541.7	4852	.
169	930514	6	19.3	18.9	7.4	8.1	3.0	60.0	79.3	13.3	5465.8	4721	.
170	930514	10	17.5	18.1	7.5	7.7	3.0	60.0	68.9	13.0	5351.9	4455	3705
171	930514	14	19.2	19.8	7.2	7.8	3.0	60.0	96.6	13.0	5351.9	4611	2202
172	930514	18	18.5	19.1	7.0	8.1	3.0	60.0	72.7	12.9	5315.0	4520	3280
173	930514	22	17.5	18.0	7.5	7.7	3.0	.	76.1	12.7	5241.3	4825	3369

Table A-4. Continued.

Page	Date	Time	Atemp	Wtemp	pH	DO	TDS	Secchi	Wvel	Rstage	Xsect	Srevs	Orevs
174	930515	2	16.2	18.5	7.2	8.0	3.0	.	73.5	12.7	5241.3	4824	4111
175	930515	6	16.2	17.5	.	7.9	2.0	60.0	69.7	12.7	5241.3	3365	3087
176	930515	10	23.2	20.0	7.0	8.2	4.0	60.0	80.7	12.6	5204.4	4257	2986
177	930515	14	22.9	20.5	7.3	8.1	4.0	60.0	74.6	12.5	5167.5	4725	4639
178	930515	18	25.5	20.0	7.2	8.1	4.0	55.0	70.3	13.5	5541.7	4697	4298
179	930515	22	19.8	19.4	6.9	7.9	4.0	.	74.5	13.5	5541.7	3619	2550
180	930516	2	19.1	19.5	6.9	8.3	4.0	.	70.3	13.5	5541.7	4777	4321
181	930516	6	18.7	19.5	7.1	7.7	4.0	50.0	80.4	12.3	5093.7	4745	4116
182	930516	10	23.1	21.9	7.0	7.7	3.0	65.0	77.5	12.3	5093.7	4560	5040
183	930516	14	25.0	22.1	6.9	7.9	3.0	65.0	75.5	12.3	5093.7	2064	4242
184	930516	18	27.1	21.1	7.2	7.5	4.0	60.0	79.1	12.2	5056.9	4745	4848
185	930516	22	20.0	20.5	7.3	8.5	4.0	.	72.5	12.3	5093.7	4130	5069
186	930517	2	17.7	19.5	7.6	7.9	4.0	.	73.2	12.1	5020.0	4092	4713
187	930517	6	18.5	19.9	7.0	8.1	4.0	65.0	71.6	12.1	5020.0	3659	2548
188	930517	10	21.8	21.1	7.6	8.0	3.0	60.0	73.2	12.0	4983.1	3983	4752
189	930517	14	26.5	22.8	7.2	7.8	4.0	70.0	62.8	11.7	4874.9	3110	2868
190	930517	18	23.8	21.5	6.8	8.5	4.0	65.0	72.2	11.7	4874.9	4108	3129
191	930517	22	21.2	20.8	7.2	7.9	4.0	.	74.6	11.9	4947.0	4869	4826
192	930518	2	18.5	19.5	6.9	8.1	4.0	.	74.0	11.9	4947.0	4050	5036
193	930518	6	18.2	19.8	7.6	7.9	4.0	65.0	76.9	12.0	4983.1	4872	3340
194	930518	10	21.2	21.0	7.2	7.8	4.0	70.0	75.5	12.0	4983.1	3748	3014
195	930518	14	23.5	21.5	6.5	7.6	3.0	70.0	80.1	12.0	4983.1	4725	4831
196	930518	18	21.5	21.0	7.5	8.2	4.0	65.0	73.8	12.0	4983.1	3622	2769
197	930518	22	21.0	20.5	7.6	7.8	4.0	.	75.9	12.0	4983.1	4151	4046
198	930519	2	19.3	19.9	7.4	8.0	4.0	.	75.5	12.0	4983.1	5366	5322
199	930519	6	21.5	19.1	7.4	8.0	4.0	65.0	76.1	12.0	4983.1	4467	4042
200	930519	10	22.7	21.5	7.7	8.4	4.0	70.0	85.5	12.0	4983.1	5225	5466
201	930519	14	19.5	21.0	7.5	8.1	3.0	65.0	71.7	12.0	4983.1	4405	4260
202	930519	18	19.8	20.8	7.1	8.5	3.0	65.0	77.2	12.1	5020.0	4546	4401
203	930519	22	18.9	20.5	7.7	8.3	3.0	.	78.1	12.1	5020.0	5176	4700
204	930520	2	17.5	19.5	7.4	7.8	3.0	.	73.7	12.0	4983.1	4288	4015
205	930520	6	16.5	19.2	7.8	7.3	3.0	60.0	79.7	12.3	5093.7	4826	3996
206	930520	10	16.5	19.5	7.1	7.7	3.0	65.0	70.6	12.1	5020.0	4229	4142
207	930520	14	19.3	19.8	7.5	7.7	3.0	70.0	72.9	12.1	5020.0	4678	4688
208	930520	18	19.4	19.0	7.6	8.2	3.0	65.0	72.6	12.1	5020.0	3956	3190

Table A-4. Continued.

Page	Date	Time	Atemp	Wtemp	pH	DO	TDS	Secchi	Wvel	Rstage	Xsect	Srevs	Orevs
209	930520	22	14.3	18.5	.	7.9	3.0	.	77.8	12.1	5020.0	3859	3424
210	930521	2	14.6	18.5	7.7	8.2	3.0	.	80.0	12.1	5020.0	4764	4712
211	930521	6	11.5	17.3	7.7	7.7	3.0	55.0	69.8	12.1	5020.0	4067	4164
212	930521	10	16.8	19.5	8.0	7.8	3.0	65.0	74.3	12.1	5020.0	4661	4610
213	930521	14	19.7	19.8	7.7	8.0	4.0	65.0	75.3	12.0	4983.1	5025	4605
214	930521	18	19.5	20.0	7.6	7.7	4.0	65.0	73.1	12.0	4983.1	3848	2621
215	930521	22	14.5	18.9	7.5	8.7	4.0	.	73.8	12.0	4983.1	5352	5366
216	930522	2	11.5	18.0	7.5	8.3	3.0	.	70.3	12.0	4983.1	4000	3762
217	930522	6	10.3	16.9	7.6	8.1	4.0	60.0	81.0	12.0	4983.1	5542	5559
218	930522	10	16.2	18.8	7.4	7.9	3.0	65.0	74.3	12.0	4983.1	5083	4724
219	930522	14	20.0	20.0	7.7	7.8	4.0	70.0	77.7	11.6	4838.8	5126	4993
220	930522	18	19.5	19.0	7.6	8.6	4.0	60.0	56.0	11.4	4766.6	3221	3023
221	930522	22	12.5	18.5	7.7	8.1	4.0	.	58.6	11.2	4694.5	3320	3151
222	930523	2	11.5	18.0	7.6	7.9	3.0	.	62.0	10.7	4519.5	3296	2748
223	930523	6	9.9	17.1	7.9	8.0	4.0	60.0	68.3	11.1	4658.4	4648	3232
224	930523	10	18.5	20.0	7.8	8.3	5.0	75.0	67.8	11.3	4730.5	3951	3765
225	930523	14	21.0	21.2	8.2	7.8	4.0	70.0	78.9	11.5	4802.7	4314	4052
226	930523	18	22.5	21.5	.	7.8	5.0	75.0	70.9	11.7	4874.9	4029	4045
227	930523	22	15.7	18.5	8.1	8.1	4.0	.	77.5	11.7	4874.9	5072	5214
228	930524	2	15.5	19.3	8.1	8.7	4.0	.	74.0	11.8	4910.9	4119	4418
229	930524	6	14.0	17.9	8.0	7.7	4.0	70.0	71.7	11.8	4910.9	4409	4785
230	930524	10	20.5	21.3	7.6	8.0	4.0	75.0	73.5	11.8	4910.9	4330	4097
231	930524	14	26.4	21.5	8.0	8.5	4.0	70.0	70.5	11.8	4910.9	4224	4620
232	930524	18	25.3	20.7	8.1	8.3	4.0	70.0	67.1	11.9	4947.0	3726	3910
233	930524	22	19.5	20.0	8.0	8.8	4.0	.	67.6	11.9	4947.0	4366	4420
234	930525	2	19.4	19.9	8.2	8.1	4.0	.	77.3	11.9	4947.0	4903	4904
235	930525	6	18.5	19.9	8.0	8.2	4.0	70.0	78.5	11.9	4947.0	4543	4330
236	930525	10	23.6	20.8	8.1	7.7	2.0	65.0	81.5	11.9	4947.0	4946	4819
237	930525	14	22.9	23.9	8.1	8.5	4.0	65.0	75.8	11.9	4947.0	4699	4536
238	930525	18	26.9	21.9	8.2	8.0	4.0	70.0	78.6	11.9	4947.0	4237	4650
239	930525	22	22.1	20.5	8.4	8.5	4.0	.	79.6	11.9	4947.0	5006	4804
240	930526	2	20.5	20.5	8.1	8.8	4.0	.	79.5	11.9	4947.0	5044	4039
241	930526	6	18.7	19.9	8.2	8.4	4.0	65.0	77.5	11.9	4947.0	5043	4733
242	930526	10	18.2	20.1	8.3	8.5	4.0	65.0	76.0	11.9	4947.0	4510	4327
243	930526	14	18.3	20.3	8.3	8.3	4.0	70.0	70.5	11.9	4947.0	5123	4814

Table A-4. Continued.

Page	Date	Time	Atemp	Wtemp	pH	DO	TDS	Secchi	Wvel	Rstage	Xsect	Srevs	Orevs
244	930526	18	17.7	20.0	8.3	8.1	4.0	70.0	66.3	11.9	4947.0	4181	3996
245	930526	22	16.1	19.8	8.2	8.2	4.0	.	79.4	11.9	4947.0	4526	4660
246	930527	2	13.5	18.9	8.2	8.8	4.0	.	74.3	11.9	4947.0	4938	4790
247	930527	6	15.5	18.9	8.2	8.1	3.0	70.0	73.0	11.9	4947.0	4393	4254
248	930527	10	17.2	19.5	8.1	8.2	3.0	80.0	67.6	11.9	4947.0	4193	7575
249	930527	14	25.0	22.0	8.1	8.0	4.0	80.0	75.0	11.9	4947.0	1370	3585
250	930527	18	22.0	20.9	8.1	8.2	5.0	70.0	68.3	11.8	4910.9	4176	3594
251	930527	22	17.5	19.5	8.1	8.6	4.0	.	70.5	11.8	4910.9	4297	4193
252	930528	2	16.4	20.1	7.3	8.4	4.0	.	76.4	11.8	4910.9	4702	4979
253	930528	6	14.1	19.0	6.8	8.4	4.0	70.0	70.4	11.7	4874.9	4276	3327
254	930528	10	21.7	20.3	7.4	7.5	4.0	75.0	78.2	11.7	4874.9	4641	4537
255	930528	14	28.2	22.5	7.5	8.0	4.0	80.0	81.4	11.7	4874.9	3212	3461
256	930528	18	25.5	21.5	6.8	8.6	4.0	75.0	71.9	11.8	4910.9	3230	3916
257	930528	22	21.2	21.5	7.4	8.2	4.0	.	77.0	11.6	4838.8	4848	4696
258	930529	2	19.5	21.5	6.9	8.2	6.0	.	69.6	11.5	4802.7	5556	4638
259	930529	6	20.3	20.8	7.5	7.9	5.0	75.0	77.3	11.5	4802.7	5556	4521
260	930529	10	25.5	22.5	7.4	7.6	4.0	75.0	72.6	11.5	4802.7	4133	4253
261	930529	14	29.7	23.8	7.4	7.8	4.0	80.0	84.2	11.5	4802.7	5157	4630
262	930529	18	23.5	21.5	7.5	8.6	5.0	75.0	71.9	11.5	4802.7	4196	4048
263	930529	22	18.5	21.5	7.4	8.4	4.0	.	73.1	11.5	4802.7	4759	4658
264	930530	2	18.3	21.1	8.2	8.1	5.0	.	72.5	11.3	4730.5	4590	4744
265	930530	6	16.5	20.5	7.4	7.9	4.0	70.0	72.0	11.3	4730.5	4109	4872
266	930530	10	19.7	21.5	7.3	8.1	4.0	75.0	76.8	11.4	4766.6	5174	5145
267	930530	14	23.9	22.9	7.7	7.9	4.0	60.0	70.9	11.4	4766.6	4370	5116
268	930530	18	23.7	21.7	8.0	7.7	4.0	55.0	81.5	11.4	4766.6	5070	4972
269	930530	22	19.4	21.2	8.0	8.2	4.0	.	78.7	11.5	4802.7	4931	4969
270	930531	2	17.8	20.5	7.9	8.5	4.0	.	74.8	11.5	4802.7	4369	4645
271	930531	6	16.5	20.0	8.1	7.8	4.0	65.0	74.1	11.5	4802.7	4274	4476
272	930531	10	23.5	21.5	7.4	7.9	4.0	75.0	69.2	11.5	4802.7	4634	4207
273	930531	14	20.5	20.0	7.6	8.2	3.0	70.0	74.9	11.5	4802.7	4517	4195
274	930531	18	20.5	20.5	7.4	8.4	4.0	70.0	72.1	11.5	4802.7	4489	4422
275	930531	22	21.5	21.0	7.6	8.6	4.0	.	76.8	11.5	4802.7	4265	4644
276	930601	2	20.1	21.1	7.8	8.1	4.0	.	78.9	11.5	4802.7	4322	4937
277	930601	6	20.1	20.5	7.4	8.1	6.0	75.0	73.4	11.5	4802.7	4538	4378
278	930601	10	17.3	20.5	7.6	8.1	4.0	75.0	68.6	11.5	4802.7	4578	4839

Table A-4. Continued.

Page	Date	Time	Atemp	Wtemp	pH	DO	TDS	Secchi	Wvel	Rstage	Xsect	Srevs	Orevs
279	930601	14	20.3	21.9	7.7	8.0	4.0	70.0	78.1	11.5	4802.7	4724	4532
280	930601	18	20.5	21.5	7.6	8.7	4.0	75.0	76.6	11.5	4802.7	4525	3810
281	930601	22	16.4	20.3	7.7	8.1	4.0	.	74.9	11.5	4802.7	4852	4416
282	930602	2	12.5	19.5	7.4	8.3	4.0	.	74.4	11.7	4874.9	4852	4609
283	930602	6	15.1	19.5	7.5	8.0	4.0	75.0	74.1	11.5	4802.7	4827	4158
284	930602	10	19.1	20.5	7.5	7.8	4.0	75.0	77.3	11.5	4802.7	4950	4593
285	930602	14	23.5	21.5	7.6	7.8	4.0	75.0	68.0	11.5	4802.7	4729	4807
286	930602	18	24.5	21.0	7.7	7.9	4.0	75.0	72.9	11.5	4802.7	3767	4590
287	930602	22	17.8	19.9	7.5	8.0	4.0	.	73.5	11.5	4802.7	4571	4297
288	930603	2	16.0	19.0	7.6	7.9	4.0	.	71.1	11.5	4802.7	6057	5089
289	930603	6	15.1	18.9	7.5	7.9	3.0	75.0	80.8	11.5	4802.7	4688	4352
290	930603	10	23.8	22.1	7.6	7.7	3.0	75.0	70.7	11.5	4802.7	4367	4133
291	930603	14	26.4	22.0	7.7	7.4	4.0	75.0	71.4	11.5	4802.7	4204	3906
292	930603	18	26.5	21.5	7.4	8.1	5.0	75.0	75.1	11.5	4802.7	4330	3806
293	930603	22	23.5	20.5	7.9	8.1	4.0	.	71.9	11.5	4802.7	4024	4234
294	930604	2	20.9	20.7	7.9	8.0	5.0	.	75.1	11.4	4766.6	4615	4469
295	930604	6	20.5	20.5	7.6	8.2	4.0	65.0	75.7	11.5	4802.7	4487	4356
296	930604	10	22.0	17.9	7.7	7.9	4.0	75.0	75.5	11.4	4766.6	4207	3280
297	930604	14	27.9	22.8	7.9	7.7	4.0	70.0	71.7	11.4	4766.6	3944	3314
298	930604	18	25.7	21.7	8.1	8.0	4.0	75.0	74.2	11.4	4766.6	4222	3690
299	930604	22	18.1	20.5	8.2	8.1	4.0	.	80.0	11.4	4766.6	4781	4664
300	930605	2	16.5	20.5	7.9	8.0	4.0	.	76.8	11.5	4802.7	4664	4151
301	930605	6	16.7	20.1	7.8	8.5	4.0	20.0	74.4	11.5	4802.7	4386	3966
302	930605	10	23.5	22.5	7.1	7.6	3.0	30.0	72.2	12.0	4983.1	4491	4368
303	930605	14	28.7	22.9	7.6	7.9	3.0	25.0	85.6	12.0	4983.1	4877	4287
304	930605	18	28.5	22.5	7.9	7.7	4.0	25.0	83.7	12.0	4983.1	4615	3506
305	930605	22	23.7	22.0	7.9	7.7	4.0	.	79.4	12.0	4983.1	4070	4189
306	930606	2	20.3	21.3	7.2	7.8	5.0	.	75.9	11.9	4947.0	4454	3869
307	930606	6	15.5	20.0	7.2	7.5	5.0	55.0	74.8	12.0	4983.1	4107	3626
308	930606	10	20.4	22.0	7.6	7.4	4.0	55.0	77.5	12.0	4983.1	4494	4214
309	930606	14	23.4	23.5	7.3	7.7	5.0	55.0	76.2	12.0	4983.1	4464	4587
310	930606	18	23.5	21.5	7.5	8.1	5.0	70.0	75.8	11.9	4947.0	3976	3406
311	930606	22	17.9	21.2	7.5	8.2	4.0	.	72.7	11.9	4947.0	4249	3848
312	930607	2	13.0	20.0	7.7	8.0	4.0	.	74.4	11.8	4910.9	5124	4990
313	930607	6	13.7	20.5	7.5	7.6	5.0	75.0	78.0	11.8	4910.9	3660	3958

Table A-4. Continued.

Page	Date	Time	Atemp	Wtemp	pH	DO	TDS	Secchi	Wvel	Rstage	Xsect	Srevs	Orevs
314	930607	10	24.0	22.5	7.5	7.4	5.0	75.0	75.8	11.8	4910.9	4867	4161
315	930607	14	26.9	23.3	7.6	7.5	5.0	75.0	75.3	11.7	4874.9	4857	4454
316	930607	18	27.4	22.7	7.8	7.7	5.0	70.0	75.5	11.7	4874.9	5026	4648
317	930607	22	21.7	21.0	7.9	7.9	4.0	.	74.3	11.7	4874.9	4519	4417
318	930608	2	16.6	20.4	7.7	7.7	4.0	.	73.3	11.7	4874.9	4661	4322
319	930608	6	23.2	22.2	7.6	7.7	4.0	70.0	75.0	11.7	4874.9	4462	3985
320	930608	10	25.9	24.1	7.7	7.3	5.0	75.0	74.4	11.6	4838.8	4132	3639
321	930608	14	31.5	25.1	7.6	7.3	6.0	80.0	75.2	11.7	4874.9	4318	3617
322	930608	18	31.2	24.2	7.9	7.9	4.0	75.0	74.4	11.6	4838.8	4336	4244
323	930608	22	25.2	23.2	8.0	8.1	6.0	.	69.4	11.6	4838.8	4135	3714
324	930609	2	24.8	22.5	8.1	7.9	5.0	.	69.9	11.7	4874.9	4382	4752
325	930609	6	23.4	22.1	7.9	7.6	5.0	75.0	73.4	11.6	4838.8	4313	3280
326	930609	10	29.5	25.2	7.5	6.9	5.0	80.0	70.8	11.7	4874.9	4709	4409
327	930609	14	32.5	25.2	7.8	6.9	5.0	85.0	69.0	11.5	4802.7	4113	1359
328	930609	18	30.0	24.9	7.8	7.3	5.0	80.0	71.2	11.5	4802.7	4595	3824
329	930609	22	25.5	24.0	8.0	7.8	6.0	.	72.5	11.5	4802.7	4116	4321
330	930610	2	23.9	23.5	7.9	7.1	5.0	.	73.6	11.5	4802.7	4470	4281
331	930610	6	23.6	23.7	7.9	7.2	5.0	75.0	74.4	11.5	4802.7	4129	4225
332	930610	10	27.9	25.2	8.0	6.9	6.0	80.0	71.9	11.5	4802.7	3966	4100
333	930610	14	33.5	26.5	8.0	6.8	5.0	85.0	76.0	11.5	4802.7	3311	2800
334	930610	18	28.0	25.0	8.1	7.3	5.0	85.0	72.1	11.5	4802.7	4389	3976
335	930610	22	25.6	24.6	8.2	8.2	5.0	.	80.8	11.5	4802.7	4817	4873
336	930611	2	25.0	23.0	8.4	6.2	5.0	.	70.9	11.5	4802.7	4776	4194
337	930611	6	23.9	23.1	8.2	7.1	6.0	75.0	77.1	11.5	4802.7	4123	4256
338	930611	10	28.0	24.7	8.1	6.9	5.0	90.0	71.2	11.5	4802.7	4663	4201
339	930611	14	32.5	25.0	8.2	7.1	5.0	85.0	78.1	11.4	4766.6	3744	3923
340	930611	18	30.0	25.0	8.2	7.2	5.0	85.0	74.4	11.5	4802.7	5117	4419
341	930611	22	.	.	.	.	.	.	.	.	.	.	.
342	930612	2	.	.	.	.	.	.	.	.	.	.	.
343	930612	6	22.6	23.2	8.1	7.2	5.0	75.0	74.7	11.4	4766.6	4496	4763
344	930612	10	26.6	24.5	8.0	7.3	5.0	80.0	77.0	11.4	4766.6	4737	4004
345	930612	14	.	24.2	8.2	7.2	6.0	80.0	75.3	11.4	4766.6	4174	4784
346	930612	18	25.4	24.0	8.2	6.9	5.0	80.0	72.4	11.5	4802.7	4112	4352
347	930612	22	.	.	.	.	.	.	.	.	.	.	.
348	930613	2	.	.	.	.	.	.	.	.	.	.	.

Table A-4. Continued.

Page	Date	Time	Atemp	Wtemp	pH	DO	TDS	Secchi	Wvel	Rstage	Xsect	Srevs	Orevs
349	930613	6	18.5	22.8	8.3	7.3	4.0	80.0	71.3	11.5	4802.7	4449	4057
350	930613	10	20.8	23.0	8.3	7.1	5.0	75.0	69.3	11.5	4802.7	4321	4047
351	930613	14	21.5	22.5	8.3	7.0	4.0	80.0	72.2	11.4	4766.6	4402	4356
352	930613	18	22.6	22.9	8.2	7.7	5.0	75.0	71.9	11.4	4766.6	4316	3782
353	930613	22	.	.	.	.	.	.	.	.	.	.	.
354	930614	2	.	.	.	.	.	.	.	.	.	.	.
355	930614	6	21.2	22.6	8.1	7.1	5.0	75.0	72.8	11.4	4766.6	4279	4287
356	930614	10	22.3	24.0	8.4	6.9	4.0	75.0	74.2	11.4	4766.6	4353	3467
357	930614	14	26.5	24.2	8.5	6.8	4.0	80.0	72.6	11.4	4766.6	4557	4685
358	930614	18	25.5	24.2	8.5	6.9	4.0	80.0	73.7	11.4	4766.6	4672	4472
359	930614	22	.	.	.	.	.	.	.	.	.	.	.
360	930615	2	.	.	.	.	.	.	.	.	.	.	.
361	930615	6	20.2	22.3	8.1	7.0	5.0	80.0	72.6	11.4	4766.6	4329	4612
362	930615	10	25.2	23.0	8.6	6.9	4.0	80.0	69.5	11.4	4766.6	4507	4944
363	930615	14	26.3	23.6	8.4	6.9	4.0	70.0	71.9	11.4	4766.6	4355	4237
364	930615	18	26.9	23.5	8.1	7.4	4.0	80.0	72.1	11.4	4766.6	4038	4154
365	930615	22	24.3	22.9	8.0	7.3	4.0	.	71.7	11.4	4766.6	4132	4303
366	930616	2	22.5	22.8	8.1	6.9	5.0	.	72.6	11.4	4766.6	4189	4166
367	930616	6	24.5	23.0	8.2	7.1	4.0	75.0	72.9	11.4	4766.6	4231	4415
368	930616	10	25.7	25.0	8.4	6.8	4.0	80.0	72.8	11.4	4766.6	4101	4125

Table A-5. Number of striped bass eggs in surface and bottom nets, number of viable eggs in each net, and number of v. eggs (in a subsample) at each stage of development, collected at Barnhill's Landing, Roanoke River, North Carolina, 16 April to 16 June, 1993.

AGE	DATE	TIME	ASURF	BSURF	AOBL	BOBL	ASVIA	BSVIA	AOVIA	BOVIA	ST1	ST2	ST3	ST4	HATCH
1	930416	6	.	.	.	.	.	.	.	.	.	.	.	.	.
2	930416	10	.	.	.	.	.	.	.	.	.	.	.	.	.
3	930416	14	.	.	.	.	.	.	.	.	.	.	.	.	.
4	930416	18	0	0	0	0	.	.	.	.	.	.	.	.	.
5	930416	22	.	.	.	.	.	.	.	.	.	.	.	.	.
6	930417	2	.	.	.	.	.	.	.	.	.	.	.	.	.
7	930417	6	0	0	0	0	.	.	.	.	.	.	.	.	.
8	930417	10	0	0	0	0	.	.	.	.	.	.	.	.	.
9	930417	14	0	0	0	0	.	.	.	.	.	.	.	.	.
10	930417	18	0	0	0	0	.	.	.	.	.	.	.	.	.
11	930417	22	.	.	.	.	.	.	.	.	.	.	.	.	.
12	930418	2	.	.	.	.	.	.	.	.	.	.	.	.	.
13	930418	6	0	0	0	0	.	.	.	.	.	.	.	.	.
14	930418	10	0	0	0	0	.	.	.	.	.	.	.	.	.
15	930418	14	0	0	0	0	.	.	.	.	.	.	.	.	.
16	930418	18	0	0	0	0	.	.	.	.	.	.	.	.	.
17	930418	22	.	.	.	.	.	.	.	.	.	.	.	.	.
18	930419	2	.	.	.	.	.	.	.	.	.	.	.	.	.
19	930419	6	0	0	0	0	.	.	.	.	.	.	.	.	.
20	930419	10	0	0	0	0	.	.	.	.	.	.	.	.	.
21	930419	14	0	0	0	0	.	.	.	.	.	.	.	.	.
22	930419	18	0	0	0	0	.	.	.	.	.	.	.	.	.
23	930419	22	.	.	.	.	.	.	.	.	.	.	.	.	.
24	930420	2	.	.	.	.	.	.	.	.	.	.	.	.	.
25	930420	6	0	0	0	0	.	.	.	.	.	.	.	.	.
26	930420	10	0	0	1	0	0	0	1	0	1	0	0	0	0
27	930420	14	0	0	0	0	.	.	.	.	.	.	.	.	.
28	930420	18	0	0	0	0	.	.	.	.	.	.	.	.	.
29	930420	22	.	.	.	.	.	.	.	.	.	.	.	.	.
30	930421	2	.	.	.	.	.	.	.	.	.	.	.	.	.
31	930421	6	0	0	1	0	0	0	1	0	1	0	0	0	0
32	930421	10	0	0	0	0	.	.	.	.	.	.	.	.	.
33	930421	14	0	0	0	0	.	.	.	.	.	.	.	.	.

Table A-5. Continued.

AGE	DATE	TIME	ASURF	BSURF	AOBL	BOBL	ASVIA	BSVIA	AOVIA	BOVIA	ST1	ST2	ST3	ST4	HATCH
34	930421	18	1	0	1	1	1	0	1	0	2	0	0	0	0
35	930421	22	.	.	.	.	.	.	.	.	.	.	.	.	.
36	930422	2	.	.	.	.	.	.	.	.	.	.	.	.	.
37	930422	6	0	0	0	3	0	0	0	1	1	0	0	0	0
38	930422	10	0	0	1	0	0	0	0	0	.	.	.	.	.
39	930422	14	0	0	0	0	.	.	.	.	.	.	.	.	.
40	930422	18	0	0	0	0	.	.	.	.	.	.	.	.	.
41	930422	22	.	.	.	.	.	.	.	.	.	.	.	.	.
42	930423	2	.	.	.	.	.	.	.	.	.	.	.	.	.
43	930423	6	0	0	0	0	.	.	.	.	.	.	.	.	.
44	930423	10	0	0	0	0	.	.	.	.	.	.	.	.	.
45	930423	14	0	0	0	0	.	.	.	.	.	.	.	.	.
46	930423	18	0	0	0	0	.	.	.	.	.	.	.	.	.
47	930423	22	.	.	.	.	.	.	.	.	.	.	.	.	.
48	930424	2	.	.	.	.	.	.	.	.	.	.	.	.	.
49	930424	6	0	0	0	0	.	.	.	.	.	.	.	.	.
50	930424	10	0	0	0	0	.	.	.	.	.	.	.	.	.
51	930424	14	0	0	0	0	.	.	.	.	.	.	.	.	.
52	930424	18	0	0	0	0	.	.	.	.	.	.	.	.	.
53	930424	22	.	.	.	.	.	.	.	.	.	.	.	.	.
54	930425	2	.	.	.	.	.	.	.	.	.	.	.	.	.
55	930425	6	0	0	0	0	.	.	.	.	.	.	.	.	.
56	930425	10	0	0	0	0	.	.	.	.	.	.	.	.	.
57	930425	14	0	0	0	0	.	.	.	.	.	.	.	.	.
58	930425	18	0	0	0	0	.	.	.	.	.	.	.	.	.
59	930425	22	.	.	.	.	.	.	.	.	.	.	.	.	.
60	930426	2	.	.	.	.	.	.	.	.	.	.	.	.	.
61	930426	6	.	.	.	.	.	.	.	.	.	.	.	.	.
62	930426	10	0	0	.	.	.	.	.	.	.	.	.	.	.
63	930426	14	0	0	.	.	.	.	.	.	.	.	.	.	.
64	930426	18	0	0	0	0	.	.	.	.	.	.	.	.	.
65	930426	22	.	.	.	.	.	.	.	.	.	.	.	.	.
66	930427	2	.	.	.	.	.	.	.	.	.	.	.	.	.
67	930427	6	0	0	0	0	.	.	.	.	.	.	.	.	.
68	930427	10	0	0	0	0	.	.	.	.	.	.	.	.	.

Table A-5. Continued.

AGE	DATE	TIME	ASURF	BSURF	AOBL	BOBL	ASVIA	BSVIA	AOVIA	BOVIA	ST1	ST2	ST3	ST4	HATCH
69	930427	14	0	0	0	0	.	.	.	.	.	.	.	.	.
70	930427	18	0	0	0	0	.	.	.	.	.	.	.	.	.
71	930427	22	.	.	.	.	.	.	.	.	.	.	.	.	.
72	930428	2	.	.	.	.	.	.	.	.	.	.	.	.	.
73	930428	6	0	0	0	0	.	.	.	.	.	.	.	.	.
74	930428	10	0	0	0	0	.	.	.	.	.	.	.	.	.
75	930428	14	0	0	0	0	.	.	.	.	.	.	.	.	.
76	930428	18	0	0	0	0	.	.	.	.	.	.	.	.	.
77	930428	22	.	.	.	.	.	.	.	.	.	.	.	.	.
78	930429	2	.	.	.	.	.	.	.	.	.	.	.	.	.
79	930429	6	0	0	0	0	.	.	.	.	.	.	.	.	.
80	930429	10	1	0	2	0	1	0	0	0	1	0	0	0	0
81	930429	14	0	0	0	0	.	.	.	.	.	.	.	.	.
82	930429	18	0	0	0	0	.	.	.	.	.	.	.	.	.
83	930429	22	.	.	.	.	.	.	.	.	.	.	.	.	.
84	930430	2	.	.	.	.	.	.	.	.	.	.	.	.	.
85	930430	6	0	0	0	0	.	.	.	.	.	.	.	.	.
86	930430	10	0	0	0	0	.	.	.	.	.	.	.	.	.
87	930430	14	0	0	0	0	.	.	.	.	.	.	.	.	.
88	930430	18	0	0	0	0	.	.	.	.	.	.	.	.	.
89	930430	22	.	.	.	.	.	.	.	.	.	.	.	.	.
90	930501	2	.	.	.	.	.	.	.	.	.	.	.	.	.
91	930501	6	0	0	0	0	.	.	.	.	.	.	.	.	.
92	930501	10	0	0	0	0	.	.	.	.	.	.	.	.	.
93	930501	14	0	0	0	0	.	.	.	.	.	.	.	.	.
94	930501	18	0	0	0	0	.	.	.	.	.	.	.	.	.
95	930501	22	.	.	.	.	.	.	.	.	.	.	.	.	.
96	930502	2	.	.	.	.	.	.	.	.	.	.	.	.	.
97	930502	6	0	0	0	0	.	.	.	.	.	.	.	.	.
98	930502	10	0	0	0	0	.	.	.	.	.	.	.	.	.
99	930502	14	0	1	0	1	0	1	0	0	1	0	0	0	0
100	930502	18	0	0	0	0	.	.	.	.	.	.	.	.	.
101	930502	22	.	.	.	.	.	.	.	.	.	.	.	.	.
102	930503	2	.	.	.	.	.	.	.	.	.	.	.	.	.
103	930503	6	0	0	0	0	.	.	.	.	.	.	.	.	.

Table A-5. Continued.

AGE	DATE	TIME	ASURF	BSURF	AOBL	BOBL	ASVIA	BSVIA	AOVIA	BOVIA	ST1	ST2	ST3	ST4	HATCH
104	930503	10	0	0	0	0	.	.	.	.	.	.	.	.	.
105	930503	14	0	0	0	0	.	.	.	.	.	.	.	.	.
106	930503	18	0	0	0	0	.	.	.	.	.	.	.	.	.
107	930503	22	0	0	0	0	.	.	.	.	.	.	.	.	.
108	930504	2	0	0	0	0	.	.	.	.	.	.	.	.	.
109	930504	6	1	0	2	0	0	0	0	0	.	.	.	.	.
110	930504	10	0	0	0	0	.	.	.	.	.	.	.	.	.
111	930504	14	0	0	0	0	.	.	.	.	.	.	.	.	.
112	930504	18	0	0	0	0	.	.	.	.	.	.	.	.	.
113	930504	22	0	0	0	0	.	.	.	.	.	.	.	.	.
114	930505	2	0	0	0	0	.	.	.	.	.	.	.	.	.
115	930505	6	0	0	1	0	.	.	.	.	.	.	.	.	.
116	930505	10	0	0	0	0	.	.	.	.	.	.	.	.	.
117	930505	14	0	0	0	0	.	.	.	.	.	.	.	.	.
118	930505	18	0	0	0	0	.	.	.	.	.	.	.	.	.
119	930505	22	0	0	0	0	.	.	.	.	.	.	.	.	.
120	930506	2	.	.	.	.	.	.	.	.	.	.	.	.	.
121	930506	6	0	0	0	0	.	.	.	.	.	.	.	.	.
122	930506	10	0	0	0	0	.	.	.	.	.	.	.	.	.
123	930506	14	0	0	0	0	.	.	.	.	.	.	.	.	.
124	930506	18	0	0	0	0	.	.	.	.	.	.	.	.	.
125	930506	22	0	0	0	0	.	.	.	.	.	.	.	.	.
126	930507	2	0	0	0	0	.	.	.	.	.	.	.	.	.
127	930507	6	0	0	0	0	.	.	.	.	.	.	.	.	.
128	930507	10	0	0	0	0	.	.	.	.	.	.	.	.	.
129	930507	14	0	0	0	0	.	.	.	.	.	.	.	.	.
130	930507	18	0	0	0	0	.	.	.	.	.	.	.	.	.
131	930507	22	1	1	0	0	0	0	0	0	.	.	.	.	.
132	930508	2	0	0	1	0	0	0	1	0	1	0	0	0	0
133	930508	6	0	0	2	0	0	0	0	0	.	.	.	.	.
134	930508	10	2	2	2	0	2	2	0	0	4	0	0	0	0
135	930508	14	1	0	0	0	1	0	0	0	1	0	0	0	0
136	930508	18	0	0	0	0	.	.	.	.	.	.	.	.	.
137	930508	22	0	0	0	0	.	.	.	.	.	.	.	.	.
138	930509	2	0	0	2	0	0	0	2	0	2	0	0	0	0

Table A-5. Continued.

AGE	DATE	TIME	ASURF	BSURF	AOBL	BOBL	ASVIA	BSVIA	AOVIA	BOVIA	ST1	ST2	ST3	ST4	HATCH
139	930509	6	0	1	5	0	0	0	3	0	3	0	0	0	0
140	930509	10	1	4	3	1	0	2	1	1	4	0	0	0	0
141	930509	14	2	0	4	1	2	0	2	0	4	0	0	0	0
142	930509	18	0	1	2	1	0	0	0	0	.	.	.	.	.
143	930509	22	0	0	1	1	0	0	0	0	.	.	.	.	.
144	930510	2	1	1	2	0	1	0	1	0	2	0	0	0	0
145	930510	6	0	0	1	2	0	0	0	0	.	.	.	.	.
146	930510	10	0	2	0	1	0	0	0	0	.	.	.	.	.
147	930510	14	0	0	0	0	.	.	.	.	.	.	.	.	.
148	930510	18	0	0	3	3	0	0	3	1	4	0	0	0	0
149	930510	22	0	0	0	0	.	.	.	.	.	.	.	.	.
150	930511	2	2	0	0	0	1	0	0	0	1	0	0	0	0
151	930511	6	2	0	0	1	2	0	0	1	3	0	0	0	0
152	930511	10	3	0	5	0	3	0	2	0	5	0	0	0	0
153	930511	14	1	0	2	0	0	0	1	0	1	0	0	0	0
154	930511	18	0	0	1	0	0	0	0	0	.	.	.	.	.
155	930511	22	1	0	2	0	1	0	2	0	3	0	0	0	0
156	930512	2	1	0	0	0	0	0	0	0	.	.	.	.	.
157	930512	6	1	3	1	1	1	3	1	1	6	0	0	0	0
158	930512	10	0	2	2	0	0	1	2	0	3	0	0	0	0
159	930512	14	0	2	2	4	0	2	1	2	5	0	0	0	0
160	930512	18	3	4	3	3	3	4	2	2	11	0	0	0	0
161	930512	22	6	3	30	2	5	3	25	2	35	0	0	0	0
162	930513	2	127	139	133	199	105	112	93	140	426	24	0	0	0
163	930513	6	785	398	1463	1378	557	248	.	795	710	95	0	0	0
164	930513	10	7245	4979	.	11355	3800	3103	.	5545	.	.	.	.	.
165	930513	14	16478	19531	.	.	8846	10151	.	.	.	.	.	.	.
166	930513	18	3002	2835	.	.	412	543	.	.	.	.	.	.	.
167	930513	22	1214	2132	.	.	.	1025	.	.	.	.	.	.	.
168	930514	2	617	787	.	.	58	58	.	.	.	.	.	.	.
169	930514	6	482	285	.	.	11	7	.	.	.	.	.	.	.
170	930514	10	223	354	146	64	5	5	3	2	15	0	0	0	0
171	930514	14	117	138	63	86	0	0	1	3	4	0	0	0	0
172	930514	18	66	54	38	26	3	1	1	3	8	0	0	0	0
173	930514	22	11	9	6	8	1	2	0	2	5	0	0	0	0

Table A-5. Continued.

AGE	DATE	TIME	ASURF	BSURF	AOBL	BOBL	ASVIA	BSVIA	AOVIA	BOVIA	ST1	ST2	ST3	ST4	HATCH
174	930515	2	4	4	1	8	1	2	0	1	4	0	0	0	0
175	930515	6	5	4	11	7	1	0	1	0	2	0	0	0	0
176	930515	10	4	5	4	6	1	0	0	0	1	0	0	0	0
177	930515	14	6	2	2	0	1	0	1	0	2	0	0	0	0
178	930515	18	10	8	12	5	0	1	1	0	2	0	0	0	0
179	930515	22	7	1	5	2	0	0	0	0	.	.	.	.	.
180	930516	2	11	3	4	13	7	0	2	4	13	0	0	0	0
181	930516	6	26	9	18	16	10	1	5	5	9	2	0	0	0
182	930516	10	7	7	9	26	1	1	4	5	11	0	0	0	0
183	930516	14	7	9	4	9	1	0	1	0	2	0	0	0	0
184	930516	18	14	15	22	16	11	10	14	3	38	0	0	0	0
185	930516	22	172	50	187	101	61	22	108	42	98	45	0	0	0
186	930517	2	1788	3151	7593	3404	1344	2279	5289	2042	.	.	.	.	.
187	930517	6	4928	3311	.	.	2718	2098	.	.	.	.	.	.	.
188	930517	10	1801	589	1590	495	135	439	516	319	.	.	.	.	.
189	930517	14	178	206	171	204	42	49	39	40	114	56	0	0	0
190	930517	18	142	113	210	126	44	40	80	54	206	12	0	0	0
191	930517	22	263	254	1391	578	121	118	765	229	190	49	0	0	0
192	930518	2	1662	1845	2334	2680	1215	1091	1514	1750	.	.	.	.	.
193	930518	6	1128	1688	2613	1812	740	914	1398	858	.	.	.	.	.
194	930518	10	125	126	306	172	53	61	88	55	.	.	.	.	.
195	930518	14	143	123	103	85	47	35	38	34	140	14	0	0	0
196	930518	18	39	39	29	34	19	16	19	10	59	5	0	0	0
197	930518	22	28	37	36	19	11	14	11	7	38	5	0	0	0
198	930519	2	67	30	52	.	24	1	16	.	39	2	0	0	0
199	930519	6	39	24	107	121	12	9	28	54	91	12	0	0	0
200	930519	10	70	36	34	31	15	6	15	1	35	2	0	0	0
201	930519	14	30	27	14	24	4	5	2	3	10	4	0	0	0
202	930519	18	15	14	16	12	7	2	10	1	14	6	0	0	0
203	930519	22	10	24	31	21	3	5	13	7	24	4	0	0	0
204	930520	2	152	140	503	435	99	111	207	256	.	.	.	.	.
205	930520	6	254	155	369	183	107	68	191	69	377	58	0	0	0
206	930520	10	114	131	202	236	25	18	30	49	106	17	0	0	0
207	930520	14	56	47	63	52	2	1	10	0	10	3	0	0	0
208	930520	18	18	12	10	15	1	5	2	7	13	2	0	0	0

Table A-5. Continued.

AGE	DATE	TIME	ASURF	BSURF	AOBL	BOBL	ASVIA	BSVIA	AOVIA	BOVIA	ST1	ST2	ST3	ST4	HATCH
209	930520	22	24	31	36	19	9	17	26	9	48	13	0	0	0
210	930521	2	30	29	111	64	8	14	66	31	111	8	0	0	0
211	930521	6	69	51	107	108	27	31	48	51	157	0	0	0	0
212	930521	10	53	38	48	36	10	8	17	8	43	0	0	0	0
213	930521	14	44	15	36	2	5	1	10	2	.	.	.	.	.
214	930521	18	5	11	6	20	1	1	2	2	6	0	0	0	0
215	930521	22	11	20	3	7	9	10	2	5	26	0	0	0	0
216	930522	2	11	24	19	36	8	18	11	33	64	6	0	0	0
217	930522	6	126	46	70	87	87	27	50	42	206	0	0	0	0
218	930522	10	97	81	51	136	33	47	30	67	171	6	0	0	0
219	930522	14	60	31	41	63	8	9	11	14	24	18	0	0	0
220	930522	18	11	7	18	13	6	3	10	7	11	15	0	0	0
221	930522	22	16	17	39	23	14	11	21	13	40	19	0	0	0
222	930523	2	43	69	97	71	12	24	61	35	109	83	0	0	0
223	930523	6	1048	956	2815	1773	861	736	1820	1112	.	.	.	.	.
224	930523	10	1667	896	846	213	152	184	132	57	462	63	0	0	0
225	930523	14	289	50	183	93	3	11	19	17	.	.	.	.	.
226	930523	18	137	114	63	66	43	49	24	21	109	29	0	0	0
227	930523	22	174	105	684	110	59	34	190	76	270	89	0	0	0
228	930524	2	631	471	966	646	447	341	621	416	.	.	.	.	.
229	930524	6	1088	428	920	654	597	262	382	386	.	.	.	.	.
230	930524	10	327	111	140	73	151	63	55	39	.	.	.	.	.
231	930524	14	72	26	87	24	11	19	39	8	59	8	0	0	0
232	930524	18	3	5	8	25	1	4	8	14	19	8	0	0	0
233	930524	22	37	89	27	24	26	74	14	13	96	31	0	0	0
234	930525	2	43	23	129	88	32	13	51	42	122	16	0	0	0
235	930525	6	996	591	739	633	301	358	428	374	.	.	.	.	.
236	930525	10	120	66	113	63	22	24	43	14	84	19	0	0	0
237	930525	14	56	61	83	15	31	18	14	17	57	23	0	0	0
238	930525	18	41	14	27	15	20	10	11	5	40	6	0	0	0
239	930525	22	44	41	76	28	26	15	41	18	93	7	0	0	0
240	930526	2	128	84	120	96	115	70	98	69	325	27	0	0	0
241	930526	6	215	218	261	156	155	140	111	86	.	.	.	.	.
242	930526	10	529	120	244	80	68	21	32	39	134	26	0	0	0
243	930526	14	192	33	66	67	2	7	3	5	12	5	0	0	0

Table A-5. Continued.

AGE	DATE	TIME	ASURF	BSURF	AOBL	BOBL	ASVIA	BSVIA	AOVIA	BOVIA	ST1	ST2	ST3	ST4	HATCH
244	930526	18	33	27	28	29	31	19	22	20	100	17	0	0	0
245	930526	22	60	36	29	35	44	25	17	20	80	26	0	0	0
246	930527	2	26	32	40	91	18	26	26	70	113	27	0	0	0
247	930527	6	54	26	38	36	12	19	20	27	67	11	0	0	0
248	930527	10	28	10	21	15	2	4	7	9	16	6	0	0	0
249	930527	14	7	4	5	2	4	2	3	0	9	0	0	0	0
250	930527	18	4	14	9	7	0	10	3	2	13	2	0	0	0
251	930527	22	2	3	1	3	1	2	1	1	4	1	0	0	0
252	930528	2	7	12	7	17	2	8	4	10	23	1	0	0	0
253	930528	6	52	22	92	57	45	13	61	35	139	15	0	0	0
254	930528	10	27	34	34	16	2	23	14	8	44	3	0	0	0
255	930528	14	10	11	25	7	3	8	5	4	18	2	0	0	0
256	930528	18	5	10	9	16	3	8	6	8	20	5	0	0	0
257	930528	22	10	9	29	20	5	5	12	14	33	3	0	0	0
258	930529	2	50	25	36	31	16	17	27	27	70	17	0	0	0
259	930529	6	49	117	184	115	27	81	130	72	289	21	0	0	0
260	930529	10	20	24	19	36	7	16	14	15	.	.	.	.	.
261	930529	14	31	8	36	10	17	5	24	5	48	3	0	0	0
262	930529	18	74	22	69	103	58	18	53	83	167	45	0	0	0
263	930529	22	44	23	48	32	29	17	34	18	80	18	0	0	0
264	930530	2	45	21	115	31	30	12	75	23	132	8	0	0	0
265	930530	6	63	8	77	9	31	5	34	4	63	14	0	0	0
266	930530	10	17	5	14	5	0	2	4	1	7	0	0	0	0
267	930530	14	9	2	2	5	4	1	1	1	7	0	0	0	0
268	930530	18	0	1	3	3	0	1	2	3	5	1	0	0	0
269	930530	22	6	5	4	5	1	3	1	4	9	0	0	0	0
270	930531	2	4	5	5	2	2	3	2	0	3	4	0	0	0
271	930531	6	10	10	9	5	7	7	4	4	19	3	0	0	0
272	930531	10	6	11	5	5	6	3	3	4	10	6	0	0	0
273	930531	14	5	5	4	6	2	1	2	4	9	0	0	0	0
274	930531	18	5	6	5	4	3	4	3	2	9	3	0	0	0
275	930531	22	6	2	6	9	3	0	3	5	4	7	0	0	0
276	930601	2	6	2	7	5	2	2	5	1	5	5	0	0	0
277	930601	6	3	3	6	8	2	3	4	3	9	3	0	0	0
278	930601	10	5	2	6	1	0	1	1	0	0	2	0	0	0

Table A-5. Continued.

AGE	DATE	TIME	ASURF	BSURF	AOBL	BOBL	ASVIA	BSVIA	AOVIA	BOVIA	ST1	ST2	ST3	ST4	HATCH
279	930601	14	2	1	3	4	2	1	1	0	2	2	0	0	0
280	930601	18	1	4	1	4	0	0	1	2	3	0	0	0	0
281	930601	22	4	1	0	1	1	1	0	0	2	0	0	0	0
282	930602	2	1	3	16	7	1	3	10	3	15	2	0	0	0
283	930602	6	2	2	7	3	1	0	2	2	4	1	0	0	0
284	930602	10	2	0	2	0	1	0	2	0	2	1	0	0	0
285	930602	14	4	2	5	9	2	2	4	8	15	3	0	0	0
286	930602	18	5	9	16	11	3	3	4	6	16	2	0	0	0
287	930602	22	5	3	9	5	0	3	4	3	10	0	0	0	0
288	930603	2	11	2	5	1	6	1	1	0	6	2	0	0	0
289	930603	6	5	2	3	2	2	2	3	1	7	1	0	0	0
290	930603	10	2	0	1	1	2	0	1	0	2	1	0	0	0
291	930603	14	2	5	3	7	1	2	1	4	8	0	0	0	0
292	930603	18	1	0	1	1	1	0	1	1	2	1	0	0	0
293	930603	22	1	2	1	0	0	1	1	0	2	0	0	0	0
294	930604	2	3	1	5	1	1	0	2	0	2	1	0	0	0
295	930604	6	1	2	3	0	0	2	2	0	2	2	0	0	0
296	930604	10	2	3	1	1	0	2	0	0	2	0	0	0	0
297	930604	14	9	3	4	4	9	2	4	4	19	0	0	0	0
298	930604	18	7	6	7	4	3	3	2	2	9	1	0	0	0
299	930604	22	4	4	4	7	3	2	3	5	10	3	0	0	0
300	930605	2	6	6	9	1	5	6	7	1	16	3	0	0	0
301	930605	6	1	2	7	2	0	0	5	2	5	2	0	0	0
302	930605	10	0	0	0	0	0	0	0	0	.	.	.	.	.
303	930605	14	0	0	0	1	0	0	0	0	.	.	.	.	.
304	930605	18	1	2	0	0	1	2	0	0	3	0	0	0	0
305	930605	22	0	2	0	1	0	2	0	1	2	1	0	0	0
306	930606	2	2	7	8	2	2	6	4	0	8	4	0	0	0
307	930606	6	12	3	11	6	11	3	7	1	15	7	0	0	0
308	930606	10	6	5	9	9	1	3	6	7	14	0	0	0	0
309	930606	14	1	1	2	1	0	1	1	1	3	0	0	0	0
310	930606	18	5	0	3	0	4	0	1	0	4	1	0	0	0
311	930606	22	1	0	2	4	0	0	1	3	4	0	0	0	0
312	930607	2	5	4	15	4	4	4	12	4	12	12	0	0	0
313	930607	6	6	0	10	1	4	0	5	1	8	2	0	0	0

Table A-5. Continued.

AGE	DATE	TIME	ASURF	BSURF	AOBL	BOBL	ASVIA	BSVIA	AOVIA	BOVIA	ST1	ST2	ST3	ST4	HATCH
314	930607	10	0	1	0	4	0	1	0	0	1	0	0	0	0
315	930607	14	2	1	2	1	1	0	1	1	3	0	0	0	0
316	930607	18	4	2	0	2	0	2	0	2	3	1	0	0	0
317	930607	22	6	0	18	1	3	0	18	0	15	6	0	0	0
318	930608	2	9	4	0	8	6	4	0	8	12	6	0	0	0
319	930608	6	0	1	1	1	0	1	1	0	2	0	0	0	0
320	930608	10	1	0	0	0	0	0	0	0	.	.	.	.	.
321	930608	14	1	1	0	0	1	1	0	0	2	0	0	0	0
322	930608	18	2	2	9	1	1	2	4	0	6	1	0	0	0
323	930608	22	2	1	1	1	0	1	1	1	3	0	0	0	0
324	930609	2	4	0	1	0	4	0	0	0	2	2	0	0	0
325	930609	6	2	0	1	3	2	0	1	1	4	0	0	0	0
326	930609	10	0	0	0	1	0	0	0	1	1	0	0	0	0
327	930609	14	1	2	0	1	1	1	0	0	2	0	0	0	0
328	930609	18	0	0	0	0	.	.	.	.	.	.	.	.	.
329	930609	22	3	2	2	0	2	2	1	0	5	0	0	0	0
330	930610	2	3	2	1	1	1	2	0	1	4	0	0	0	0
331	930610	6	1	0	1	1	0	0	1	0	1	0	0	0	0
332	930610	10	0	0	0	0	.	.	.	.	.	.	.	.	.
333	930610	14	0	0	0	0	.	.	.	.	.	.	.	.	.
334	930610	18	0	1	0	0	0	1	0	0	1	0	0	0	0
335	930610	22	0	1	1	0	0	1	0	0	1	0	0	0	0
336	930611	2	1	1	0	0	0	0	0	0	.	.	.	.	.
337	930611	6	1	0	0	0	0	0	0	0	.	.	.	.	.
338	930611	10	0	0	0	0	.	.	.	.	.	.	.	.	.
339	930611	14	0	0	1	0	0	0	1	0	1	0	0	0	0
340	930611	18	0	0	0	0	.	.	.	.	.	.	.	.	.
341	930611	22	.	.	.	.	.	.	.	.	.	.	.	.	.
342	930612	2	.	.	.	.	.	.	.	.	.	.	.	.	.
343	930612	6	0	0	0	0	.	.	.	.	.	.	.	.	.
344	930612	10	0	0	0	0	.	.	.	.	.	.	.	.	.
345	930612	14	0	0	0	0	.	.	.	.	.	.	.	.	.
346	930612	18	0	0	0	0	.	.	.	.	.	.	.	.	.
347	930612	22	.	.	.	.	.	.	.	.	.	.	.	.	.
348	930613	2	.	.	.	.	.	.	.	.	.	.	.	.	.

Table A-5. Continued.

AGE	DATE	TIME	ASURF	BSURF	AOBL	BOBL	ASVIA	BSVIA	AOVIA	BOVIA	ST1	ST2	ST3	ST4	HATCH
349	930613	6	0	0	0	0	.	.	.	.	.	.	.	.	.
350	930613	10	0	0	0	0	.	.	.	.	.	.	.	.	.
351	930613	14	0	0	0	0	.	.	.	.	.	.	.	.	.
352	930613	18	0	0	1	0	0	0	1	0	1	0	0	0	0
353	930613	22	.	.	.	.	.	.	.	.	.	.	.	.	.
354	930614	2	.	.	.	.	.	.	.	.	.	.	.	.	.
355	930614	6	0	0	0	0	.	.	.	.	.	.	.	.	.
356	930614	10	0	0	0	0	.	.	.	.	.	.	.	.	.
357	930614	14	0	0	0	0	.	.	.	.	.	.	.	.	.
358	930614	18	0	0	0	0	.	.	.	.	.	.	.	.	.
359	930614	22	.	.	.	.	.	.	.	.	.	.	.	.	.
360	930615	2	.	.	.	.	.	.	.	.	.	.	.	.	.
361	930615	6	0	0	0	0	.	.	.	.	.	.	.	.	.
362	930615	10	0	0	0	0	.	.	.	.	.	.	.	.	.
363	930615	14	0	0	0	0	.	.	.	.	.	.	.	.	.
364	930615	18	0	0	0	0	.	.	.	.	.	.	.	.	.
365	930615	22	0	0	0	0	.	.	.	.	.	.	.	.	.
366	930616	2	0	0	0	0	.	.	.	.	.	.	.	.	.
367	930616	6	0	0	0	0	.	.	.	.	.	.	.	.	.
368	930616	10	0	0	0	0	.	.	.	.	.	.	.	.	.

Table A-6. Surface net egg collections, Barnhill's Landing, Roanoke River, North Carolina, in 1993.

Day	Date	0200	0600	1000	1400	1800	2200	Total
1	930416	.	.	.	.	0	.	0
2	930417	.	0	0	0	0	.	0
3	930418	.	0	0	0	0	.	0
4	930419	.	0	0	0	0	.	0
5	930420	.	0	0	0	0	.	0
6	930421	.	0	0	0	1	.	1
7	930422	.	0	0	0	0	.	0
8	930423	.	0	0	0	0	.	0
9	930424	.	0	0	0	0	.	0
10	930425	.	0	0	0	0	.	0
11	930426	.	.	0	0	0	.	0
12	930427	.	0	0	0	0	.	0
13	930428	.	0	0	0	0	.	0
14	930429	.	0	1	0	0	.	1
15	930430	.	0	0	0	0	.	0
16	930501	.	0	0	0	0	.	0
17	930502	.	0	0	1	0	.	1
18	930503	.	0	0	0	0	0	0
19	930504	0	1	0	0	0	0	1
20	930505	0	0	0	0	0	0	0
21	930506	.	0	0	0	0	0	0
22	930507	0	0	0	0	0	2	2
23	930508	0	0	4	1	0	0	5
24	930509	0	1	5	2	1	0	9
25	930510	2	0	2	0	0	0	4
26	930511	2	2	3	1	0	1	9
27	930512	1	4	2	2	7	9	25
28	930513	266	1183	12224	36009	5837	3346	58865
29	930514	1404	767	577	255	120	20	3143
30	930515	8	9	9	8	18	8	60
31	930516	14	35	14	16	29	222	330
32	930517	4939	8239	2390	384	255	517	16724
33	930518	3507	2816	251	266	78	65	6983
34	930519	97	63	106	57	29	34	386
35	930520	292	409	245	103	30	55	1134
36	930521	59	120	91	59	16	31	376
37	930522	35	172	178	91	18	33	527
38	930523	112	2004	2563	339	251	279	5548
39	930524	1102	1516	438	98	8	126	3288
40	930525	66	1587	186	117	55	85	2096
41	930526	212	433	649	225	60	96	1675
42	930527	58	80	38	11	18	5	210
43	930528	19	74	61	21	15	19	209
44	930529	75	166	44	39	96	67	487
45	930530	66	71	22	11	1	11	182

Table A-6 Continued.

Day	Date	0200	0600	1000	1400	1800	2200	Total
46	930531	9	20	17	10	11	8	75
47	930601	8	6	7	3	5	5	34
48	930602	4	4	2	6	14	8	38
49	930603	13	7	2	7	1	3	33
50	930604	4	3	5	12	13	8	45
51	930605	12	3	0	0	3	2	20
52	930606	9	15	11	2	5	1	43
53	930607	9	6	1	3	6	6	31
54	930608	13	1	1	2	4	3	24
55	930609	4	2	0	3	0	5	14
56	930610	5	1	0	0	1	1	8
57	930611	2	1	0	0	0	.	3
58	930612	.	0	0	0	0	.	0
59	930613	.	0	0	0	0	.	0
60	930614	.	0	0	0	0	.	0
61	930615	.	0	0	0	0	0	0
62	930616	0	0	0	.	.	.	0

Table A-7. Raw data and egg production estimates by trip for striped bass egg samples taken at Barnhill's Landing, Roanoke River, North Carolina, in 1993. Discharge and volume calculations based on USGS hourly flow data recorded upstream six hours previous to sample collection.

Date	Time	Egg count Surface (rep A)	Egg count Surface (rep B)	River stage (feet)	Cross-section (sq.ft.)	Surface velocity (ft/sec)	Discharge Flowl6 (cfs)	Egg production Surfxst	Egg production Surfvl6
930416	6	.	.	.	.	.	34,071	.	.
	10	.	.	.	.	.	34,841	.	.
	14	.	.	.	.	.	35,258	.	.
	18	0	0	30.0	12,827	.	35,618	0	.
	22	.	.	.	.	.	35,139	.	.
930417	2	.	.	.	.	.	35,258	.	.
	6	0	0	30.0	12,827	.	36,283	0	.
	10	0	0	30.0	12,827	.	35,378	0	.
	14	0	0	30.0	12,827	.	35,139	0	.
	18	0	0	30.0	12,827	.	35,079	0	.
	22	.	.	.	.	.	35,139	.	.
930418	2	.	.	.	.	.	35,079	.	.
	6	0	0	30.0	12,827	.	35,079	0	.
	10	0	0	30.0	12,827	.	35,079	0	.
	14	0	0	30.0	12,827	.	35,079	0	.
	18	0	0	29.9	12,781	.	35,318	0	.
	22	.	.	.	.	.	35,378	.	.
930419	2	.	.	.	.	.	35,378	.	.
	6	0	0	29.9	12,781	.	35,258	0	.
	10	0	0	29.9	12,781	.	35,258	0	.
	14	0	0	29.9	12,781	.	35,139	0	.
	18	0	0	29.9	12,781	4.1	35,139	0	0
	22	.	.	.	.	.	35,139	.	.

Table A-7 (continued).

Date	Time	Egg count Surface (rep A)	Egg count Surface (rep B)	River stage (feet)	Cross-section (sq.ft.)	Surface velocity (ft/sec)	Discharge Flowl6 (cfs)	Egg production Surfxst	Egg production Surfvl6
930420	2	.	.	.	.	.	35,199	.	.
	6	0	0	29.9	12,781	3.6	35,139	0	0
	10	0	0	29.9	12,781	3.7	35,199	0	0
	14	0	0	29.9	12,781	4.4	35,199	0	0
	18	0	0	29.9	12,781	4.8	35,199	0	0
	22	.	.	.	.	.	35,199	.	.
930421	2	.	.	.	.	.	35,199	.	.
	6	0	0	29.9	12,781	3.9	35,199	0	0
	10	0	0	29.9	12,781	3.7	35,079	0	0
	14	0	0	29.9	12,781	3.8	35,139	0	0
	18	1	0	29.9	12,781	4.0	35,079	11,411	8,716
	22	.	.	.	.	.	35,139	.	.
930422	2	.	.	.	.	.	35,139	.	.
	6	0	0	29.9	12,781	4.7	35,258	0	0
	10	0	0	29.9	12,781	4.5	35,199	0	0
	14	0	0	29.9	12,781	3.9	35,258	0	0
	18	0	0	29.9	12,781	3.8	35,199	0	0
	22	.	.	29.9	12,781	.	35,199	.	.
930423	2	.	.	29.9	12,781	.	35,258	.	.
	6	0	0	29.9	12,781	3.7	35,258	0	0
	10	0	0	29.9	12,781	3.9	34,960	0	0
	14	0	0	29.9	12,781	4.1	34,900	0	0
	18	0	0	29.9	12,781	4.4	35,019	0	0
	22	.	.	29.9	12,781	.	34,841	.	.

Table A-7 (continued).

Date	Time	Egg count Surface (rep A)	Egg count Surface (rep B)	River stage (feet)	Cross-section (sq.ft.)	Surface velocity (ft/sec)	Discharge Flowl6 (cfs)	Egg production Surfxst	Egg production Surfvl6
930424	2	.	.	29.9	12,781	.	34,544	.	.
	6	0	0	29.7	12,689	4.5	33,660	0	0
	10	0	0	29.3	12,505	3.5	29,250	0	0
	14	0	0	29.2	12,459	4.2	25,239	0	0
	18	0	0	28.7	12,230	3.9	25,185	0	0
	22	.	.	28.5	12,138	.	25,023	.	.
930425	2	.	.	28.5	12,138	.	24,969	.	.
	6	0	0	28.0	11,909	4.3	24,862	0	0
	10	0	0	27.8	11,817	3.7	24,862	0	0
	14	0	0	27.7	11,771	4.3	25,293	0	0
	18	0	0	27.5	11,679	3.6	25,077	0	0
	22	.	.	27.5	11,679	.	25,077	.	.
930426	2	.	.	27.5	11,679	.	25,185	.	.
	6	.	.	27.2	11,541	3.8	25,239	.	.
	10	0	0	27.1	11,496	.	25,185	0	.
	14	0	0	27.1	11,496	4.2	25,185	0	0
	18	0	0	26.9	11,404	4.1	25,347	0	0
	22	.	.	26.9	11,404	.	25,347	.	.
930427	2	.	.	26.9	11,404	.	24,969	.	.
	6	0	0	26.7	11,312	3.8	24,862	0	0
	10	0	0	26.7	11,312	3.5	24,754	0	0
	14	0	0	26.6	11,266	3.8	24,701	0	0
	18	0	0	26.6	11,266	3.9	24,808	0	0
	22	.	.	26.6	11,266	.	24,915	.	.
930428	2	.	.	26.5	11,220	.	25,347	.	.
	6	0	0	26.5	11,220	4.0	25,456	0	0
	10	0	0	26.5	11,220	3.9	25,023	0	0

Table A-7 (continued).

Date	Time	Egg count Surface (rep A)	Egg count Surface (rep B)	River stage (feet)	Cross-section (sq.ft.)	Surface velocity (ft/sec)	Discharge Flowl6 (cfs)	Egg production Surfxst	Egg production Surfvl6
	14	0	0	26.4	11,174	3.5	25,023	0	0
	18	0	0	26.4	11,174	3.8	25,131	0	0
	22	.	.	26.4	11,174	.	25,185	.	.
930429	2	.	.	26.4	11,174	.	24,754	.	.
	6	0	0	26.4	11,174	3.9	20,957	0	0
	10	1	0	26.3	11,128	4.0	25,185	9,936	6,321
	14	0	0	26.2	11,082	3.8	25,185	0	0
	18	0	0	26.2	11,082	3.9	25,347	0	0
	22	.	.	26.3	11,128	.	25,510	.	.
930430	2	.	.	26.3	11,128	.	25,456	.	.
	6	0	0	26.3	11,128	3.7	25,401	0	0
	10	0	0	26.2	11,082	3.8	25,185	0	0
	14	0	0	25.7	10,853	3.6	21,550	0	0
	18	0	0	25.4	10,715	4.1	19,749	0	0
	22	.	.	25.0	10,532	.	19,987	.	.
930501	2	.	.	25.0	10,532	.	20,083	.	.
	6	0	0	24.8	10,440	3.7	20,083	0	0
	10	0	0	24.8	10,440	3.5	19,940	0	0
	14	0	0	24.5	10,302	3.6	19,844	0	0
	18	0	0	24.3	10,210	3.5	20,035	0	0
	22	.	.	24.3	10,210	.	20,180	.	.
930502	2	.	.	24.3	10,210	.	20,180	.	.
	6	0	0	24.0	10,073	.	20,180	0	.
	10	0	0	24.0	10,073	.	20,035	0	.
	14	0	1	23.9	10,027	3.5	19,940	8,952	5,588
	18	0	0	23.9	10,027	3.7	19,940	0	0
	22	.	.	23.8	9,981	.	20,035	.	.

Table A-7 (continued).

Date	Time	Egg count Surface (rep A)	Egg count Surface (rep B)	River stage (feet)	Cross-section (sq.ft.)	Surface velocity (ft/sec)	Discharge Flowl6 (cfs)	Egg production Surfxst	Egg production Surfvl6
930503	2	.	.	23.8	9,981	.	20,131	.	.
	6	0	0	23.7	9,935	3.4	20,131	0	0
	10	0	0	23.7	9,935	3.7	20,035	0	0
	14	0	0	23.6	9,889	3.4	19,940	0	0
	18	0	0	23.6	9,889	3.5	19,464	0	0
	22	0	0	23.6	9,889	.	20,131	0	.
930504	2	0	0	23.6	9,889	.	20,131	0	.
	6	1	0	23.5	9,843	3.5	20,131	8,788	5,712
	10	0	0	23.5	9,843	3.4	19,987	0	0
	14	0	0	23.5	9,843	3.1	19,987	0	0
	18	0	0	23.5	9,843	3.3	20,083	0	0
	22	0	0	23.5	9,843	.	20,131	0	.
930505	2	0	0	23.5	9,843	.	20,228	0	.
	6	0	0	23.5	9,843	3.3	20,276	0	0
	10	0	0	23.3	9,751	3.2	20,180	0	0
	14	0	0	23.3	9,751	3.3	20,131	0	0
	18	0	0	23.3	9,751	3.4	19,844	0	0
	22	0	0	23.5	9,843	.	20,228	0	.
930506	2	.	.	23.5	9,843	.	20,276	.	.
	6	0	0	23.5	9,843	3.3	20,276	0	0
	10	0	0	23.4	9,797	3.4	20,180	0	0
	14	0	0	23.4	9,797	3.4	20,035	0	0
	18	0	0	23.4	9,797	3.6	20,131	0	0
	22	0	0	23.4	9,797	.	20,131	0	.
930507	2	0	0	23.4	9,797	3.4	20,180	0	0
	6	0	0	23.4	9,797	3.4	20,228	0	0
	10	0	0	23.4	9,797	3.2	20,131	0	0

Table A-7 (continued).

Date	Time	Egg count Surface (rep A)	Egg count Surface (rep B)	River stage (feet)	Cross-section (sq.ft.)	Surface velocity (ft/sec)	Discharge Flowl6 (cfs)	Egg production Surfxst	Egg production Surfvl6
	14	0	0	23.3	9,751	3.4	19,987	0	0
	18	0	0	23.0	9,614	3.2	19,987	0	0
	22	1	1	23.3	9,751	3.3	19,987	17,413	11,909
930508	2	0	0	23.3	9,751	3.4	20,131	0	0
	6	0	0	23.3	9,751	.	20,180	0	.
	10	2	2	23.3	9,751	2.9	20,131	34,826	27,266
	14	1	0	23.3	9,751	3.2	20,131	8,707	6,270
	18	0	0	23.3	9,751	3.3	20,228	0	0
	22	0	0	23.3	9,751	3.2	20,372	0	0
930509	2	0	0	23.3	9,751	3.3	20,228	0	0
	6	0	1	23.3	9,751	.	20,276	8,707	.
	10	1	4	23.3	9,751	.	20,083	43,533	.
	14	2	0	23.3	9,751	.	19,987	17,413	.
	18	0	1	23.3	9,751	3.3	19,987	8,707	5,943
	22	0	0	23.3	9,751	.	20,083	0	.
930510	2	1	1	23.3	9,751	3.3	20,180	17,413	12,021
	6	0	0	23.3	9,751	3.2	20,228	0	0
	10	0	2	23.0	9,614	3.1	19,464	17,167	12,365
	14	0	0	22.8	9,522	3.2	18,394	0	0
	18	0	0	22.7	9,476	3.2	18,348	0	0
	22	0	0	22.6	9,430	3.5	18,348	0	0
930511	2	2	0	22.5	9,384	3.3	18,348	16,757	11,041
	6	2	0	22.5	9,384	3.3	18,348	16,757	10,932
	10	3	0	22.4	9,338	3.5	18,302	25,013	15,516
	14	1	0	22.1	9,201	3.0	18,211	8,215	6,085
	18	0	0	22.1	9,201	2.7	14,535	0	0
	22	1	0	.	.	2.8	11,444	.	4,033

Table A-7 (continued).

Date	Time	Egg count Surface (rep A)	Egg count Surface (rep B)	River stage (feet)	Cross-section (sq.ft.)	Surface velocity (ft/sec)	Discharge Flowl6 (cfs)	Egg production Surfxst	Egg production Surfvl6
930512	2	1	0	.	.	2.3	9,729	.	4,207
	6	1	3	14.8	6,042	2.3	9,207	21,579	16,183
	10	0	2	14.5	5,926	2.2	9,142	10,582	8,432
	14	0	2	15.9	6,475	2.0	9,207	11,563	9,298
	18	3	4	15.4	6,278	2.6	9,271	39,236	24,809
	22	6	3	15.0	6,120	2.2	9,110	49,178	36,566
930513	2	127	139	14.8	6,042	2.5	9,207	1,435,022	980,807
	6	785	398	14.5	5,926	2.5	9,239	6,259,020	4,362,340
	10	7,245	4,979	14.3	5,848	2.4	9,304	63,826,733	46,284,899
	14	16,478	19,531	14.1	5,770	2.3	9,598	85,520,267	149,937,040
	18	3,002	2,835	13.8	5,656	2.6	9,304	29,474,761	20,945,389
	22	1,214	2,132	13.6	5,580	2.4	9,271	16,669,351	12,938,472
930514	2	617	787	13.5	5,542	2.4	9,304	6,946,916	5,330,448
	6	482	285	13.3	5,466	2.6	9,271	3,743,096	2,711,548
	10	223	354	13.0	5,352	2.3	9,239	2,757,184	2,339,544
	14	117	138	13.0	5,352	3.2	9,239	1,218,513	737,459
	18	66	54	12.9	5,315	2.4	9,239	569,464	461,128
	22	11	9	12.7	5,241	2.5	9,174	93,595	72,955
930515	2	4	4	12.7	5,241	2.4	9,239	37,438	30,407
	6	5	4	12.7	5,241	2.3	9,239	42,118	36,078
	10	4	5	12.6	5,204	2.6	9,239	41,821	31,175
	14	6	2	12.5	5,168	2.4	9,239	36,911	29,947
	18	10	8	13.5	5,542	2.3	9,239	89,063	71,490
	22	7	1	13.5	5,542	2.4	9,271	39,584	30,092
930516	2	11	3	13.5	5,542	2.3	9,239	69,271	55,667
	6	26	9	12.3	5,094	2.6	9,239	159,178	121,570
	10	7	7	12.3	5,094	2.5	9,239	63,671	50,453

Table A-7 (continued).

Date	Time	Egg count Surface (rep A)	Egg count Surface (rep B)	River stage (feet)	Cross-section (sq.ft.)	Surface velocity (ft/sec)	Discharge Flowl6 (cfs)	Egg production Surfxst	Egg production Surfvl6
	14	7	9	12.3	5,094	2.5	9,239	72,767	59,227
	18	14	15	12.2	5,057	2.6	9,271	130,938	102,847
	22	172	50	12.3	5,094	2.4	9,271	1,009,644	858,914
930517	2	1,788	3,151	12.1	5,020	2.4	9,239	22,137,300	18,857,350
	6	4,928	3,311	12.1	5,020	2.3	9,239	36,928,369	32,151,174
	10	1,801	589	12.0	4,983	2.4	9,239	10,633,578	9,123,893
	14	178	206	11.7	4,875	2.1	8,540	1,671,394	1,578,326
	18	142	113	11.7	4,875	2.4	8,478	1,109,910	905,454
	22	263	254	11.9	4,947	2.4	9,271	2,283,570	1,942,884
930518	2	1,662	1,845	11.9	4,947	2.4	9,304	15,490,291	13,332,723
	6	1,128	1,688	12.0	4,983	2.5	9,271	12,528,935	10,266,003
	10	125	126	12.0	4,983	2.5	9,271	1,116,748	932,013
	14	143	123	12.0	4,983	2.6	9,271	1,183,486	930,988
	18	39	39	12.0	4,983	2.4	9,271	347,037	296,462
	22	28	37	12.0	4,983	2.5	9,304	289,198	241,055
930519	2	67	30	12.0	4,983	2.5	9,304	431,572	361,443
	6	39	24	12.0	4,983	2.5	9,271	280,299	231,965
	10	70	36	12.0	4,983	2.8	9,304	471,615	348,782
	14	30	27	12.0	4,983	2.4	9,304	253,604	223,713
	18	15	14	12.1	5,020	2.5	9,304	129,982	105,681
	22	10	24	12.1	5,020	2.6	9,336	152,393	122,903
930520	2	152	140	12.0	4,983	2.4	9,336	1,299,165	1,118,382
	6	254	155	12.3	5,094	2.6	9,304	1,860,110	1,443,709
	10	114	131	12.1	5,020	2.3	9,336	1,098,125	979,844
	14	56	47	12.1	5,020	2.4	9,304	461,661	397,488
	18	18	12	12.1	5,020	2.4	9,336	134,464	116,739
	22	24	31	12.1	5,020	2.6	9,304	246,518	198,832

Table A-7 (continued).

Date	Time	Egg count Surface (rep A)	Egg count Surface (rep B)	River stage (feet)	Cross-section (sq.ft.)	Surface velocity (ft/sec)	Discharge Flowl6 (cfs)	Egg production Surfxst	Egg production Surfvl6
930521	2	30	29	12.1	5,020	2.6	9,304	264,446	207,480
	6	69	51	12.1	5,020	2.3	9,304	537,857	483,868
	10	53	38	12.1	5,020	2.4	9,304	407,875	344,562
	14	44	15	12.0	4,983	2.5	9,271	262,503	219,719
	18	5	11	12.0	4,983	2.4	9,271	71,187	61,379
	22	11	20	12.0	4,983	2.4	9,271	137,925	117,761
930522	2	11	24	12.0	4,983	2.3	9,271	155,722	139,496
	6	126	46	12.0	4,983	2.7	9,336	765,262	599,706
	10	97	81	12.0	4,983	2.4	9,336	791,957	676,340
	14	60	31	11.6	4,839	2.5	9,110	393,152	322,531
	18	11	7	11.4	4,767	1.8	6,390	76,606	62,141
	22	16	17	11.2	4,695	1.9	6,308	138,320	107,440
930523	2	43	69	10.7	4,520	2.0	8,202	451,950	448,157
	6	1,048	956	11.1	4,658	2.2	9,271	8,335,207	8,220,871
	10	1,667	896	11.3	4,731	2.2	9,271	10,825,241	10,597,757
	14	289	50	11.5	4,803	2.6	9,271	1,453,674	1,204,530
	18	137	114	11.7	4,875	2.3	9,271	1,092,500	992,482
	22	174	105	11.7	4,875	2.5	9,271	1,214,372	1,009,247
930524	2	631	471	11.8	4,911	2.4	9,271	4,831,974	4,176,018
	6	1,088	428	11.8	4,911	2.4	9,304	6,647,253	5,948,327
	10	327	111	11.8	4,911	2.4	9,304	1,920,512	1,675,808
	14	72	26	11.8	4,911	2.3	9,304	429,704	390,957
	18	3	5	11.9	4,947	2.2	9,271	35,336	33,419
	22	37	89	11.9	4,947	2.2	9,304	556,537	524,604
930525	2	43	23	11.9	4,947	2.5	9,271	291,520	239,364
	6	996	591	11.9	4,947	2.6	9,304	7,009,721	5,685,336
	10	120	66	11.9	4,947	2.7	9,304	821,555	642,052

Table A-7 (continued).

Date	Time	Egg count Surface (rep A)	Egg count Surface (rep B)	River stage (feet)	Cross-section (sq.ft.)	Surface velocity (ft/sec)	Discharge Flow16 (cfs)	Egg production Surfxst	Egg production Surfv16
	14	56	61	11.9	4,947	2.5	9,304	516,785	434,471
	18	41	14	11.9	4,947	2.6	9,304	242,933	196,784
	22	44	41	11.9	4,947	2.6	9,304	375,442	300,528
930526	2	128	84	11.9	4,947	2.6	9,239	936,396	745,259
	6	215	218	11.9	4,947	2.5	9,271	1,912,545	1,566,323
	10	529	120	11.9	4,947	2.5	9,271	2,866,609	2,392,752
	14	192	33	11.9	4,947	2.3	9,304	993,817	897,859
	18	33	27	11.9	4,947	2.2	9,336	265,018	255,489
	22	60	36	11.9	4,947	2.6	9,304	424,029	340,318
930527	2	26	32	11.9	4,947	2.4	9,304	256,184	219,729
	6	54	26	11.9	4,947	2.4	9,304	353,357	308,348
	10	28	10	11.9	4,947	2.2	9,271	167,845	157,498
	14	7	4	11.9	4,947	2.5	9,304	48,587	41,262
	18	4	14	11.8	4,911	2.2	9,014	78,925	71,861
	22	2	3	11.8	4,911	2.3	9,533	21,924	20,440
930528	2	7	12	11.8	4,911	2.5	9,142	83,310	68,747
	6	52	22	11.7	4,875	2.3	9,174	322,092	291,513
	10	27	34	11.7	4,875	2.6	9,142	265,508	215,635
	14	10	11	11.7	4,875	2.7	9,271	91,404	72,325
	18	5	10	11.8	4,911	2.4	9,142	65,771	57,703
	22	10	9	11.6	4,839	2.5	8,950	82,087	66,777
930529	2	50	25	11.5	4,803	2.3	8,918	321,609	290,540
	6	49	117	11.5	4,803	2.5	8,918	711,829	578,940
	10	20	24	11.5	4,803	2.4	8,918	188,677	163,340
	14	31	8	11.5	4,803	2.8	8,950	167,237	125,422
	18	74	22	11.5	4,803	2.4	8,950	411,660	361,532
	22	44	23	11.5	4,803	2.4	8,950	287,304	248,107

Table A-7 (continued).

Date	Time	Egg count Surface (rep A)	Egg count Surface (rep B)	River stage (feet)	Cross-section (sq.ft.)	Surface velocity (ft/sec)	Discharge Flowl6 (cfs)	Egg production Surfxst	Egg production Surfvl6
930530	2	45	21	11.3	4,731	2.4	7,026	278,762	193,512
	6	63	8	11.3	4,731	2.4	8,950	299,880	266,752
	10	17	5	11.4	4,767	2.5	8,918	93,630	77,226
	14	9	2	11.4	4,767	2.3	8,950	46,815	41,986
	18	0	1	11.4	4,767	2.7	8,982	4,256	3,332
	22	6	5	11.5	4,803	2.6	9,014	47,169	38,076
930531	2	4	5	11.5	4,803	2.5	8,950	38,593	32,557
	6	10	10	11.5	4,803	2.4	8,950	85,762	73,072
	10	6	11	11.5	4,803	2.3	8,950	72,898	66,482
	14	5	5	11.5	4,803	2.5	8,982	42,881	36,260
	18	5	6	11.5	4,803	2.4	9,110	47,169	42,015
	22	6	2	11.5	4,803	2.5	8,982	34,305	28,283
930601	2	6	2	11.5	4,803	2.6	9,014	34,305	27,621
	6	3	3	11.5	4,803	2.4	8,982	25,729	22,188
	10	5	2	11.5	4,803	2.2	8,982	30,017	27,725
	14	2	1	11.5	4,803	2.6	8,982	12,864	10,432
	18	1	4	11.5	4,803	2.5	8,982	21,441	17,721
	22	4	1	11.5	4,803	2.5	9,014	21,441	18,195
930602	2	1	3	11.7	4,875	2.4	9,014	17,410	14,646
	6	2	2	11.5	4,803	2.4	9,014	17,152	14,719
	10	2	0	11.5	4,803	2.5	9,014	8,576	7,052
	14	4	2	11.5	4,803	2.2	8,982	25,729	23,953
	18	5	9	11.5	4,803	2.4	9,014	60,034	52,342
	22	5	3	11.5	4,803	2.4	8,982	34,305	29,560
930603	2	11	2	11.5	4,803	2.3	8,982	55,746	49,664
	6	5	2	11.5	4,803	2.6	8,982	30,017	23,543
	10	2	0	11.5	4,803	2.3	8,950	8,576	7,659

Table A-7 (continued).

Date	Time	Egg count Surface (rep A)	Egg count Surface (rep B)	River stage (feet)	Cross-section (sq.ft.)	Surface velocity (ft/sec)	Discharge Flowl6 (cfs)	Egg production Surfxst	Egg production Surfvl6
	14	2	5	11.5	4,803	2.3	8,918	30,017	26,426
	18	1	0	11.5	4,803	2.5	8,918	4,288	3,591
	22	1	2	11.5	4,803	2.4	8,918	12,864	11,258
930604	2	3	1	11.4	4,767	2.5	8,918	17,024	14,365
	6	1	2	11.5	4,803	2.5	8,918	12,864	10,692
	10	2	3	11.4	4,767	2.5	8,918	21,279	17,865
	14	9	3	11.4	4,767	2.4	8,918	51,071	45,144
	18	7	6	11.4	4,767	2.4	8,950	55,327	47,439
	22	4	4	11.4	4,767	2.6	8,982	34,047	27,176
930605	2	6	6	11.5	4,803	2.5	9,271	51,457	43,787
	6	1	2	11.5	4,803	2.4	9,174	12,864	11,186
	10	0	0	12.0	4,983	2.4	8,918	0	0
	14	0	0	12.0	4,983	2.8	8,982	0	0
	18	1	2	12.0	4,983	2.7	8,918	13,348	9,668
	22	0	2	12.0	4,983	2.6	8,886	8,898	6,771
930606	2	2	7	11.9	4,947	2.5	8,854	39,753	31,769
	6	12	3	12.0	4,983	2.5	8,823	66,738	53,492
	10	6	5	12.0	4,983	2.5	8,886	48,941	38,138
	14	1	1	12.0	4,983	2.5	8,886	8,898	7,049
	18	5	0	11.9	4,947	2.5	8,854	22,085	17,670
	22	1	0	11.9	4,947	2.4	8,854	4,417	3,682
930607	2	5	4	11.8	4,911	2.4	8,886	39,463	32,486
	6	6	0	11.8	4,911	2.6	8,854	26,308	20,590
	10	0	1	11.8	4,911	2.5	8,886	4,385	3,547
	14	2	1	11.7	4,875	2.5	8,854	13,058	10,670
	18	4	2	11.7	4,875	2.5	8,854	26,116	21,286
	22	6	0	11.7	4,875	2.4	8,854	26,116	21,609

Table A-7 (continued).

Date	Time	Egg count Surface (rep A)	Egg count Surface (rep B)	River stage (feet)	Cross-section (sq.ft.)	Surface velocity (ft/sec)	Discharge Flowl6 (cfs)	Egg production Surfxst	Egg production Surfvl6
930608	2	9	4	11.7	4,875	2.4	8,886	56,584	47,681
	6	0	1	11.7	4,875	2.5	8,854	4,353	3,570
	10	1	0	11.6	4,839	2.4	8,854	4,320	3,599
	14	1	1	11.7	4,875	2.5	8,886	8,705	7,147
	18	2	2	11.6	4,839	2.4	8,886	17,281	14,446
	22	2	1	11.6	4,839	2.3	8,886	12,961	11,615
930609	2	4	0	11.7	4,875	2.3	8,854	17,410	15,332
	6	2	0	11.6	4,839	2.4	8,854	8,641	7,295
	10	0	0	11.7	4,875	2.3	8,886	0	0
	14	1	2	11.5	4,803	2.3	8,854	12,864	11,646
	18	0	0	11.5	4,803	2.3	8,854	0	0
	22	3	2	11.5	4,803	2.4	8,854	21,441	18,475
930610	2	3	2	11.5	4,803	2.4	8,823	21,441	18,119
	6	1	0	11.5	4,803	2.4	8,791	4,288	3,575
	10	0	0	11.5	4,803	2.4	8,823	0	0
	14	0	0	11.5	4,803	2.5	8,823	0	0
	18	0	1	11.5	4,803	2.4	8,823	4,288	3,699
	22	0	1	11.5	4,803	2.6	8,854	4,288	3,316
930611	2	1	1	11.5	4,803	2.3	8,854	8,576	7,550
	6	1	0	11.5	4,803	2.5	8,854	4,288	3,472
	10	0	0	11.5	4,803	2.3	8,886	0	0
	14	0	0	11.4	4,767	2.6	8,854	0	0
	18	0	0	11.5	4,803	2.4	8,823	0	0
	22	.	.	.	.	.	8,823	.	.
930612	2	.	.	.	.	.	8,823	.	.
	6	0	0	11.4	4,767	2.5	8,823	0	0
	10	0	0	11.4	4,767	2.5	8,823	0	0

APPENDIX B

Table B-1. Description of trawl and beach seine sampling stations in Albemarle Sound used by the N.C. Division of Marine Fisheries. See Figure 3 for locations.

Code	DMF station number	Station name	Description
Hassler trawls for YOY striped bass (JAI)			
BPT	139	Black Walnut Point	Hassler station #1; western Alb. Sound south of Chowan River bridge
CPC	153	Cape Colony	Hassler station #2; north shore of western Alb. Sound near Edenton Bay; west of NC power lines
BKH	149	Brickhouse Point	Hassler station #3; north shore of western Alb. Sound between power lines and Hwy 32 bridge
NIB	137	Nixon's Beach	Hassler station #4; north shore of western Alb. Sound east of Hwy 32 bridge (east of Sandy Pt.)
GOB	150	George's Beach	Hassler station #5; south shore of western Alb. Sound east of Hwy 32 bridge
BTB	151	Bateman's Beach	Hassler station #6; south shore of western Alb. Sound between power lines and Hwy 32 bridge
ALB	152	Albemarle Beach	Hassler station #7; south shore of western Alb. Sound west of NC power lines
Eastern Sound trawl survey (EST) for striped bass			
NLR	28	Little River	mouth of Little River; north shore of eastern Alb. Sound
BFC	134	off Big Flatty Creek	north shore of central Alb. Sound off-shore from Frog Island Seafood
LOP	142	Laurel Point	south shore of central Alb. Sound west of Bull Bay off light (inshore of light tower)
HIS	160	off Holiday Island	north shore of central Alb. Sound east of Yeopim River mouth
BUB	143	Bull Bay	south shore of central Alb. Sound off west side of Scuppernong River mouth

Table B-1. Continued.

Code	DMF station number	Station name	Description
Eastern Sound trawl survey (EST) for striped bass (continued)			
DPI	144	off Dewey's Pier	south shore of central Alb. Sound west of Ship Pt. (near shore)
PAA	154	Mid-sound	Middle of eastern Alb. Sound between Pasquotank and Alligator rivers mouths
BAT	155	off Barge (bombing) target	south shore of central Alb. Sound west of Ship Pt. (offshore)
NAR	156	Alligator River	western side of Alligator River mouth; south shore of eastern Alb. Sound
HAP	157	Harvey Point	north shore of central Alb. Sound in the mouth of Perquimans River
NPR		Pasquotank River (mouth)	mouth of Pasquotank River on north shore of eastern Alb. Sound
PTR	159	Pasquotank River - Coast Guard Air Station	in Pasquotank River near the Coast Guard Air Station; north shore of eastern Alb. Sound
Juvenile alosid beach seine survey (ALO)			
CWR	46S	Chowan River Bridge	directly south of Chowan River bridge; north shore of western Alb. Sound
NOG	47S	Sheep's Landing Rd. (Mount Gould)	west side of Chowan River below Colerain
TUB	48S	Tuscaroara Beach	western shore of Chowan River below Winton
ARB	56S	Arrowhead Beach	eastern shore of Chowan River at Arrowhead State Park
BAB	128S	Batchelor Bay	western Alb. Sound between Cashie River mouth and Black Walnut Creek
SOV	130S	Soundview	south shore of western Alb. Sound just east of Hwy 32 bridge
SAP	127S	Sandy Point	north shore of western Alb. Sound just east of Hwy 32 bridge

Table B-1. Continued.

Code	DMF station number	Station name	Description
Juvenile alosid beach seine survey (ALO) (continued)			
HAP	126S	Harvey Point	west of Perquimans River, north shore of central Alb. Sound
SCR	84S	Scuppernong River	eastern shore of Scuppernong River, south shore of central Alb. Sound
COB	85S	Colonial Beach	mouth of Scuppernong River, south shore of central Alb. Sound (Bull Bay)
YOB	39S	Yeopim River	near mouth of Yeopim River north of Holiday Island, north shore of central Alb. Sound
Exploratory beach seine survey (EXP) for striped bass			
BAB	128S	Batchelor Bay	west shore of western Alb. Sound between Terrapin Pt. and Avoca Farm
CWR	46S	Chowan River Bridge	same as Alosid seines
		Country Club Drive: Swim Beach	north shore of central Alb. Sound, east of Edenton Bay, Cape Colony, and the old Bayliner plant
BPT	139S	Black Walnut Point	Point below mouth of Salmon Creek, north of Black Walnut Creek
BAF	162S	Batchelor Bay @ Avoca Farm	north side of Batchelor Bay along south shore of Black Walnut Creek
ALB	152S	Albemarle Beach	south side of western Alb. Sound east of Swan Bay and west of Mackey's Creek
WOM	129S	West of Mackey's Creek	south shore of western Alb. Sound west of NC power lines
CPC	153S	Albemarle Sound at Cape Colony	north shore of western Alb. Sound west of NC power lines
EDT	49S	Edenton Bay	east side of Edenton Bay mouth, north shore of western Alb. Sound

Table B-1. Continued.

Code	DMF station number	Station name	Description
Exploratory beach seine survey (EXP) for striped bass (continued)			
OBP	163S	Albemarle Sound off Old Bayliner Plant	north shore of western Alb. Sound near the Union Camp pier and east of the power lines off Horniblow Pt.

Appendix Table B-2. Individual data for young-of-year striped bass collected by trawl from locations in Albemarle Sound, North Carolina, in 1993. Location codes as in Table B-1. Age in days from time of hatch. Growth, FL, and TL in millimeters; WT in grams.

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
1	EST-BAT	93-07-20	930009	64.4	68.1	3.23	51	1.33529
2	EST-BFC	93-08-18	932341	71.0	78.0	3.95	69	1.13043
3	EST-BKH	93-10-05	932424	84.0	91.0	5.84	109	0.83486
4	EST-BKH	93-10-05	932428	97.0	106.0	9.76	94	1.12766
5	EST-BKH	93-10-05	932430	104.0	113.0	12.63	115	0.98261
6	EST-BKH	93-10-05	932431	105.0	113.0	11.48	95	1.18947
7	EST-BKH	93-10-05	932434	119.0	127.0	19.00	106	1.19811
8	EST-BKH	93-10-05	932436	95.0	101.0	9.10	116	0.87069
9	EST-BKH	93-10-05	932439	148.0	158.0	36.11	121	1.30579
10	EST-BKH	93-10-05	932440	145.0	153.0	31.62	114	1.34211
11	EST-BTB	93-10-05	932409	121.0	131.0	17.14	96	1.36458
12	EST-BUB	93-07-20	930001	36.5	40.8	0.66	41	0.99512
13	EST-BUB	93-07-20	930002	49.8	54.9	1.54	40	1.37250
14	EST-BUB	93-07-20	930004	44.8	47.6	1.21	46	1.03478
15	EST-BUB	93-07-20	930005	54.4	58.4	1.93	51	1.14510
16	EST-BUB	93-08-18	932321	70.0	77.0	4.13	68	1.13235
17	EST-BUB	93-08-18	932322	75.0	80.0	3.95	75	1.06667
18	EST-BUB	93-08-18	932323	80.0	86.0	5.10	74	1.16216
19	EST-BUB	93-10-14	932318	115.0	123.0	13.92	105	1.17143
20	EST-BUB	93-10-14	932319	98.0	107.0	8.87	103	1.03883
21	EST-CPC	93-10-05	932441	98.0	102.0	9.26	98	1.04082
22	EST-CPC	93-10-05	932443	93.0	100.0	8.92	95	1.05263
23	EST-CPC	93-10-05	932445	92.0	98.0	8.24	100	0.98000
24	EST-CPC	93-10-05	932457	05.0	113.0	11.28	105	1.07619
25	EST-CPC	93-10-05	932458	136.0	147.0	28.66	108	1.36111
26	EST-CPC	93-10-05	932460	146.0	158.0	37.00	119	1.32773
27	EST-DPI	93-07-20	930016	67.0	72.1	4.37	63	1.14444
28	EST-DPI	93-07-20	930017	59.4	64.9	3.01	53	1.22453
29	EST-DPI	93-07-20	930019	53.7	58.8	2.30	56	1.05000
30	EST-DPI	93-07-20	930022	52.9	57.4	2.07	50	1.14800
31	EST-DPI	93-07-20	930023	54.4	57.3	2.07	59	0.97119
32	EST-DPI	93-07-20	930025	52.8	56.4	1.81	53	1.06415

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
33	EST-DPI	93-07-20	930026	59.6	63.1	2.84	51	1.23725
34	EST-DPI	93-07-20	930027	64.3	68.1	3.81	55	1.23818
35	EST-DPI	93-07-20	930030	52.9	55.8	1.91	45	1.24000
36	EST-DPI	93-07-20	930032	60.7	64.8	3.10	72	0.90000
37	EST-DPI	93-07-20	930033	43.9	45.5	1.05	47	0.96809
38	EST-DPI	93-07-20	930035	56.6	60.3	2.45	54	1.11667
39	EST-DPI	93-07-20	930037	48.9	50.8	1.48	40	1.27000
40	EST-DPI	93-07-20	930039	50.2	53.9	1.80	57	0.94561
41	EST-DPI	93-07-20	930041	55.8	60.8	2.51	52	1.16923
42	EST-DPI	93-07-20	930042	48.2	51.5	1.58	54	0.95370
43	EST-DPI	93-07-20	930043	56.9	61.1	2.55	54	1.13148
44	EST-DPI	93-07-20	930045	57.2	60.6	2.66	44	1.37727
45	EST-DPI	93-07-20	930046	57.5	60.7	2.58	52	1.16731
46	EST-DPI	93-07-20	930047	46.3	48.4	1.35	46	1.05217
47	EST-DPI	93-07-20	930048	52.2	56.0	1.88	46	1.21739
48	EST-DPI	93-07-20	930051	48.4	50.8	1.46	44	1.15455
49	EST-DPI	93-07-20	930052	55.8	60.5	2.37	52	1.16346
50	EST-DPI	93-07-20	930053	43.2	46.8	1.00	39	1.20000
51	EST-DPI	93-07-20	930054	54.5	56.8	1.99	48	1.18333
52	EST-DPI	93-07-20	930055	45.5	48.6	1.24	52	0.93462
53	EST-DPI	93-07-20	930056	52.8	56.3	2.14	52	1.08269
54	EST-DPI	93-07-20	930060	54.1	57.1	2.03	49	1.16531
55	EST-DPI	93-07-20	930061	51.8	55.9	1.90	59	0.94746
56	EST-DPI	93-07-20	930062	54.6	58.5	2.33	53	1.10377
57	EST-DPI	93-07-20	930064	62.1	66.3	3.24	55	1.20545
58	EST-DPI	93-07-20	930066	47.7	49.7	1.44	64	0.77656
59	EST-DPI	93-07-20	930067	70.9	75.8	5.13	63	1.20317
60	EST-DPI	93-07-20	930069	59.4	62.3	3.03	49	1.27143
61	EST-DPI	93-07-20	930070	66.0	68.9	4.03	61	1.12951
62	EST-DPI	93-07-20	930072	52.0	54.8	2.04	47	1.16596
63	EST-DPI	93-07-20	930074	71.0	76.9	5.40	63	1.22063
64	EST-DPI	93-07-20	930075	57.5	61.5	2.83	53	1.16038
65	EST-DPI	93-07-20	930077	59.3	64.2	3.18	51	1.25882
66	EST-DPI	93-07-20	930078	68.4	73.0	4.73	65	1.12308
67	EST-DPI	93-07-20	930079	59.9	63.5	3.17	67	0.94776
68	EST-DPI	93-07-20	930080	59.5	62.7	2.98	67	0.93582
69	EST-DPI	93-07-20	930081	62.8	67.3	3.66	51	1.31961
70	EST-DPI	93-07-20	930082	61.9	65.0	3.34	52	1.25000
71	EST-DPI	93-07-20	930083	60.0	63.9	3.21	53	1.20566
72	EST-DPI	93-07-20	930084	58.2	62.7	2.74	45	1.39333
73	EST-DPI	93-07-20	930095	60.6	64.2	2.80	71	0.90423
74	EST-DPI	93-07-20	930096	54.1	56.7	2.17	52	1.09038

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
75	EST-DPI	93-07-20	930097	53.0	55.8	1.97	53	1.05283
76	EST-DPI	93-07-20	930099	56.7	59.6	2.61	52	1.14615
77	EST-DPI	93-07-20	930101	54.1	56.4	2.05	51	1.10588
78	EST-DPI	93-07-20	930102	55.2	58.6	2.38	45	1.30222
79	EST-DPI	93-07-20	930103	57.9	61.5	2.80	53	1.16038
80	EST-DPI	93-07-20	930104	58.2	61.0	2.60	54	1.12963
81	EST-DPI	93-07-20	930106	59.9	63.6	3.01	52	1.22308
82	EST-DPI	93-07-20	930108	58.4	62.8	2.71	60	1.04667
83	EST-DPI	93-07-20	930110	59.5	63.6	2.85	59	1.07797
84	EST-DPI	93-07-20	930111	55.0	58.4	2.37	46	1.26957
85	EST-DPI	93-07-20	930112	58.4	62.4	2.77	50	1.24800
86	EST-DPI	93-07-20	930113	66.7	70.0	4.06	58	1.20690
87	EST-DPI	93-07-20	930116	53.0	54.5	2.15	54	1.00926
88	EST-DPI	93-07-20	930117	54.1	56.7	2.22	52	1.09038
89	EST-DPI	93-07-20	930120	52.2	55.7	1.89	44	1.26591
90	EST-DPI	93-07-20	930121	44.7	47.4	1.21	47	1.00851
91	EST-DPI	93-07-20	930122	51.8	55.5	2.08	56	0.99107
92	EST-DPI	93-07-20	930124	46.8	49.3	1.44	45	1.09556
93	EST-DPI	93-08-18	932381	87.0	92.0	7.40	76	1.21053
94	EST-DPI	93-08-18	932382	75.0	81.0	5.01	61	1.32787
95	EST-DPI	93-08-18	932383	79.0	85.0	5.47	69	1.23188
96	EST-DPI	93-08-18	932384	82.0	89.0	6.53	66	1.34848
97	EST-DPI	93-08-18	932385	75.0	80.0	4.75	65	1.23077
98	EST-DPI	93-08-18	932386	77.0	82.0	5.14	71	1.15493
99	EST-DPI	93-08-18	932387	85.0	92.0	7.02	69	1.33333
100	EST-DPI	93-08-18	932389	84.0	91.0	7.28	69	1.31884
101	EST-DPI	93-08-18	932390	82.0	87.0	5.95	74	1.17568
102	EST-DPI	93-08-18	932392	84.0	90.0	6.93	76	1.18421
103	EST-DPI	93-08-18	932393	91.0	98.0	8.45	78	1.25641
104	EST-DPI	93-08-18	932394	82.0	87.0	5.74	69	1.26087
105	EST-DPI	93-08-18	932395	75.0	79.0	4.54	60	1.31667
106	EST-DPI	93-08-18	932396	82.0	88.0	6.23	75	1.17333
107	EST-DPI	93-08-18	932397	86.0	93.0	8.03	72	1.29167
108	EST-DPI	93-08-18	932398	74.0	80.0	4.55	68	1.17647
109	EST-DPI	93-08-18	932399	70.0	75.0	3.96	61	1.22951
110	EST-DPI	93-08-18	932400	71.0	76.0	3.78	60	1.26667
111	EST-DPI	93-09-02	931554	89.0	97.0	8.83	84	1.15476
112	EST-DPI	93-09-02	931557	95.0	103.0	10.55	76	1.35526
113	EST-DPI	93-09-02	931558	98.0	107.0	10.17	85	1.25882
114	EST-DPI	93-09-02	931560	100.0	108.0	12.00	76	1.42105
115	EST-DPI	93-09-02	931562	83.0	90.0	6.65	92	0.97826
116	EST-DPI	93-09-15	932693	99.0	107.0	9.94	100	1.07000

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
117	EST-DPI	93-09-15	932694	95.0	105.0	10.19	86	1.22093
118	EST-DPI	93-09-15	932697	109.0	116.0	14.14	103	1.12621
119	EST-DPI	93-09-15	932698	110.0	117.0	14.79	94	1.24468
120	EST-DPI	93-09-15	932701	94.0	103.0	9.39	92	1.11957
121	EST-DPI	93-09-15	932704	94.0	112.0	12.85	90	1.24444
122	EST-DPI	93-09-15	932707	104.0	113.0	12.27	103	1.09709
123	EST-DPI	93-09-15	932709	93.0	100.0	7.99	84	1.19048
124	EST-DPI	93-09-15	932711	106.0	115.0	14.51	105	1.09524
125	EST-DPI	93-09-15	932712	99.0	106.0	10.60	102	1.03922
126	EST-DPI	93-09-28	932661	98.0	105.0	9.39	103	1.01942
127	EST-DPI	93-09-28	932666	100.0	108.0	10.58	87	1.24138
128	EST-DPI	93-09-28	932671	111.0	120.0	16.05	95	1.26316
129	EST-GOB	93-10-05	932402	139.0	148.0	30.59	113	1.30973
130	EST-GOB	93-10-05	932405	119.0	125.0	14.85	95	1.31579
131	EST-GOB	93-10-05	932406	123.0	137.0	21.58	105	1.30476
132	EST-HAP	93-08-18	932343	88.0	94.0	7.68	75	1.25333
133	EST-HAP	93-08-18	932344	79.0	84.0	5.74	78	1.07692
134	EST-HAP	93-08-18	932345	77.0	82.0	5.10	61	1.34426
135	EST-HAP	93-08-18	932346	84.0	91.0	7.30	74	1.22973
136	EST-HAP	93-08-18	932347	68.0	73.0	3.39	60	1.21667
137	EST-HAP	93-08-18	932348	61.0	66.0	2.68	55	1.20000
138	EST-HAP	93-08-18	932349	65.0	70.0	3.14	57	1.22807
139	EST-HAP	93-08-18	932350	80.0	84.0	5.19	69	1.21739
140	EST-HAP	93-08-18	932351	70.0	75.0	3.77	64	1.17188
141	EST-HAP	93-08-18	932352	68.0	72.0	3.41	66	1.09091
142	EST-HAP	93-08-18	932353	65.0	70.0	2.86	60	1.16667
143	EST-HAP	93-08-18	932354	85.0	91.0	6.88	66	1.37879
144	EST-HAP	93-08-18	932355	80.0	85.0	5.55	73	1.16438
145	EST-HAP	93-08-18	932356	69.0	74.0	4.13	62	1.19355
146	EST-HAP	93-08-18	932357	75.0	79.0	4.12	57	1.38596
147	EST-HAP	93-09-02	931583	83.0	90.0	7.15	65	1.38462
148	EST-HAP	93-09-02	931586	91.0	101.0	10.50	79	1.27848
149	EST-HAP	93-09-02	931588	71.0	78.0	4.46	62	1.25806
150	EST-HAP	93-09-02	931589	103.0	110.0	13.79	84	1.30952
151	EST-HAP	93-09-02	931591	90.0	97.0	9.84	79	1.22785
152	EST-HAP	93-09-02	931593	89.0	96.0	8.71	83	1.15663
153	EST-HAP	93-09-02	931594	97.0	104.0	12.00	84	1.23810
154	EST-HIS	93-08-18	932360	94.0	100.0	8.86	78	1.28205
155	EST-HIS	93-08-18	932361	108.0	114.0	16.24	80	1.42500
156	EST-HIS	93-09-02	931596	105.0	113.0	15.77	89	1.26966
157	EST-HIS	93-09-02	931597	93.0	100.0	9.91	93	1.07527
158	EST-HIS	93-09-02	931598	99.0	107.0	12.10	77	1.38961

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
159	EST-HIS	93-09-02	931603	93.0	100.0	9.97	86	1.16279
160	EST-HIS	93-09-02	931604	90.0	95.0	9.36	69	1.37681
161	EST-HIS	93-09-02	931605	85.0	91.0	8.04	80	1.13750
162	EST-HIS	93-09-02	931607	109.0	117.0	17.21	106	1.10377
163	EST-HIS	93-09-02	931609	77.0	82.0	5.40	62	1.32258
164	EST-HIS	93-09-02	931610	105.0	113.0	15.01	82	1.37805
165	EST-HIS	93-09-02	931611	91.0	97.0	10.34	74	1.31081
166	EST-HIS	93-09-02	931613	112.0	121.0	19.95	96	1.26042
167	EST-HIS	93-09-02	931614	93.0	100.0	10.95	81	1.23457
168	EST-HIS	93-09-14	932713	113.0	122.0	17.18	89	1.37079
169	EST-HIS	93-09-14	932715	114.0	122.0	15.56	87	1.40230
170	EST-HIS	93-09-14	932719	114.0	124.0	17.41	93	1.33333
171	EST-HIS	93-09-14	932721	115.0	124.0	18.82	88	1.40909
172	EST-HIS	93-09-14	932722	120.0	129.0	19.56	112	1.15179
173	EST-HIS	93-09-14	932723	130.0	140.0	20.52	97	1.44330
174	EST-HIS	93-09-14	932725	111.0	121.0	14.18	92	1.31522
175	EST-HIS	93-09-14	932726	112.0	122.0	14.85	102	1.19608
176	EST-HIS	93-09-14	932727	122.0	134.0	20.47	114	1.17544
177	EST-HIS	93-09-14	932728	122.0	131.0	18.26	94	1.39362
178	EST-HIS	93-09-14	932729	125.0	134.0	23.15	107	1.25234
179	EST-HIS	93-10-14	932236	115.0	124.0	16.32	110	1.12727
180	EST-HIS	93-10-14	932243	126.0	135.0	23.97	104	1.29808
181	EST-HIS	93-10-14	932250	110.0	117.0	14.74	108	1.08333
182	EST-HIS	93-10-14	932252	113.0	122.0	17.75	118	1.03390
183	EST-LOP	93-08-18	932324	70.0	77.0	4.13	60	1.28333
184	EST-LOP	93-08-18	932325	70.0	77.0	3.79	71	1.08451
185	EST-LOP	93-08-18	932326	60.0	66.0	2.66	58	1.13793
186	EST-LOP	93-08-18	932327	72.0	77.0	3.75	73	1.05479
187	EST-LOP	93-08-18	932328	60.0	65.0	2.17	62	1.04839
188	EST-LOP	93-08-18	932329	65.0	68.0	2.89	60	1.13333
189	EST-LOP	93-08-18	932331	85.0	91.0	7.12	68	1.33824
190	EST-LOP	93-08-18	932332	78.0	85.0	5.37	66	1.28788
191	EST-LOP	93-08-18	932333	78.0	77.0	5.37	65	1.18462
192	EST-LOP	93-08-18	932334	71.0	77.0	4.03	66	1.16667
193	EST-LOP	93-08-18	932335	67.0	71.0	2.86	61	1.16393
194	EST-LOP	93-08-18	932336	66.0	72.0	3.08	62	1.16129
195	EST-LOP	93-08-18	932337	100.0	108.0	11.36	77	1.40260
196	EST-LOP	93-08-18	932338	72.0	75.0	3.75	74	1.01351
197	EST-LOP	93-08-18	932339	85.0	91.0	6.12	78	1.16667
198	EST-LOP	93-08-18	932340	65.0	70.0	2.80	62	1.12903
199	EST-LOP	93-08-18	932342	60.0	68.0	2.45	61	1.11475
200	EST-LOP	93-09-02	931563	99.0	107.0	11.13	86	1.24419

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
201	EST-LOP	93-09-02	931564	81.0	88.0	5.94	77	1.14286
202	EST-LOP	93-09-02	931567	81.0	87.0	5.77	83	1.04819
203	EST-LOP	93-09-02	931568	93.0	100.0	9.29	83	1.20482
204	EST-LOP	93-09-02	931571	95.0	102.0	11.44	81	1.25926
205	EST-LOP	93-09-02	931573	83.0	88.0	6.69	72	1.22222
206	EST-LOP	93-09-02	931574	68.0	73.0	3.78	69	1.05797
207	EST-LOP	93-09-02	931575	107.0	115.0	16.39	109	1.05505
208	EST-LOP	93-09-02	931577	95.0	102.0	10.16	90	1.13333
209	EST-LOP	93-09-02	931578	101.0	110.0	12.66	84	1.30952
210	EST-LOP	93-09-02	931579	90.0	98.0	9.19	74	1.32432
211	EST-LOP	93-09-02	931580	81.0	88.0	5.95	77	1.14286
212	EST-LOP	93-09-02	931581	99.0	107.0	12.00	84	1.27381
213	EST-LOP	93-09-02	931582	86.0	93.0	7.25	75	1.24000
214	EST-LOP	93-09-15	932688	89.0	95.0	7.76	94	1.01064
215	EST-LOP	93-09-15	932689	93.0	101.0	8.53	94	1.07447
216	EST-LOP	93-09-15	932690	91.0	100.0	8.24	97	1.03093
217	EST-LOP	93-09-15	932691	98.0	105.0	9.68	83	1.26506
218	EST-LOP	93-09-15	932692	95.0	104.0	10.53	101	1.02970
219	EST-LOP	93-10-14	932302	125.0	136.0	24.55	109	1.24771
220	EST-LOP	93-10-14	932304	114.0	124.0	16.71	106	1.16981
221	EST-LOP	93-10-14	932308	135.0	147.0	30.14	125	1.17600
222	EST-NAR	93-07-20	930012	58.3	60.9	2.37	60	1.01500
223	EST-NAR	93-07-20	930013	57.4	62.6	2.40	61	1.02623
224	EST-NLR	93-08-18	932359	107.0	115.0	16.19	84	1.36905
225	EST-PTR	93-07-20	930006	60.2	64.1	2.67	44	1.45682
226	EST-PTR	93-08-18	932362	78.0	83.0	5.76	72	1.15278
227	EST-PTR	93-08-18	932363	80.0	87.0	7.00	72	1.20833
228	EST-PTR	93-08-18	932364	100.0	107.0	11.94	73	1.46575
229	EST-PTR	93-08-18	932365	79.0	82.0	5.08	66	1.24242
230	EST-PTR	93-08-18	932366	91.0	98.0	9.25	81	1.20988
231	EST-PTR	93-08-18	932367	80.0	85.0	6.13	65	1.30769
232	EST-PTR	93-08-18	932368	71.0	75.0	3.89	60	1.25000
233	EST-PTR	93-08-18	932369	81.0	86.0	5.89	66	1.30303
234	EST-PTR	93-08-18	932370	82.0	87.0	6.29	67	1.29851
235	EST-PTR	93-08-18	932372	96.0	103.0	10.84	71	1.45070
236	EST-PTR	93-08-18	932373	82.0	87.0	5.96	68	1.27941
237	EST-PTR	93-08-18	932374	95.0	101.0	10.37	78	1.29487
238	EST-PTR	93-08-18	932375	85.0	91.0	8.14	75	1.21333
239	EST-PTR	93-08-18	932376	95.0	102.0	11.39	78	1.30769
240	EST-PTR	93-08-18	932377	90.0	94.0	7.69	78	1.20513
241	EST-PTR	93-08-18	932379	100.0	107.0	12.42	88	1.21591
242	EST-PTR	93-08-18	932380	63.0	68.0	2.94	54	1.25926

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
243	EST-PTR	93-09-02	931552	87.0	94.0	7.45	83	1.13253
244	EST-PTR	93-09-02	931553	104.0	111.0	13.60	106	1.04717
245	EST-PTR	93-09-16	932675	99.0	107.0	9.67	104	1.02885
246	EST-PTR	93-09-16	932680	102.0	111.0	11.16	106	1.04717
247	EST-PTR	93-09-28	932651	106.0	115.0	10.40	103	1.11650
248	EXP-ALB	93-06-30	930973	46.5	49.3	0.75	44	1.12045
249	EXP-ALB	93-06-30	930975	36.5	39.9	0.46	39	1.02308
250	EXP-ALB	93-06-30	930976	38.2	40.8	0.49	33	1.23636
251	EXP-ALB	93-06-30	930977	34.6	37.4	0.33	40	0.93500
252	EXP-ALB	93-06-30	930978	42.4	45.3	0.61	38	1.19211
253	EXP-ALB	93-06-30	930979	40.5	43.4	0.64	30	1.44667
254	EXP-ALB	93-06-30	930980	41.6	45.7	0.68	38	1.20263
255	EXP-ALB	93-06-30	930983	43.9	47.4	0.84	40	1.18500
256	EXP-ALB	93-06-30	930984	42.0	44.8	0.69	36	1.24444
257	EXP-ALB	93-06-30	930986	39.0	42.0	0.54	29	1.44828
258	EXP-ALB	93-06-30	930989	43.7	45.9	0.90	44	1.04318
259	EXP-ALB	93-07-07	930936	46.4	48.3	0.57	46	1.05000
260	EXP-ALB	93-07-07	930938	49.7	50.8	0.97	37	1.37297
261	EXP-ALB	93-07-07	930939	47.5	49.9	0.92	42	1.18810
262	EXP-ALB	93-07-07	930940	47.4	50.0	0.97	45	1.11111
263	EXP-ALB	93-07-07	930941	49.8	52.7	1.26	64	0.82344
264	EXP-ALB	93-07-07	930942	49.0	51.0	0.90	48	1.06250
265	EXP-ALB	93-07-07	930943	43.3	46.1	0.67	42	1.09762
266	EXP-ALB	93-07-07	930944	45.5	48.7	0.88	58	0.83966
267	EXP-ALB	93-07-07	930945	57.5	61.0	2.06	58	1.05172
268	EXP-ALB	93-07-07	930946	44.0	47.1	0.71	47	1.00213
269	EXP-ALB	93-07-07	930947	47.2	49.9	0.97	43	1.16047
270	EXP-ALB	93-07-07	930948	42.6	44.7	0.57	42	1.06429
271	EXP-ALB	93-07-07	930949	42.9	46.3	0.63	44	1.05227
272	EXP-ALB	93-07-07	930951	48.6	53.2	1.18	42	1.26667
273	EXP-ALB	93-07-07	930953	41.0	44.2	0.74	58	0.76207
274	EXP-ALB	93-07-07	930954	50.3	54.0	1.34	49	1.10204
275	EXP-ALB	93-07-07	930955	43.7	46.0	0.66	62	0.74194
276	EXP-ALB	93-07-07	930956	54.7	57.9	1.63	42	1.37857
277	EXP-ALB	93-07-07	930957	47.3	50.6	1.09	46	1.10000
278	EXP-ALB	93-07-07	930958	44.6	47.8	0.80	56	0.85357
279	EXP-ALB	93-07-07	930959	45.4	48.5	0.96	38	1.27632
280	EXP-ALB	93-07-07	930960	41.5	43.5	0.55	39	1.11538
281	EXP-ALB	93-07-07	930961	55.1	57.9	1.74	46	1.25870
282	EXP-ALB	93-07-07	930962	49.7	53.8	1.23	59	0.91186
283	EXP-ALB	93-07-07	930963	39.5	42.0	0.52	39	1.07692
284	EXP-ALB	93-07-07	930964	43.1	47.4	0.84	37	1.28108

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
285	EXP-ALB	93-07-07	930966	52.4	55.2	1.53	47	1.17447
286	EXP-ALB	93-07-07	930968	51.6	54.8	1.46	65	0.84308
287	EXP-ALB	93-07-07	930969	39.6	42.9	0.67	36	1.19167
288	EXP-ALB	93-07-07	930970	44.9	47.7	0.92	51	0.93529
289	EXP-ALB	93-07-14	931718	60.0	65.0	1.89	51	1.27451
290	EXP-ALB	93-07-14	931719	45.0	48.0	0.55	42	1.14286
291	EXP-ALB	93-07-14	931720	45.0	48.0	0.58	41	1.17073
292	EXP-ALB	93-07-14	931723	40.0	43.0	0.55	42	1.02381
293	EXP-ALB	93-07-14	931724	45.0	48.0	0.82	41	1.17073
294	EXP-ALB	93-07-14	931725	47.0	50.0	0.77	44	1.13636
295	EXP-ALB	93-07-14	931726	50.0	54.0	0.86	46	1.17391
296	EXP-ALB	93-07-14	931727	50.0	53.0	1.01	42	1.26190
297	EXP-ALB	93-07-14	931728	50.0	53.0	0.96	44	1.20455
298	EXP-ALB	93-07-14	931729	45.0	48.0	0.57	44	1.09091
299	EXP-ALB	93-07-14	931730	51.0	55.0	1.13	42	1.30952
300	EXP-ALB	93-07-14	931731	42.0	45.0	0.52	39	1.15385
301	EXP-BAB	93-06-23	930149	23.9	26.2	0.16	26	1.00769
302	EXP-BAB	93-06-23	930150	30.7	33.8	0.36	37	0.91351
303	EXP-BAB	93-07-07	930862	39.2	41.5	0.60	36	1.15278
304	EXP-BAB	93-07-07	930863	37.8	39.6	0.54	38	1.04211
305	EXP-BAB	93-07-07	930864	36.5	38.7	0.53	31	1.24839
306	EXP-BAB	93-07-07	930865	35.6	37.3	0.41	44	0.84773
307	EXP-BAB	93-07-07	930866	35.4	36.7	0.40	36	1.01944
308	EXP-BAB	93-07-07	930867	38.7	40.8	0.59	47	0.86809
309	EXP-BAB	93-07-07	930868	33.0	34.6	0.18	34	1.01765
310	EXP-BAB	93-07-07	930870	33.0	36.5	0.44	37	0.98649
311	EXP-BAB	93-07-07	930871	37.2	38.6	0.47	37	1.04324
312	EXP-BAB	93-07-07	930872	44.3	46.7	0.65	46	1.01522
313	EXP-BAB	93-07-07	930873	37.5	39.0	0.32	41	0.95122
314	EXP-BAB	93-07-07	930874	35.2	37.6	0.47	39	0.96410
315	EXP-BAB	93-07-07	930875	35.7	38.1	0.39	41	0.92927
316	EXP-BAB	93-07-07	930876	27.5	29.2	0.15	32	0.91250
317	EXP-BAB	93-07-07	930878	37.8	39.6	0.38	43	0.92093
318	EXP-BAB	93-07-07	930879	40.5	42.0	0.62	44	0.95455
319	EXP-BAB	93-07-07	930880	37.2	39.9	0.50	38	1.05000
320	EXP-BAB	93-07-07	930881	41.8	43.8	0.72	41	1.06829
321	EXP-BAB	93-07-07	930884	34.9	37.2	0.41	47	0.79149
322	EXP-BAB	93-07-07	930885	38.9	41.4	0.68	45	0.92000
323	EXP-BAB	93-07-07	930886	31.5	33.6	0.31	43	0.78140
324	EXP-BAB	93-07-07	930887	32.8	34.2	0.38	42	0.81429
325	EXP-BAB	93-07-07	930890	35.4	36.6	0.48	37	0.98919
326	EXP-BAB	93-07-14	931758	41.0	44.0	0.96	48	0.91667

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
327	EXP-BAB	93-07-14	931759	50.0	53.0	1.09	49	1.08163
328	EXP-BAB	93-07-14	931760	42.0	44.0	0.83	38	1.15789
329	EXP-BAB	93-07-14	931761	63.0	67.0	3.31	46	1.45652
330	EXP-BAB	93-07-14	931762	43.0	45.0	0.97	40	1.12500
331	EXP-BAB	93-07-14	931763	55.0	58.0	2.15	52	1.11538
332	EXP-BAB	93-07-14	931765	50.0	53.0	1.55	39	1.35897
333	EXP-BAB	93-07-14	931766	51.0	54.0	1.64	42	1.28571
334	EXP-BAB	93-07-14	931767	53.0	56.0	1.20	44	1.27273
335	EXP-BAB	93-07-14	931768	45.0	48.0	0.98	42	1.14286
336	EXP-BAB	93-07-14	931769	45.0	48.0	0.84	51	0.94118
337	EXP-BAB	93-07-14	931770	50.0	52.0	1.49	39	1.33333
338	EXP-BAB	93-07-14	931771	48.0	50.0	1.32	34	1.47059
339	EXP-BAB	93-07-14	931772	41.0	43.0	0.80	36	1.19444
340	EXP-BAB	93-07-14	931773	60.0	64.0	3.04	46	1.39130
341	EXP-BAB	93-07-14	931774	55.0	58.0	2.12	55	1.05455
342	EXP-BAB	93-07-14	931775	50.0	53.0	1.54	43	1.23256
343	EXP-BAB	93-07-14	931776	45.0	48.0	1.16	45	1.06667
344	EXP-BAB	93-07-14	931777	40.0	43.0	0.82	41	1.04878
345	EXP-BAB	93-07-14	931778	48.0	50.0	1.40	51	0.98039
346	EXP-BAB	93-07-14	931779	45.0	48.0	1.12	43	1.11628
347	EXP-BAB	93-07-14	931780	42.0	44.0	0.90	40	1.10000
348	EXP-BAB	93-07-14	931781	44.0	47.0	1.10	43	1.09302
349	EXP-BAB	93-07-14	931782	45.0	47.0	0.89	40	1.17500
350	EXP-BAB	93-07-14	931783	50.0	53.0	1.76	42	1.26190
351	EXP-BAB	93-07-14	931784	57.0	60.0	2.55	58	1.03448
352	EXP-BAB	93-07-14	931785	45.0	48.0	1.13	37	1.29730
353	EXP-BAB	93-07-14	931786	53.0	55.0	1.75	43	1.27907
354	EXP-BAB	93-07-14	931787	47.0	49.0	1.37	43	1.13953
355	EXP-BAB	93-07-14	931788	46.0	49.0	1.33	41	1.19512
356	EXP-BAF	93-06-23	930143	32.2	36.2	0.46	36	1.00556
357	EXP-BAF	93-06-23	930144	32.4	34.9	0.49	35	0.99714
358	EXP-BAF	93-06-23	930145	24.5	26.2	0.17	30	0.87333
359	EXP-BAF	93-06-23	930147	32.3	34.8	0.44	34	1.02353
360	EXP-BAF	93-06-30	931040	35.0	37.0	0.14	29	1.27586
361	EXP-BAF	93-06-30	931045	32.0	33.0	0.30	32	1.03125
362	EXP-BAF	93-06-30	931049	38.0	41.0	0.63	38	1.07895
363	EXP-BAF	93-07-07	930810	38.5	41.0	0.60	44	0.93182
364	EXP-BAF	93-07-07	930811	38.6	40.3	0.48	43	0.93721
365	EXP-BAF	93-07-07	930812	34.2	36.8	0.33	43	0.85581
366	EXP-BAF	93-07-07	930813	36.1	38.4	0.43	37	1.03784
367	EXP-BAF	93-07-07	930814	35.1	37.0	0.26	41	0.90244
368	EXP-BAF	93-07-07	930815	34.9	37.1	0.38	44	0.84318

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
369	EXP-BAF	93-07-07	930816	38.5	40.0	0.37	40	1.00000
370	EXP-BAF	93-07-07	930817	41.0	42.5	0.65	40	1.06250
371	EXP-BAF	93-07-07	930818	45.5	47.7	0.71	48	0.99375
372	EXP-BAF	93-07-07	930819	41.5	43.8	0.72	54	0.81111
373	EXP-BAF	93-07-07	930822	40.6	42.3	0.71	31	1.36452
374	EXP-BAF	93-07-07	930823	40.5	42.3	0.60	34	1.24412
375	EXP-BAF	93-07-07	930824	31.0	32.5	0.30	32	1.01563
376	EXP-BAF	93-07-07	930827	28.1	29.8	0.20	29	1.02759
377	EXP-BAF	93-07-07	930828	34.4	36.2	0.45	34	1.06471
378	EXP-BAF	93-07-07	930829	37.2	39.2	0.40	43	0.91163
379	EXP-BAF	93-07-07	930830	36.4	37.8	0.48	49	0.77143
380	EXP-BAF	93-07-07	930831	34.0	35.4	0.43	38	0.93158
381	EXP-BAF	93-07-07	930832	36.7	40.0	0.59	40	1.00000
382	EXP-BAF	93-07-07	930833	35.6	37.2	0.40	42	0.88571
383	EXP-BAF	93-07-07	930834	34.9	37.0	0.37	43	0.86047
384	EXP-BAF	93-07-07	930835	35.3	34.7	0.37	35	0.99143
385	EXP-BAF	93-07-07	930836	32.0	34.1	0.25	34	1.00294
386	EXP-BAF	93-07-07	930837	29.7	31.3	0.27	42	0.74524
387	EXP-BAF	93-07-07	930838	37.4	39.2	0.48	42	0.93333
388	EXP-BAF	93-07-07	930839	38.4	40.4	0.60	34	1.18824
389	EXP-BAF	93-07-07	930840	46.5	49.6	1.08	42	1.18095
390	EXP-BAF	93-07-07	930842	40.5	41.7	0.67	47	0.88723
391	EXP-BAF	93-07-07	930844	36.7	38.1	0.49	37	1.02973
392	EXP-BAF	93-07-07	930845	39.2	40.8	0.56	35	1.16571
393	EXP-BAF	93-07-07	930847	34.7	35.8	0.32	39	0.91795
394	EXP-BAF	93-07-14	931704	42.0	45.0	0.67	40	1.12500
395	EXP-BAF	93-07-14	931705	38.0	41.0	0.44	43	0.95349
396	EXP-BAF	93-07-14	931706	38.0	40.0	0.40	35	1.14286
397	EXP-BAF	93-07-14	931707	40.0	43.0	0.44	39	1.10256
398	EXP-BAF	93-07-14	931708	45.0	49.0	0.87	49	1.00000
399	EXP-BAF	93-07-14	931711	38.0	41.0	0.40	42	0.97619
400	EXP-BAF	93-07-14	931713	45.0	48.0	0.92	42	1.14286
401	EXP-BAF	93-07-14	931714	31.0	35.0	0.21	45	0.77778
402	EXP-BAF	93-07-14	931717	39.0	41.0	0.52	46	0.89130
403	EXP-BPT	93-07-07	930796	35.4	36.8	0.35	35	1.05143
404	EXP-BPT	93-07-07	930797	33.9	35.5	0.28	40	0.88750
405	EXP-BPT	93-07-07	930798	45.2	48.2	0.76	56	0.86071
406	EXP-BPT	93-07-07	930799	35.7	37.9	0.29	40	0.94750
407	EXP-BPT	93-07-14	931702	46.0	48.0	0.73	41	1.17073
408	EXP-CPC	93-07-07	930800	42.9	44.5	0.57	46	0.96739
409	EXP-CPC	93-07-07	930802	35.9	37.6	0.32	44	0.85455
410	EXP-CPC	93-07-07	930803	38.0	40.0	0.38	36	1.11111

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
411	EXP-CPC	93-07-07	930804	41.5	43.2	0.60	47	0.91915
412	EXP-CPC	93-07-07	930805	40.0	41.9	0.52	46	0.91087
413	EXP-CPC	93-07-07	930806	36.0	38.7	0.33	47	0.82340
414	EXP-CPC	93-07-07	930807	50.8	53.5	1.08	59	0.90678
415	EXP-CPC	93-07-07	930808	44.9	47.2	0.74	53	0.89057
416	EXP-CPC	93-07-07	930809	40.0	42.2	0.57	42	1.00476
417	EXP-CPC	93-07-14	931892	49.0	53.0	1.03	40	1.32500
418	EXP-CPC	93-07-14	931894	46.0	48.0	0.63	41	1.17073
419	EXP-CPC	93-07-14	931897	46.0	48.0	0.89	45	1.06667
420	EXP-CPC	93-07-14	931898	43.0	45.0	0.89	34	1.32353
421	EXP-CPC	93-07-14	931899	39.0	41.0	0.66	39	1.05128
422	EXP-CPC	93-07-14	931900	43.0	45.0	0.87	35	1.28571
423	EXP-CPC	93-07-14	931901	45.0	48.0	0.85	46	1.04348
424	EXP-CPC	93-07-14	931902	45.0	48.0	0.94	34	1.41176
425	EXP-CPC	93-07-14	931904	45.0	47.0	0.68	36	1.30556
426	EXP-CPC	93-07-14	931905	50.0	53.0	1.56	42	1.26190
427	EXP-CPC	93-07-14	931906	45.0	48.0	0.73	38	1.26316
428	EXP-CPC	93-07-14	931911	43.0	46.0	0.89	36	1.27778
429	EXP-CPC	93-07-14	931913	45.0	47.0	0.86	35	1.34286
430	EXP-CPC	93-07-14	931914	42.0	44.0	0.64	49	0.89796
431	EXP-CPC	93-07-14	931915	50.0	53.0	1.37	44	1.20455
432	EXP-CPC	93-07-14	931916	41.0	43.0	0.74	42	1.02381
433	EXP-CPC	93-07-14	931917	41.0	44.0	0.73	37	1.18919
434	EXP-CPC	93-07-14	931918	52.0	55.0	1.66	43	1.27907
435	EXP-CPC	93-07-14	931919	45.0	47.0	0.71	37	1.27027
436	EXP-CPC	93-07-14	931923	45.0	48.0	0.82	42	1.14286
437	EXP-CPC	93-07-14	931924	37.0	39.0	0.42	37	1.05405
438	EXP-CPC	93-07-14	931925	40.0	43.0	0.42	39	1.10256
439	EXP-CPC	93-07-14	931927	42.0	44.0	0.57	42	1.04762
440	EXP-CPC	93-07-14	931928	42.0	44.0	0.59	42	1.04762
441	EXP-CPC	93-07-14	931933	50.0	53.0	0.98	48	1.10417
442	EXP-CPC	93-07-14	931934	48.0	50.0	0.84	49	1.02041
443	EXP-CPC	93-07-14	931935	43.0	46.0	0.64	32	1.43750
444	EXP-CPC	93-07-14	931937	47.0	49.0	0.71	41	1.19512
445	EXP-CPC	93-07-14	931939	50.0	54.0	1.26	52	1.03846
446	EXP-CPC	93-07-14	931940	42.0	44.0	0.62	32	1.37500
447	EXP-CPC	93-07-14	931941	45.0	49.0	0.84	42	1.16667
448	EXP-CPC	93-07-14	931942	52.0	55.0	1.35	44	1.25000
449	EXP-CPC	93-07-14	931944	48.0	51.0	1.05	46	1.10870
450	EXP-CPC	93-07-14	931945	50.0	54.0	1.34	59	0.91525
451	EXP-CPC	93-07-14	931950	47.0	50.0	1.04	47	1.06383

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
452	EXP-CPC	93-07-14	931951	45.0	47.0	0.91	43	1.09302
453	EXP-CPC	93-07-14	931952	46.0	49.0	0.89	34	1.44118
454	EXP-CPC	93-07-14	931953	46.0	48.0	0.77	38	1.26316
455	EXP-CPC	93-07-14	931954	50.0	52.0	1.10	35	1.48571
456	EXP-CPC	93-07-14	931957	51.0	54.0	1.37	36	1.50000
457	EXP-CPC	93-07-14	931958	52.0	55.0	1.30	43	1.27907
458	EXP-CPC	93-07-14	931959	40.0	43.0	0.58	37	1.16216
459	EXP-CPC	93-07-14	931960	44.0	47.0	0.71	43	1.09302
460	EXP-CPC	93-07-14	931961	50.0	53.0	1.27	37	1.43243
461	EXP-CPC	93-07-14	931962	48.0	51.0	1.09	43	1.18605
462	EXP-CPC	93-07-14	931963	43.0	46.0	0.80	43	1.06977
463	EXP-CPC	93-07-14	931964	50.0	52.0	1.16	42	1.23810
464	EXP-CPC	93-07-14	931965	48.0	50.0	0.97	44	1.13636
465	EXP-CPC	93-07-14	931966	43.0	46.0	0.85	38	1.21053
466	EXP-CPC	93-07-14	931967	43.0	46.0	0.69	46	1.00000
467	EXP-CPC	93-07-14	931968	43.0	46.0	0.66	40	1.15000
468	EXP-CPC	93-07-14	931969	46.0	50.0	0.96	47	1.06383
469	EXP-CPC	93-07-14	931971	51.0	54.0	1.26	42	1.28571
470	EXP-CPC	93-07-14	931972	57.0	61.0	2.27	48	1.27083
471	EXP-CPC	93-07-14	931974	49.0	51.0	1.16	59	0.86441
472	EXP-CPC	93-07-14	931976	47.0	49.0	0.96	44	1.11364
473	EXP-CPC	93-07-14	931978	47.0	49.0	1.14	36	1.36111
474	EXP-CPC	93-07-14	931979	53.0	56.0	1.61	54	1.03704
475	EXP-CPC	93-07-14	931980	44.0	46.0	0.74	37	1.24324
476	EXP-CPC	93-07-14	931981	60.0	65.0	2.02	44	1.47727
477	EXP-CPC	93-07-14	931982	43.0	44.0	0.89	42	1.04762
478	EXP-CPC	93-07-14	931983	43.0	46.0	0.93	41	1.12195
479	EXP-CPC	93-07-14	931984	48.0	51.0	1.38	41	1.24390
480	EXP-CPC	93-07-14	931985	45.0	48.0	0.98	43	1.11628
481	EXP-CPC	93-07-14	931986	43.0	46.0	0.81	38	1.21053
482	EXP-CPC	93-07-14	931989	47.0	49.0	1.02	41	1.19512
483	EXP-CPC	93-07-14	931991	47.0	50.0	1.24	47	1.06383
484	EXP-CPC	93-07-14	931992	50.0	52.0	1.31	38	1.36842
485	EXP-CPC	93-07-14	931993	48.0	51.0	1.12	47	1.08511
486	EXP-CPC	93-07-14	931995	48.0	50.0	1.17	44	1.13636
487	EXP-CPC	93-07-14	931996	43.0	45.0	0.93	51	0.88235
488	EXP-CPC	93-07-14	931997	47.0	49.0	1.00	44	1.11364
489	EXP-CPC	93-07-14	932000	45.0	47.0	0.92	40	1.17500
490	EXP-CPC	93-07-14	932001	41.0	44.0	0.79	39	1.12821
491	EXP-CPC	93-07-14	932002	45.0	47.0	0.96	36	1.30556
492	EXP-CPC	93-07-14	932005	47.0	50.0	1.02	40	1.25000
493	EXP-CPC	93-07-14	932006	48.0	51.0	0.93	38	1.34211

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
494	EXP-CPC	93-07-14	932009	40.0	42.0	0.66	38	1.10526
495	EXP-CPC	93-07-14	932013	46.0	48.0	1.06	47	1.02128
496	EXP-CPC	93-07-14	932014	42.0	44.0	0.73	42	1.04762
497	EXP-CPC	93-07-14	932016	45.0	48.0	0.89	50	0.96000
498	EXP-CPC	93-07-14	932017	50.0	52.0	1.08	50	1.04000
499	EXP-CPC	93-07-14	932018	50.0	53.0	1.18	42	1.26190
500	EXP-CPC	93-07-14	932020	48.0	51.0	1.29	43	1.18605
501	EXP-CPC	93-07-14	932021	45.0	48.0	1.26	38	1.26316
502	EXP-CPC	93-07-14	932023	46.0	49.0	0.88	54	0.90741
503	EXP-CPC	93-07-14	932024	46.0	48.0	1.04	43	1.11628
504	EXP-CPC	93-07-14	932025	51.0	54.0	1.22	44	1.22727
505	EXP-CPC	93-07-14	932026	48.0	50.0	1.03	42	1.19048
506	EXP-CPC	93-07-14	932027	40.0	43.0	0.68	43	1.00000
507	EXP-CPC	93-07-14	932029	46.0	48.0	1.12	44	1.09091
508	EXP-CPC	93-07-14	932030	44.0	47.0	1.10	52	0.90385
509	EXP-CPC	93-07-14	932031	41.0	43.0	0.83	34	1.26471
510	EXP-CPC	93-07-14	932032	40.0	43.0	0.68	49	0.87755
511	EXP-CPC	93-07-14	932033	50.0	52.0	1.33	40	1.30000
512	EXP-CPC	93-07-14	932034	45.0	47.0	0.85	32	1.46875
513	EXP-CPC	93-07-14	932035	42.0	44.0	0.80	43	1.02326
514	EXP-CPC	93-07-14	932036	45.0	48.0	1.10	42	1.14286
515	EXP-CPC	93-07-14	932039	43.0	46.0	0.77	40	1.15000
516	EXP-CPC	93-07-14	932040	43.0	46.0	0.80	34	1.35294
517	EXP-CPC	93-07-14	932041	40.0	43.0	0.60	35	1.22857
518	EXP-CPC	93-07-14	932042	41.0	43.0	0.63	35	1.22857
519	EXP-CPC	93-07-14	932044	47.0	51.0	0.99	43	1.18605
520	EXP-CPC	93-07-14	932045	53.0	56.0	1.80	46	1.21739
521	EXP-CPC	93-07-14	932046	59.0	64.0	2.70	55	1.16364
522	EXP-CPC	93-07-14	932050	60.0	63.0	2.25	60	1.05000
523	EXP-CPC	93-07-14	932051	41.0	43.0	0.62	37	1.16216
524	EXP-CPC	93-07-14	932052	46.0	48.0	1.00	47	1.02128
525	EXP-CPC	93-07-14	932053	46.0	49.0	1.21	40	1.22500
526	EXP-CPC	93-07-14	932054	53.0	55.0	1.66	46	1.19565
527	EXP-CPC	93-07-14	932055	39.0	42.0	0.61	35	1.20000
528	EXP-CPC	93-07-14	932056	43.0	45.0	0.89	38	1.18421
529	EXP-CPC	93-07-14	932057	45.0	48.0	0.93	48	1.00000
530	EXP-CPC	93-07-14	932058	44.0	47.0	0.75	39	1.20513
531	EXP-CPC	93-07-14	932059	52.0	55.0	1.62	48	1.14583
532	EXP-CPC	93-07-14	932061	44.0	46.0	0.91	38	1.21053
533	EXP-CPC	93-07-14	932063	44.0	46.0	0.92	55	0.83636
534	EXP-CPC	93-07-14	932065	64.0	67.0	2.89	55	1.21818
535	EXP-CPC	93-07-14	932066	49.0	52.0	1.10	43	1.20930

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
536	EXP-CPC	93-07-14	932067	45.0	47.0	0.67	42	1.11905
537	EXP-CPC	93-07-14	932070	49.0	52.0	1.49	39	1.33333
538	EXP-CPC	93-07-14	932071	43.0	46.0	0.92	41	1.12195
539	EXP-CPC	93-07-14	932072	54.0	56.0	1.44	43	1.30233
540	EXP-CPC	93-07-14	932073	48.0	51.0	1.28	48	1.06250
541	EXP-CPC	93-07-14	932074	55.0	58.0	1.74	42	1.38095
542	EXP-CPC	93-07-14	932077	43.0	46.0	0.82	42	1.09524
543	EXP-CPC	93-07-14	932078	40.0	43.0	0.77	40	1.07500
544	EXP-CPC	93-07-14	932079	45.0	48.0	0.96	47	1.02128
545	EXP-CPC	93-07-14	932080	45.0	48.0	0.93	45	1.06667
546	EXP-CPC	93-07-14	932082	39.0	42.0	0.64	38	1.10526
547	EXP-CPC	93-07-14	932083	48.0	50.0	1.25	41	1.21951
548	EXP-CPC	93-07-14	932085	38.0	41.0	0.63	37	1.10811
549	EXP-CPC	93-07-14	932086	47.0	49.0	1.09	45	1.08889
550	EXP-CPC	93-07-14	932088	36.0	38.0	0.51	30	1.26667
551	EXP-CPC	93-07-14	932090	48.0	51.0	1.19	39	1.30769
552	EXP-CPC	93-07-14	932091	49.0	51.0	1.38	40	1.27500
553	EXP-CPC	93-07-14	932092	42.0	44.0	0.65	37	1.18919
554	EXP-CPC	93-07-14	932093	45.0	48.0	0.92	40	1.20000
555	EXP-CPC	93-07-14	932094	55.0	58.0	1.58	47	1.23404
556	EXP-CPC	93-07-14	932095	48.0	50.0	1.17	42	1.19048
557	EXP-CPC	93-07-14	932096	43.0	45.0	0.84	36	1.25000
558	EXP-CPC	93-07-14	932097	45.0	48.0	0.89	50	0.96000
559	EXP-CPC	93-07-14	932098	48.0	52.0	1.18	44	1.18182
560	EXP-CPC	93-07-14	932099	55.0	58.0	1.80	45	1.28889
561	EXP-CPC	93-07-14	932100	49.0	51.0	1.49	37	1.37838
562	EXP-CPC	93-07-14	932101	50.0	52.0	1.25	39	1.33333
563	EXP-CPC	93-07-14	932102	46.0	49.0	1.16	40	1.22500
564	EXP-CPC	93-07-14	932103	51.0	53.0	1.29	45	1.17778
565	EXP-CPC	93-07-14	932107	45.0	48.0	1.10	48	1.00000
566	EXP-CPC	93-07-14	932108	44.0	46.0	0.83	43	1.06977
567	EXP-CPC	93-07-14	932110	43.0	45.0	0.77	43	1.04651
568	EXP-CPC	93-07-14	932111	50.0	53.0	1.26	38	1.39474
569	EXP-CPC	93-07-14	932112	40.0	43.0	0.69	51	0.84314
570	EXP-CPC	93-07-14	932113	43.0	46.0	0.94	40	1.15000
571	EXP-CPC	93-07-14	932114	46.0	48.0	1.04	49	0.97959
572	EXP-CPC	93-07-14	932115	49.0	51.0	1.12	39	1.30769
573	EXP-CPC	93-07-14	932117	39.0	42.0	0.60	35	1.20000
574	EXP-CPC	93-07-14	932118	51.0	54.0	1.44	44	1.22727
575	EXP-CPC	93-07-14	932119	45.0	47.0	0.89	39	1.20513
576	EXP-CPC	93-07-14	932120	46.0	49.0	1.05	42	1.16667
577	EXP-CPC	93-07-14	932121	44.0	46.0	1.09	48	0.95833

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
578	EXP-CPC	93-07-14	932122	50.0	54.0	1.34	45	1.20000
579	EXP-CPC	93-07-14	932123	43.0	45.0	0.77	41	1.09756
580	EXP-CPC	93-07-14	932124	43.0	45.0	0.83	38	1.18421
581	EXP-CPC	93-07-14	932125	48.0	51.0	1.17	51	1.00000
582	EXP-CPC	93-07-14	932126	39.0	41.0	0.59	34	1.20588
583	EXP-CPC	93-07-14	932127	46.0	48.0	0.88	43	1.11628
584	EXP-CPC	93-07-14	932128	40.0	42.0	0.80	33	1.27273
585	EXP-CPC	93-07-14	932129	56.0	60.0	1.95	50	1.20000
586	EXP-CPC	93-07-14	932130	45.0	49.0	1.11	42	1.16667
587	EXP-CPC	93-07-14	932131	45.0	48.0	0.93	42	1.14286
588	EXP-CPC	93-07-14	932132	48.0	50.0	1.15	49	1.02041
589	EXP-CPC	93-07-14	932133	45.0	47.0	0.96	38	1.23684
590	EXP-CPC	93-07-14	932134	43.0	45.0	0.92	42	1.07143
591	EXP-CPC	93-07-14	932135	43.0	45.0	0.72	46	0.97826
592	EXP-CPC	93-07-14	932136	50.0	53.0	1.38	43	1.23256
593	EXP-CPC	93-07-14	932137	55.0	57.0	1.94	43	1.32558
594	EXP-CPC	93-07-14	932138	50.0	54.0	1.52	44	1.22727
595	EXP-CPC	93-07-14	932139	40.0	43.0	0.83	50	0.86000
596	EXP-CPC	93-07-14	932141	47.0	49.0	1.14	45	1.08889
597	EXP-CPC	93-07-14	932142	51.0	54.0	1.32	59	0.91525
598	EXP-CPC	93-07-14	932143	50.0	53.0	1.22	48	1.10417
599	EXP-CPC	93-07-14	932144	45.0	47.0	0.85	42	1.11905
600	EXP-CPC	93-07-14	932145	39.0	41.0	0.68	44	0.93182
601	EXP-CPC	93-07-14	932146	43.0	45.0	0.73	37	1.21622
602	EXP-CPC	93-07-14	932147	43.0	45.0	0.80	40	1.12500
603	EXP-CPC	93-07-14	932149	48.0	51.0	1.24	42	1.21429
604	EXP-CPC	93-07-14	932150	46.0	48.0	0.93	42	1.14286
605	EXP-CPC	93-07-14	932151	59.0	63.0	2.38	57	1.10526
606	EXP-CPC	93-07-14	932152	50.0	52.0	1.27	47	1.10638
607	EXP-CPC	93-07-14	932153	44.0	46.0	0.72	35	1.31429
608	EXP-CPC	93-07-14	932154	43.0	46.0	1.53	42	1.09524
609	EXP-CPC	93-07-14	932155	43.0	46.0	0.87	38	1.21053
610	EXP-CPC	93-07-14	932156	41.0	43.0	0.71	44	0.97727
611	EXP-CPC	93-07-14	932157	45.0	48.0	1.01	43	1.11628
612	EXP-CPC	93-07-14	932158	55.0	58.0	1.82	41	1.41463
613	EXP-CPC	93-07-14	932159	45.0	49.0	0.92	42	1.16667
614	EXP-CPC	93-07-14	932160	45.0	48.0	1.02	42	1.14286
615	EXP-CPC	93-07-14	932161	51.0	54.0	1.47	44	1.22727
616	EXP-CPC	93-07-14	932162	45.0	47.0	0.96	36	1.30556
617	EXP-CPC	93-07-14	932164	47.0	49.0	1.09	47	1.04255
618	EXP-CPC	93-07-14	932165	50.0	54.0	1.63	44	1.22727
619	EXP-CPC	93-07-14	932166	49.0	52.0	1.32	41	1.26829

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
620	EXP-CPC	93-07-14	932167	48.0	50.0	1.12	48	1.04167
621	EXP-CPC	93-07-14	932168	46.0	49.0	1.05	43	1.13953
622	EXP-CPC	93-07-14	932170	50.0	54.0	1.25	45	1.20000
623	EXP-CPC	93-07-14	932171	45.0	47.0	0.93	42	1.11905
624	EXP-CPC	93-07-14	932172	48.0	51.0	1.17	40	1.27500
625	EXP-CPC	93-07-14	932173	45.0	47.0	0.95	40	1.17500
626	EXP-CPC	93-07-14	932175	50.0	52.0	1.35	41	1.26829
627	EXP-CPC	93-07-14	932176	43.0	47.0	0.86	39	1.20513
628	EXP-CPC	93-07-14	932177	39.0	41.0	0.50	34	1.20588
629	EXP-CPC	93-07-14	932178	50.0	54.0	1.33	46	1.17391
630	EXP-CPC	93-07-14	932179	48.0	51.0	1.36	45	1.13333
631	EXP-CPC	93-07-14	932180	48.0	52.0	1.29	44	1.18182
632	EXP-CPC	93-07-14	932181	48.0	51.0	1.25	38	1.34211
633	EXP-CPC	93-07-14	932182	43.0	46.0	0.90	38	1.21053
634	EXP-CPC	93-07-14	932183	43.0	45.0	0.82	39	1.15385
635	EXP-CPC	93-07-14	932184	40.0	43.0	0.72	41	1.04878
636	EXP-CPC	93-07-14	932185	45.0	49.0	1.09	41	1.19512
637	EXP-CPC	93-07-14	932187	53.0	56.0	1.50	38	1.47368
638	EXP-CPC	93-07-14	932188	45.0	47.0	0.90	33	1.42424
639	EXP-CPC	93-07-14	932189	47.0	50.0	1.30	40	1.25000
640	EXP-CPC	93-07-14	932190	43.0	45.0	0.78	38	1.18421
641	EXP-CPC	93-07-14	932191	43.0	45.0	0.82	39	1.15385
642	EXP-CPC	93-07-14	932192	46.0	49.0	0.85	42	1.16667
643	EXP-CPC	93-07-14	932193	40.0	42.0	0.66	41	1.02439
644	EXP-CPC	93-07-14	932194	45.0	37.0	0.42	33	1.12121
645	EXP-CPC	93-07-14	932195	42.0	45.0	0.84	44	1.02273
646	EXP-CPC	93-07-14	932196	45.0	48.0	1.00	36	1.33333
647	EXP-CPC	93-07-14	932197	43.0	45.0	0.87	38	1.18421
648	EXP-CPC	93-07-14	932198	42.0	44.0	0.84	45	0.97778
649	EXP-CPC	93-07-14	932199	46.0	49.0	1.15	41	1.19512
650	EXP-CPC	93-07-14	932200	46.0	48.0	1.06	42	1.14286
651	EXP-CPC	93-07-14	932201	40.0	43.0	0.76	39	1.10256
652	EXP-CPC	93-07-14	932202	40.0	43.0	0.64	38	1.13158
653	EXP-CPC	93-07-14	932203	45.0	48.0	1.00	42	1.14286
654	EXP-CPC	93-07-14	932204	50.0	53.0	1.46	42	1.26190
655	EXP-CPC	93-07-14	932205	39.0	41.0	0.61	40	1.02500
656	EXP-CPC	93-07-14	932206	44.0	46.0	0.89	38	1.21053
657	EXP-CPC	93-07-14	932207	48.0	51.0	1.26	47	1.08511
658	EXP-CPC	93-07-14	932208	41.0	43.0	0.76	38	1.13158
659	EXP-CPC	93-07-14	932209	48.0	51.0	1.37	36	1.41667
660	EXP-CPC	93-07-14	932210	45.0	47.0	0.90	42	1.11905
661	EXP-CPC	93-07-14	932212	38.0	41.0	0.59	37	1.10811

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
662	EXP-CWR	93-07-07	930849	52.9	55.8	1.31	54	1.03333
663	EXP-CWR	93-07-07	930850	53.4	56.0	1.52	59	0.94915
664	EXP-CWR	93-07-07	930851	51.8	55.1	1.45	49	1.12449
665	EXP-CWR	93-07-07	930852	48.2	51.1	0.96	44	1.16136
666	EXP-CWR	93-07-07	930854	53.9	56.7	1.68	52	1.09038
667	EXP-CWR	93-07-07	930855	52.4	54.9	1.37	51	1.07647
668	EXP-CWR	93-07-07	930857	44.5	46.9	0.83	40	1.17250
669	EXP-CWR	93-07-07	930860	43.7	46.2	0.81	47	0.98298
670	EXP-EDT	93-06-30	930990	41.8	44.7	0.69	43	1.03953
671	EXP-EDT	93-06-30	930994	27.5	28.5	0.18	29	0.98276
672	EXP-EDT	93-06-30	931000	34.7	36.8	0.45	37	0.99459
673	EXP-EDT	93-06-30	931006	38.9	41.0	0.69	37	1.10811
674	EXP-EDT	93-06-30	931008	35.4	37.5	0.47	35	1.07143
675	EXP-EDT	93-06-30	931009	35.4	37.7	0.52	39	0.96667
676	EXP-EDT	93-06-30	931010	33.7	35.8	0.38	32	1.11875
677	EXP-EDT	93-06-30	931011	29.8	31.3	0.29	32	0.97813
678	EXP-EDT	93-06-30	931012	27.5	29.4	0.22	38	0.77368
679	EXP-EDT	93-06-30	931016	31.9	33.4	0.23	44	0.75909
680	EXP-EDT	93-06-30	931017	34.5	36.8	0.45	32	1.15000
681	EXP-EDT	93-06-30	931018	27.3	29.2	0.20	27	1.08148
682	EXP-EDT	93-06-30	931019	36.8	39.0	0.51	34	1.14706
683	EXP-EDT	93-06-30	931021	41.4	44.3	0.88	39	1.13590
684	EXP-EDT	93-06-30	931023	36.2	38.0	0.46	38	1.00000
685	EXP-EDT	93-06-30	931024	35.5	38.2	0.56	36	1.06111
686	EXP-EDT	93-06-30	931028	31.2	33.7	0.33	35	0.96286
687	EXP-EDT	93-06-30	931029	33.4	35.7	0.43	37	0.96486
688	EXP-EDT	93-06-30	931030	27.2	30.6	0.21	29	1.05517
689	EXP-EDT	93-06-30	931031	33.0	36.1	0.48	32	1.12812
690	EXP-EDT	93-06-30	931033	34.3	36.8	0.42	31	1.18710
691	EXP-EDT	93-06-30	931036	32.2	34.1	0.41	31	1.10000
692	EXP-EDT	93-06-30	931037	29.6	31.2	0.23	33	0.94545
693	EXP-EDT	93-06-30	931038	28.4	29.8	0.22	27	1.10370
694	EXP-EDT	93-07-07	930892	46.3	48.2	0.78	42	1.14762
695	EXP-EDT	93-07-07	930893	50.9	53.0	1.13	46	1.15217
696	EXP-EDT	93-07-07	930894	43.5	45.0	0.73	33	1.36364
697	EXP-EDT	93-07-07	930895	36.8	38.0	0.31	42	0.90476
698	EXP-EDT	93-07-07	930897	41.9	43.2	0.40	39	1.10769
699	EXP-EDT	93-07-07	930898	56.1	58.5	1.70	55	1.06364
700	EXP-EDT	93-07-07	930903	38.7	40.1	0.40	40	1.00250
701	EXP-EDT	93-07-07	930905	32.2	34.2	0.25	37	0.92432
702	EXP-EDT	93-07-07	930908	33.5	35.5	0.40	36	0.98611
703	EXP-EDT	93-07-07	930910	37.1	39.4	0.45	42	0.93810

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
704	EXP-EDT	93-07-07	930914	34.3	35.6	0.32	32	1.11250
705	EXP-EDT	93-07-07	930918	42.4	44.9	0.65	46	0.97609
706	EXP-EDT	93-07-07	930920	43.0	45.2	0.63	32	1.41250
707	EXP-EDT	93-07-07	930921	38.2	40.5	0.47	30	1.35000
708	EXP-EDT	93-07-07	930922	42.2	45.1	0.83	48	0.93958
709	EXP-EDT	93-07-07	930925	37.4	39.3	0.40	49	0.80204
710	EXP-EDT	93-07-07	930926	35.8	38.4	0.48	41	0.93659
711	EXP-EDT	93-07-07	930927	36.3	38.8	0.44	35	1.10857
712	EXP-EDT	93-07-07	930928	34.6	36.3	0.35	42	0.86429
713	EXP-EDT	93-07-07	930930	30.6	32.0	0.22	37	0.86486
714	EXP-EDT	93-07-07	930931	38.5	40.4	0.49	37	1.09189
715	EXP-EDT	93-07-07	930932	36.5	38.5	0.37	41	0.93902
716	EXP-EDT	93-07-07	930935	35.4	37.2	0.30	49	0.75918
717	EXP-EDT	93-07-14	931732	53.0	56.0	1.39	43	1.30233
718	EXP-EDT	93-07-14	931733	48.0	50.0	0.73	44	1.13636
719	EXP-EDT	93-07-14	931736	43.0	46.0	0.52	50	0.92000
720	EXP-EDT	93-07-14	931737	58.0	62.0	1.88	53	1.16981
721	EXP-EDT	93-07-14	931738	48.0	51.0	0.70	42	1.21429
722	EXP-EDT	93-07-14	931739	45.0	48.0	0.70	43	1.11628
723	EXP-EDT	93-07-14	931740	42.0	44.0	0.36	40	1.10000
724	EXP-EDT	93-07-14	931741	38.0	41.0	0.36	40	1.02500
725	EXP-EDT	93-07-14	931742	48.0	51.0	0.75	43	1.18605
726	EXP-EDT	93-07-14	931743	43.0	46.0	0.48	37	1.24324
727	EXP-EDT	93-07-14	931745	45.0	49.0	0.55	41	1.19512
728	EXP-EDT	93-07-14	931746	48.0	51.0	0.70	43	1.18605
729	EXP-EDT	93-07-14	931747	50.0	53.0	0.67	46	1.15217
730	EXP-EDT	93-07-14	931748	47.0	50.0	0.70	42	1.19048
731	EXP-EDT	93-07-14	931749	51.0	55.0	1.07	55	1.00000
732	EXP-EDT	93-07-14	931751	44.0	47.0	0.54	39	1.20513
733	EXP-EDT	93-07-14	931752	40.0	42.0	0.41	39	1.07692
734	EXP-EDT	93-07-14	931753	43.0	47.0	0.49	37	1.27027
735	EXP-EDT	93-07-14	931755	41.0	44.0	0.51	38	1.15789
736	EXP-EDT	93-07-14	931756	32.0	35.0	0.20	44	0.79545
737	EXP-EDT	93-07-14	931757	32.0	34.0	0.27	38	0.89474
738	EXP-OBP	93-06-23	930140	25.9	27.5	0.24	38	0.72368
739	EXP-OBP	93-06-23	930142	38.5	40.6	0.79	41	0.99024
740	EXP-OBP	93-07-07	930789	51.9	55.0	1.33	42	1.30952
741	EXP-OBP	93-07-07	930790	31.2	33.4	0.33	35	0.95429
742	EXP-OBP	93-07-07	930791	44.9	47.9	1.07	53	0.90377
743	EXP-OBP	93-07-07	930792	53.6	56.2	1.43	56	1.00357
744	EXP-OBP	93-07-07	930795	44.1	46.7	0.63	59	0.79153
745	EXP-WOM	93-06-23	930128	31.4	33.3	0.38	35	0.95143

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
746	EXP-WOM	93-06-23	930129	37.7	40.2	0.72	33	1.21818
747	EXP-WOM	93-06-23	930131	34.5	38.1	0.55	34	1.12059
748	EXP-WOM	93-06-23	930134	33.2	35.4	0.47	30	1.18000
749	EXP-WOM	93-06-23	930135	35.9	38.4	0.65	41	0.93659
750	EXP-WOM	93-06-23	930136	32.4	34.2	0.48	30	1.14000
751	EXP-WOM	93-06-23	930137	29.0	31.1	0.27	32	0.97188
752	EXP-WOM	93-06-23	930139	35.1	37.1	0.54	36	1.03056
753	EXP-WOM	93-06-30	931133	27.0	29.0	0.17	33	0.87879
754	EXP-WOM	93-06-30	931134	29.0	31.0	0.21	29	1.06897
755	EXP-WOM	93-06-30	931137	37.0	39.0	0.42	32	1.21875
756	EXP-WOM	93-06-30	931138	32.0	34.0	0.18	34	1.00000
757	EXP-WOM	93-06-30	931140	27.0	29.0	0.17	36	0.80556
758	EXP-WOM	93-06-30	931141	31.0	33.0	0.21	35	0.94286
759	EXP-WOM	93-06-30	931142	34.0	36.0	0.32	30	1.20000
760	EXP-WOM	93-06-30	931145	43.0	45.0	0.65	42	1.07143
761	EXP-WOM	93-06-30	931146	43.0	45.0	0.48	34	1.32353
762	EXP-WOM	93-06-30	931147	37.0	39.0	0.46	39	1.00000
763	EXP-WOM	93-06-30	931148	33.0	35.0	0.21	32	1.09375
764	EXP-WOM	93-06-30	931149	30.0	32.0	0.17	30	1.06667
765	EXP-WOM	93-06-30	931151	30.0	32.0	0.19	31	1.03226
766	EXP-WOM	93-06-30	931152	31.0	33.0	0.19	33	1.00000
767	EXP-WOM	93-06-30	931153	30.0	32.0	0.19	30	1.06667
768	EXP-WOM	93-06-30	931154	43.0	45.0	0.49	38	1.18421
769	EXP-WOM	93-06-30	931155	40.0	43.0	0.43	39	1.10256
770	EXP-WOM	93-06-30	931156	38.0	40.0	0.58	35	1.14286
771	EXP-WOM	93-06-30	931158	40.0	42.0	0.43	36	1.16667
772	EXP-WOM	93-06-30	931159	36.0	38.0	0.44	31	1.22581
773	EXP-WOM	93-06-30	931160	38.0	40.0	0.36	32	1.25000
774	EXP-WOM	93-06-30	931161	35.0	37.0	0.29	34	1.08824
775	EXP-WOM	93-06-30	931162	31.0	33.0	0.20	32	1.03125
776	EXP-WOM	93-06-30	931163	31.0	33.0	0.21	30	1.10000
777	EXP-WOM	93-06-30	931164	29.0	31.0	0.19	31	1.00000
778	EXP-WOM	93-06-30	931166	28.0	30.0	0.18	29	1.03448
779	EXP-WOM	93-06-30	931167	33.0	35.0	0.30	30	1.16667
780	EXP-WOM	93-06-30	931168	43.0	46.0	0.90	34	1.35294
781	EXP-WOM	93-06-30	931170	38.0	40.0	0.35	35	1.14286
782	EXP-WOM	93-06-30	931171	27.0	29.0	0.15	32	0.90625
783	EXP-WOM	93-06-30	931172	37.0	39.0	0.34	35	1.11429
784	EXP-WOM	93-06-30	931174	35.0	38.0	0.33	41	0.92683
785	EXP-WOM	93-06-30	931175	31.0	33.0	0.25	30	1.10000
786	EXP-WOM	93-06-30	931176	30.0	33.0	0.22	28	1.17857
787	EXP-WOM	93-06-30	931178	26.0	28.0	0.14	33	0.84848

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
788	EXP-WOM	93-06-30	931179	29.0	31.0	0.20	32	0.96875
789	EXP-WOM	93-06-30	931180	41.0	43.0	0.55	48	0.89583
790	EXP-WOM	93-06-30	931182	40.0	42.0	0.50	36	1.16667
791	EXP-WOM	93-06-30	931183	35.0	36.0	0.32	36	1.00000
792	EXP-WOM	93-06-30	931184	39.0	41.0	0.35	37	1.10811
793	EXP-WOM	93-06-30	931185	43.0	46.0	0.49	38	1.21053
794	EXP-WOM	93-06-30	931186	43.0	45.0	0.47	42	1.07143
795	EXP-WOM	93-06-30	931187	43.0	45.0	0.51	38	1.18421
796	EXP-WOM	93-06-30	931188	42.0	44.0	0.62	36	1.22222
797	EXP-WOM	93-06-30	931189	30.0	32.0	0.20	39	0.82051
798	EXP-WOM	93-06-30	931191	41.0	43.0	0.49	40	1.07500
799	EXP-WOM	93-07-07	930673	41.9	44.1	0.60	37	1.19189
800	EXP-WOM	93-07-07	930675	36.7	37.8	0.42	43	0.87907
801	EXP-WOM	93-07-07	930677	43.2	45.5	0.72	48	0.94792
802	EXP-WOM	93-07-07	930678	43.5	46.5	0.67	49	0.94898
803	EXP-WOM	93-07-07	930679	34.1	34.7	0.33	30	1.15667
804	EXP-WOM	93-07-07	930680	43.4	45.7	0.71	38	1.20263
805	EXP-WOM	93-07-07	930683	37.2	38.6	0.41	38	1.01579
806	EXP-WOM	93-07-07	930684	34.2	35.3	0.33	36	0.98056
807	EXP-WOM	93-07-07	930685	39.5	41.6	0.37	40	1.04000
808	EXP-WOM	93-07-07	930687	37.8	39.8	0.43	35	1.13714
809	EXP-WOM	93-07-07	930688	44.8	47.2	0.57	48	0.98333
810	EXP-WOM	93-07-07	930689	38.8	40.1	0.36	34	1.17941
811	EXP-WOM	93-07-07	930690	39.4	41.1	0.44	41	1.00244
812	EXP-WOM	93-07-07	930691	41.1	42.9	0.62	33	1.30000
813	EXP-WOM	93-07-07	930693	34.9	36.8	0.30	37	0.99459
814	EXP-WOM	93-07-07	930694	34.9	36.7	0.31	34	1.07941
815	EXP-WOM	93-07-07	930697	45.0	46.9	0.95	48	0.97708
816	EXP-WOM	93-07-07	930699	41.6	43.6	0.65	49	0.88980
817	EXP-WOM	93-07-07	930703	37.2	39.5	0.37	40	0.98750
818	EXP-WOM	93-07-07	930704	41.4	44.1	0.67	48	0.91875
819	EXP-WOM	93-07-07	930705	37.6	40.1	0.52	40	1.00250
820	EXP-WOM	93-07-07	930707	30.8	32.4	0.18	32	1.01250
821	EXP-WOM	93-07-07	930708	35.8	38.2	0.41	39	0.97949
822	EXP-WOM	93-07-07	930709	35.2	36.6	0.33	34	1.07647
823	EXP-WOM	93-07-07	930710	35.3	36.7	0.30	37	0.99189
824	EXP-WOM	93-07-07	930711	37.6	39.1	0.43	39	1.00256
825	EXP-WOM	93-07-07	930712	39.2	42.0	0.44	39	1.07692
826	EXP-WOM	93-07-07	930714	35.1	36.9	0.33	35	1.05429
827	EXP-WOM	93-07-07	930715	41.7	45.6	0.59	45	1.01333
828	EXP-WOM	93-07-07	930717	40.0	41.7	0.46	37	1.12703
829	EXP-WOM	93-07-07	930718	39.4	41.7	0.55	39	1.06923

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
830	EXP-WOM	93-07-07	930719	36.3	37.7	0.33	33	1.14242
831	EXP-WOM	93-07-07	930720	40.8	42.5	0.41	42	1.01190
832	EXP-WOM	93-07-07	930721	39.4	42.2	0.48	50	0.84400
833	EXP-WOM	93-07-07	930722	34.0	36.6	0.42	33	1.10909
834	EXP-WOM	93-07-07	930723	38.1	40.3	0.41	39	1.03333
835	EXP-WOM	93-07-07	930724	45.6	48.5	0.45	34	1.42647
836	EXP-WOM	93-07-07	930727	48.7	40.8	0.61	44	0.92727
837	EXP-WOM	93-07-07	930728	37.0	39.1	0.46	32	1.22187
838	EXP-WOM	93-07-07	930729	30.4	31.9	0.22	36	0.88611
839	EXP-WOM	93-07-07	930730	41.7	43.7	0.50	34	1.28529
840	EXP-WOM	93-07-07	930731	54.5	58.5	1.28	52	1.12500
841	EXP-WOM	93-07-07	930732	42.4	44.4	0.71	38	1.16842
842	EXP-WOM	93-07-07	930734	38.6	41.6	0.62	53	0.78491
843	EXP-WOM	93-07-07	930735	36.4	37.6	0.43	33	1.13939
844	EXP-WOM	93-07-07	930736	36.0	37.0	0.39	44	0.84091
845	EXP-WOM	93-07-07	930737	36.4	37.8	0.34	34	1.11176
846	EXP-WOM	93-07-07	930738	50.9	53.9	0.96	44	1.22500
847	EXP-WOM	93-07-07	930739	38.5	40.3	0.54	44	0.91591
848	EXP-WOM	93-07-07	930740	35.7	37.3	0.31	44	0.84773
849	EXP-WOM	93-07-07	930741	36.1	38.2	0.40	46	0.83043
850	EXP-WOM	93-07-07	930742	55.9	58.9	1.73	59	0.99831
851	EXP-WOM	93-07-07	930744	43.0	44.9	0.78	43	1.04419
852	EXP-WOM	93-07-07	930746	37.2	40.3	0.48	41	0.98293
853	EXP-WOM	93-07-07	930748	39.2	41.3	0.43	42	0.98333
854	EXP-WOM	93-07-07	930749	44.2	46.5	0.83	47	0.98936
855	EXP-WOM	93-07-07	930750	36.3	37.4	0.46	36	1.03889
856	EXP-WOM	93-07-07	930752	33.3	35.0	0.28	28	1.25000
857	EXP-WOM	93-07-07	930756	51.4	53.7	0.41	48	1.11875
858	EXP-WOM	93-07-07	930757	28.8	30.2	0.17	28	1.07857
859	EXP-WOM	93-07-07	930758	43.3	45.6	0.68	61	0.74754
860	EXP-WOM	93-07-07	930759	43.7	45.9	0.88	44	1.04318
861	EXP-WOM	93-07-07	930760	47.1	48.9	1.11	41	1.19268
862	EXP-WOM	93-07-07	930761	40.8	42.4	0.66	39	1.08718
863	EXP-WOM	93-07-07	930762	36.0	38.0	0.46	37	1.02703
864	EXP-WOM	93-07-07	930763	38.0	40.2	0.43	47	0.85532
865	EXP-WOM	93-07-07	930764	42.7	45.5	0.89	44	1.03409
866	EXP-WOM	93-07-07	930765	42.3	44.0	0.74	50	0.88000
867	EXP-WOM	93-07-07	930766	41.5	43.3	0.75	52	0.83269
868	EXP-WOM	93-07-07	930768	34.8	35.9	0.34	50	0.71800
869	EXP-WOM	93-07-07	930769	40.5	42.4	0.64	47	0.90213
870	EXP-WOM	93-07-07	930770	39.1	40.1	0.53	37	1.08378
871	EXP-WOM	93-07-07	930772	40.9	42.5	0.48	34	1.25000

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
872	EXP-WOM	93-07-07	930773	38.2	39.9	0.49	50	0.79800
873	EXP-WOM	93-07-07	930774	39.9	41.3	0.47	42	0.98333
874	EXP-WOM	93-07-07	930775	36.7	37.6	0.32	46	0.81739
875	EXP-WOM	93-07-07	930776	37.4	39.5	0.52	34	1.16176
876	EXP-WOM	93-07-07	930777	47.3	48.6	0.85	39	1.24615
877	EXP-WOM	93-07-07	930778	34.6	36.4	0.30	36	1.01111
878	EXP-WOM	93-07-07	930781	36.0	38.2	0.51	38	1.00526
879	EXP-WOM	93-07-07	930783	34.4	36.6	0.45	33	1.10909
880	EXP-WOM	93-07-07	930784	35.2	37.9	0.50	38	0.99737
881	EXP-WOM	93-07-07	930785	32.5	35.1	0.40	31	1.13226
882	EXP-WOM	93-07-07	930786	39.9	42.9	0.59	40	1.07250
883	EXP-WOM	93-07-07	930787	37.5	39.2	0.36	28	1.40000
884	EXP-WOM	93-07-14	931789	52.0	55.0	1.11	46	1.19565
885	EXP-WOM	93-07-14	931790	45.0	48.0	0.58	40	1.20000
886	EXP-WOM	93-07-14	931791	42.0	44.0	0.51	37	1.18919
887	EXP-WOM	93-07-14	931793	48.0	50.0	1.08	44	1.13636
888	EXP-WOM	93-07-14	931794	46.0	48.0	0.76	42	1.14286
889	EXP-WOM	93-07-14	931795	43.0	45.0	0.58	37	1.21622
890	EXP-WOM	93-07-14	931797	42.0	44.0	0.42	39	1.12821
891	EXP-WOM	93-07-14	931798	47.0	49.0	0.59	40	1.22500
892	EXP-WOM	93-07-14	931799	42.0	44.0	0.61	39	1.12821
893	EXP-WOM	93-07-14	931800	48.0	51.0	0.68	46	1.10870
894	EXP-WOM	93-07-14	931801	44.0	46.0	0.59	36	1.27778
895	EXP-WOM	93-07-14	931802	47.0	49.0	0.69	37	1.32432
896	EXP-WOM	93-07-14	931803	53.0	55.0	0.84	39	1.41026
897	EXP-WOM	93-07-14	931804	52.0	54.0	0.83	47	1.14894
898	EXP-WOM	93-07-14	931806	42.0	44.0	0.42	36	1.22222
899	EXP-WOM	93-07-14	931807	45.0	47.0	0.72	36	1.30556
900	EXP-WOM	93-07-14	931809	53.0	55.0	1.07	42	1.30952
901	EXP-WOM	93-07-14	931810	43.0	45.0	0.67	38	1.18421
902	EXP-WOM	93-07-14	931811	45.0	48.0	0.84	39	1.23077
903	EXP-WOM	93-07-14	931812	51.0	54.0	1.18	42	1.28571
904	EXP-WOM	93-07-14	931813	49.0	52.0	0.86	45	1.15556
905	EXP-WOM	93-07-14	931814	48.0	50.0	0.56	45	1.11111
906	EXP-WOM	93-07-14	931816	43.0	46.0	0.58	38	1.21053
907	EXP-WOM	93-07-14	931817	43.0	46.0	0.47	43	1.06977
908	EXP-WOM	93-07-14	931818	48.0	51.0	0.63	40	1.27500
909	EXP-WOM	93-07-14	931820	65.0	68.0	0.76	66	1.03030
910	EXP-WOM	93-07-14	931821	43.0	45.0	0.47	38	1.18421
911	EXP-WOM	93-07-14	931822	45.0	47.0	0.55	41	1.14634
912	EXP-WOM	93-07-14	931823	47.0	50.0	0.91	38	1.31579
913	EXP-WOM	93-07-14	931824	47.0	49.0	0.78	46	1.06522

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
914	EXP-WOM	93-07-14	931825	53.0	56.0	0.98	39	1.43590
915	EXP-WOM	93-07-14	931826	45.0	47.0	0.52	40	1.17500
916	EXP-WOM	93-07-14	931827	50.0	52.0	0.93	52	1.00000
917	EXP-WOM	93-07-14	931828	60.0	62.0	1.40	42	1.47619
918	EXP-WOM	93-07-14	931829	44.0	46.0	0.50	39	1.17949
919	EXP-WOM	93-07-14	931830	45.0	47.0	0.80	37	1.27027
920	EXP-WOM	93-07-14	931832	47.0	50.0	0.92	42	1.19048
921	EXP-WOM	93-07-14	931835	43.0	45.0	0.44	39	1.15385
922	EXP-WOM	93-07-14	931836	43.0	45.0	0.44	45	1.00000
923	EXP-WOM	93-07-14	931837	45.0	48.0	0.92	40	1.20000
924	EXP-WOM	93-07-14	931838	44.0	46.0	0.47	36	1.27778
925	EXP-WOM	93-07-14	931839	45.0	47.0	0.73	47	1.00000
926	EXP-WOM	93-07-14	931840	43.0	45.0	0.47	46	0.97826
927	EXP-WOM	93-07-14	931841	42.0	44.0	0.45	41	1.07317
928	EXP-WOM	93-07-14	931842	54.0	57.0	1.33	52	1.09615
929	EXP-WOM	93-07-14	931844	51.0	53.0	1.13	43	1.23256
930	EXP-WOM	93-07-14	931845	45.0	48.0	0.75	42	1.14286
931	EXP-WOM	93-07-14	931846	57.0	59.0	1.64	52	1.13462
932	EXP-WOM	93-07-14	931847	58.0	61.0	1.68	59	1.03390
933	EXP-WOM	93-07-14	931848	45.0	47.0	0.64	50	0.94000
934	EXP-WOM	93-07-14	931849	47.0	50.0	0.89	44	1.13636
935	EXP-WOM	93-07-14	931850	48.0	51.0	1.10	51	1.00000
936	EXP-WOM	93-07-14	931851	41.0	44.0	0.46	51	0.86275
937	EXP-WOM	93-07-14	931852	43.0	46.0	0.47	38	1.21053
938	EXP-WOM	93-07-14	931853	47.0	49.0	0.80	40	1.22500
939	EXP-WOM	93-07-14	931854	44.0	47.0	0.70	38	1.23684
940	EXP-WOM	93-07-14	931855	44.0	47.0	0.49	40	1.17500
941	EXP-WOM	93-07-14	931857	55.0	59.0	1.17	42	1.40476
942	EXP-WOM	93-07-14	931858	53.0	55.0	0.84	41	1.34146
943	EXP-WOM	93-07-14	931859	47.0	50.0	0.89	40	1.25000
944	EXP-WOM	93-07-14	931860	46.0	48.0	0.59	38	1.26316
945	EXP-WOM	93-07-14	931861	47.0	49.0	0.79	41	1.19512
946	EXP-WOM	93-07-14	931862	45.0	48.0	0.64	42	1.14286
947	EXP-WOM	93-07-14	931863	47.0	49.0	1.01	38	1.28947
948	EXP-WOM	93-07-14	931865	51.0	54.0	1.12	50	1.08000
949	EXP-WOM	93-07-14	931868	47.0	49.0	0.87	39	1.25641
950	EXP-WOM	93-07-14	931869	35.0	36.0	0.32	42	0.85714
951	EXP-WOM	93-07-14	931870	59.0	62.0	1.20	49	1.26531
952	EXP-WOM	93-07-14	931871	40.0	43.0	0.51	36	1.19444
953	EXP-WOM	93-07-14	931872	39.0	42.0	0.44	35	1.20000
954	EXP-WOM	93-07-14	931873	43.0	45.0	0.76	41	1.09756
955	EXP-WOM	93-07-14	931874	46.0	49.0	0.65	38	1.28947

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
956	EXP-WOM	93-07-14	931875	44.0	46.0	0.64	45	1.02222
957	EXP-WOM	93-07-14	931876	49.0	51.0	1.06	43	1.18605
958	EXP-WOM	93-07-14	931877	49.0	51.0	0.86	49	1.04082
959	EXP-WOM	93-07-14	931879	48.0	50.0	0.97	42	1.19048
960	EXP-WOM	93-07-14	931880	43.0	45.0	0.63	42	1.07143
961	EXP-WOM	93-07-14	931881	47.0	49.0	0.84	44	1.11364
962	EXP-WOM	93-07-14	931882	45.0	48.0	0.63	40	1.20000
963	EXP-WOM	93-07-14	931885	44.0	46.0	0.99	45	1.02222
964	EXP-WOM	93-07-14	931886	50.0	52.0	0.99	40	1.30000
965	EXP-WOM	93-07-14	931887	45.0	47.0	0.63	41	1.14634
966	EXP-WOM	93-07-14	931888	50.0	52.0	0.75	43	1.20930
967	EXP-WOM	93-07-14	931890	53.0	56.0	1.20	44	1.27273
968	JAI-ALB	93-07-13	930295	35.6	38.3	0.55	40	0.95750
969	JAI-ALB	93-07-13	930296	41.3	44.9	0.74	40	1.12250
970	JAI-ALB	93-07-13	930297	32.1	34.9	0.38	41	0.85122
971	JAI-ALB	93-07-13	930298	42.3	46.9	0.78	42	1.11667
972	JAI-ALB	93-07-13	930299	36.7	39.9	0.59	53	0.75283
973	JAI-ALB	93-07-13	930300	41.2	44.5	0.88	42	1.05952
974	JAI-ALB	93-07-13	930301	35.6	38.6	0.57	41	0.94146
975	JAI-ALB	93-07-13	930302	41.9	47.8	0.97	52	0.91923
976	JAI-ALB	93-07-13	930303	35.6	38.8	0.56	33	1.17576
977	JAI-ALB	93-07-13	930305	33.3	35.2	0.43	36	0.97778
978	JAI-ALB	93-07-13	930306	32.0	34.7	0.29	40	0.86750
979	JAI-ALB	93-07-13	930307	31.7	34.5	0.33	33	1.04545
980	JAI-ALB	93-07-13	930308	27.1	29.4	0.21	29	1.01379
981	JAI-ALB	93-07-13	930311	36.6	40.7	0.60	41	0.99268
982	JAI-ALB	93-07-13	930312	33.9	37.1	0.45	30	1.23667
983	JAI-ALB	93-07-13	930313	30.0	33.4	0.31	30	1.11333
984	JAI-ALB	93-07-13	930315	36.1	39.1	0.54	37	1.05676
985	JAI-ALB	93-07-13	930316	39.2	43.3	0.74	52	0.83269
986	JAI-ALB	93-07-13	930317	33.1	36.7	0.44	32	1.14687
987	JAI-ALB	93-07-13	930318	38.9	41.6	0.63	41	1.01463
988	JAI-ALB	93-07-13	930320	36.3	38.3	0.57	29	1.32069
989	JAI-ALB	93-07-13	930321	39.0	43.0	0.30	41	1.04878
990	JAI-ALB	93-07-13	930322	40.7	42.4	0.72	46	0.92174
991	JAI-ALB	93-07-13	930323	29.7	33.5	0.26	33	1.01515
992	JAI-ALB	93-07-13	930324	29.5	31.6	0.30	28	1.12857
993	JAI-ALB	93-07-13	930325	31.8	34.8	0.36	32	1.08750
994	JAI-ALB	93-07-13	930326	36.3	39.7	0.64	34	1.16765
995	JAI-ALB	93-07-13	930327	38.8	41.5	0.75	37	1.12162
996	JAI-ALB	93-07-13	930328	27.8	30.8	0.32	41	0.75122
997	JAI-ALB	93-07-13	930329	35.2	37.4	0.52	33	1.13333

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
998	JAI-ALB	93-07-13	930330	32.2	36.6	0.42	38	0.96316
999	JAI-ALB	93-07-13	930331	42.5	46.1	0.89	43	1.07209
1000	JAI-ALB	93-07-13	930332	37.5	41.3	0.67	33	1.25152
1001	JAI-ALB	93-07-13	930333	39.3	43.9	0.68	39	1.12564
1002	JAI-ALB	93-07-13	930334	38.9	42.5	0.71	37	1.14865
1003	JAI-ALB	93-07-13	930335	32.3	34.5	0.37	36	0.95833
1004	JAI-ALB	93-07-13	930340	31.8	34.5	0.37	35	0.98571
1005	JAI-ALB	93-07-13	930341	30.5	33.0	0.29	28	1.17857
1006	JAI-ALB	93-07-13	930342	40.1	43.8	0.94	44	0.99545
1007	JAI-ALB	93-07-13	930345	41.5	44.5	0.45	44	1.01136
1008	JAI-ALB	93-07-13	930346	51.8	55.1	0.94	45	1.22444
1009	JAI-ALB	93-07-13	930347	39.6	41.6	0.51	39	1.06667
1010	JAI-ALB	93-07-13	930349	41.9	43.9	0.77	42	1.04524
1011	JAI-ALB	93-07-13	930350	43.6	45.6	0.54	53	0.86038
1012	JAI-ALB	93-07-13	930351	38.8	42.2	0.55	43	0.98140
1013	JAI-ALB	93-07-13	930352	41.1	44.1	0.46	46	0.95870
1014	JAI-ALB	93-07-13	930353	41.7	44.0	0.44	44	1.00000
1015	JAI-ALB	93-07-13	930354	36.9	40.5	0.31	38	1.06579
1016	JAI-ALB	93-07-13	930355	36.3	38.6	0.30	45	0.85778
1017	JAI-ALB	93-07-13	930356	37.5	40.4	0.52	49	0.82449
1018	JAI-ALB	93-07-13	930357	40.4	43.2	0.49	45	0.96000
1019	JAI-ALB	93-07-13	930358	37.8	41.4	0.37	44	0.94091
1020	JAI-ALB	93-07-13	930359	37.5	40.4	0.40	39	1.03590
1021	JAI-ALB	93-07-13	930360	38.8	41.9	0.56	44	0.95227
1022	JAI-ALB	93-07-13	930361	35.3	38.5	0.33	41	0.93902
1023	JAI-ALB	93-07-13	930362	39.3	41.2	0.29	47	0.87660
1024	JAI-ALB	93-07-13	930363	35.6	38.0	0.29	33	1.15152
1025	JAI-ALB	93-07-13	930364	40.8	42.4	0.61	43	0.98605
1026	JAI-ALB	93-07-13	930365	35.4	39.1	0.37	41	0.95366
1027	JAI-ALB	93-07-13	930366	39.1	41.8	0.34	33	1.26667
1028	JAI-ALB	93-07-13	930367	33.5	35.9	0.22	35	1.02571
1029	JAI-ALB	93-07-13	930368	38.6	42.3	0.56	44	0.96136
1030	JAI-ALB	93-07-13	930369	37.6	40.1	0.32	37	1.08378
1031	JAI-ALB	93-07-13	930371	38.8	41.3	0.35	36	1.14722
1032	JAI-ALB	93-07-13	930372	37.8	40.8	0.31	33	1.23636
1033	JAI-ALB	93-07-13	930373	37.3	39.8	0.33	45	0.88444
1034	JAI-ALB	93-07-13	930374	31.3	32.7	0.24	34	0.96176
1035	JAI-ALB	93-07-13	930375	33.5	35.1	0.24	36	0.97500
1036	JAI-ALB	93-07-13	930376	37.7	40.1	0.33	38	1.05526
1037	JAI-ALB	93-07-13	930377	31.0	32.8	0.19	37	0.88649
1038	JAI-ALB	93-07-13	930379	33.8	36.4	0.35	35	1.04000
1039	JAI-ALB	93-07-13	930380	30.5	32.2	0.19	33	0.97576

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
1040	JAI-ALB	93-07-13	930381	33.5	36.1	0.22	35	1.03143
1041	JAI-ALB	93-07-13	930383	39.9	41.6	0.52	36	1.15556
1042	JAI-ALB	93-07-13	930384	39.3	41.6	0.53	35	1.18857
1043	JAI-ALB	93-07-13	930385	29.5	31.2	0.23	32	0.97500
1044	JAI-ALB	93-07-13	930386	39.0	41.4	0.66	46	0.90000
1045	JAI-ALB	93-07-13	930387	41.5	43.5	0.40	41	1.06098
1046	JAI-ALB	93-07-13	930388	39.4	41.5	0.62	40	1.03750
1047	JAI-ALB	93-07-13	930389	35.5	37.1	0.28	40	0.92750
1048	JAI-ALB	93-07-13	930390	37.5	39.5	0.40	38	1.03947
1049	JAI-ALB	93-07-13	930391	41.0	41.8	0.51	43	0.97209
1050	JAI-ALB	93-07-13	930392	34.7	35.7	0.26	42	0.85000
1051	JAI-ALB	93-07-13	930393	36.3	38.3	0.33	39	0.98205
1052	JAI-ALB	93-07-13	930394	32.3	35.1	0.24	38	0.92368
1053	JAI-ALB	93-07-13	930395	37.3	39.4	0.53	39	1.01026
1054	JAI-ALB	93-07-13	930396	35.8	38.6	0.33	36	1.07222
1055	JAI-ALB	93-07-13	930397	36.4	38.2	0.44	28	1.36429
1056	JAI-ALB	93-07-13	930398	43.6	45.2	0.85	45	1.00444
1057	JAI-ALB	93-07-13	930400	30.6	32.4	0.23	36	0.90000
1058	JAI-ALB	93-07-13	930401	32.6	35.3	0.34	37	0.95405
1059	JAI-ALB	93-07-13	930402	36.0	38.7	0.51	37	1.04595
1060	JAI-ALB	93-07-13	930403	31.5	33.5	0.25	36	0.93056
1061	JAI-ALB	93-07-13	930404	42.4	44.4	0.65	42	1.05714
1062	JAI-ALB	93-07-13	930405	32.2	34.7	0.30	39	0.88974
1063	JAI-ALB	93-07-13	930406	32.9	34.5	0.31	37	0.93243
1064	JAI-ALB	93-07-13	930407	37.2	39.4	0.48	34	1.15882
1065	JAI-ALB	93-07-13	930408	33.7	35.2	0.33	34	1.03529
1066	JAI-ALB	93-07-13	930409	30.9	33.4	0.24	32	1.04375
1067	JAI-ALB	93-07-13	930410	33.7	34.9	0.25	40	0.87250
1068	JAI-ALB	93-07-13	930411	34.0	36.9	0.38	40	0.92250
1069	JAI-ALB	93-07-13	930412	37.1	38.8	0.50	43	0.90233
1070	JAI-ALB	93-07-13	930413	30.1	33.1	0.21	35	0.94571
1071	JAI-ALB	93-07-13	930415	37.3	38.3	0.51	37	1.03514
1072	JAI-ALB	93-07-13	930416	31.7	33.2	0.30	37	0.89730
1073	JAI-ALB	93-07-13	930417	34.8	36.6	0.33	38	0.96316
1074	JAI-ALB	93-07-13	930418	30.5	32.3	0.26	33	0.97879
1075	JAI-ALB	93-07-13	930419	37.5	39.8	0.50	39	1.02051
1076	JAI-ALB	93-07-13	930420	29.7	32.1	0.18	32	1.00312
1077	JAI-ALB	93-07-13	930421	33.2	35.2	0.33	36	0.97778
1078	JAI-ALB	93-07-13	930424	24.7	27.2	0.13	32	0.85000
1079	JAI-ALB	93-07-27	930198	52.5	55.2	1.59	53	1.04151
1080	JAI-ALB	93-07-27	930200	41.8	45.2	0.90	46	0.98261
1081	JAI-ALB	93-07-27	930201	48.2	52.6	1.41	48	1.09583

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
1082	JAI-ALB	93-07-27	930202	51.0	55.9	2.05	58	0.96379
1083	JAI-ALB	93-07-27	930203	53.3	56.6	2.01	58	0.97586
1084	JAI-ALB	93-07-27	930204	47.8	52.8	1.28	57	0.92632
1085	JAI-ALB	93-07-27	930205	44.6	49.3	1.02	54	0.91296
1086	JAI-ALB	93-07-27	930206	41.8	45.7	0.84	49	0.93265
1087	JAI-ALB	93-07-27	930208	53.9	58.1	1.90	47	1.23617
1088	JAI-ALB	93-07-27	930210	40.8	43.8	0.78	56	0.78214
1089	JAI-ALB	93-07-27	930211	49.1	52.0	1.43	46	1.13043
1090	JAI-ALB	93-07-27	930212	39.5	43.0	0.73	49	0.87755
1091	JAI-ALB	93-07-27	930214	47.4	51.2	1.28	50	1.02400
1092	JAI-ALB	93-07-27	930215	43.6	47.0	1.00	56	0.83929
1093	JAI-ALB	93-07-27	930216	46.1	51.6	1.52	53	0.97358
1094	JAI-ALB	93-07-27	930217	44.2	48.2	1.09	52	0.92692
1095	JAI-ALB	93-07-27	930218	39.1	44.9	0.90	52	0.86346
1096	JAI-ALB	93-07-27	930219	54.0	60.2	2.34	58	1.03793
1097	JAI-ALB	93-07-27	930220	50.2	50.6	1.61	48	1.05417
1098	JAI-ALB	93-07-27	930222	49.1	52.9	1.45	53	0.99811
1099	JAI-ALB	93-07-27	930223	46.0	50.6	1.34	45	1.12444
1100	JAI-ALB	93-07-27	930225	49.8	54.8	1.76	61	0.89836
1101	JAI-ALB	93-07-27	930226	52.6	59.0	2.21	54	1.09259
1102	JAI-ALB	93-07-27	930227	46.1	50.6	1.29	61	0.82951
1103	JAI-ALB	93-07-27	930228	42.4	46.4	1.03	50	0.92800
1104	JAI-ALB	93-07-27	930229	45.5	49.0	1.22	47	1.04255
1105	JAI-ALB	93-07-27	930230	41.5	46.4	0.98	51	0.90980
1106	JAI-ALB	93-07-27	930232	49.4	53.7	1.57	53	1.01321
1107	JAI-ALB	93-07-27	930234	45.5	51.4	1.36	53	0.96981
1108	JAI-ALB	93-07-27	930235	40.7	46.3	0.95	52	0.89038
1109	JAI-ALB	93-07-27	930236	50.5	56.7	1.96	61	0.92951
1110	JAI-ALB	93-07-27	930237	41.8	48.2	1.07	39	1.23590
1111	JAI-ALB	93-07-27	930238	38.8	43.4	0.74	45	0.96444
1112	JAI-ALB	93-07-27	930240	41.4	45.9	0.92	43	1.06744
1113	JAI-ALB	93-07-27	930241	41.3	43.2	0.81	46	0.93913
1114	JAI-ALB	93-07-27	930242	41.7	45.3	0.93	52	0.87115
1115	JAI-ALB	93-09-07	931463	115.0	124.0	17.81	83	1.49398
1116	JAI-ALB	93-09-07	931464	65.0	69.0	2.80	70	0.98571
1117	JAI-ALB	93-09-07	931465	74.0	80.0	4.76	85	0.94118
1118	JAI-ALB	93-09-07	931466	77.0	83.0	5.17	78	1.06410
1119	JAI-ALB	93-09-07	931467	74.0	80.0	5.38	92	0.86957
1120	JAI-ALB	93-09-07	931469	71.0	75.0	3.68	79	0.94937
1121	JAI-ALB	93-09-23	932230	101.0	108.0	9.17	101	1.06931
1122	JAI-ALB	93-09-23	932231	90.0	95.0	7.09	108	0.87963
1123	JAI-ALB	93-09-23	932232	98.0	105.0	8.00	104	1.00962

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
1124	JAI-ALB	93-09-23	932233	99.0	105.0	7.94	84	1.25000
1125	JAI-ALB	93-09-23	932235	79.0	81.0	4.14	82	0.98780
1126	JAI-ALB	93-10-19	932537	92.0	99.0	6.74	108	0.91667
1127	JAI-ALB	93-10-19	932543	170.0	181.0	58.10	130	1.39231
1128	JAI-BKH	93-07-13	930426	45.8	48.5	0.82	46	1.05435
1129	JAI-BKH	93-07-13	930427	43.5	46.0	0.64	43	1.06977
1130	JAI-BKH	93-07-13	930429	52.8	55.2	1.54	48	1.15000
1131	JAI-BKH	93-07-13	930430	40.7	42.7	0.71	51	0.83725
1132	JAI-BKH	93-07-13	930431	38.3	40.7	0.45	46	0.88478
1133	JAI-BKH	93-07-13	930432	41.3	43.7	0.60	45	0.97111
1134	JAI-BKH	93-07-13	930433	39.0	41.6	0.39	47	0.88511
1135	JAI-BKH	93-07-13	930434	39.8	41.7	0.53	49	0.85102
1136	JAI-BKH	93-07-13	930435	47.7	49.5	0.93	51	0.97059
1137	JAI-BKH	93-07-13	930436	43.3	45.1	0.65	44	1.02500
1138	JAI-BKH	93-07-13	930437	32.7	34.9	0.39	36	0.96944
1139	JAI-BKH	93-07-13	930438	43.5	46.6	0.98	48	0.97083
1140	JAI-BKH	93-07-13	930439	48.3	49.6	0.96	53	0.93585
1141	JAI-BKH	93-07-13	930440	40.3	42.7	0.68	45	0.94889
1142	JAI-BKH	93-07-13	930441	43.9	46.1	0.81	42	1.09762
1143	JAI-BKH	93-07-13	930442	42.8	44.3	0.61	41	1.08049
1144	JAI-BKH	93-07-13	930444	47.7	48.5	0.86	52	0.93269
1145	JAI-BKH	93-07-13	930445	50.3	52.8	1.18	44	1.20000
1146	JAI-BKH	93-07-13	930446	41.3	44.4	0.78	47	0.94468
1147	JAI-BKH	93-07-13	930447	40.3	42.1	0.71	53	0.79434
1148	JAI-BKH	93-07-13	930448	45.3	47.9	0.92	57	0.84035
1149	JAI-BKH	93-07-13	930449	37.4	39.3	0.53	45	0.87333
1150	JAI-BKH	93-07-13	930450	40.8	42.7	0.67	51	0.83725
1151	JAI-BKH	93-07-13	930451	38.7	41.1	0.66	50	0.82200
1152	JAI-BKH	93-07-13	930452	43.8	45.1	0.75	46	0.98043
1153	JAI-BKH	93-07-13	930453	37.4	40.5	0.52	46	0.88043
1154	JAI-BKH	93-07-13	930454	38.0	40.0	0.57	46	0.86957
1155	JAI-BKH	93-07-13	930455	44.6	47.1	0.94	54	0.87222
1156	JAI-BKH	93-07-13	930456	44.8	46.4	0.90	59	0.78644
1157	JAI-BKH	93-07-13	930457	40.4	41.3	0.58	45	0.91778
1158	JAI-BKH	93-07-13	930458	35.1	38.1	0.36	52	0.73269
1159	JAI-BKH	93-07-13	930460	41.5	44.0	0.70	48	0.91667
1160	JAI-BKH	93-07-13	930461	39.6	42.6	0.55	52	0.81923
1161	JAI-BKH	93-07-13	930462	41.2	43.7	0.60	54	0.80926
1162	JAI-BKH	93-07-13	930463	44.6	46.8	0.74	53	0.88302
1163	JAI-BKH	93-07-13	930465	42.4	44.9	0.69	58	0.77414
1164	JAI-BKH	93-07-13	930466	38.0	39.8	0.53	49	0.81224
1165	JAI-BKH	93-07-13	930467	36.9	39.5	0.47	47	0.84043

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
1166	JAI-BKH	93-07-13	930468	37.0	39.6	0.46	54	0.73333
1167	JAI-BKH	93-07-13	930470	34.3	35.8	0.31	39	0.91795
1168	JAI-BKH	93-07-13	930471	38.8	41.5	0.54	55	0.75455
1169	JAI-BKH	93-07-13	930472	33.6	35.3	0.35	42	0.84048
1170	JAI-BKH	93-07-13	930473	37.2	38.9	0.47	44	0.88409
1171	JAI-BKH	93-07-13	930475	40.9	41.9	0.53	56	0.74821
1172	JAI-BKH	93-07-13	930476	46.8	49.7	1.02	55	0.90364
1173	JAI-BKH	93-07-13	930477	41.5	44.4	0.54	42	1.05714
1174	JAI-BKH	93-07-13	930480	45.4	48.6	1.03	60	0.81000
1175	JAI-BKH	93-07-13	930481	39.8	42.4	0.62	55	0.77091
1176	JAI-BKH	93-07-13	930489	46.4	49.4	1.08	68	0.72647
1177	JAI-BKH	93-07-13	930490	48.0	50.1	1.08	56	0.89464
1178	JAI-BKH	93-07-13	930491	44.1	47.5	0.95	64	0.74219
1179	JAI-BKH	93-07-13	930492	36.8	38.9	0.46	46	0.84565
1180	JAI-BKH	93-07-13	930501	45.8	47.1	0.87	45	1.04667
1181	JAI-BKH	93-07-13	930506	37.8	40.4	0.53	42	0.96190
1182	JAI-BKH	93-07-13	930513	32.2	34.2	0.33	39	0.87692
1183	JAI-BKH	93-07-13	930515	43.5	46.1	0.68	48	0.96042
1184	JAI-BKH	93-07-13	930516	42.5	44.8	0.68	46	0.97391
1185	JAI-BKH	93-07-13	930517	39.4	41.7	0.64	42	0.99286
1186	JAI-BKH	93-07-13	930518	38.3	40.0	0.57	47	0.85106
1187	JAI-BKH	93-07-13	930521	38.9	42.9	0.64	49	0.87551
1188	JAI-BKH	93-07-13	930523	39.1	41.9	0.73	49	0.85510
1189	JAI-BKH	93-07-13	930524	44.0	47.9	0.82	46	1.04130
1190	JAI-BKH	93-07-13	930531	47.8	51.6	1.26	53	0.97358
1191	JAI-BKH	93-07-13	930534	45.5	48.0	0.91	52	0.92308
1192	JAI-BKH	93-07-13	930536	41.2	43.9	0.78	43	1.02093
1193	JAI-BKH	93-07-13	930537	35.4	37.2	0.40	44	0.84545
1194	JAI-BKH	93-07-13	930539	47.9	50.0	1.05	51	0.98039
1195	JAI-BKH	93-07-13	930542	38.8	40.6	0.50	40	1.01500
1196	JAI-BKH	93-07-13	930543	43.2	45.4	0.86	54	0.84074
1197	JAI-BKH	93-07-13	930544	36.5	37.6	0.45	37	1.01622
1198	JAI-BKH	93-07-13	930545	57.8	60.2	2.13	57	1.05614
1199	JAI-BKH	93-07-13	930546	60.1	62.9	2.26	63	0.99841
1200	JAI-BKH	93-07-13	930547	47.4	50.2	0.98	47	1.06809
1201	JAI-BKH	93-07-13	930548	36.8	39.2	0.50	49	0.80000
1202	JAI-BKH	93-07-13	930550	47.4	50.4	1.04	52	0.96923
1203	JAI-BKH	93-07-13	930553	37.6	38.7	0.39	48	0.80625
1204	JAI-BKH	93-07-13	930554	39.4	41.8	0.64	47	0.88936
1205	JAI-BKH	93-07-13	930555	37.0	39.4	0.45	49	0.80408
1206	JAI-BKH	93-07-13	930557	43.8	45.9	0.90	55	0.83455
1207	JAI-BKH	93-07-13	930559	41.8	43.1	0.74	49	0.87959

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
1208	JAI-BKH	93-07-13	930561	31.2	32.5	0.30	42	0.77381
1209	JAI-BKH	93-07-13	930562	51.6	54.6	1.64	38	1.43684
1210	JAI-BKH	93-07-13	930563	42.4	44.7	0.79	42	1.06429
1211	JAI-BKH	93-07-13	930564	30.2	34.4	0.32	45	0.76444
1212	JAI-BKH	93-07-13	930565	37.9	40.0	0.54	44	0.90909
1213	JAI-BKH	93-07-13	930566	42.7	44.2	0.72	44	1.00455
1214	JAI-BKH	93-07-13	930567	44.2	44.9	0.69	48	0.93542
1215	JAI-BKH	93-07-13	930568	40.1	41.9	0.67	40	1.04750
1216	JAI-BKH	93-07-13	930570	45.0	48.5	1.05	49	0.98980
1217	JAI-BKH	93-07-13	930571	55.9	60.9	1.88	52	1.17115
1218	JAI-BKH	93-07-13	930572	59.8	62.7	2.22	57	1.10000
1219	JAI-BKH	93-07-13	930573	45.2	48.1	0.86	45	1.06889
1220	JAI-BKH	93-07-13	930574	46.6	49.3	1.06	43	1.14651
1221	JAI-BKH	93-07-13	930575	46.2	48.5	0.85	44	1.10227
1222	JAI-BKH	93-07-13	930576	43.4	46.1	0.74	50	0.92200
1223	JAI-BKH	93-07-13	930577	34.1	34.6	0.38	42	0.82381
1224	JAI-BKH	93-07-13	930578	38.3	40.4	0.58	43	0.93953
1225	JAI-BKH	93-07-13	930579	42.5	45.0	0.75	36	1.25000
1226	JAI-BKH	93-07-13	930580	42.7	45.4	0.92	52	0.87308
1227	JAI-BKH	93-07-13	930581	37.5	40.0	0.54	44	0.90909
1228	JAI-BKH	93-07-13	930582	62.2	65.5	2.15	59	1.11017
1229	JAI-BKH	93-07-13	930583	49.4	52.4	1.16	66	0.79394
1230	JAI-BKH	93-07-13	930585	40.8	43.0	0.61	54	0.79630
1231	JAI-BKH	93-07-13	930586	37.4	50.2	0.93	64	0.78438
1232	JAI-BKH	93-07-13	930588	40.9	42.5	0.65	46	0.92391
1233	JAI-BKH	93-07-13	930589	46.3	48.1	1.07	66	0.72879
1234	JAI-BKH	93-07-13	930591	43.9	46.1	0.93	64	0.72031
1235	JAI-BKH	93-07-13	930592	42.4	44.6	0.84	49	0.91020
1236	JAI-BKH	93-07-13	930594	35.6	37.7	0.38	48	0.78542
1237	JAI-BKH	93-07-13	930595	46.1	46.5	0.74	53	0.87736
1238	JAI-BKH	93-07-13	930597	49.9	51.4	1.40	56	0.91786
1239	JAI-BKH	93-07-13	930598	39.9	42.1	0.69	54	0.77963
1240	JAI-BKH	93-07-13	930599	46.2	47.3	0.92	61	0.77541
1241	JAI-BKH	93-07-13	930600	43.2	45.0	0.87	58	0.77586
1242	JAI-BKH	93-07-13	930604	34.5	37.1	0.39	49	0.75714
1243	JAI-BKH	93-07-13	930606	55.3	58.8	1.56	68	0.86471
1244	JAI-BKH	93-07-13	930607	44.5	46.4	0.92	62	0.74839
1245	JAI-BKH	93-07-13	930608	41.6	44.6	0.81	53	0.84151
1246	JAI-BKH	93-07-13	930609	53.6	56.8	1.50	62	0.91613
1247	JAI-BKH	93-07-13	930610	47.0	49.0	1.02	54	0.90741
1248	JAI-BKH	93-07-13	930611	39.2	40.7	0.61	48	0.84792
1249	JAI-BKH	93-07-13	930612	41.0	44.7	0.82	54	0.82778

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
1250	JAI-BKH	93-07-13	930613	46.3	44.3	0.94	45	0.98444
1251	JAI-BKH	93-07-13	930614	47.6	51.9	1.27	40	1.29750
1252	JAI-BKH	93-07-13	930616	43.4	45.2	0.72	42	1.07619
1253	JAI-BKH	93-07-13	930617	40.2	43.0	0.62	36	1.19444
1254	JAI-BKH	93-07-13	930618	48.9	52.2	1.30	53	0.98491
1255	JAI-BKH	93-07-13	930620	43.1	46.0	0.80	44	1.04545
1256	JAI-BKH	93-07-13	930622	40.3	41.9	0.48	41	1.02195
1257	JAI-BKH	93-07-13	930624	40.5	41.7	0.45	44	0.94773
1258	JAI-BKH	93-07-13	930625	46.2	48.0	0.64	44	1.09091
1259	JAI-BKH	93-07-13	930626	53.5	55.9	1.61	60	0.93167
1260	JAI-BKH	93-07-13	930627	46.0	48.3	0.95	46	1.05000
1261	JAI-BKH	93-07-13	930628	45.0	47.9	0.68	45	1.06444
1262	JAI-BKH	93-07-13	930630	42.1	45.8	0.65	42	1.09048
1263	JAI-BKH	93-07-13	930631	42.6	43.9	0.67	58	0.75690
1264	JAI-BKH	93-07-13	930632	39.5	41.8	0.46	48	0.87083
1265	JAI-BKH	93-07-13	930634	49.5	52.0	1.30	45	1.15556
1266	JAI-BKH	93-07-13	930636	52.7	54.7	1.29	52	1.05192
1267	JAI-BKH	93-07-13	930637	46.9	49.1	0.90	54	0.90926
1268	JAI-BKH	93-07-13	930638	45.3	48.5	0.91	47	1.03191
1269	JAI-BKH	93-07-13	930639	43.5	46.4	0.78	41	1.13171
1270	JAI-BKH	93-07-13	930640	49.7	51.4	1.01	57	0.90175
1271	JAI-BKH	93-07-13	930643	39.8	42.1	0.57	36	1.16944
1272	JAI-BKH	93-07-13	930644	48.1	51.5	1.19	40	1.28750
1273	JAI-BKH	93-07-13	930645	35.1	37.0	0.29	30	1.23333
1274	JAI-BKH	93-07-13	930647	45.2	47.7	0.74	42	1.13571
1275	JAI-BKH	93-07-13	930649	34.3	36.8	0.38	48	0.76667
1276	JAI-BKH	93-07-13	930650	50.0	53.9	1.13	41	1.31463
1277	JAI-BKH	93-07-13	930651	48.7	52.1	1.27	56	0.93036
1278	JAI-BKH	93-07-13	930652	48.5	50.8	1.31	65	0.78154
1279	JAI-BKH	93-07-13	930653	45.9	48.2	1.00	48	1.00417
1280	JAI-BKH	93-07-13	930654	44.4	46.4	0.62	44	1.05455
1281	JAI-BKH	93-07-13	930655	49.8	51.4	1.34	62	0.82903
1282	JAI-BKH	93-07-13	930656	42.5	45.2	0.64	46	0.98261
1283	JAI-BKH	93-07-13	930657	48.4	50.6	1.14	50	1.01200
1284	JAI-BKH	93-07-13	930658	45.6	47.4	1.02	46	1.03043
1285	JAI-BKH	93-07-13	930659	48.3	39.7	0.41	47	0.84468
1286	JAI-BKH	93-07-13	930660	48.9	40.5	0.56	42	0.96429
1287	JAI-BKH	93-07-13	930663	42.7	45.4	0.62	46	0.98696
1288	JAI-BKH	93-07-13	930665	38.0	40.5	0.58	51	0.79412
1289	JAI-BKH	93-07-13	930666	41.5	43.0	0.58	42	1.02381
1290	JAI-BKH	93-07-13	930667	49.2	51.3	1.29	50	1.02600
1291	JAI-BKH	93-07-13	930668	40.3	42.0	0.60	39	1.07692

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
1292	JAI-BKH	93-07-13	930671	37.4	39.3	0.37	42	0.93571
1293	JAI-BKH	93-07-27	930243	66.2	73.5	3.53	64	1.14844
1294	JAI-BKH	93-07-27	930246	50.0	52.9	1.43	58	0.91207
1295	JAI-BKH	93-07-27	930247	46.5	49.9	0.92	64	0.77969
1296	JAI-BKH	93-07-27	930248	55.9	61.1	1.72	52	1.17500
1297	JAI-BKH	93-09-07	931508	86.0	92.0	7.34	69	1.33333
1298	JAI-BKH	93-09-07	931509	82.0	88.0	6.26	77	1.14286
1299	JAI-BKH	93-09-07	931518	74.0	80.0	4.87	68	1.17647
1300	JAI-BKH	93-09-07	931519	72.0	77.0	4.33	71	1.08451
1301	JAI-BKH	93-09-07	931521	88.0	95.0	7.93	68	1.39706
1302	JAI-BKH	93-09-07	931522	88.0	93.0	7.52	68	1.36765
1303	JAI-BKH	93-09-07	931528	115.0	122.0	18.09	95	1.28421
1304	JAI-BKH	93-09-07	931530	71.0	75.0	3.67	75	1.00000
1305	JAI-BKH	93-09-07	931531	83.0	87.0	6.25	75	1.16000
1306	JAI-BPT	93-07-13	930151	38.5	41.9	0.68	40	1.04750
1307	JAI-BPT	93-07-27	930249	44.9	49.3	1.18	49	1.00612
1308	JAI-BPT	93-07-27	930250	50.1	55.4	1.71	45	1.23111
1309	JAI-BPT	93-07-27	930251	47.5	51.1	1.32	55	0.92909
1310	JAI-BPT	93-07-27	930252	53.9	58.0	2.06	68	0.85294
1311	JAI-BPT	93-07-27	930253	48.5	52.0	1.36	47	1.10638
1312	JAI-BPT	93-07-27	930254	51.2	53.8	1.64	50	1.07600
1313	JAI-BPT	93-07-27	930255	37.5	41.2	0.56	42	0.98095
1314	JAI-BPT	93-07-27	930256	48.6	54.3	1.48	58	0.93621
1315	JAI-BPT	93-07-27	930257	45.6	50.6	1.07	58	0.87241
1316	JAI-BPT	93-07-27	930258	47.2	49.7	1.28	44	1.12955
1317	JAI-BPT	93-07-27	930259	55.5	60.1	1.96	53	1.13396
1318	JAI-BPT	93-07-27	930260	49.2	53.0	1.47	54	0.98148
1319	JAI-BPT	93-07-27	930261	46.6	49.8	1.16	59	0.84407
1320	JAI-BPT	93-07-27	930262	46.7	51.4	1.28	55	0.93455
1321	JAI-BPT	93-07-27	930263	44.3	47.8	1.08	50	0.95600
1322	JAI-BPT	93-07-27	930264	50.4	55.8	1.66	59	0.94576
1323	JAI-BPT	93-07-27	930266	49.7	53.1	1.57	48	1.10625
1324	JAI-BPT	93-07-27	930267	54.3	57.5	1.82	55	1.04545
1325	JAI-BPT	93-07-27	930268	47.7	52.5	1.32	56	0.93750
1326	JAI-BPT	93-08-11	931231	58.0	61.0	1.81	53	1.15094
1327	JAI-BPT	93-08-11	931232	55.0	59.0	1.58	65	0.90769
1328	JAI-BPT	93-08-11	931233	51.0	55.0	1.16	59	0.93220
1329	JAI-BPT	93-08-11	931234	57.0	60.0	1.80	52	1.15385
1330	JAI-BPT	93-08-11	931235	62.0	66.0	2.66	59	1.11864
1331	JAI-BPT	93-08-11	931236	58.0	62.0	2.07	60	1.03333
1332	JAI-BPT	93-08-11	931237	52.0	56.0	1.40	60	0.93333
1333	JAI-BPT	93-08-11	931238	58.0	62.0	2.17	66	0.93939

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
1334	JAI-BPT	93-08-11	931240	55.0	60.0	1.82	61	0.98361
1335	JAI-BPT	93-09-07	931470	60.0	66.0	2.44	68	0.97059
1336	JAI-BPT	93-09-07	931473	70.0	75.0	3.77	88	0.85227
1337	JAI-BPT	93-09-07	931474	63.0	66.0	2.61	67	0.98507
1338	JAI-BPT	93-09-07	931475	69.0	74.0	3.50	92	0.80435
1339	JAI-BPT	93-09-07	931478	96.0	103.0	9.92	84	1.22619
1340	JAI-BPT	93-09-07	931480	76.0	82.0	5.04	69	1.18841
1341	JAI-BPT	93-09-23	932604	70.0	76.0	2.99	91	0.83516
1342	JAI-BPT	93-09-23	932605	71.0	75.0	2.70	88	0.85227
1343	JAI-BPT	93-09-23	932610	84.0	87.0	6.30	95	0.91579
1344	JAI-BPT	93-09-23	932611	90.0	96.0	5.79	94	1.02128
1345	JAI-BTB	93-07-13	930152	34.4	38.5	0.53	28	1.37500
1346	JAI-BTB	93-07-13	930153	32.4	35.9	0.41	37	0.97027
1347	JAI-BTB	93-07-13	930154	44.4	48.7	1.18	43	1.13256
1348	JAI-BTB	93-07-13	930156	42.2	47.0	0.99	42	1.11905
1349	JAI-BTB	93-07-13	930157	36.4	39.9	0.63	32	1.24687
1350	JAI-BTB	93-07-13	930158	41.5	46.3	0.99	45	1.02889
1351	JAI-BTB	93-07-27	930269	51.7	59.0	1.99	64	0.92188
1352	JAI-BTB	93-07-27	930270	52.7	55.8	1.57	55	1.01455
1353	JAI-BTB	93-07-27	930271	49.0	51.8	1.34	44	1.17727
1354	JAI-BTB	93-08-11	931241	66.0	71.0	3.13	66	1.07576
1355	JAI-BTB	93-08-11	931242	62.0	66.0	2.86	56	1.17857
1356	JAI-BTB	93-08-11	931243	68.0	72.0	3.90	58	1.24138
1357	JAI-BTB	93-08-11	931244	56.0	60.0	2.17	51	1.17647
1358	JAI-BTB	93-08-11	931246	68.0	73.0	3.52	57	1.28070
1359	JAI-BTB	93-08-11	931247	58.0	62.0	2.35	55	1.12727
1360	JAI-BTB	93-08-11	931248	59.0	62.0	2.36	61	1.01639
1361	JAI-BTB	93-08-11	931249	62.0	66.0	3.16	73	0.90411
1362	JAI-BTB	93-08-11	931250	65.0	70.0	3.20	61	1.14754
1363	JAI-BTB	93-08-11	931251	65.0	70.0	3.14	60	1.16667
1364	JAI-BTB	93-08-11	931252	60.0	65.0	2.53	60	1.08333
1365	JAI-BTB	93-08-11	931253	67.0	70.0	3.14	57	1.22807
1366	JAI-BTB	93-08-11	931254	60.0	65.0	2.64	60	1.08333
1367	JAI-BTB	93-08-11	931256	58.0	63.0	2.31	59	1.06780
1368	JAI-BTB	93-08-11	931257	68.0	72.0	2.31	64	1.12500
1369	JAI-BTB	93-08-11	931258	60.0	63.0	2.38	50	1.26000
1370	JAI-BTB	93-08-11	931259	54.0	58.0	1.91	53	1.09434
1371	JAI-BTB	93-08-11	931260	57.0	61.0	2.12	54	1.12963
1372	JAI-BTB	93-08-11	931261	53.0	57.0	1.76	54	1.05556
1373	JAI-BTB	93-09-07	931488	78.0	85.0	5.22	70	1.21429
1374	JAI-BTB	93-09-07	931490	93.0	100.0	9.84	67	1.49254
1375	JAI-BTB	93-09-07	931493	80.0	87.0	6.30	74	1.17568

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
1376	JAI-BTB	93-09-07	931496	85.0	92.0	7.51	100	0.92000
1377	JAI-BTB	93-09-07	931497	83.0	88.0	6.49	66	1.33333
1378	JAI-BTB	93-09-07	931499	82.0	88.0	6.47	72	1.22222
1379	JAI-BTB	93-09-07	931500	92.0	99.0	9.12	74	1.33784
1380	JAI-BTB	93-09-07	931505	73.0	79.0	4.69	70	1.12857
1381	JAI-BTB	93-09-23	932617	112.0	120.0	14.63	106	1.13208
1382	JAI-BTB	93-09-23	932618	102.0	112.0	10.80	90	1.24444
1383	JAI-BTB	93-09-23	932620	83.0	88.0	5.70	86	1.02326
1384	JAI-BTB	93-09-23	932622	109.0	117.0	15.98	105	1.11429
1385	JAI-BTB	93-09-23	932623	95.0	102.0	9.15	88	1.15909
1386	JAI-BTB	93-09-23	932624	107.0	115.0	11.65	88	1.30682
1387	JAI-BTB	93-09-23	932625	87.0	94.0	6.67	83	1.13253
1388	JAI-BTB	93-09-23	932627	99.0	107.0	10.64	104	1.02885
1389	JAI-BTB	93-09-23	932628	91.0	96.0	6.98	87	1.10345
1390	JAI-BTB	93-09-23	932632	85.0	92.0	6.55	82	1.12195
1391	JAI-BTB	93-09-23	932633	88.0	94.0	7.53	94	1.00000
1392	JAI-BTB	93-09-23	932635	116.0	127.0	17.97	118	1.07627
1393	JAI-BTB	93-10-19	932547	111.0	120.0	10.49	109	1.10092
1394	JAI-BTB	93-10-19	932559	120.0	128.0	17.02	113	1.13274
1395	JAI-BTB	93-10-19	932560	117.0	125.0	13.89	112	1.11607
1396	JAI-BTB	93-10-19	932563	125.0	135.0	20.74	122	1.10656
1397	JAI-CPC	93-09-07	931442	79.0	86.0	4.83	68	1.26471
1398	JAI-CPC	93-09-07	931444	79.0	84.0	5.20	74	1.13514
1399	JAI-CPC	93-09-07	931446	76.0	81.0	4.61	77	1.05195
1400	JAI-CPC	93-09-07	931447	77.0	80.0	4.87	73	1.09589
1401	JAI-CPC	93-09-07	931448	81.0	86.0	5.64	84	1.02381
1402	JAI-CPC	93-09-07	931449	76.0	81.0	4.83	73	1.10959
1403	JAI-CPC	93-09-07	931450	78.0	82.0	4.65	70	1.17143
1404	JAI-CPC	93-09-07	931451	81.0	87.0	6.20	75	1.16000
1405	JAI-CPC	93-09-07	931452	77.0	83.0	4.81	70	1.18571
1406	JAI-CPC	93-09-07	931453	78.0	83.0	4.70	77	1.07792
1407	JAI-CPC	93-09-07	931454	78.0	84.0	5.48	82	1.02439
1408	JAI-CPC	93-09-07	931455	69.0	73.0	3.51	67	1.08955
1409	JAI-CPC	93-09-07	931456	81.0	86.0	5.99	74	1.16216
1410	JAI-CPC	93-09-07	931457	75.0	81.0	4.99	82	0.98780
1411	JAI-CPC	93-09-07	931459	91.0	98.0	8.37	74	1.32432
1412	JAI-CPC	93-09-23	932213	83.0	90.0	5.93	91	0.98901
1413	JAI-CPC	93-09-23	932217	109.0	119.0	13.85	88	1.35227
1414	JAI-CPC	93-09-23	932218	93.0	101.0	8.53	99	1.02020
1415	JAI-CPC	93-09-23	932220	90.0	97.0	7.36	88	1.10227
1416	JAI-CPC	93-09-23	932222	80.0	85.0	4.99	84	1.01190
1417	JAI-CPC	93-09-23	932223	78.0	85.0	5.61	103	0.82524

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
1418	JAI-CPC	93-09-23	932226	84.0	92.0	6.02	82	1.12195
1419	JAI-CPC	93-10-19	932573	95.0	103.0	8.74	112	0.91964
1420	JAI-GOB	93-07-13	930160	40.4	43.0	0.79	37	1.16216
1421	JAI-GOB	93-07-13	930161	35.5	37.9	0.48	34	1.11471
1422	JAI-GOB	93-07-13	930162	57.3	60.7	2.57	72	0.84306
1423	JAI-GOB	93-07-13	930163	43.0	47.0	1.12	46	1.02174
1424	JAI-GOB	93-07-13	930164	37.8	41.5	0.72	41	1.01220
1425	JAI-GOB	93-07-13	930165	54.6	58.3	2.18	58	1.00517
1426	JAI-GOB	93-07-13	930166	51.4	55.2	1.90	42	1.31429
1427	JAI-GOB	93-07-13	930167	41.3	43.7	0.89	38	1.15000
1428	JAI-GOB	93-07-13	930168	51.5	55.4	1.94	49	1.13061
1429	JAI-GOB	93-07-13	930169	35.8	38.5	0.58	35	1.10000
1430	JAI-GOB	93-07-13	930171	39.4	42.8	0.82	43	0.99535
1431	JAI-GOB	93-07-13	930172	33.4	35.9	0.46	31	1.15806
1432	JAI-GOB	93-07-13	930173	43.1	46.4	1.01	38	1.22105
1433	JAI-GOB	93-07-13	930176	45.9	48.9	1.26	52	0.94038
1434	JAI-GOB	93-07-13	930177	37.5	39.8	0.61	42	0.94762
1435	JAI-GOB	93-07-13	930178	37.0	38.9	0.63	40	0.97250
1436	JAI-GOB	93-07-13	930179	48.4	52.0	1.43	62	0.83871
1437	JAI-GOB	93-07-13	930180	45.5	48.9	1.18	41	1.19268
1438	JAI-GOB	93-07-13	930181	51.9	56.0	1.78	48	1.16667
1439	JAI-GOB	93-07-13	930182	37.7	40.8	0.78	36	1.13333
1440	JAI-GOB	93-07-13	930188	40.6	42.7	0.75	41	1.04146
1441	JAI-GOB	93-07-13	930190	40.4	42.6	0.80	44	0.96818
1442	JAI-GOB	93-07-13	930191	45.2	47.5	1.11	37	1.28378
1443	JAI-GOB	93-07-13	930194	44.0	47.1	1.09	48	0.98125
1444	JAI-GOB	93-07-13	930196	36.4	38.3	0.51	35	1.09429
1445	JAI-GOB	93-07-27	930272	47.8	51.8	1.17	62	0.83548
1446	JAI-GOB	93-09-23	932229	85.0	93.0	6.34	93	1.00000
1447	JAI-NIB	93-07-13	930280	58.5	61.7	2.03	62	0.99516
1448	JAI-NIB	93-07-13	930282	54.1	58.2	1.68	44	1.32273
1449	JAI-NIB	93-07-13	930283	60.0	64.1	2.30	58	1.10517
1450	JAI-NIB	93-07-13	930284	60.3	65.4	2.60	52	1.25769
1451	JAI-NIB	93-07-13	930285	44.8	48.4	1.08	44	1.10000
1452	JAI-NIB	93-07-13	930286	64.3	68.7	3.28	59	1.16441
1453	JAI-NIB	93-07-13	930287	36.7	40.1	0.54	39	1.02821
1454	JAI-NIB	93-07-13	930288	48.0	51.1	1.14	50	1.02200
1455	JAI-NIB	93-07-13	930289	44.1	46.7	0.84	43	1.08605
1456	JAI-NIB	93-07-13	930290	39.7	42.3	0.74	52	0.81346
1457	JAI-NIB	93-07-13	930292	58.7	63.2	2.38	49	1.28980
1458	JAI-NIB	93-07-13	930293	48.1	50.6	1.17	47	1.07660
1459	JAI-NIB	93-07-13	930294	41.9	48.8	0.87	41	1.19024

Appendix B-2 (continued).

OBS	LOC	DATE	FISHNO	FL	TL	WT	AGE	GROWTH
1460	JAI-NIB	93-07-27	930273	72.5	78.1	4.49	101	0.77327
1461	JAI-NIB	93-07-27	930274	70.0	75.2	4.22	66	1.13939
1462	JAI-NIB	93-07-27	930275	74.5	78.6	4.95	74	1.06216
1463	JAI-NIB	93-07-27	930276	70.7	75.3	4.60	63	1.19524
1464	JAI-NIB	93-07-27	930277	69.3	73.8	3.86	63	1.17143
1465	JAI-NIB	93-07-27	930278	61.3	65.9	2.90	72	0.91528
1466	JAI-NIB	93-09-07	931532	93.0	101.0	9.43	72	1.40278
1467	JAI-NIB	93-09-07	931533	89.0	96.0	8.56	77	1.24675
1468	JAI-NIB	93-09-07	931537	93.0	100.0	9.38	77	1.29870
1469	JAI-NIB	93-09-07	931539	95.0	102.0	10.65	72	1.41667
1470	JAI-NIB	93-09-07	931541	96.0	104.0	11.65	87	1.19540
1471	JAI-NIB	93-09-07	931542	96.0	103.0	10.48	72	1.43056
1472	JAI-NIB	93-09-07	931544	83.0	90.0	6.90	75	1.20000
1473	JAI-NIB	93-09-07	931549	109.0	119.0	15.92	89	1.33708
1474	JAI-NIB	93-09-23	932282	121.0	129.0	24.14	93	1.38710
1475	JAI-NIB	93-09-23	932284	111.0	120.0	17.20	115	1.04348
1476	JAI-NIB	93-09-23	932286	95.0	102.0	9.18	98	1.04082
1477	JAI-NIB	93-09-23	932287	92.0	100.0	7.75	97	1.03093
1478	JAI-NIB	93-09-23	932288	110.0	120.0	16.18	98	1.22449
1479	JAI-NIB	93-09-23	932289	115.0	123.0	19.86	89	1.38202
1480	JAI-NIB	93-09-23	932293	88.0	95.0	7.50	95	1.00000
1481	JAI-NIB	93-09-23	932294	95.0	102.0	9.16	92	1.10870
1482	JAI-NIB	93-09-23	932295	80.0	87.0	5.58	85	1.02353
1483	JAI-NIB	93-10-05	932461	110.0	118.0	13.80	96	1.22917
1484	JAI-NIB	93-10-05	932463	124.0	133.0	20.79	111	1.19820
1485	JAI-NIB	93-10-05	932464	127.0	137.0	22.86	102	1.34314
1486	JAI-NIB	93-10-19	932599	128.0	137.0	21.48	114	1.20175