Figure A1. Distribution of goosefish catches in NEFSC winter surveys (1992-1999), spring surveys (1968-1999), scallop surveys (1984-1999), and autumn surveys (1963-1999).
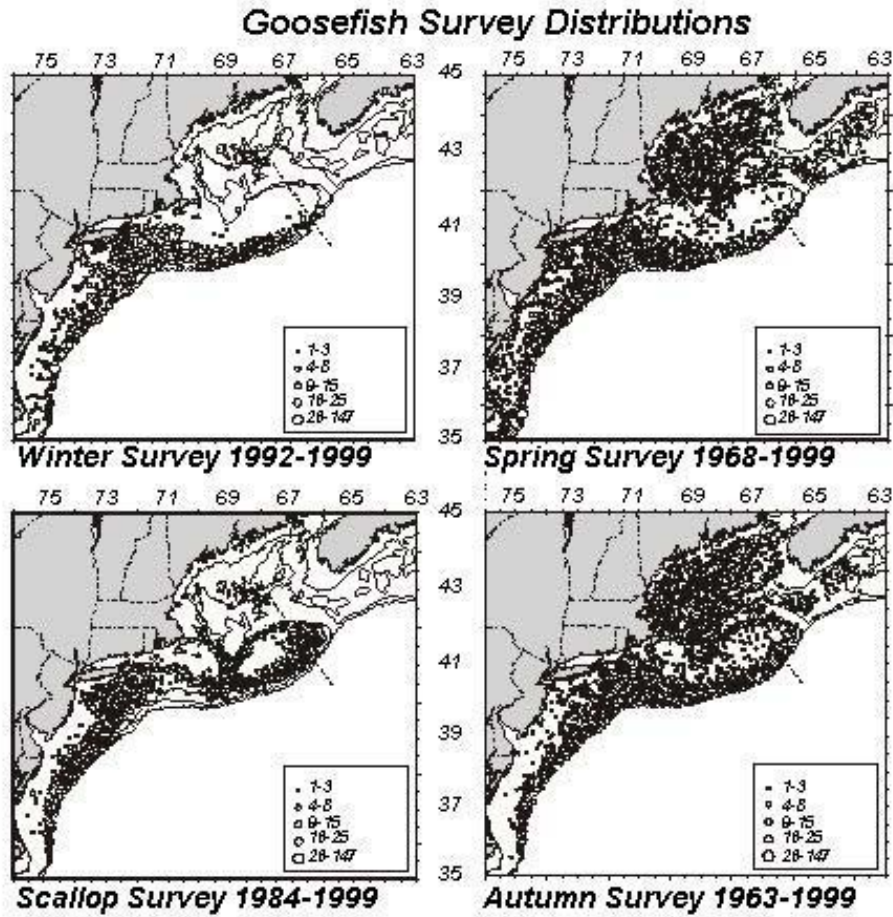
Figure A2. Monkfish commercial landings (live weight, mt) by management area.
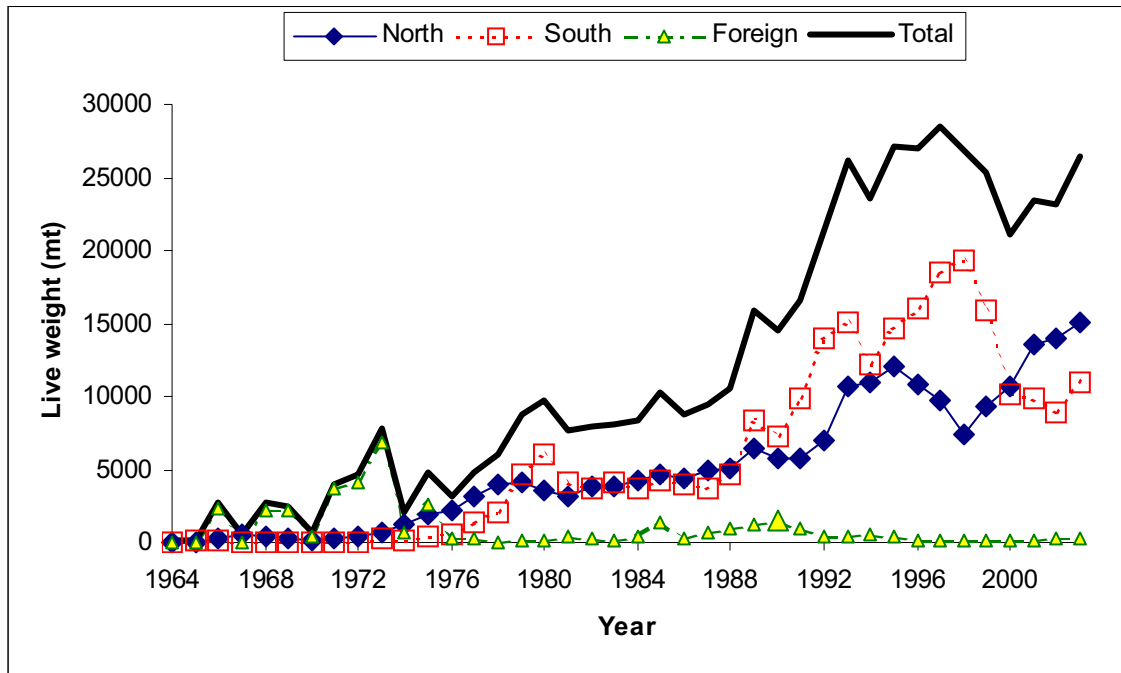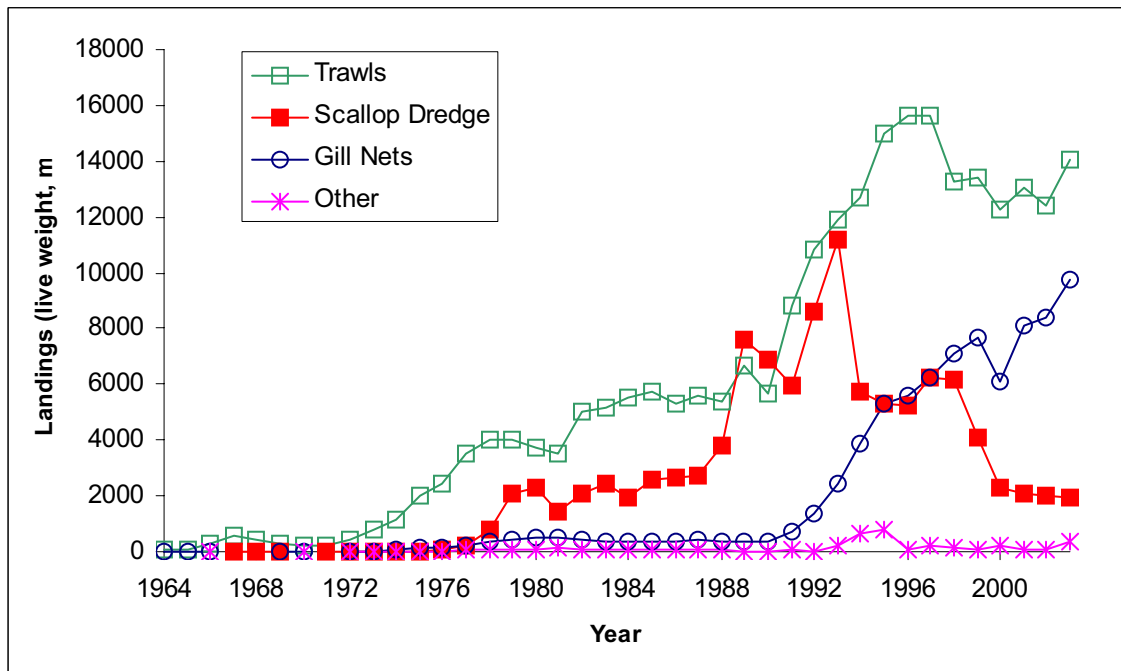

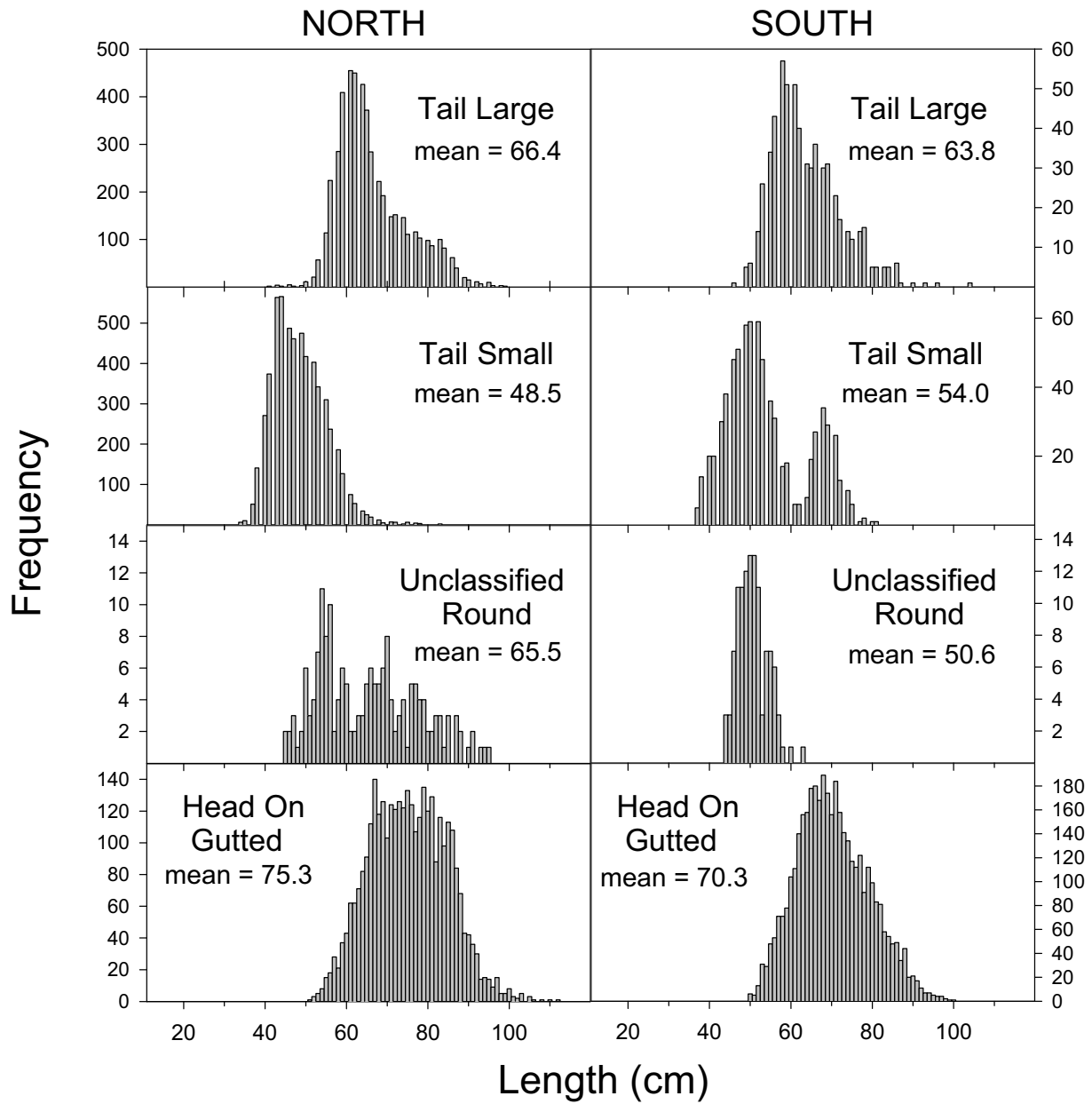Figure A3. Monkfish commercial landings (live weight, mt) by gear type.

2001

NORTH   SOUTH

Tail Large
mean = 66.4

Tail Large
mean = 63.8

Tail Small
mean = 48.5

Tail Small
mean = 54.0

Unclassified
Round
mean = 65.5

Unclassified
Round
mean = 50.6

Head On
Gutted
mean = 75.3

Head On
Gutted
mean = 70.3

Frequency

Length (cm)

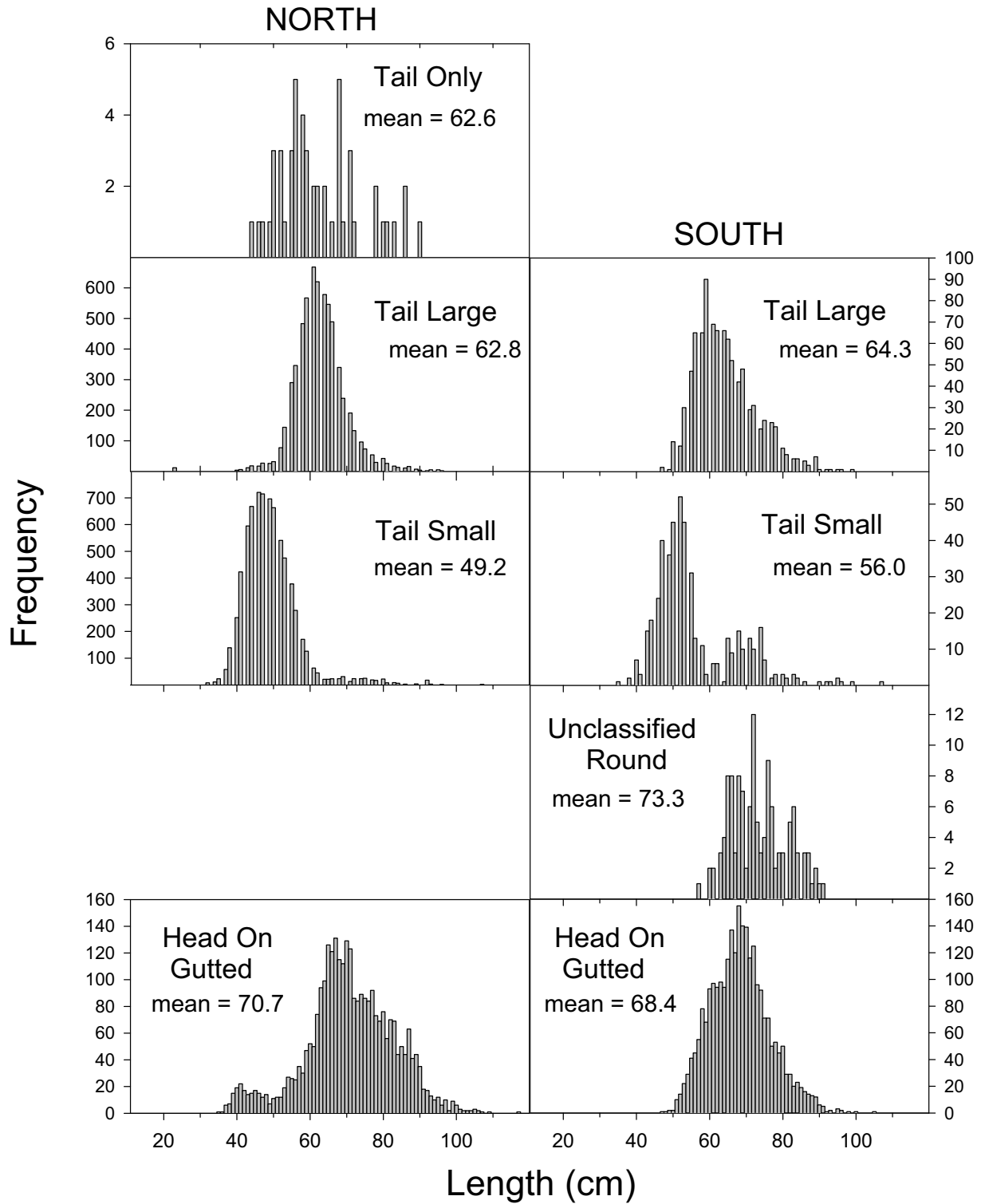Figure A4.   Commercial goosefish length frequency samples taken during 2001

2002

Figure A5. Commercial goosefish length frequency samples taken during 2002

2003

Figure A6.   Commercial goosefish length frequency samples taken during 2003
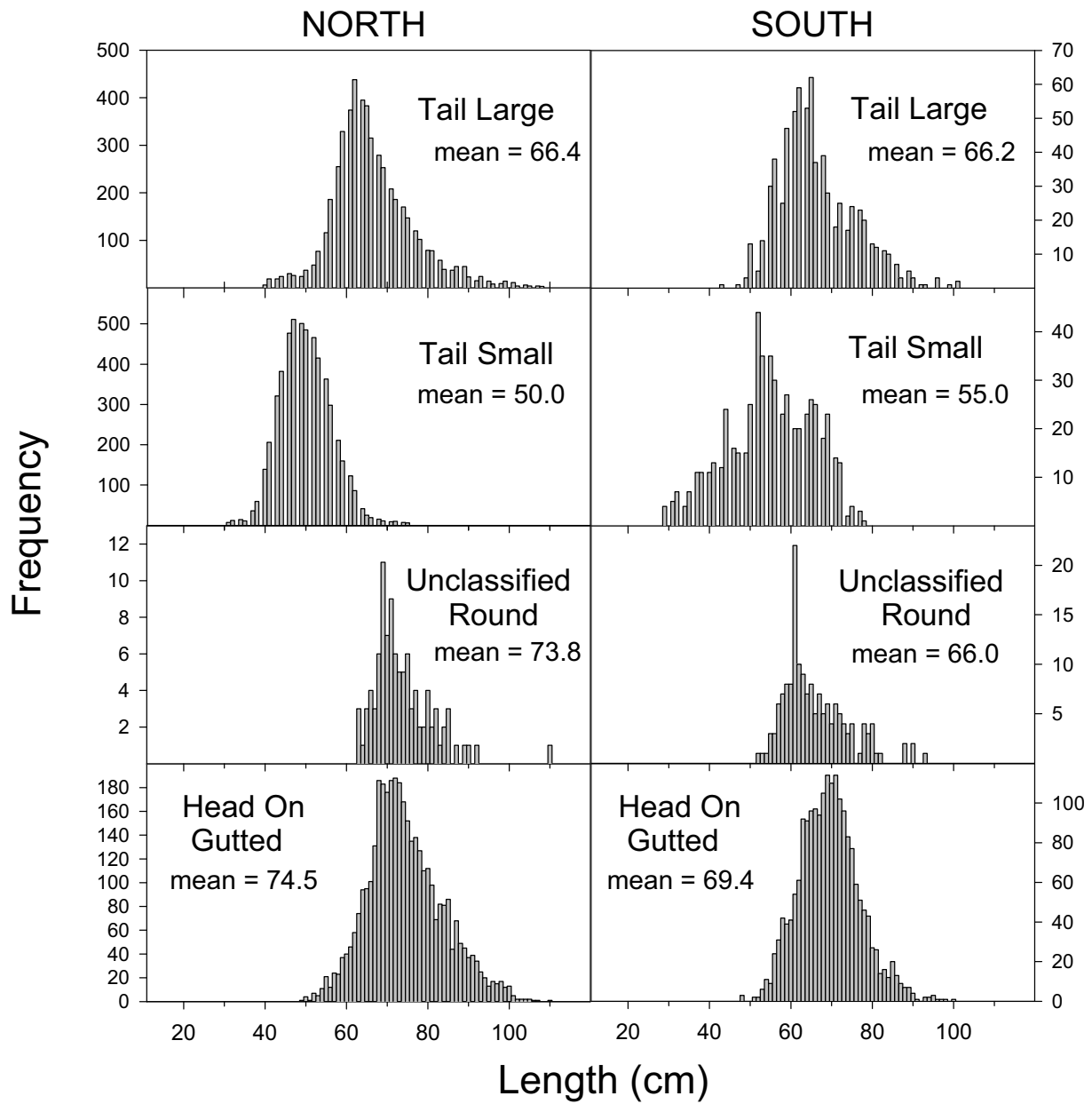
2003

Figure A6.   Commercial goosefish length frequency samples taken during 2003
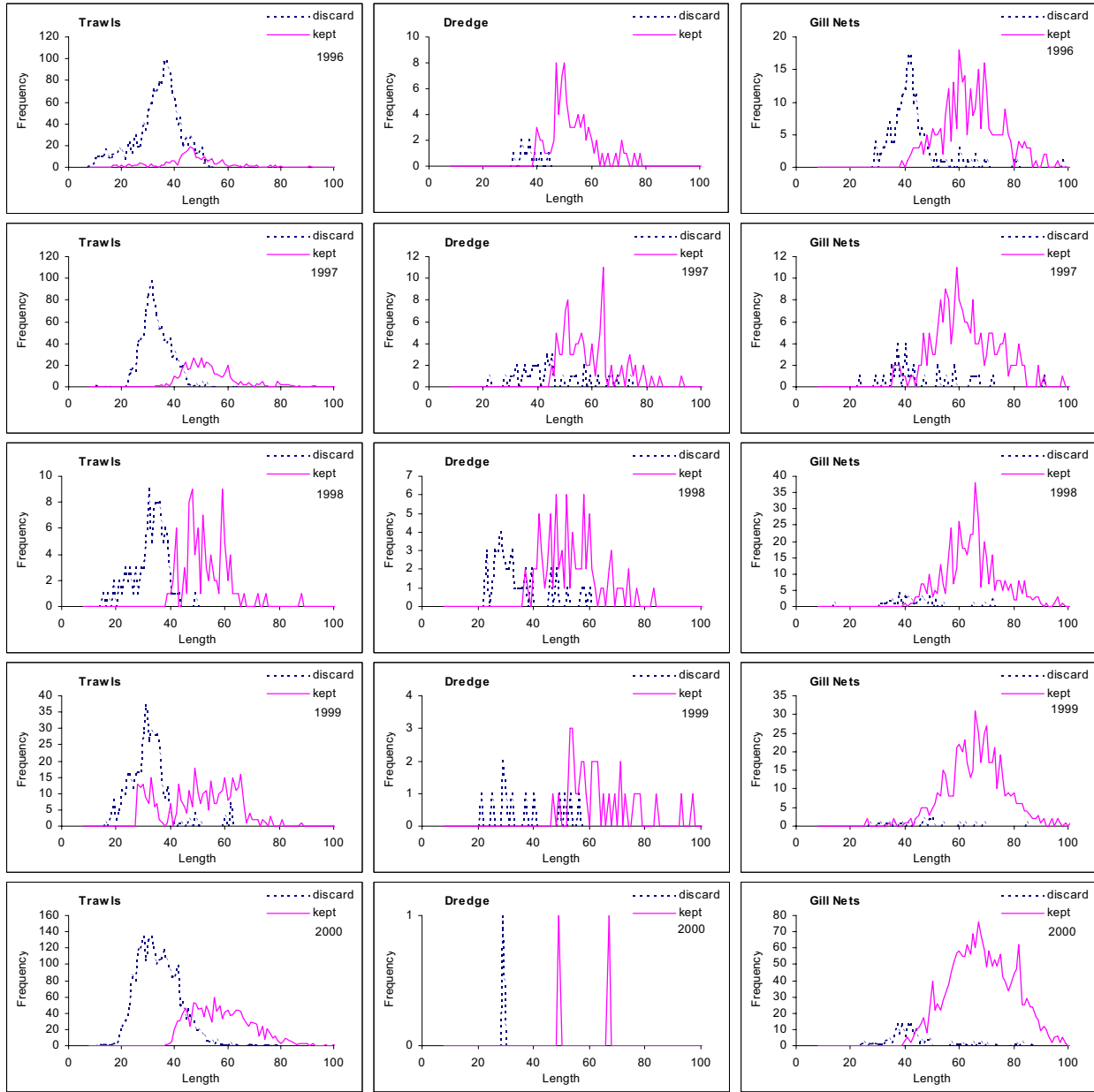
Figure A7. Size composition of kept and discarded goosefish estimated from sea sampling observations, northern region.
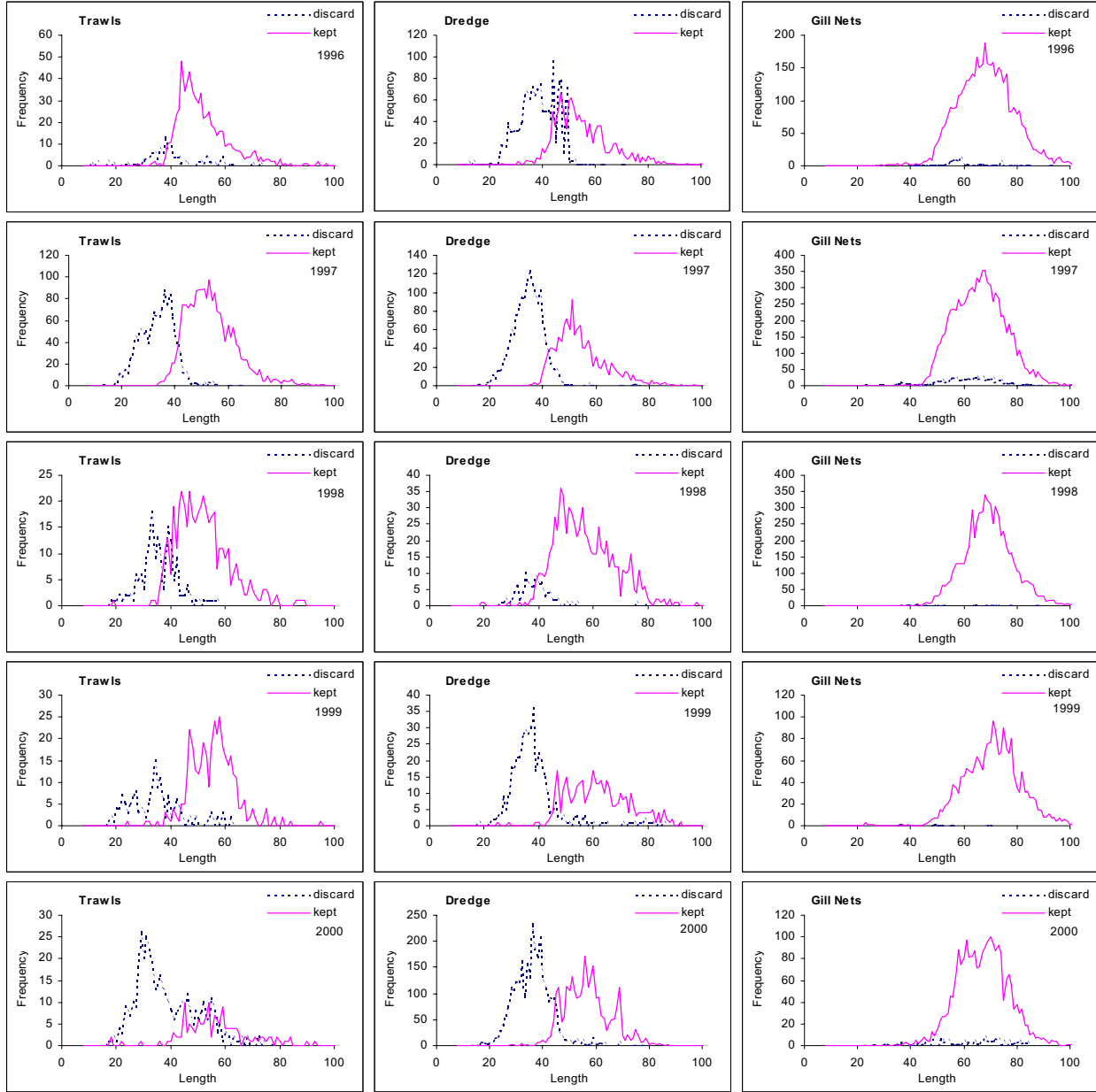
Figure A8. Size composition of kept and discarded goosefish estimated from sea sampling observations, southern region..

Figure A9. Discard ratios by major gear type and half year for goosefish, northern region.
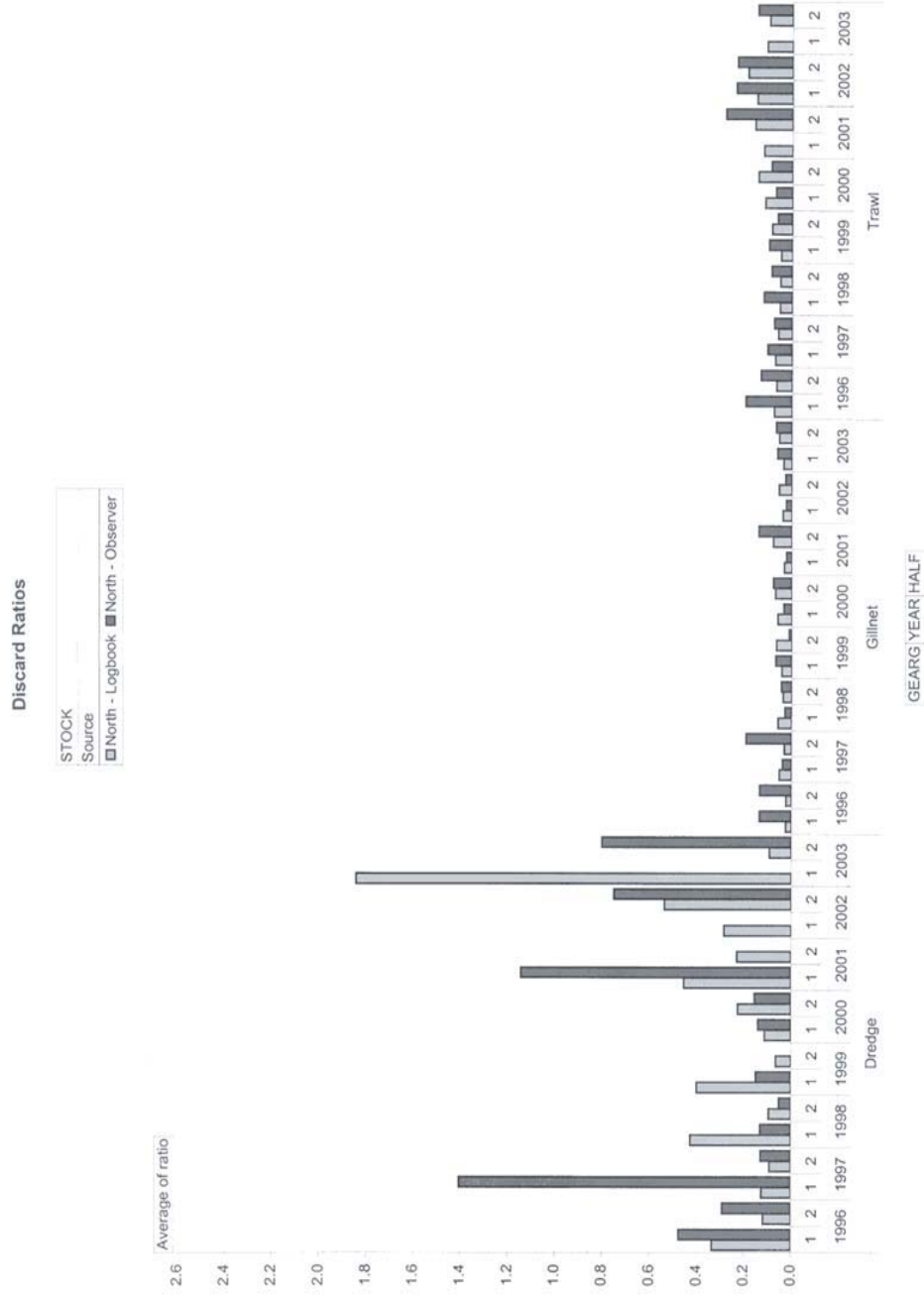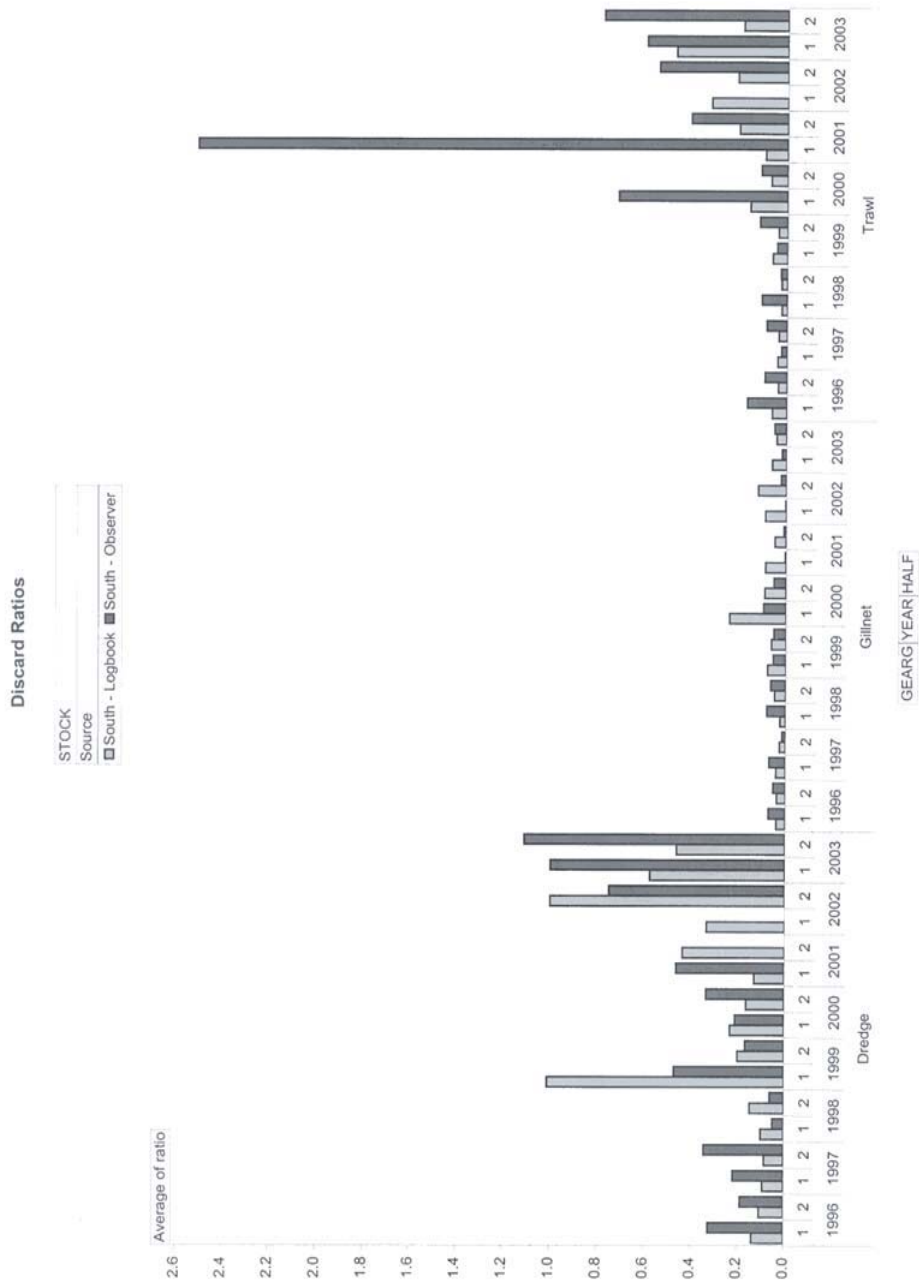
Assessment Report

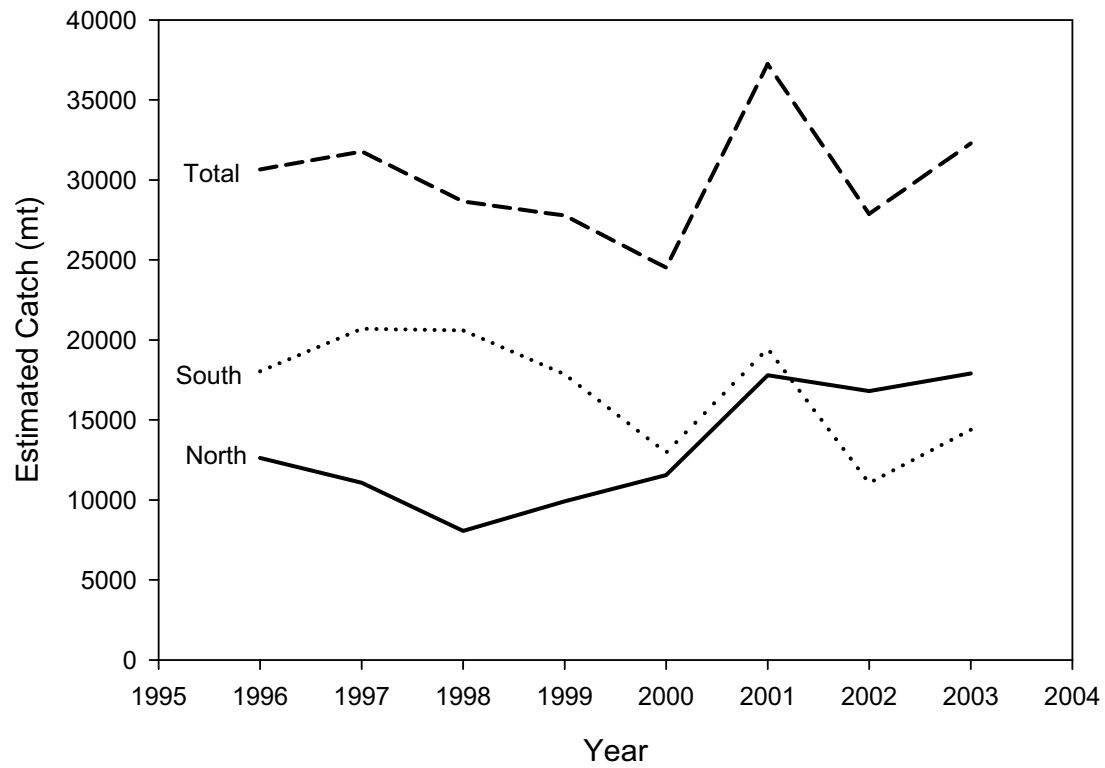Figure A10. Discard ratios by major gear type and half year for goosefish, southern region.

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Figure A11. Estimated total catch (landings + discards) by management area.

Biomass Indices

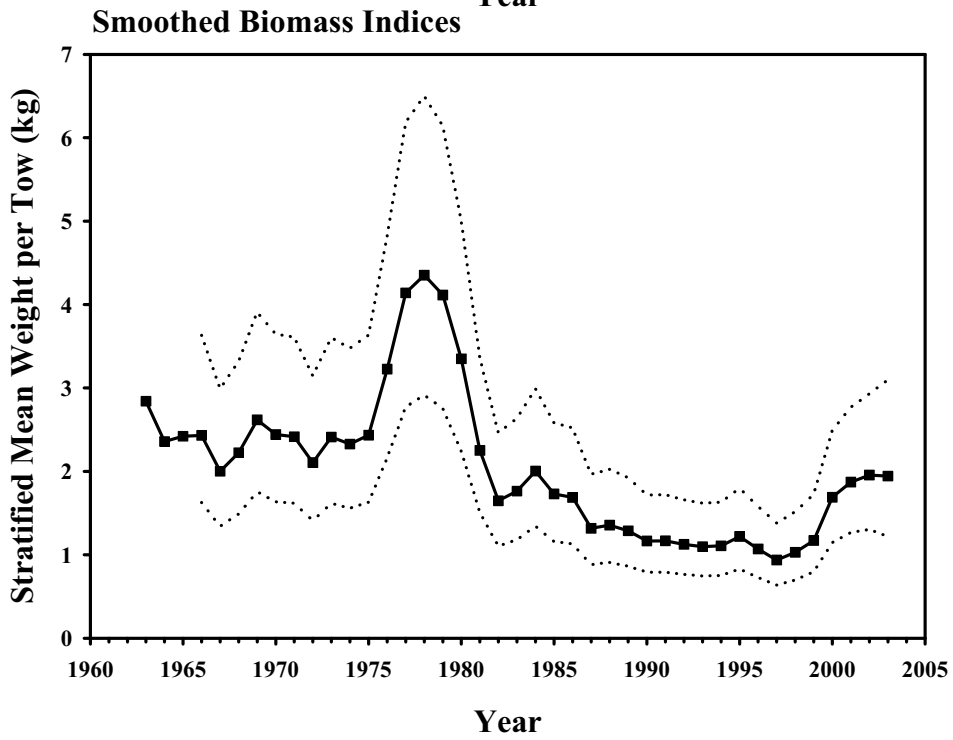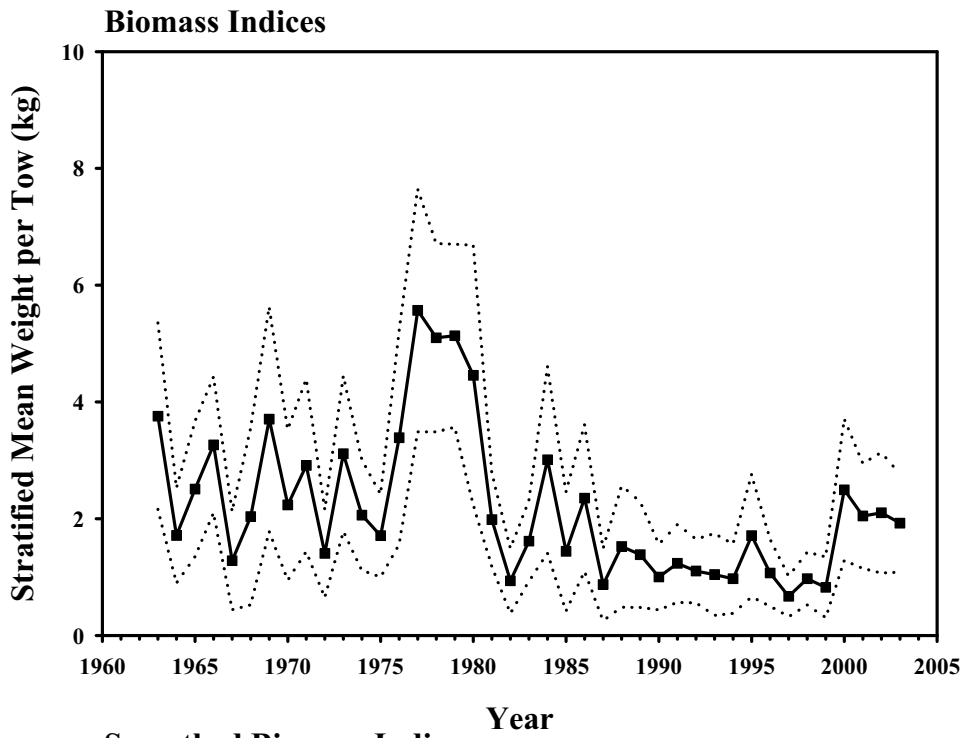

Smoothed Biomass Indices

Figure A12. Biomass indices and smoothed indices from the NEFSC autumn bottom trawl survey for the northern management region from 1963-2003. The 95% confidence limits are shown by the dashed line.

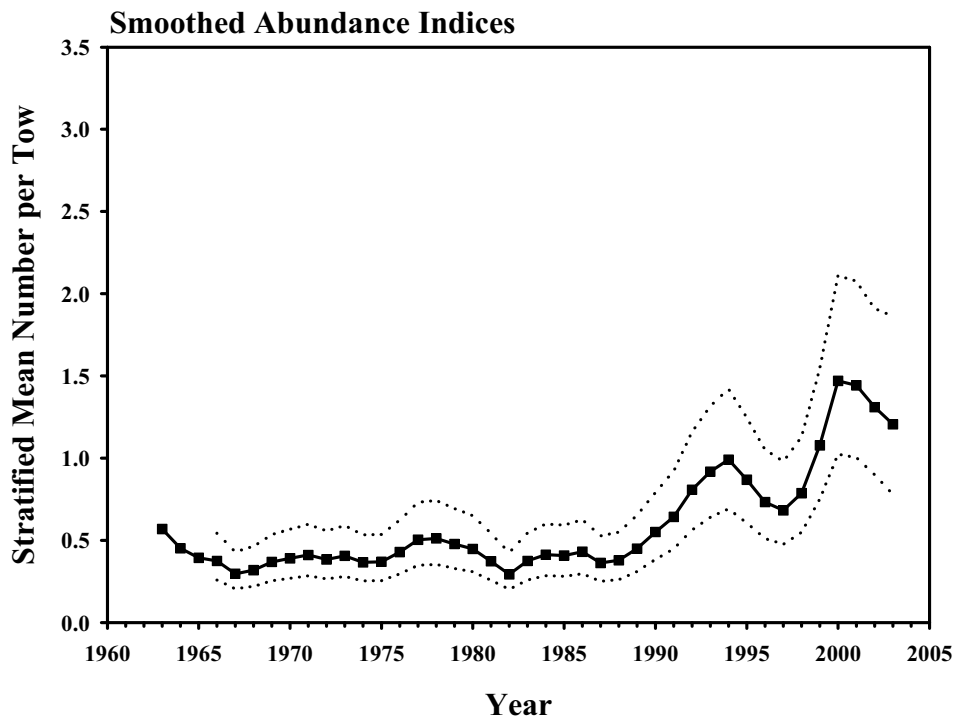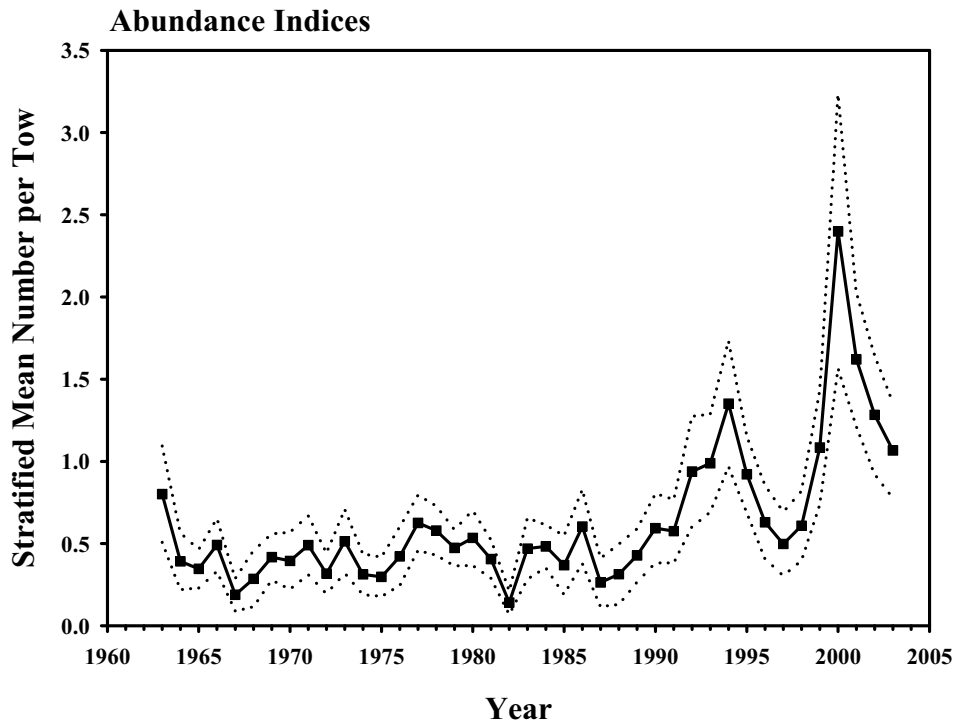## Abundance Indices

Smoothed Abundance Indices

Figure A13. Abundance indices and smoothed indices from the NEFSC autumn bottom trawl survey for the northern management region from 1963-2003. The 95% confidence limits are shown by the dashed line.
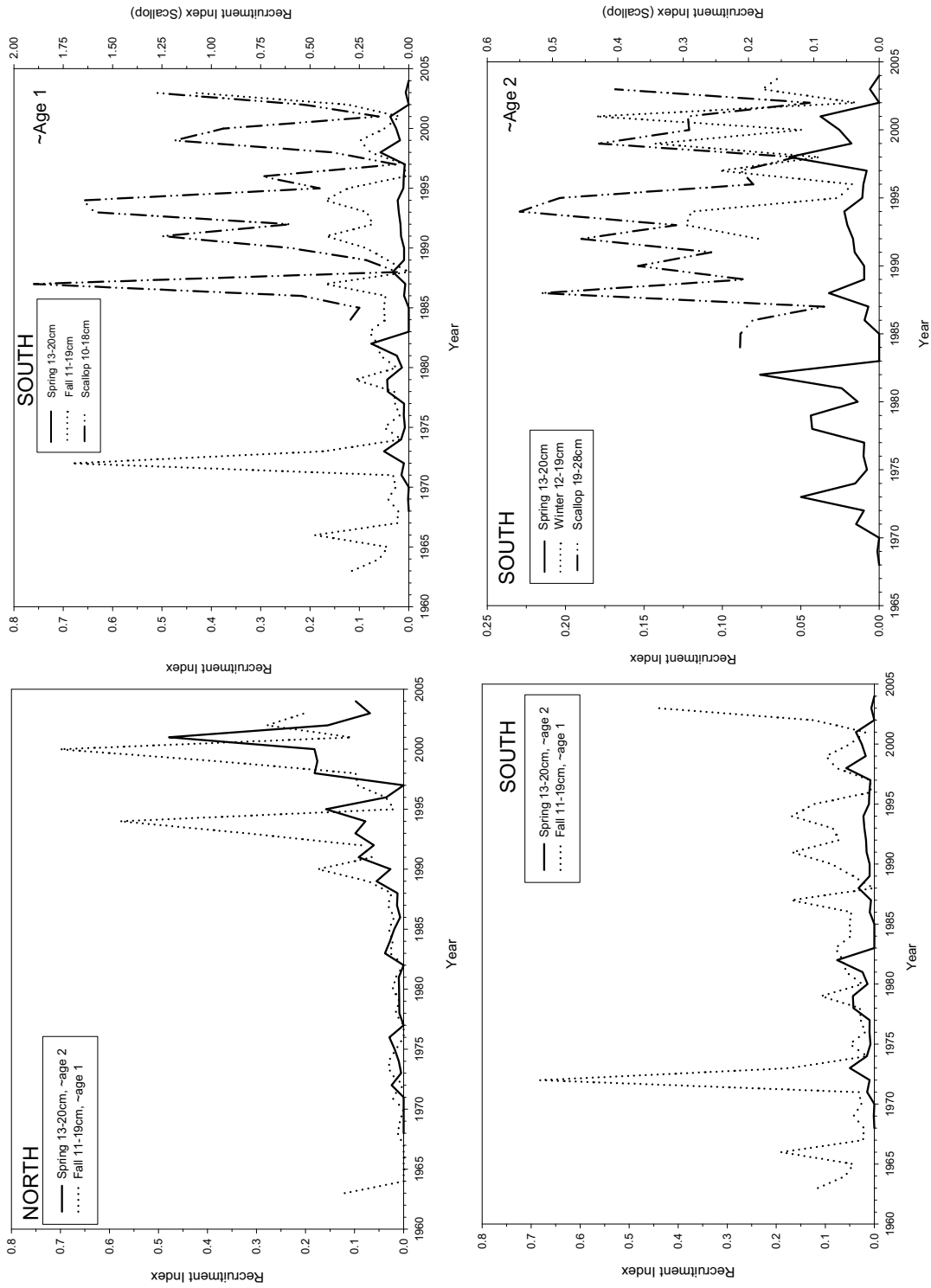
Figure A14. Abundance indices (number per tow) for monkfish at lengths corresponding to ages 1 and 2.

Biomass Indices

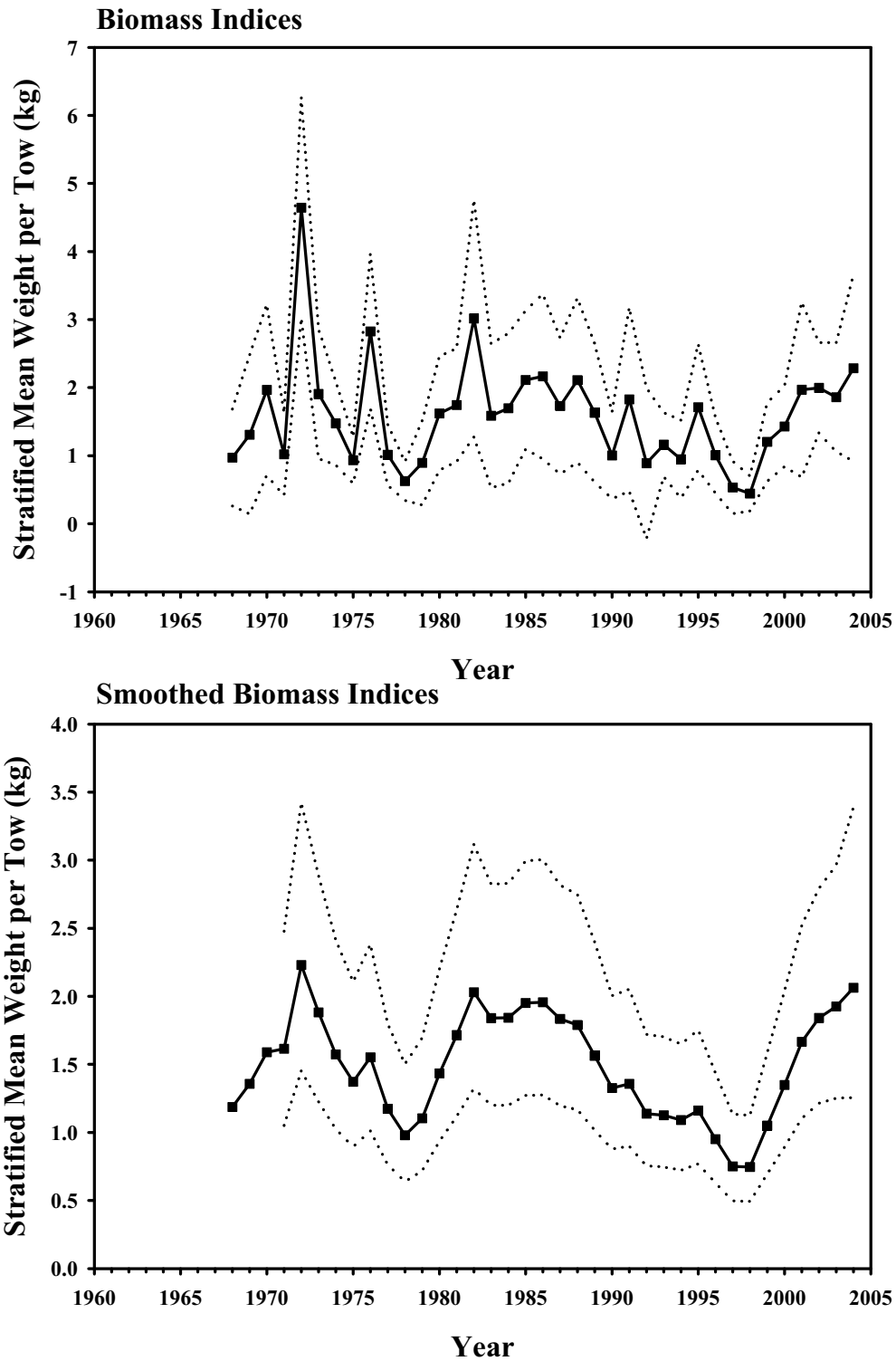

Smoothed Biomass Indices

Figure A15. Biomass indices and smoothed indices from the NEFSC spring bottom trawl survey
for the northern management region from 1968-2004. The 95%
confidence limits are shown by the dashed line.
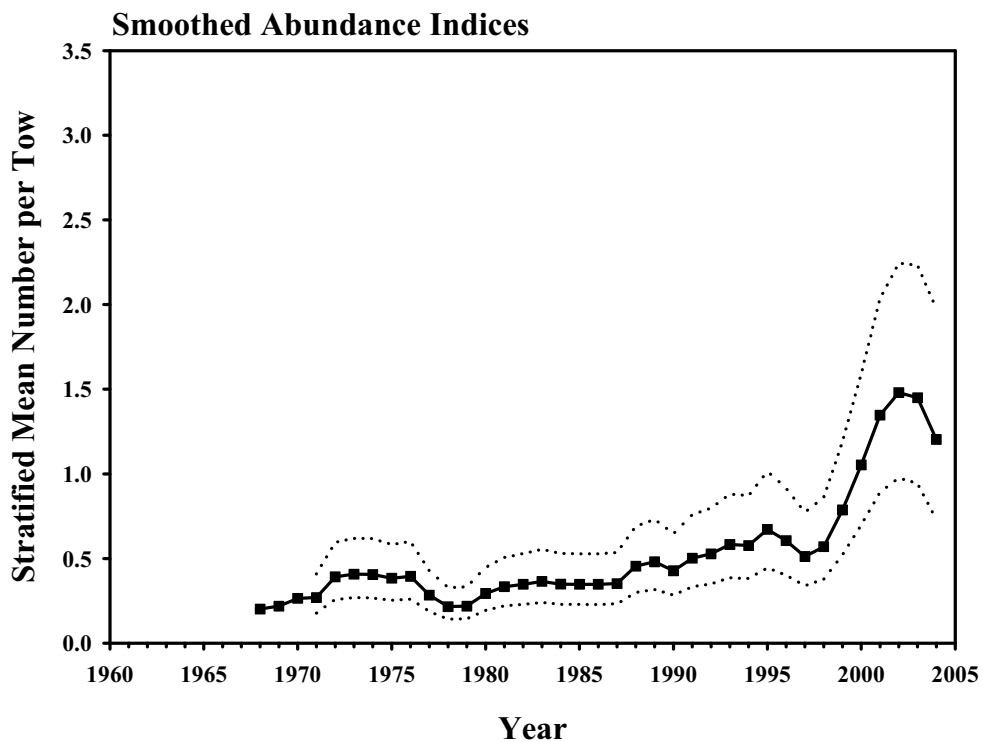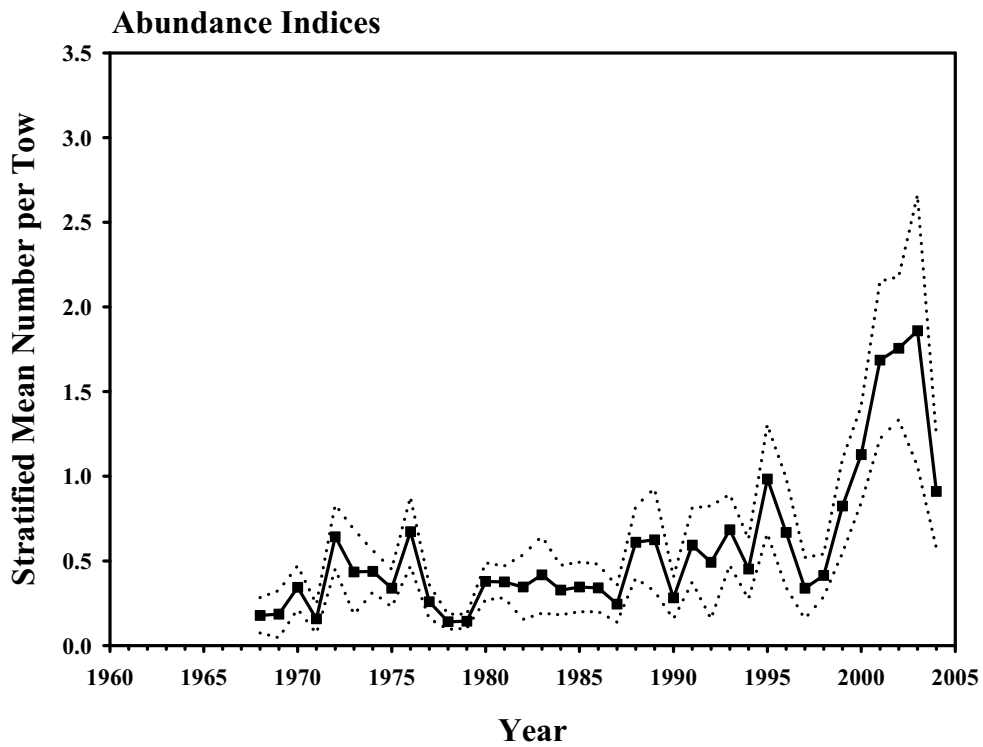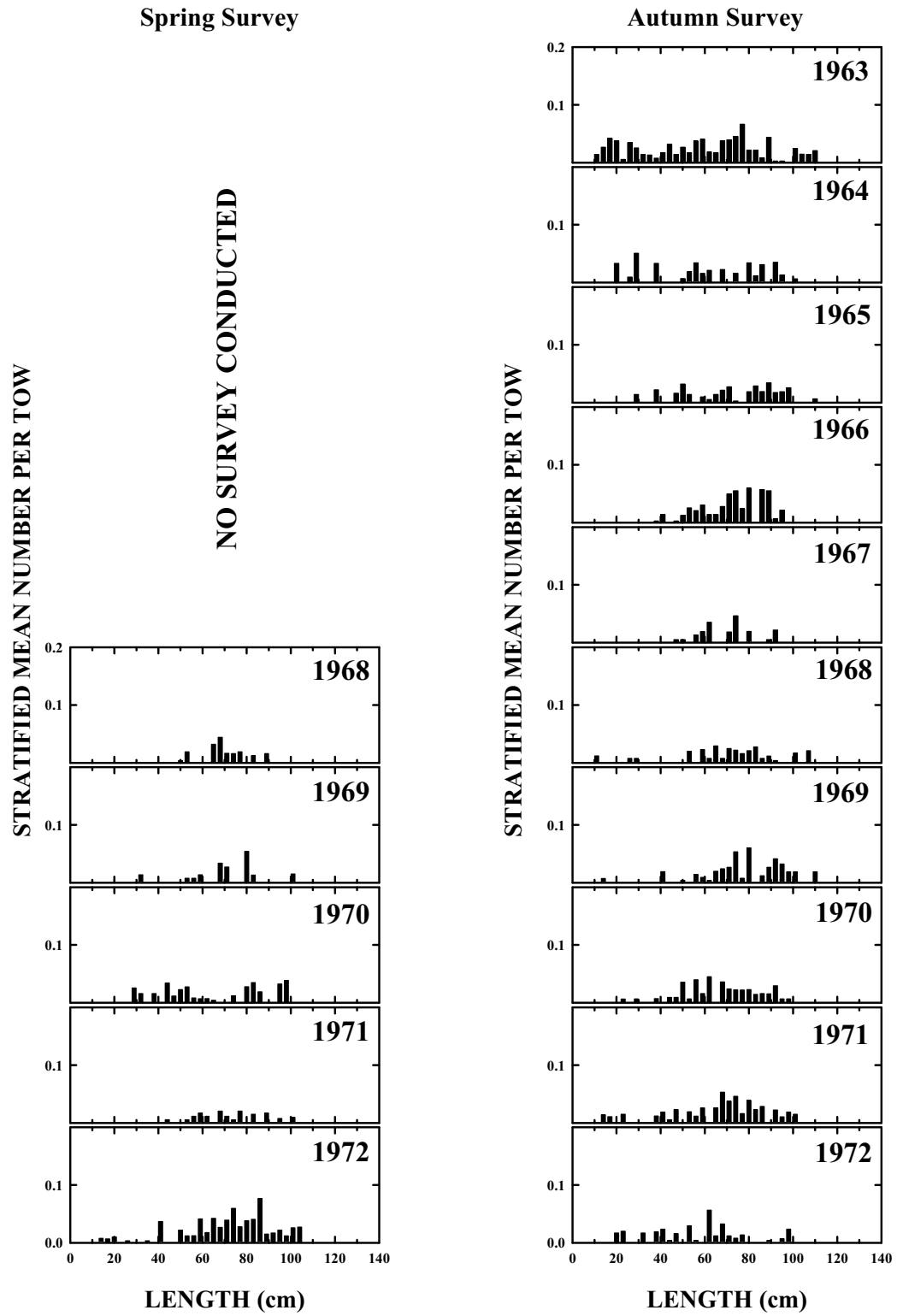
Abundance Indices

Smoothed Abundance Indices

Figure A16. Abundance indices and smoothed indices from the NEFSC spring bottom trawl survey for the northern management region from 1968-2004. The 95% confidence limits are shown by the dashed line.

Spring Survey

Autumn Survey

NO SURVEY CONDUCTED

STRATIFIED MEAN NUMBER PER TOW

Figure A17. Goosefish length composition from the NEFSC spring and autumn bottom trawl
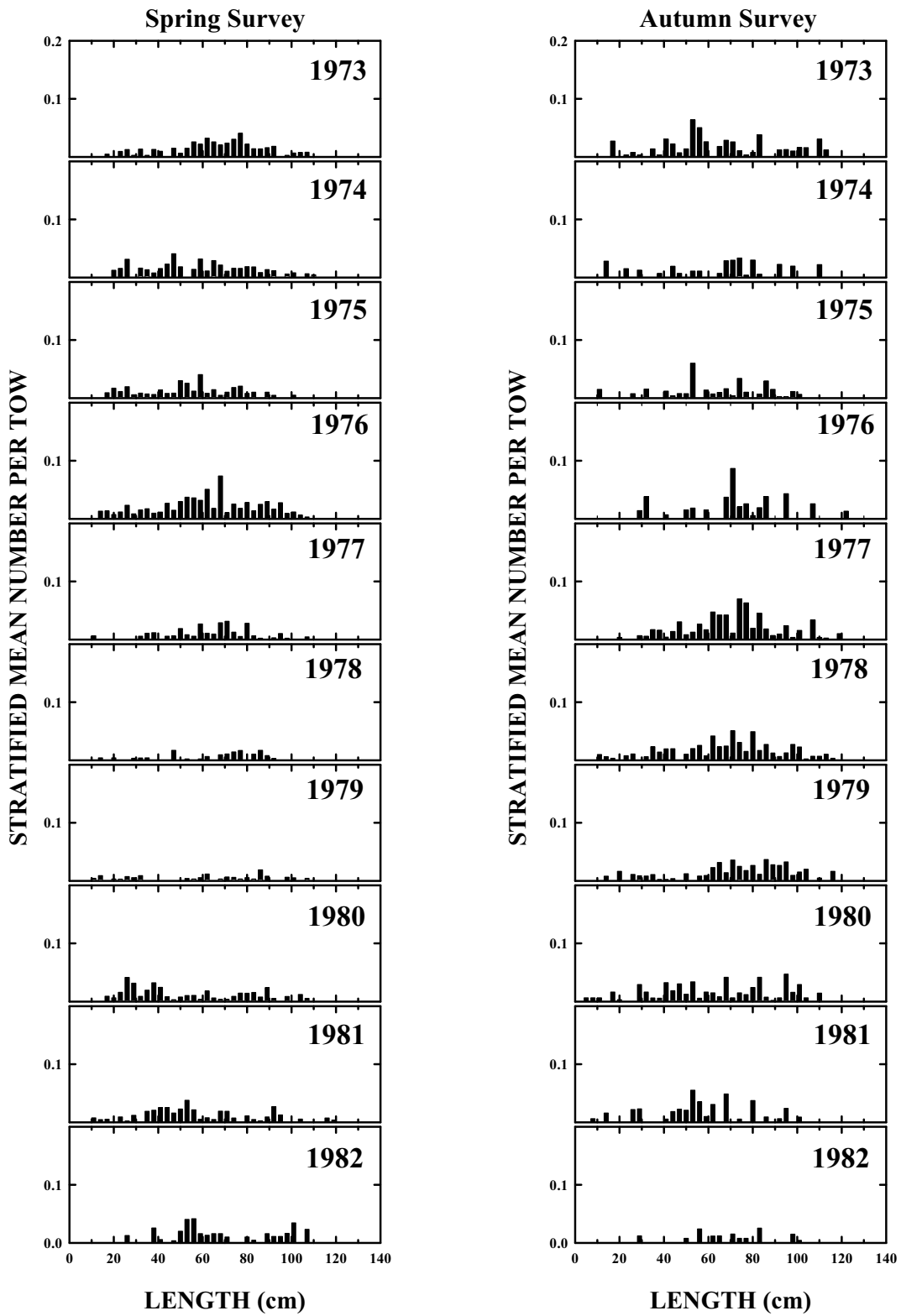surveys in the northern management region, 1963-2004.
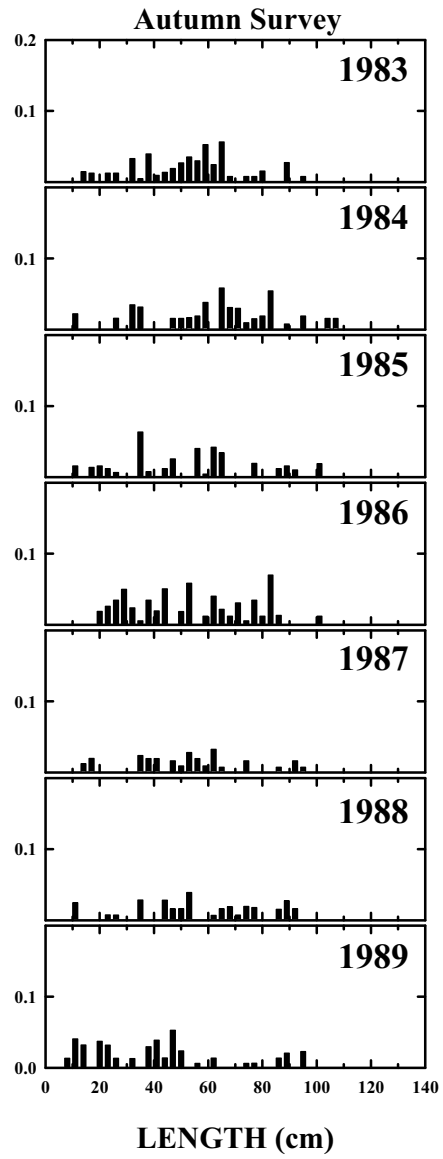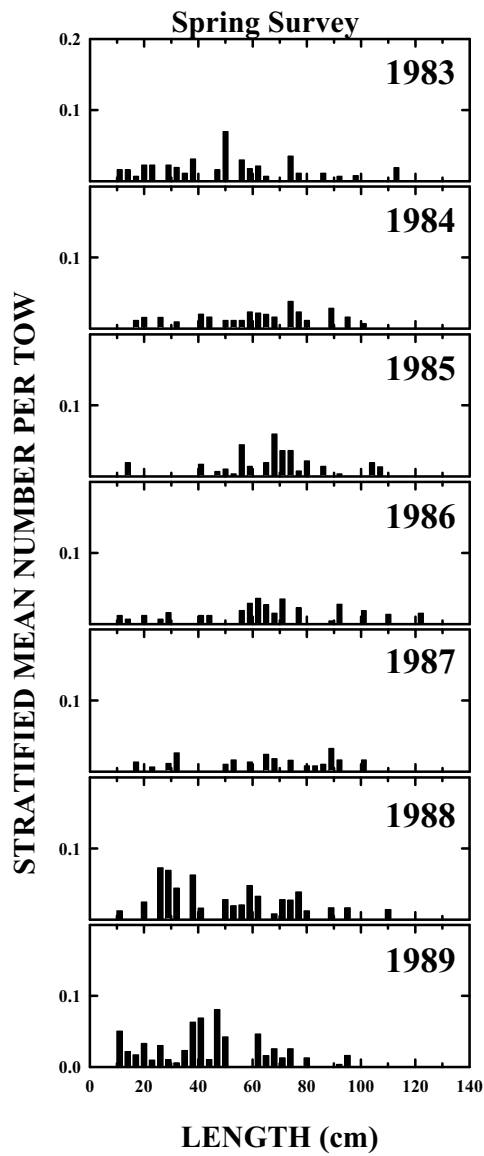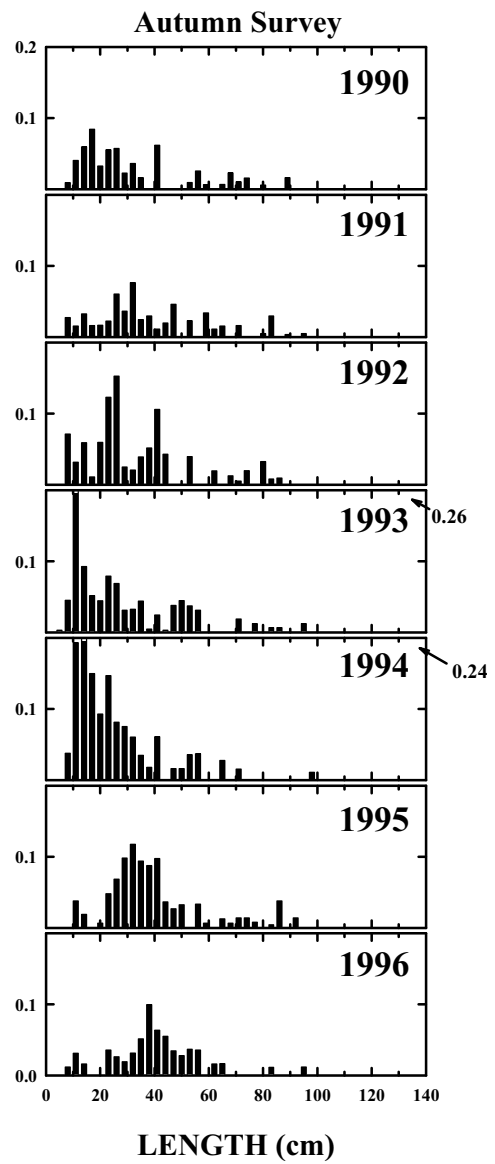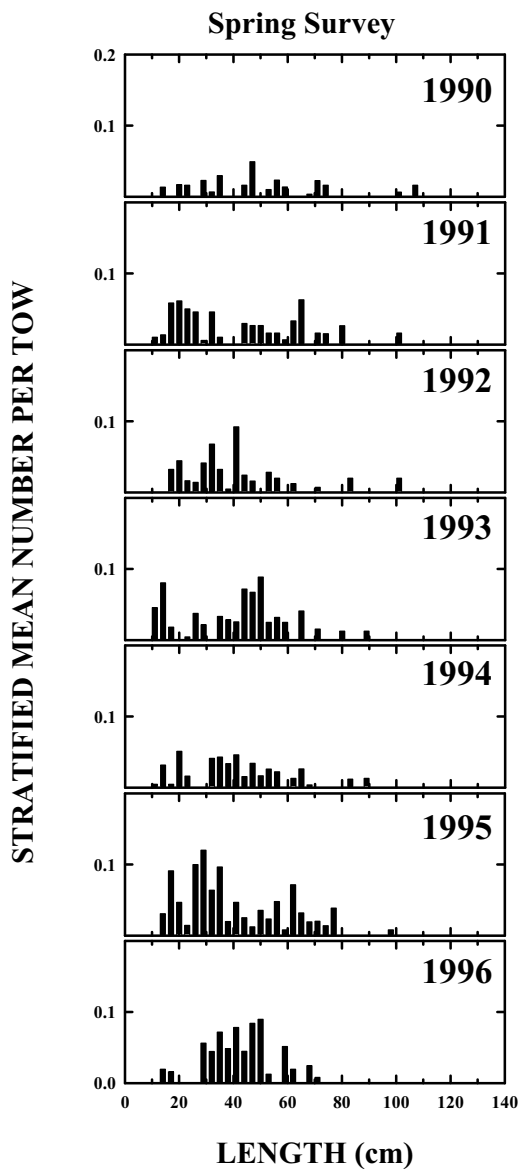
Figure A17. continued.

Figure A17, continued.

Figure A17, continued.

NOTE: Y-AXIS SCALE CHANGES ON THIS PAGE
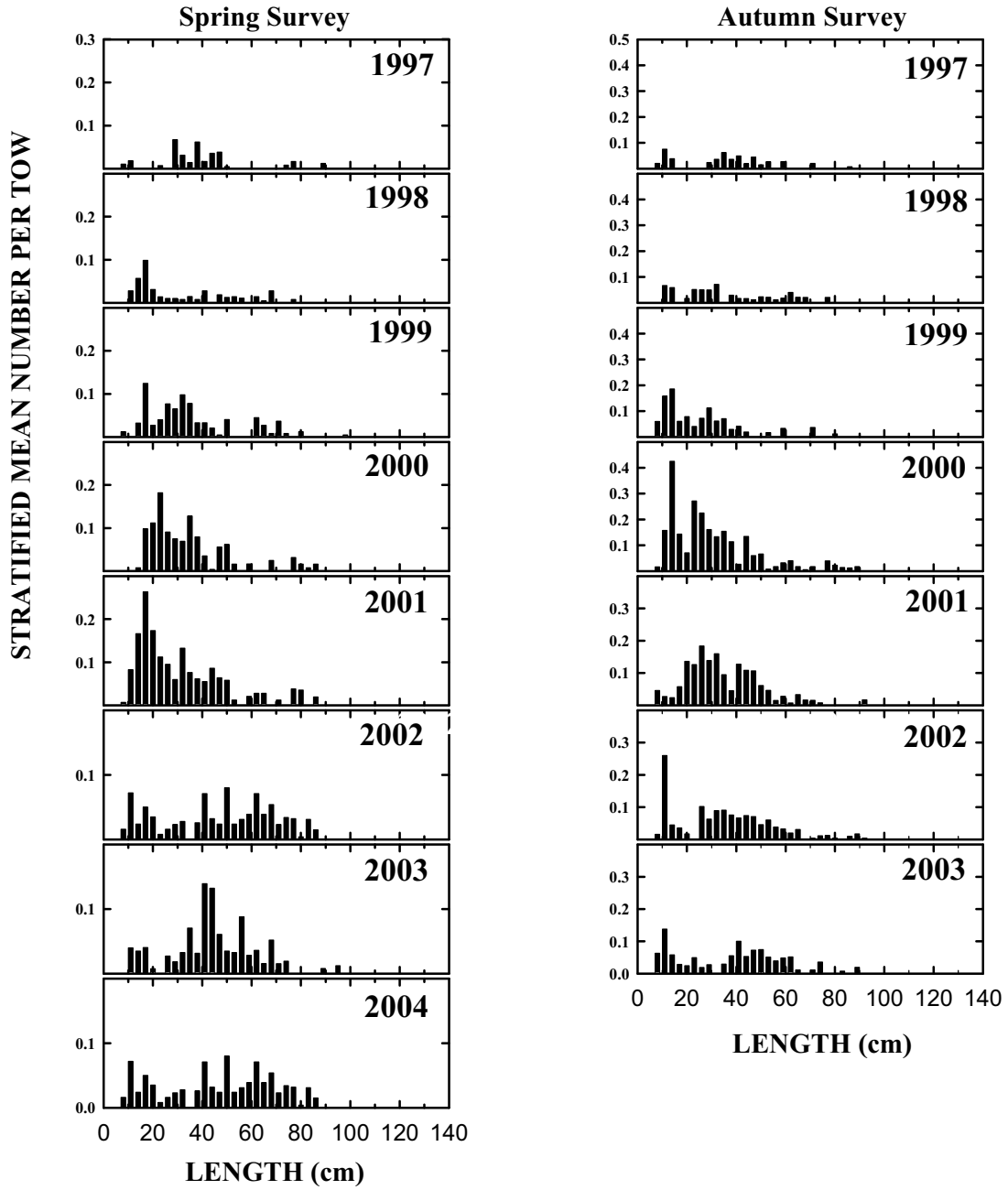
Figure A17, continued.
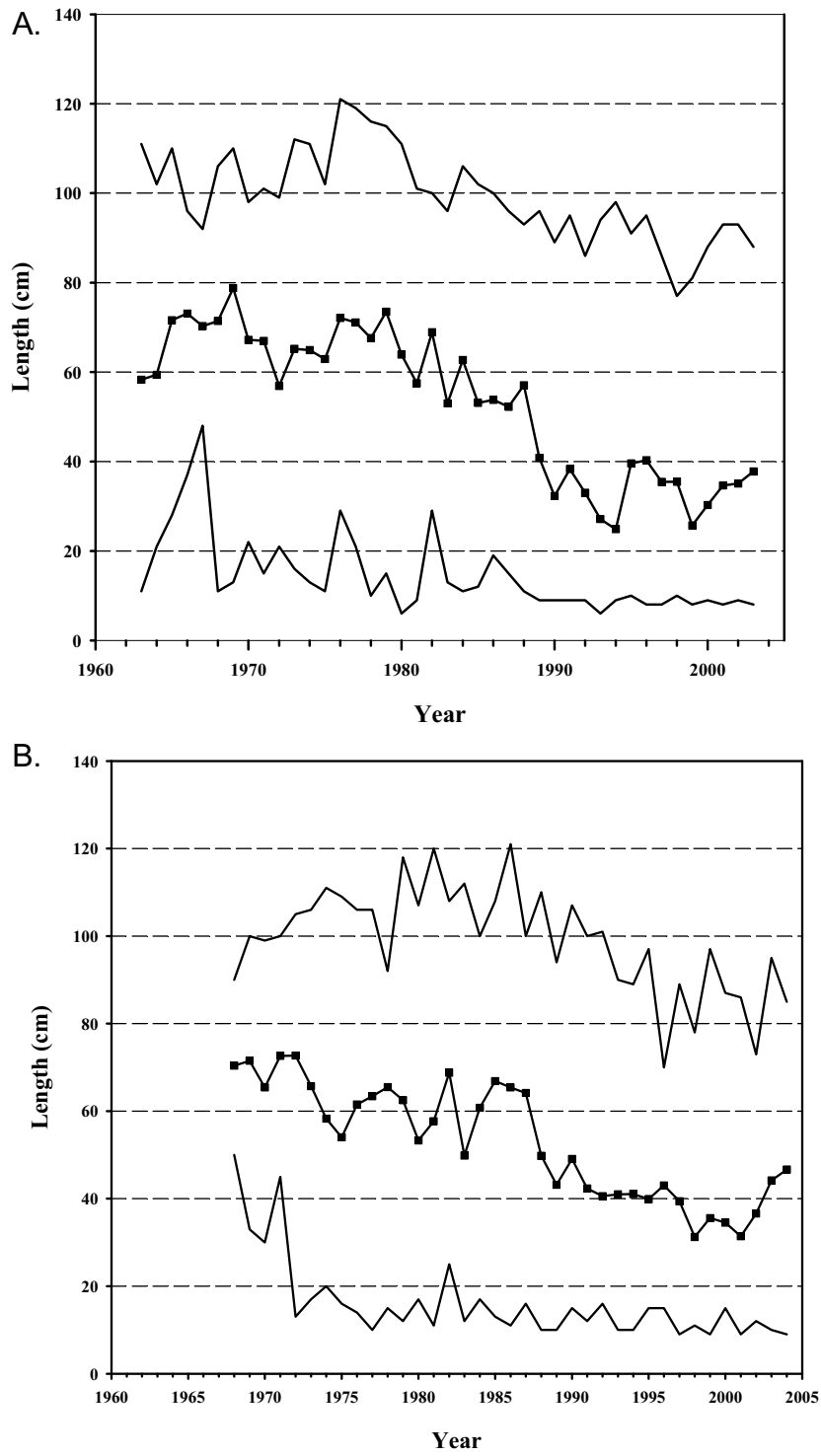
Figure A18. Minimum, mean, and, maximum lengths for the northern management region
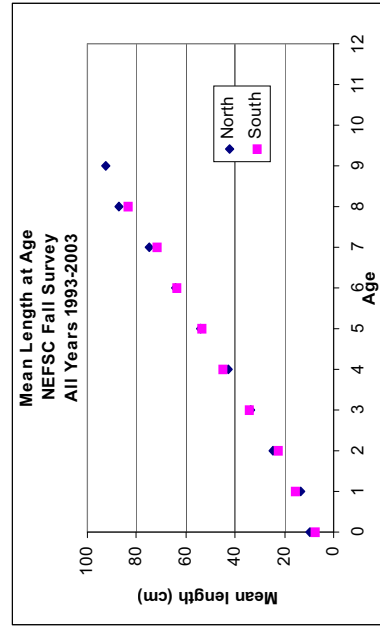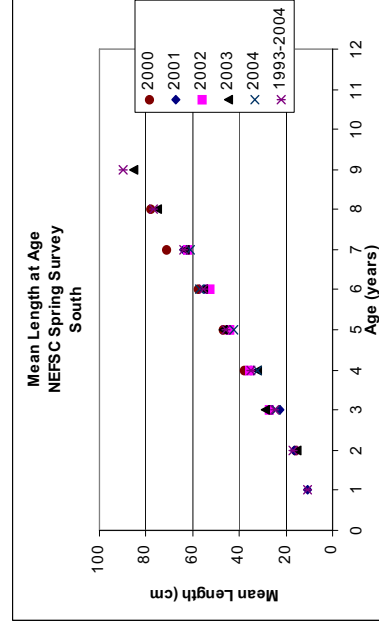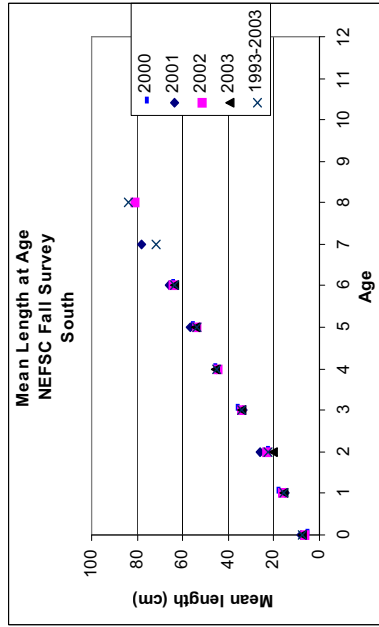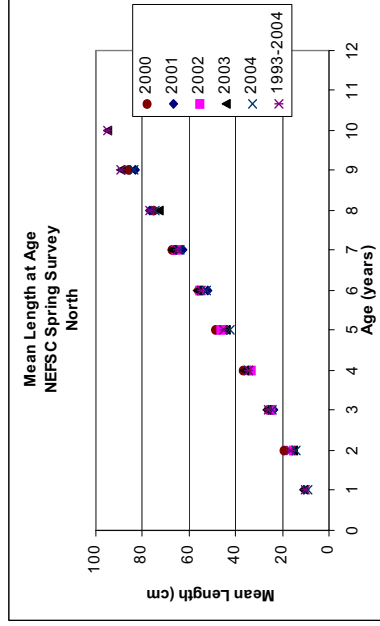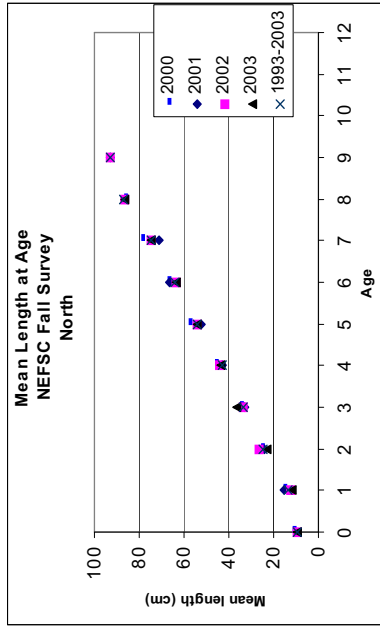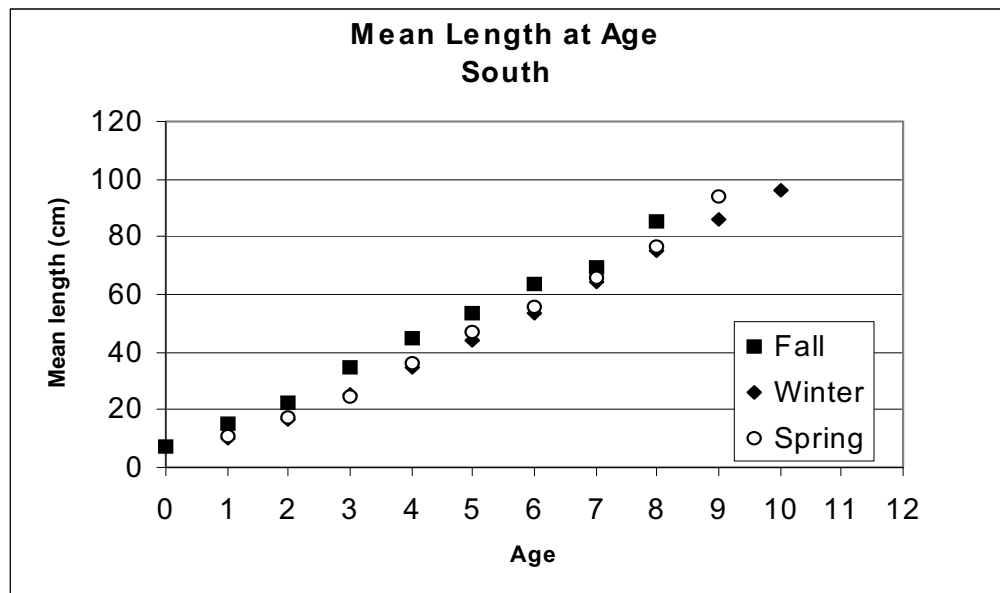from (A) NEFSC autumn surveys and (B) NEFSC spring surveys.

Mean Length at Age
NEFSC Spring Survey
North

Mean Length at Age
NEFSC Spring Survey
South

Mean Length at Age
NEFSC Spring Survey
All Years 1995-2004

Mean Length at Age
NEFSC Fall Survey
North

Mean Length at Age
NEFSC Fall Survey
South

Mean Length at Age
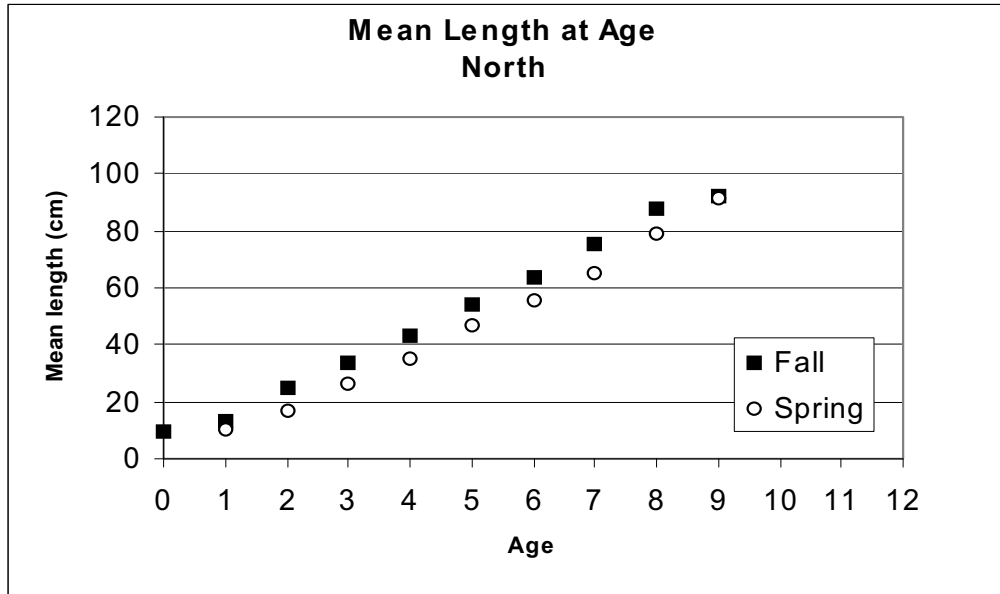NEFSC Fall Survey
All Years 1993-2003

Assessment Report
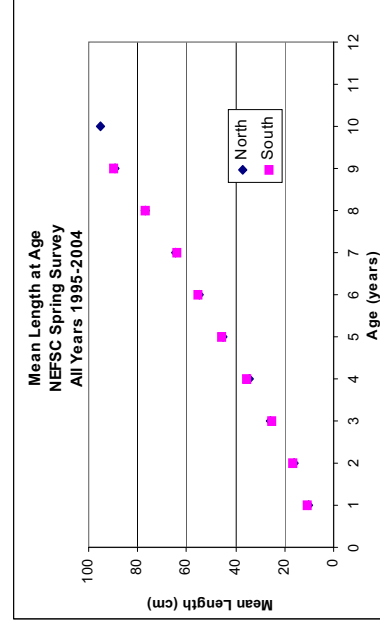
Figure A20. Comparison of seasonal mean lengths at age in the northern and southern management regions, NEFSC fall, spring, and winter surveys.

Biomass Indices

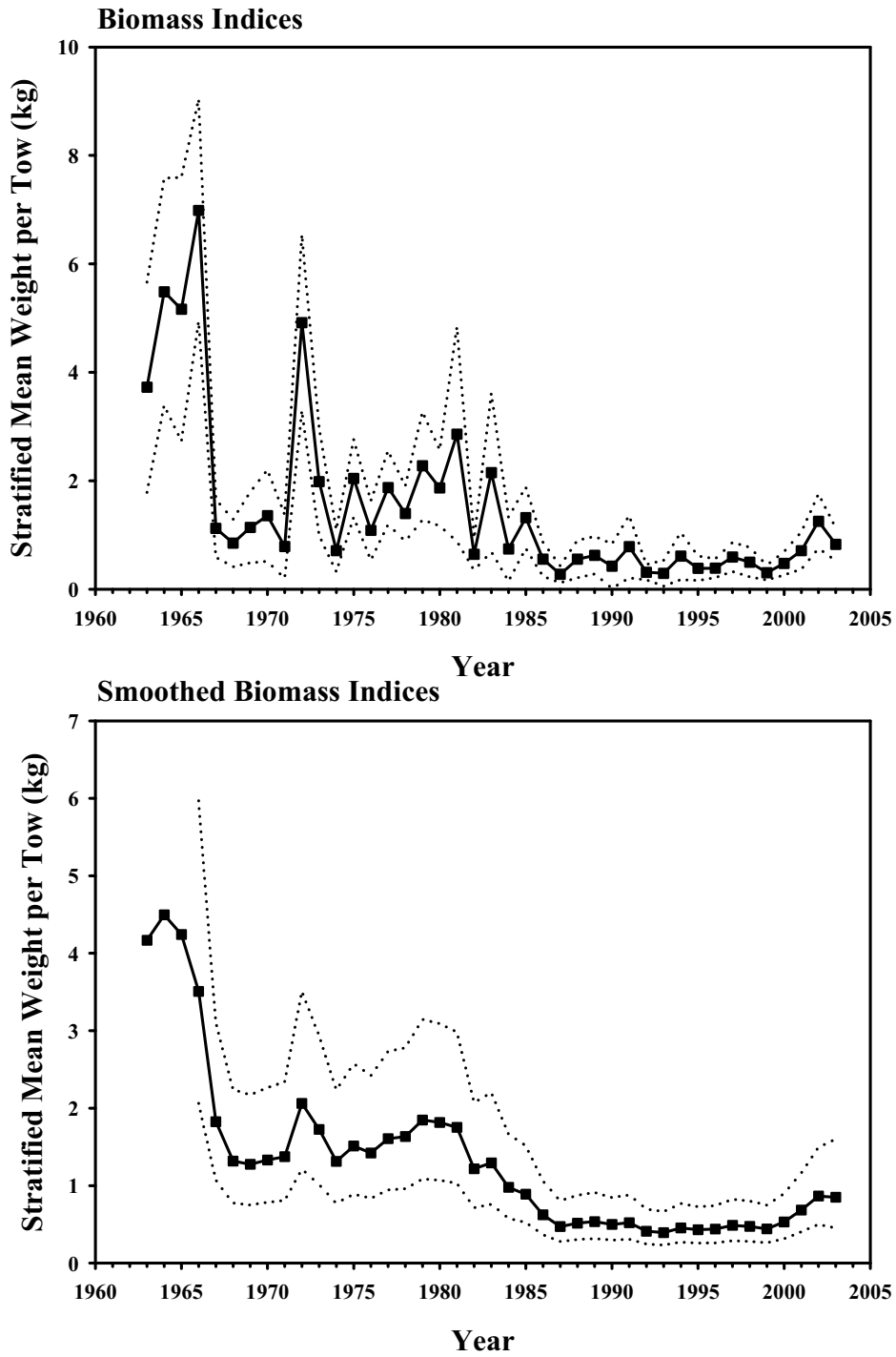

Smoothed Biomass Indices

Figure A21. Biomass indices and smoothed indices from the NEFSC autumn bottom trawl survey for the southern management region from 1963-2003. The 95% confidence limits are shown by the dashed line.
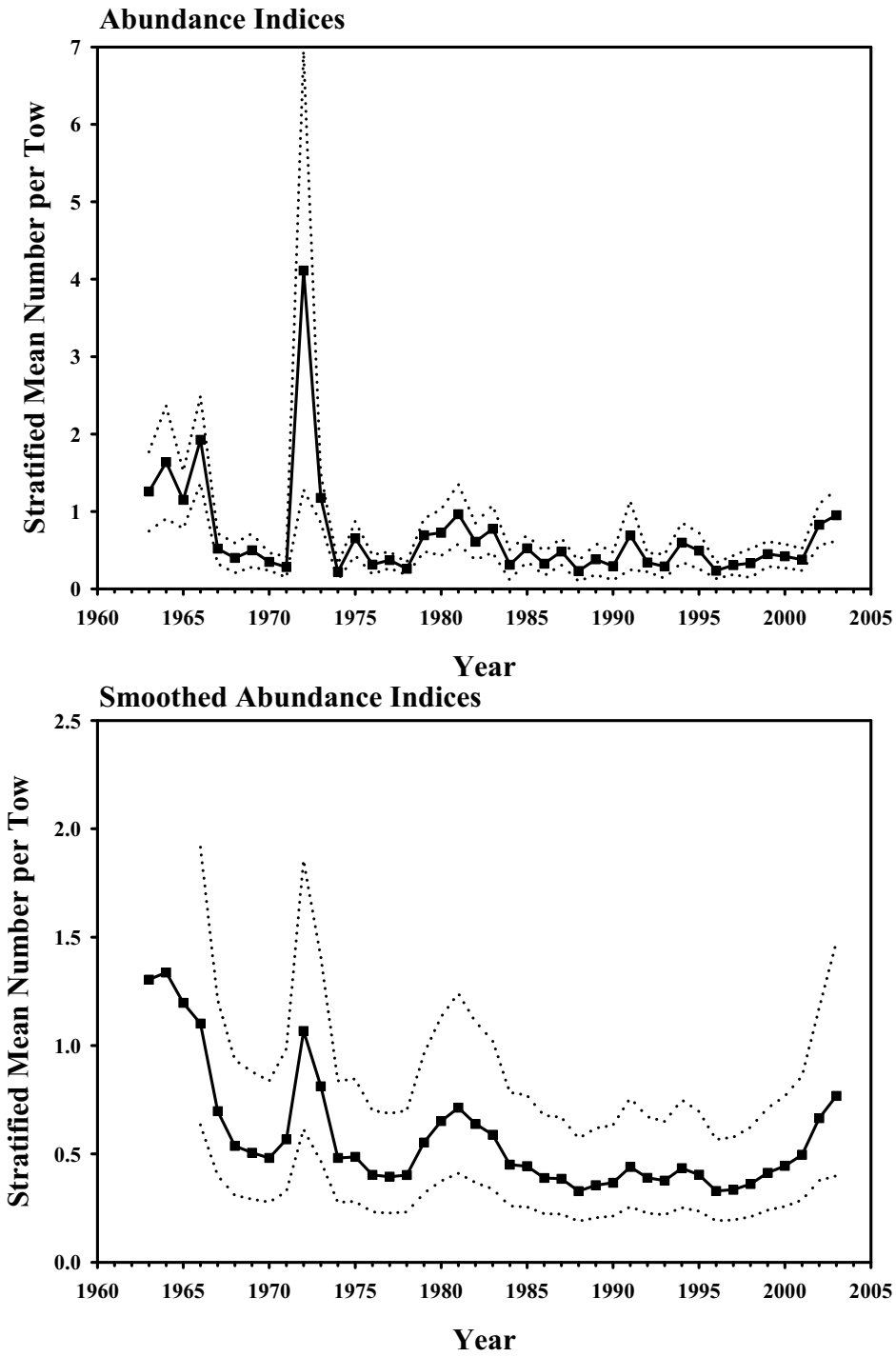
Figure A22. Abundance indices and smoothed indices from the NEFSC autumn bottom trawl survey for the southern management region from 1963-2003. The 95% confidence limits are shown by the dashed line.

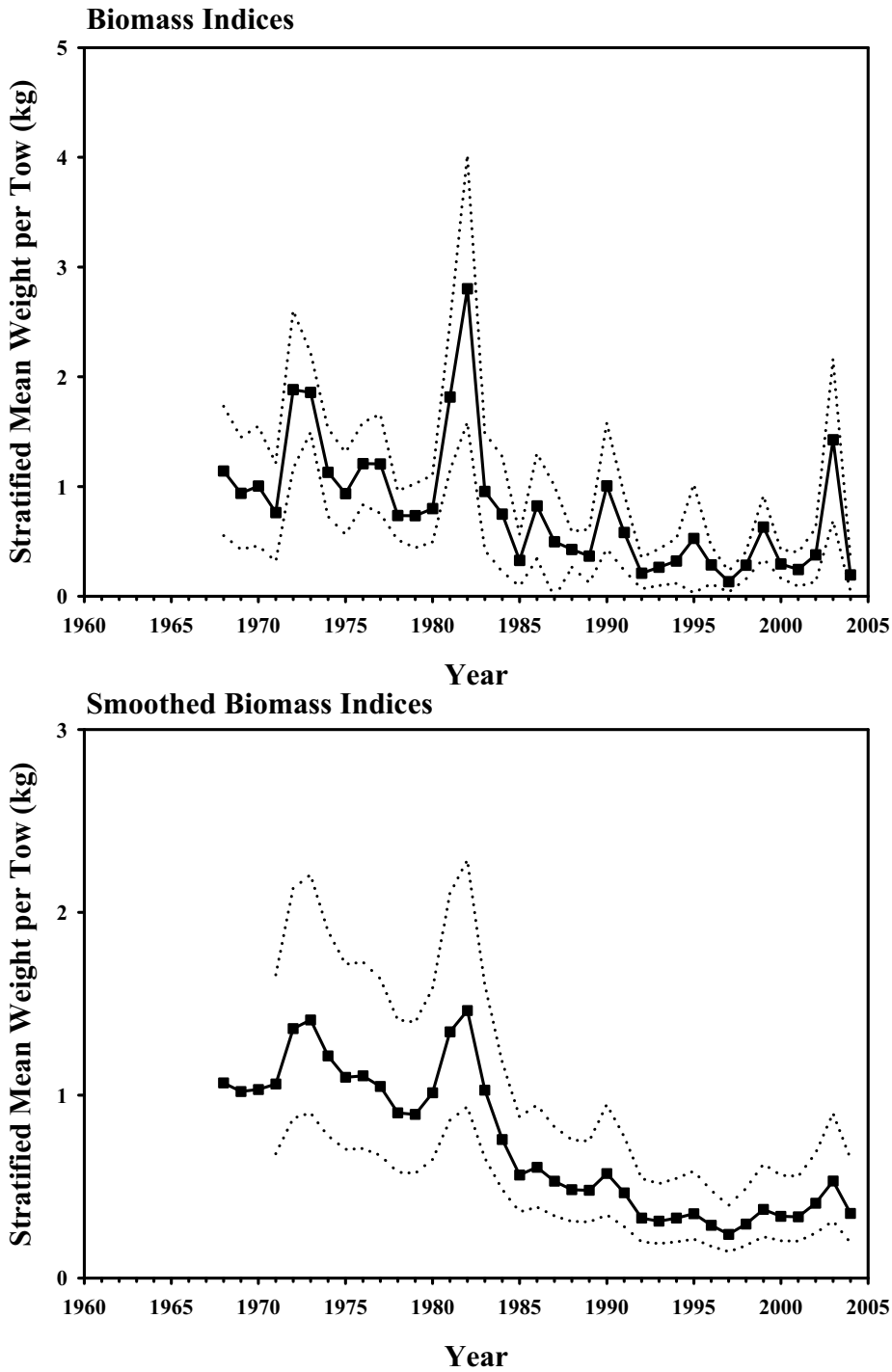## Biomass Indices

Smoothed Biomass Indices

Figure A23. Biomass indices and smoothed indices from the NEFSC spring bottom trawl survey for the southern management region from 1968-2004. The 95% confidence limits are shown by the dashed line.
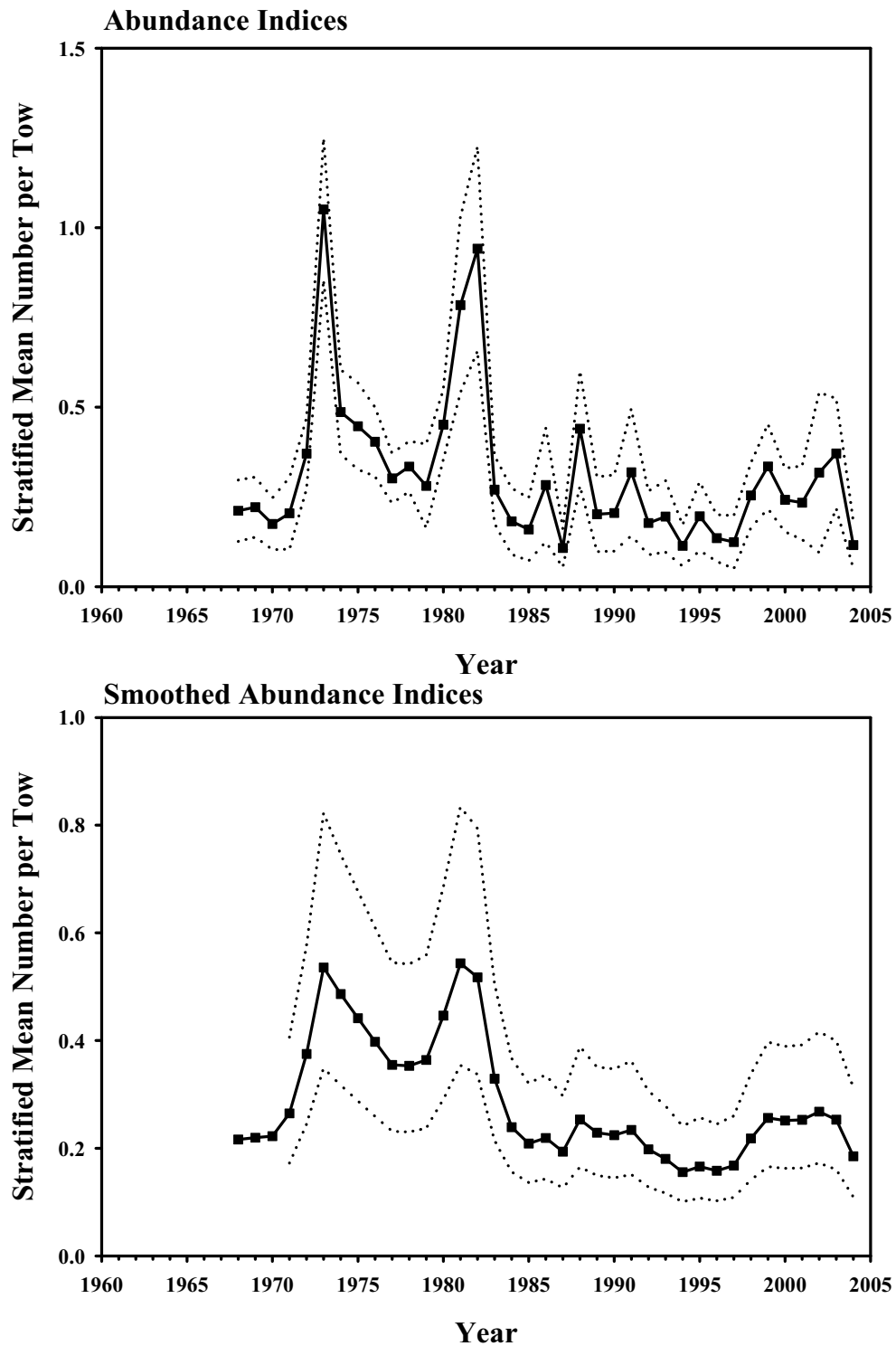
Figure A24. Abundance indices and smoothed indices from the NEFSC spring bottom trawl survey for the southern management region from 1968-2004. The 95% confidence limits are shown by the dashed line.
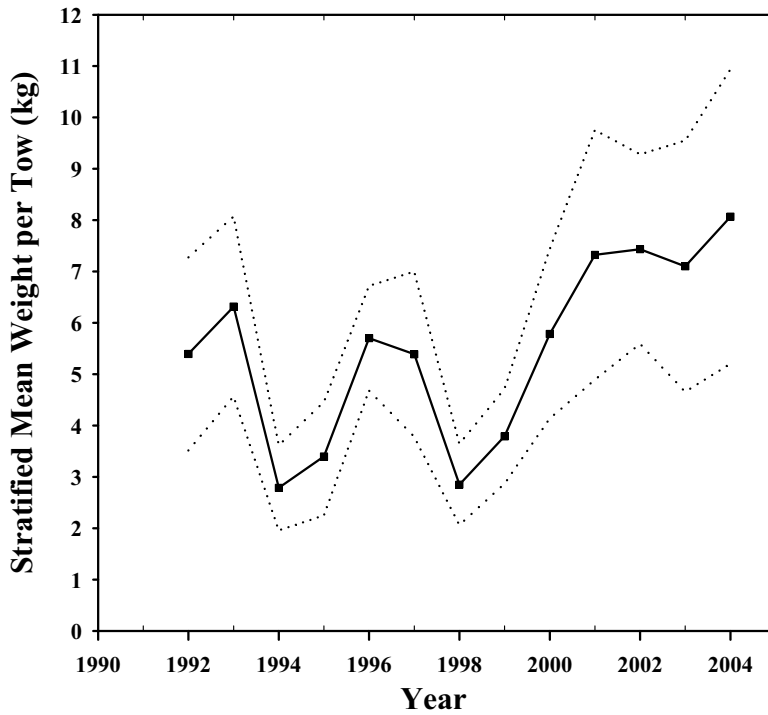
Figure A25. Biomass indices from the NEFSC winter flatfish survey for the southern management region from 1992-2004. The 95% confidence limits are shown by the dashed line.
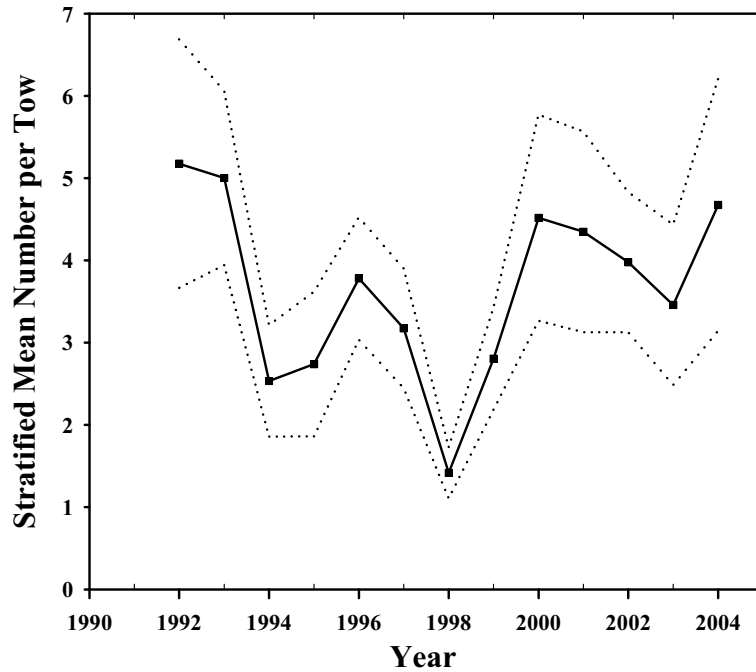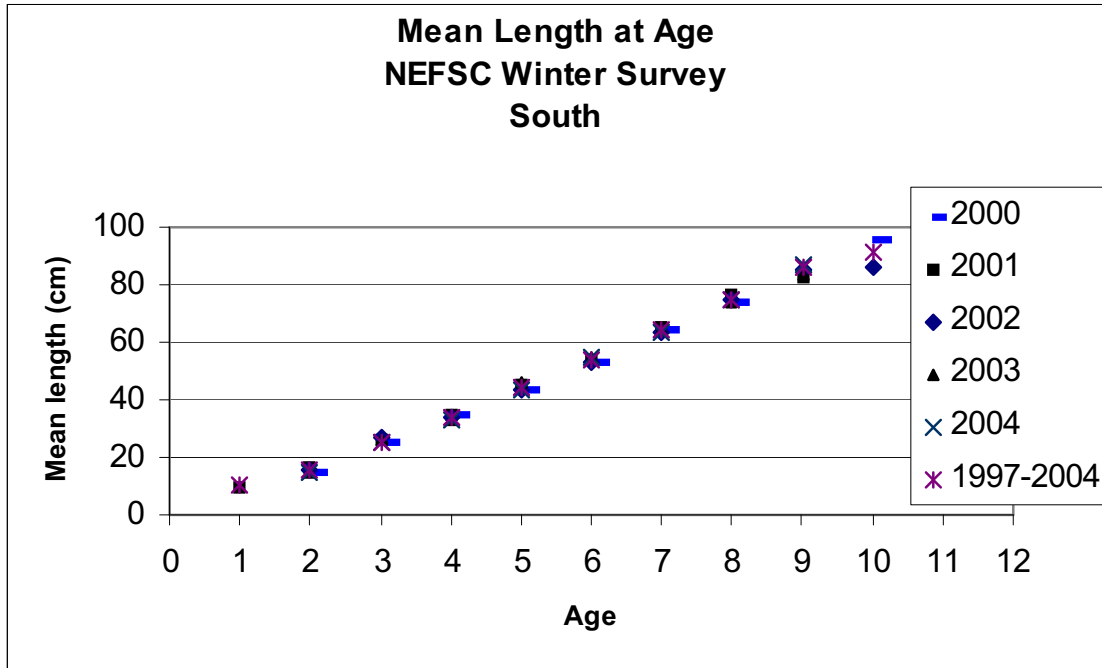

Figure A26. Abundance indices from the NEFSC winter flatfish survey for the southern management region from 1992-2004. The 95% confidence limits are shown by the dashed line.

Figure A27. Mean length at age for goosefish in NEFSC winter surveys, southern management region.

Abundance Indices
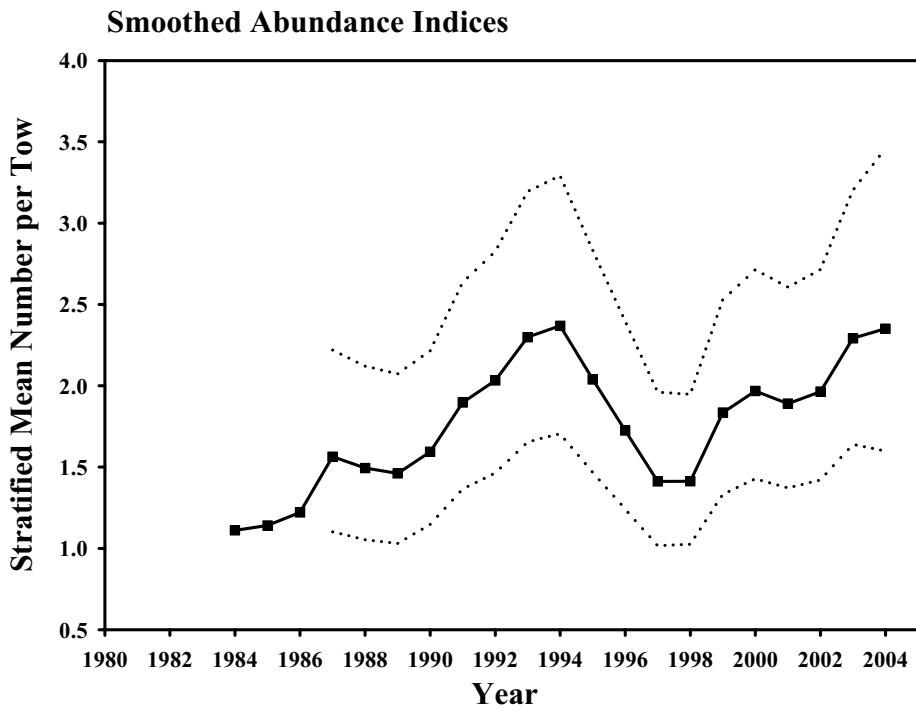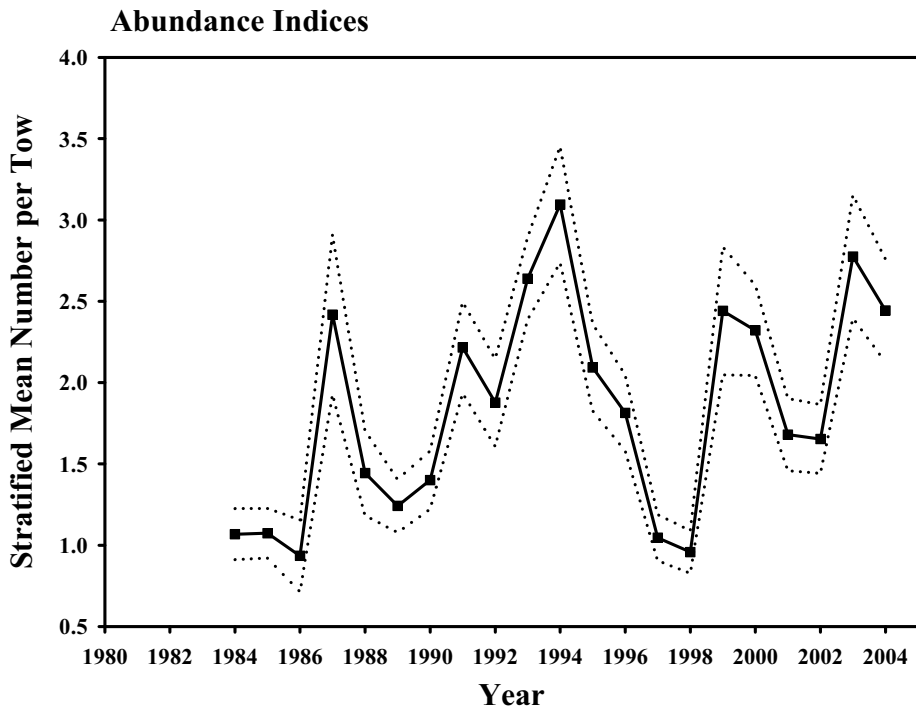

Smoothed Abundance Indices

Figure A28. Abundance indices and smoothed indices from the NEFSC scallop dredge survey for the southern management region from 1984-2003. The 95% confidence limits are shown by the dashed line.
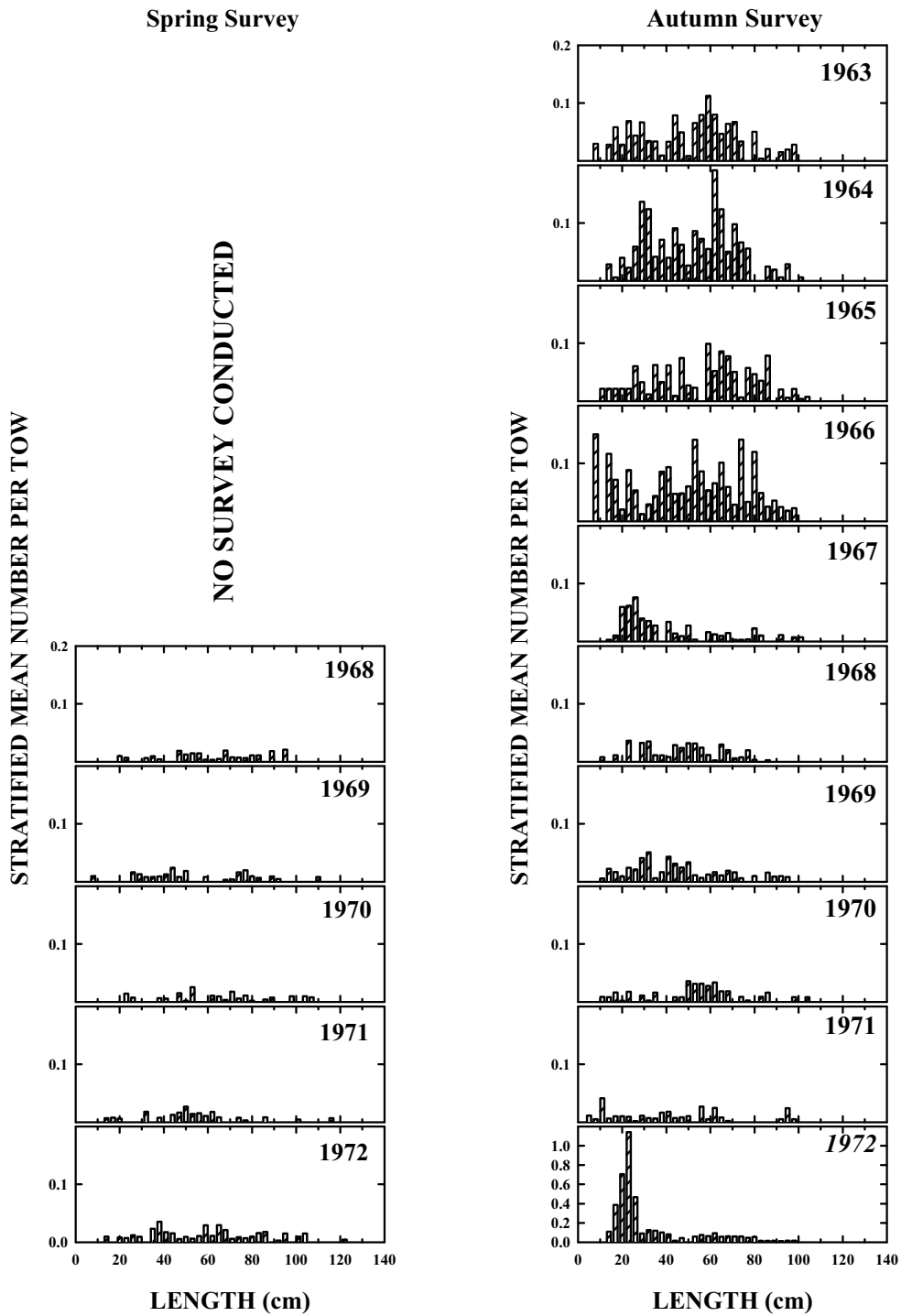
Spring Survey

Autumn Survey

NO SURVEY CONDUCTED

STRATIFIED MEAN NUMBER PER TOW

STRATIFIED MEAN NUMBER PER TOW

LENGTH (cm)

LENGTH (cm)

Figure A29. Goosefish length composition from the NEFSC spring bottom trawl (March-April), winter flatfish (February), summer scallop (July-August), and autumn (September-October) bottom trawl surveys in the southern management region, 1963-2004.
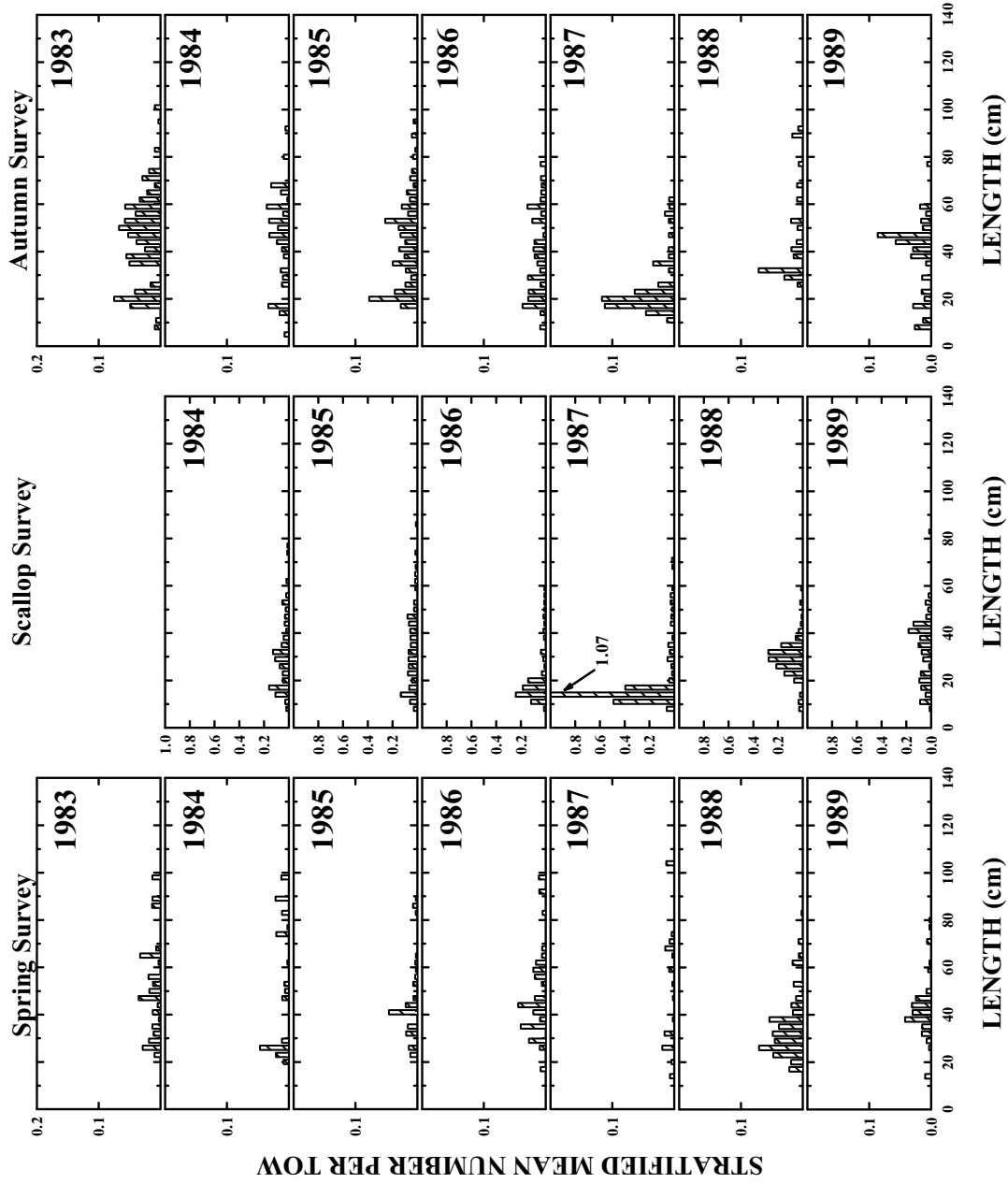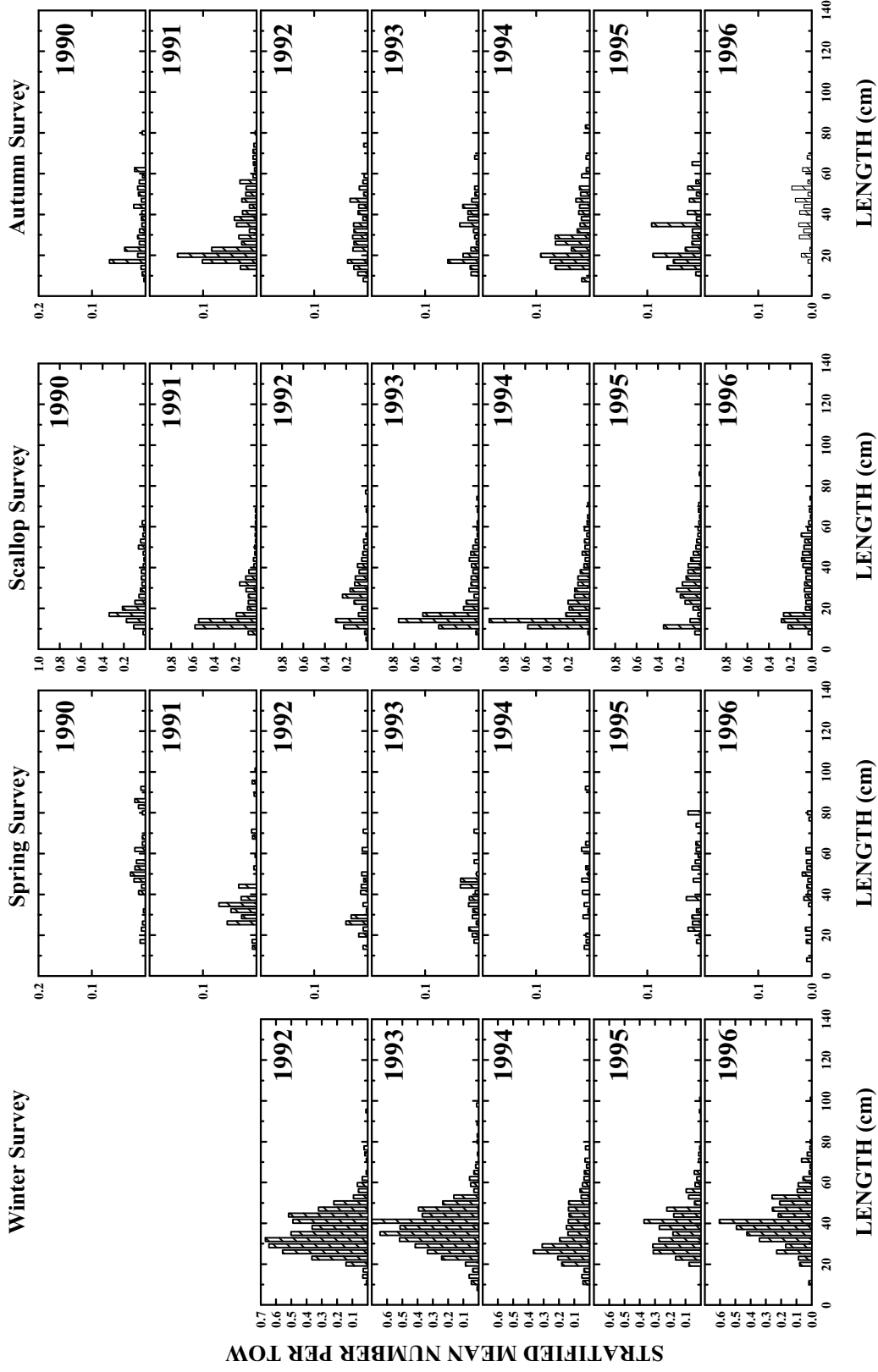
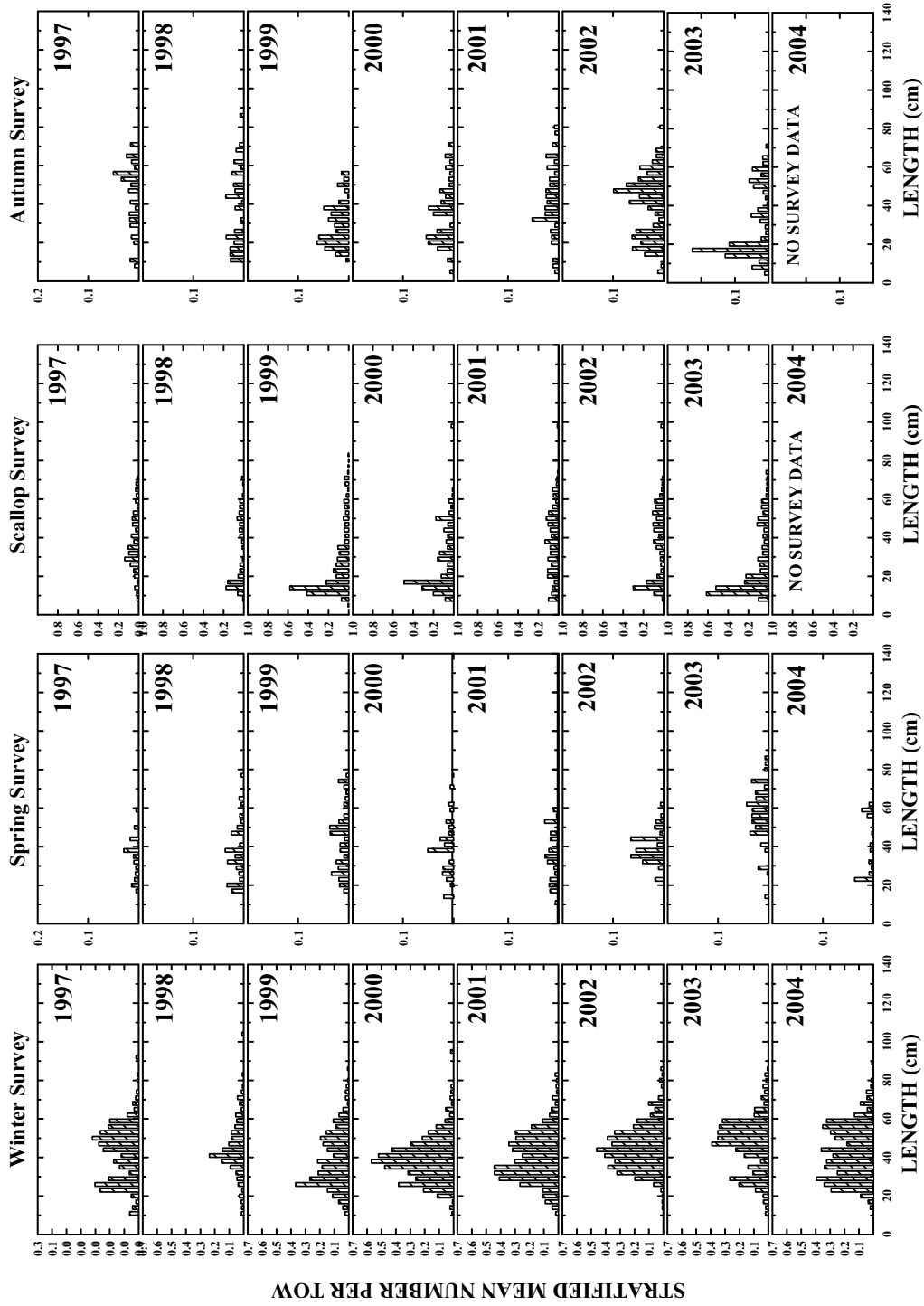Figure A29, continued.

Figure A29, continued.
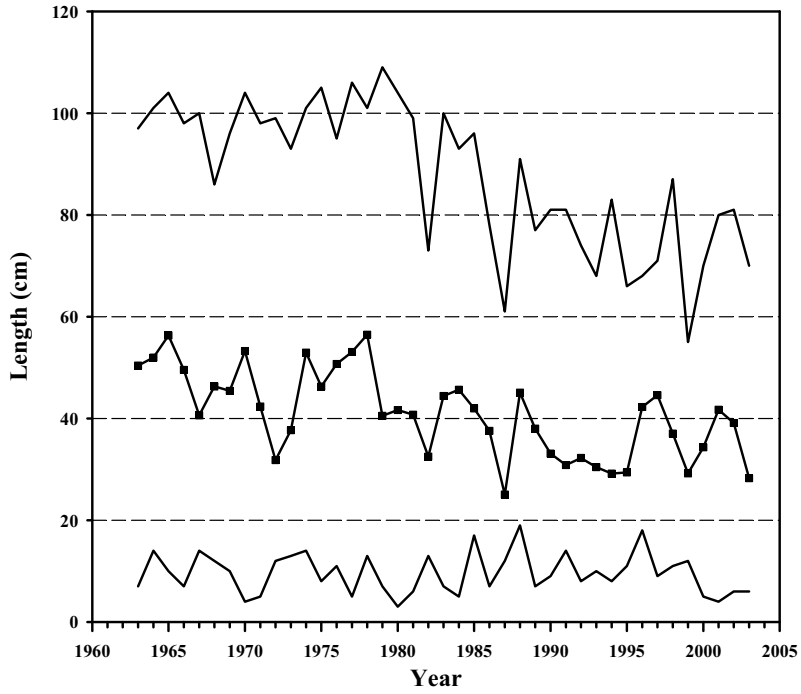
Figure A29, continued.

Figure A30. Minimum, mean, and, maximum lengths for the southern management region from the NEFSC autumn surveys.
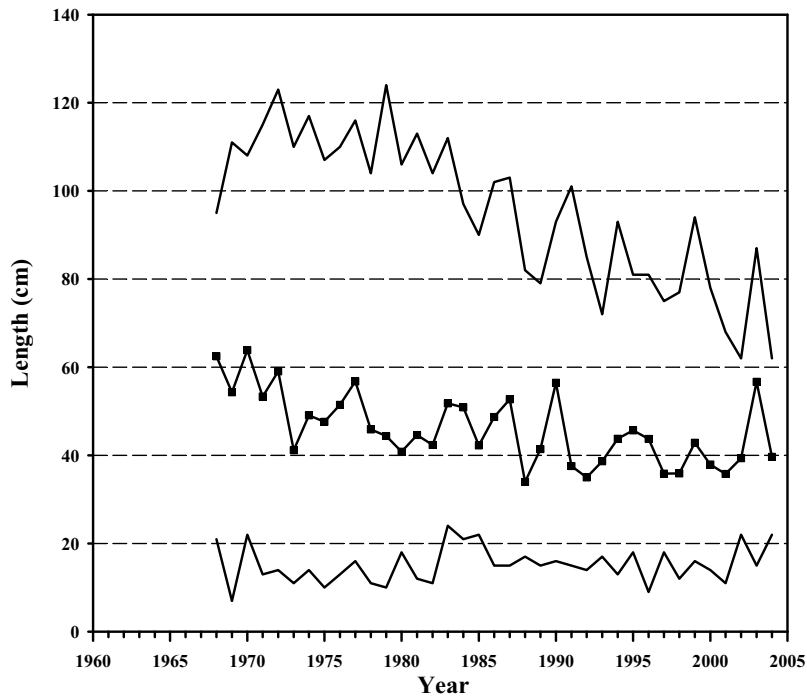

Figure A31. Minimum, mean, and, maximum lengths for the southern management region from the NEFSC spring surveys.
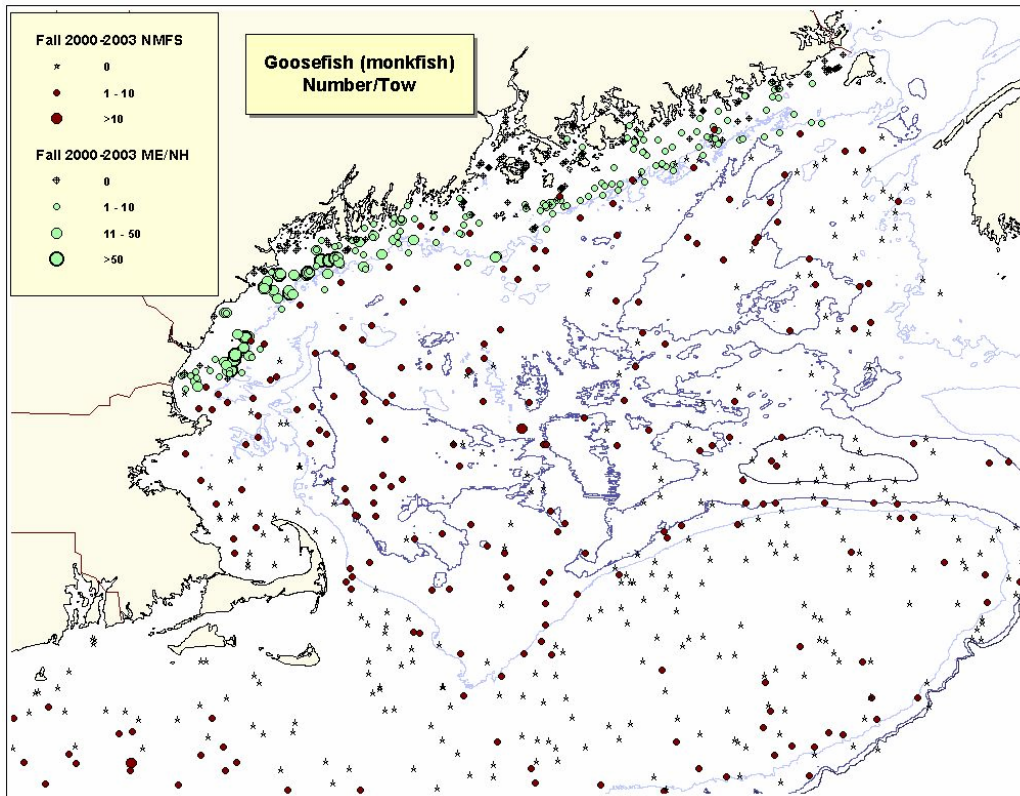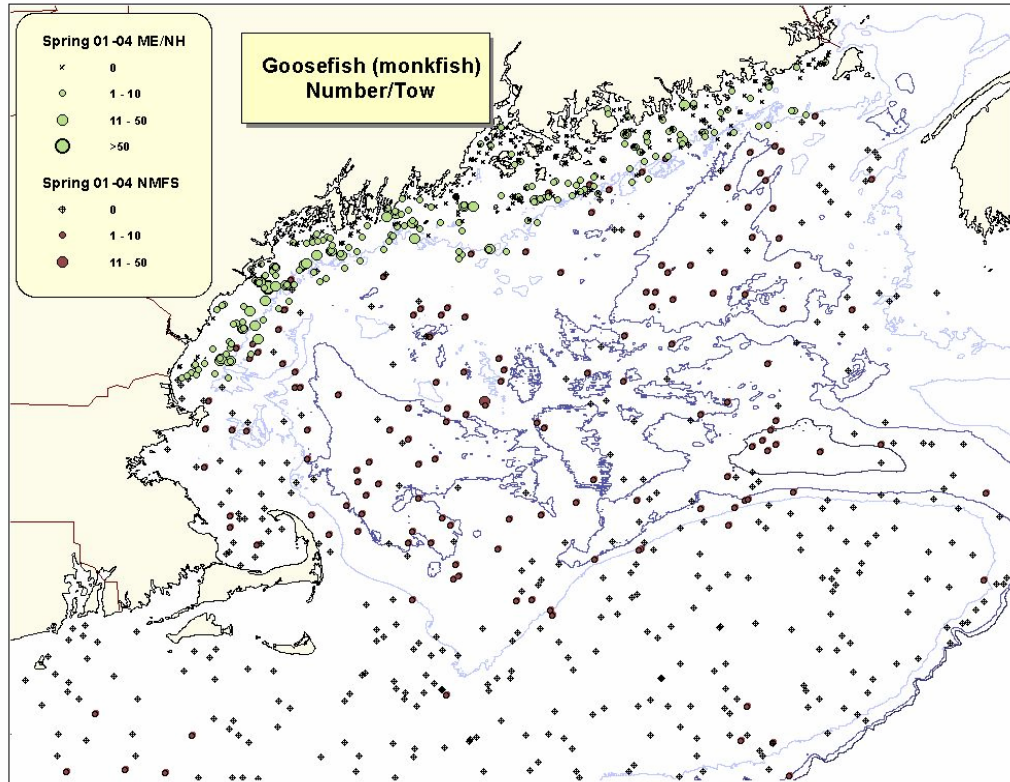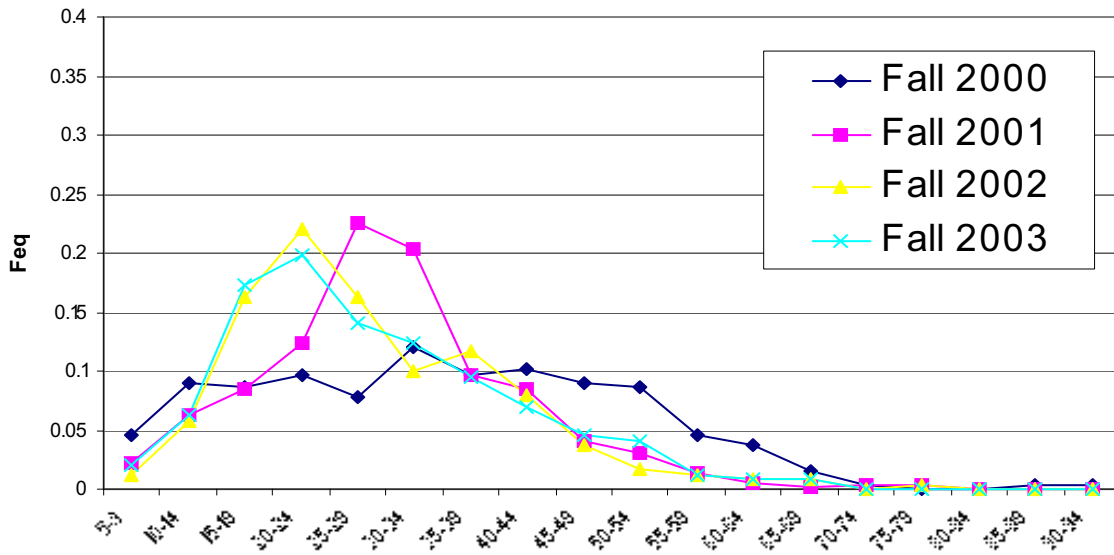
Figure A32. Distribution of goosefish catches in inshore surveys conducted by the states of Maine and New Hampshire, and in NMFS surveys, autumn and spring, 2001-2004.

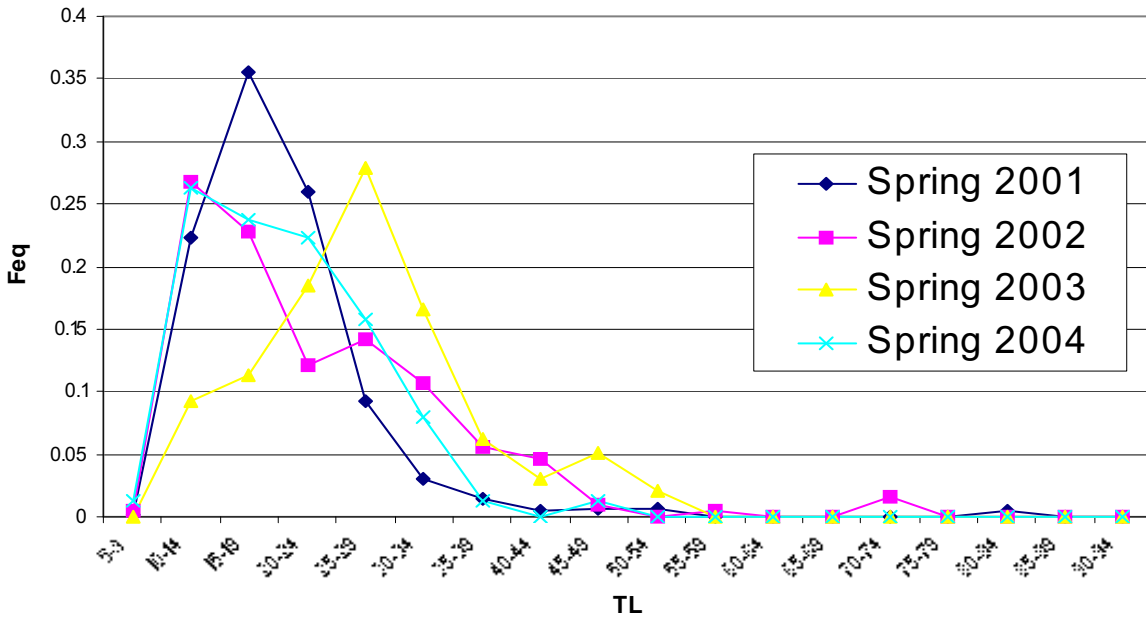# Length frequency: Fall

Length frequency: Spring

Figure A33. Length frequency distributions of monkfish caught in Maine/New Hampshire inshore surveys, fall and spring.
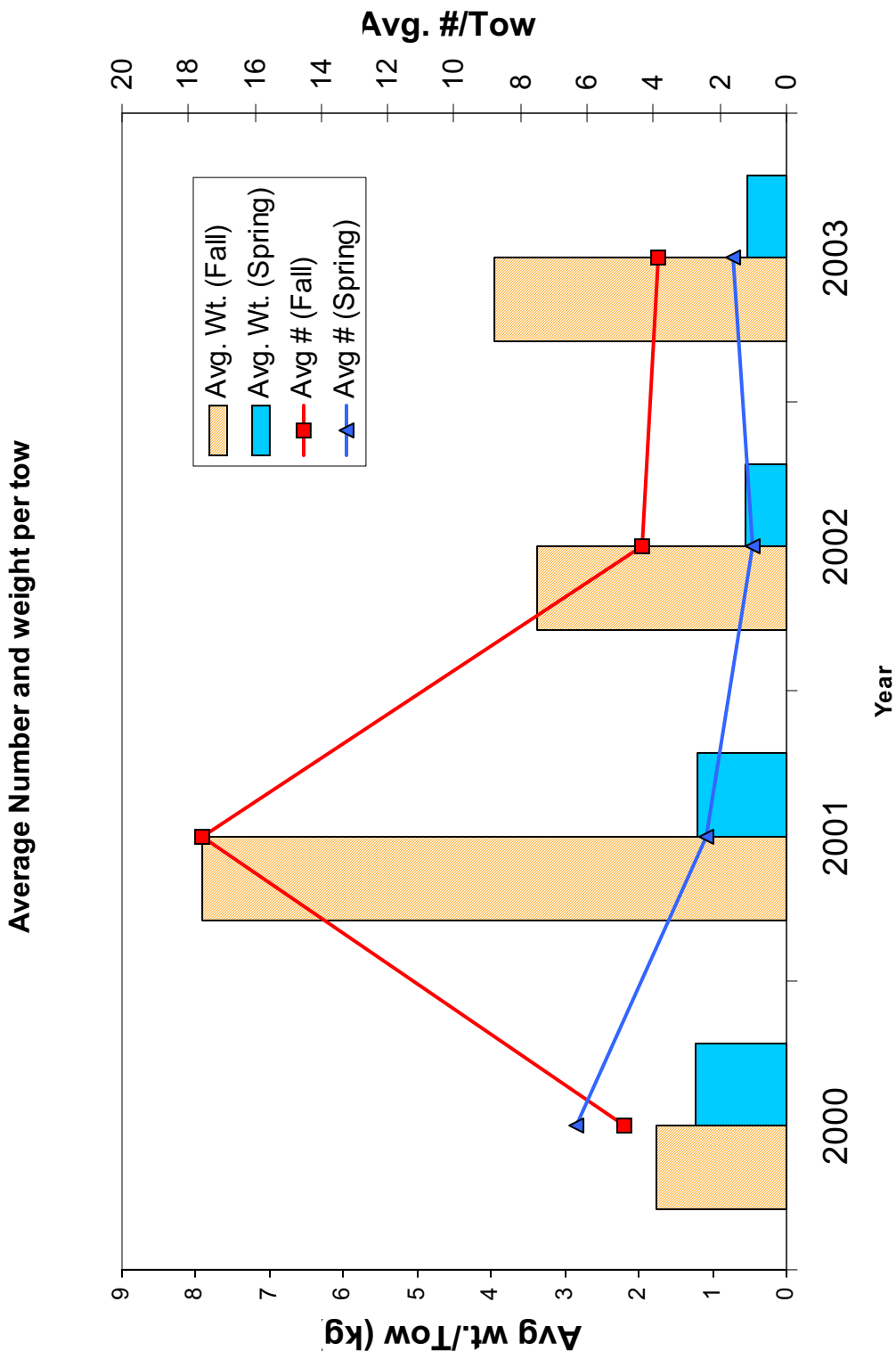
Figure A34. Mean number and weight per tow for goosefish in Maine/New Hampshire inshore surveys.
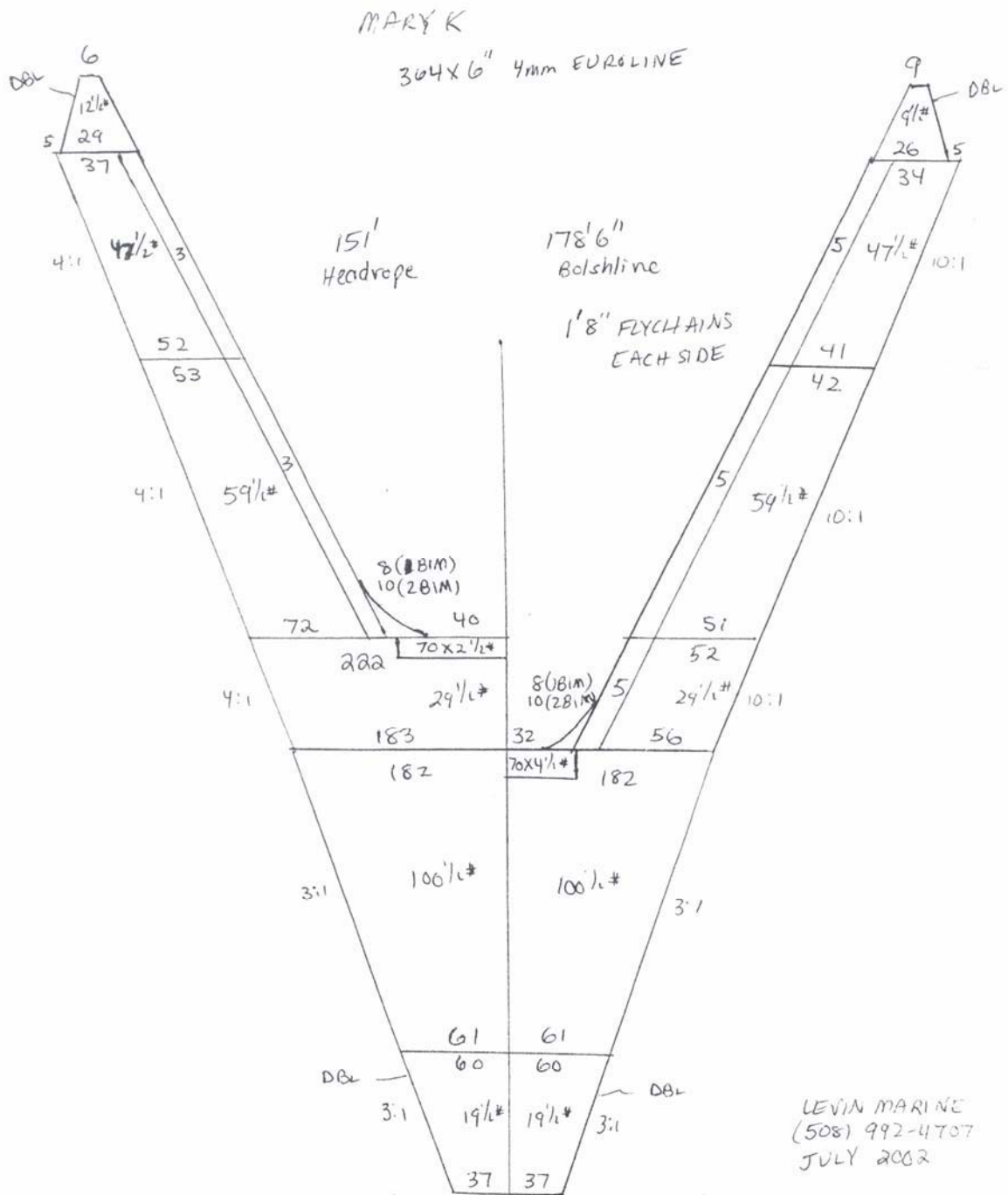
Figure A35. Net plan for the rockhopper net used on the Mary K for the 2004 cooperative monkfish survey.
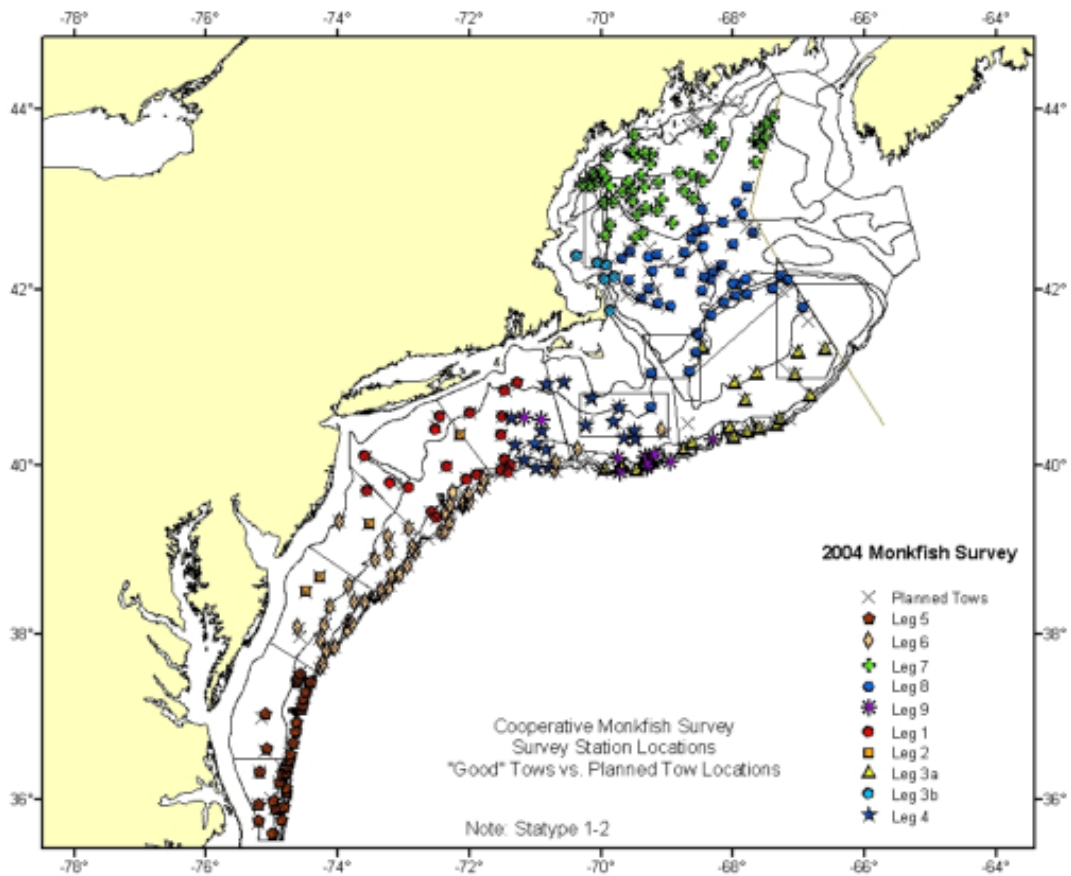
Figure A36. 2005 monkfish cooperative survey stations. Planned station locations that were not sampled are also shown (X).
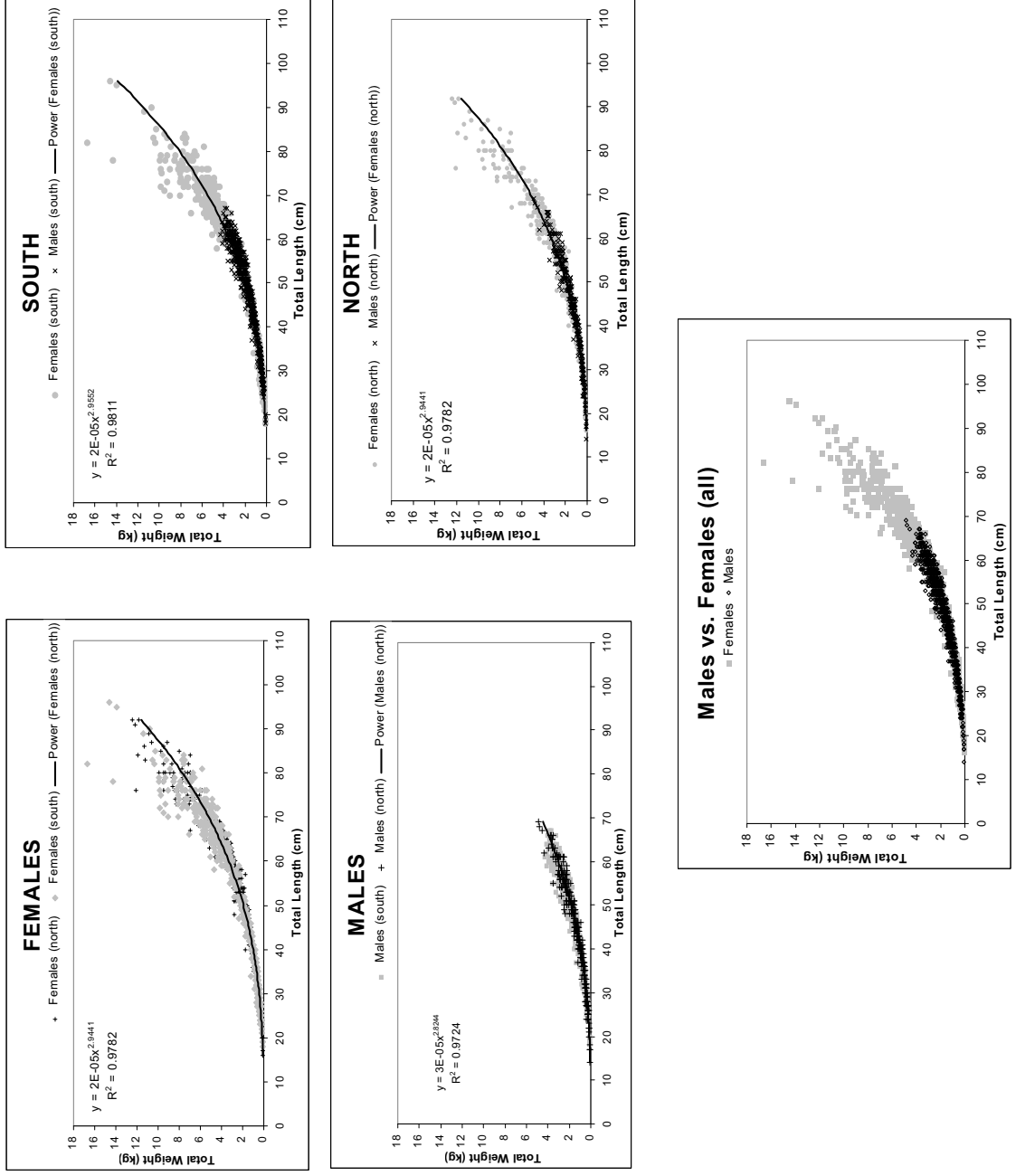
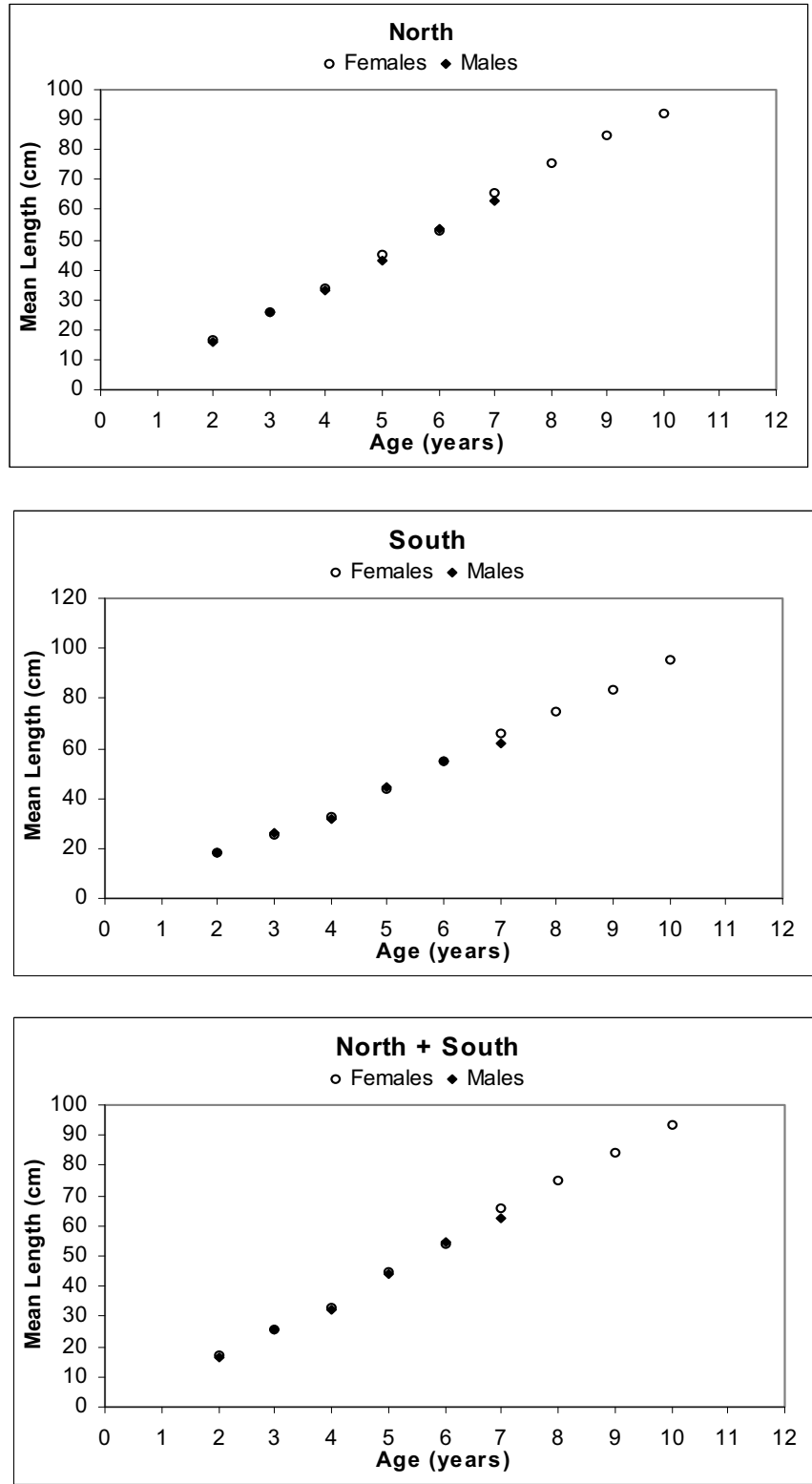Figure A37. Length-weight relationships for monkfish captured during the 2004 cooperative survey.

Figure A38. Monkfish age-length relationships from 2004 cooperative monkfish survey samples, by gender and management region.
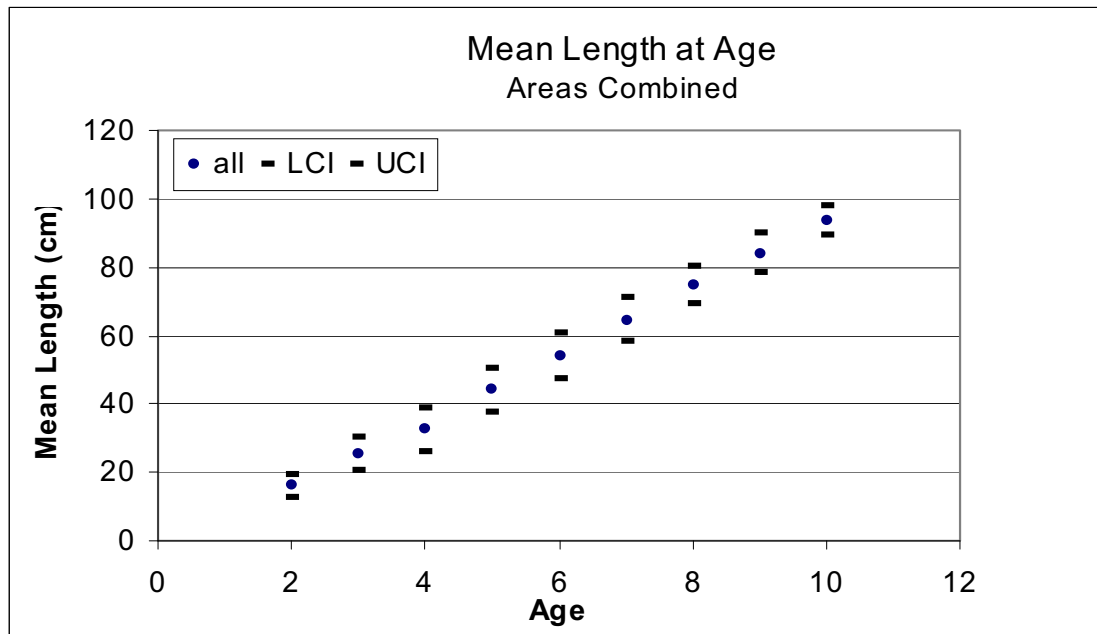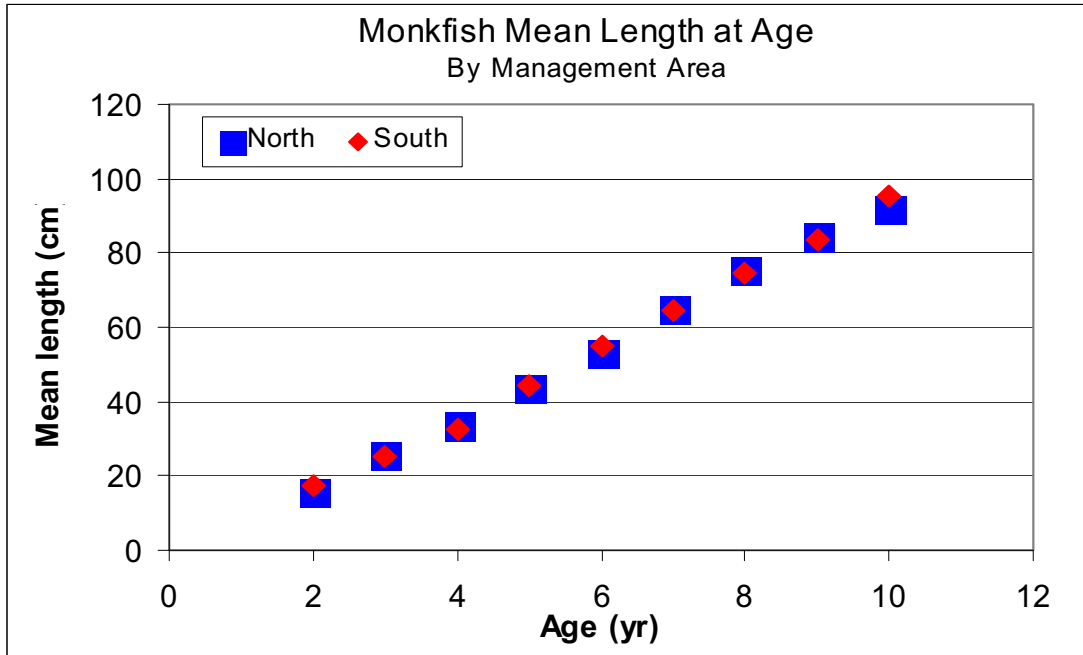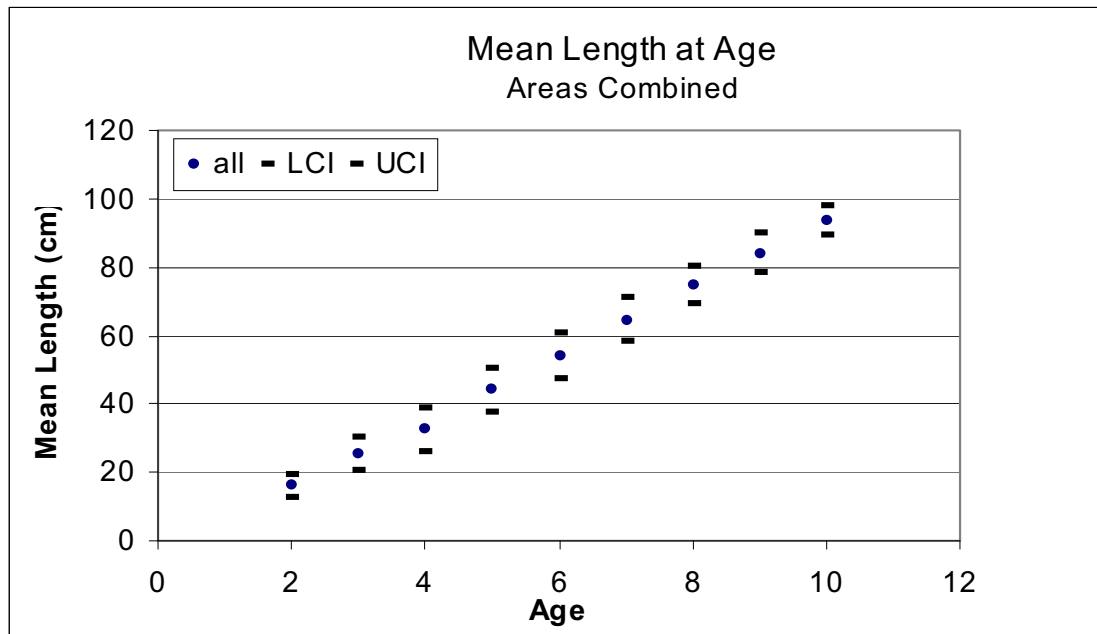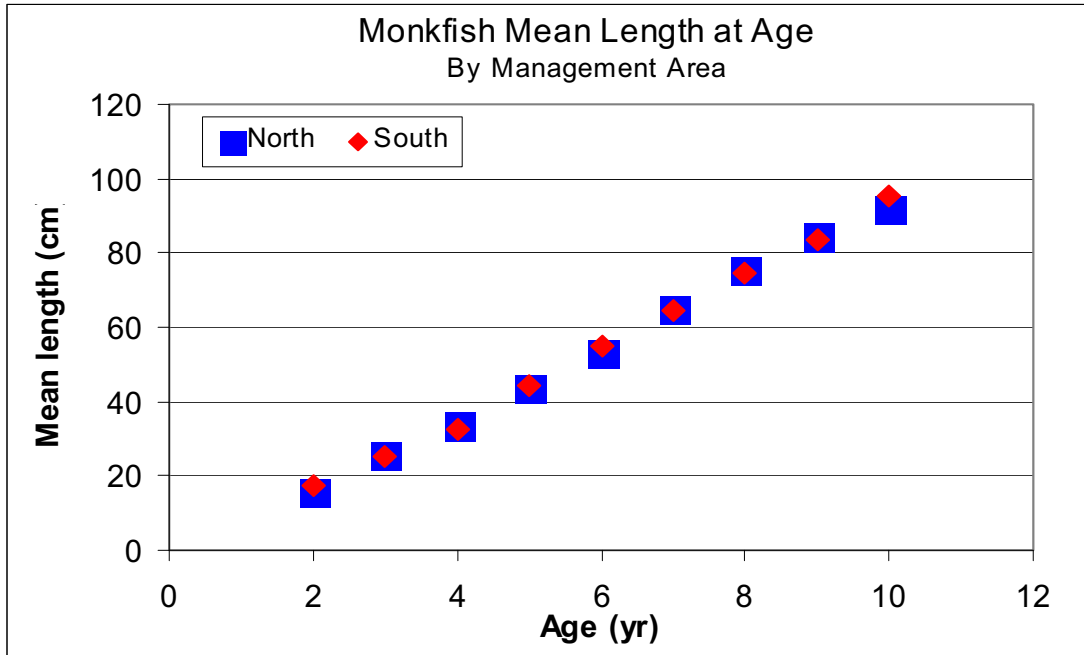
Figure A39. Mean length at age in samples from 2004 cooperative survey. LCI = lower 95% confidence interval, UCI = upper 95% confidence interval.

Figure A39. Mean length at age in samples from 2004 cooperative survey. LCI = lower 95% confidence interval, UCI = upper 95% confidence interval.
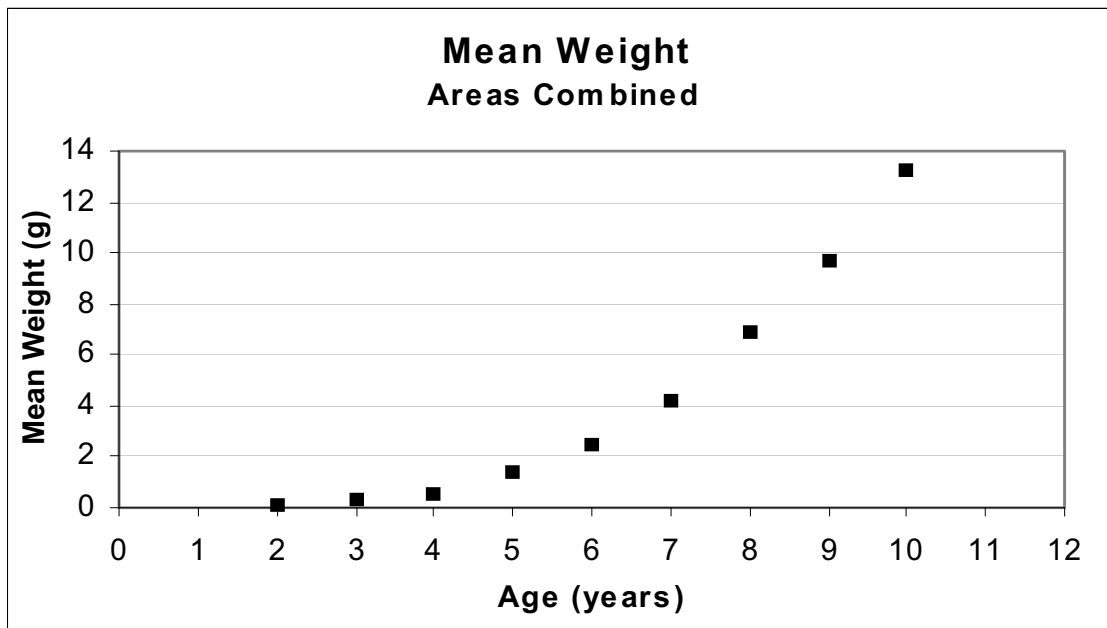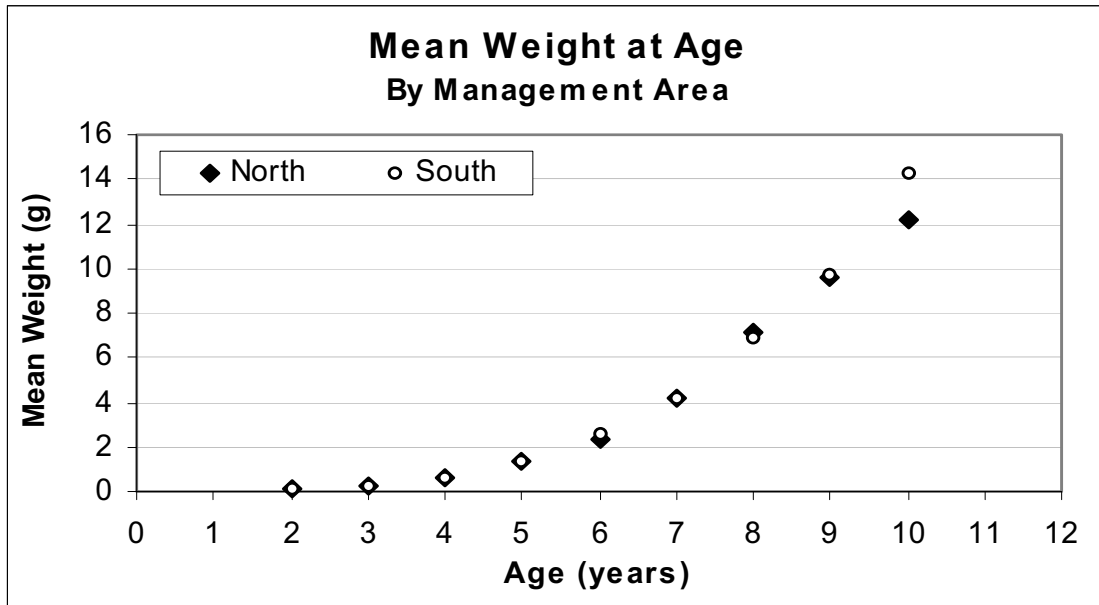
Figure A40. Monkfish mean weight at age from samples taken during 2004 cooperative monkfish survey.
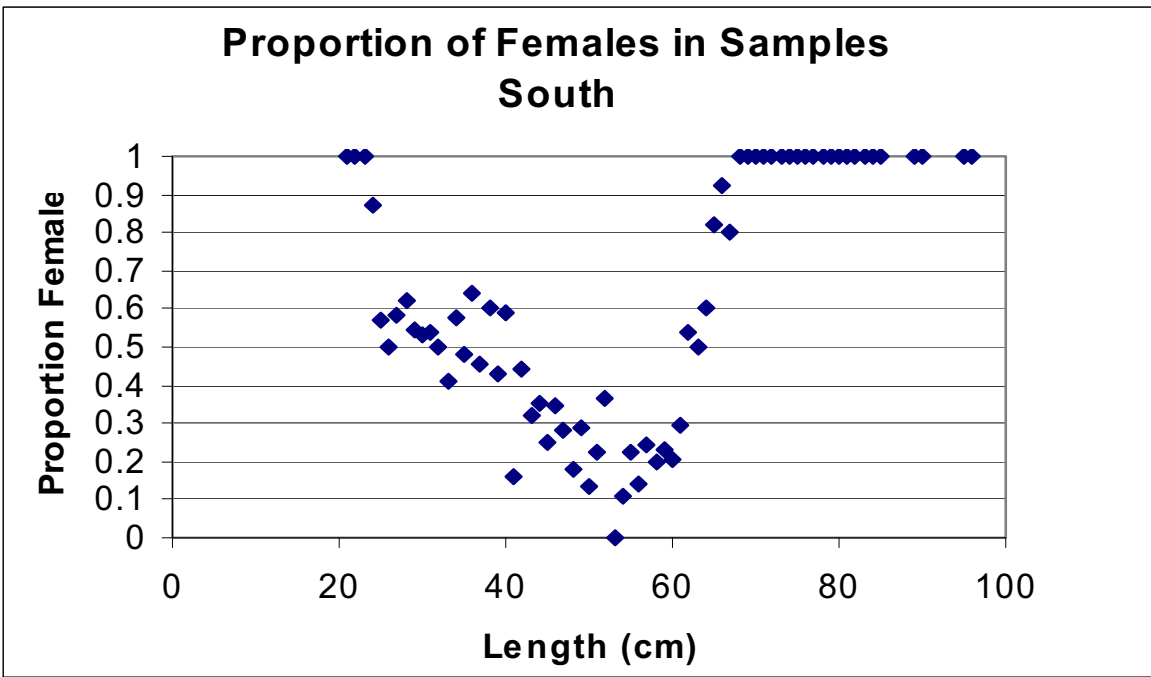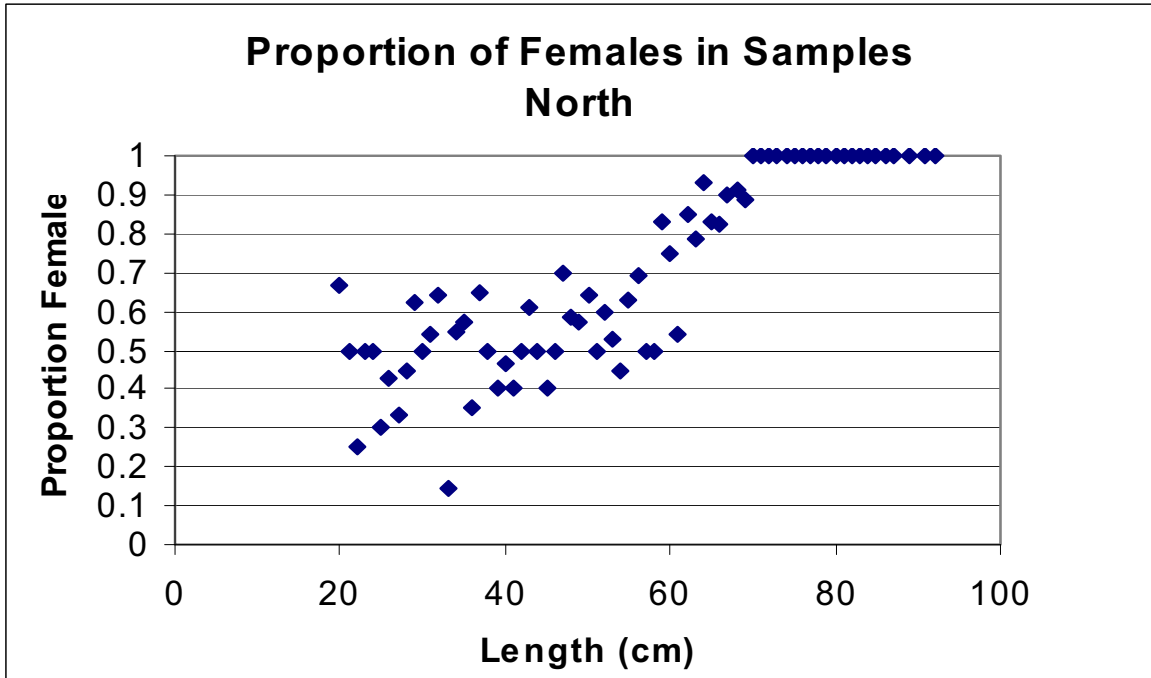
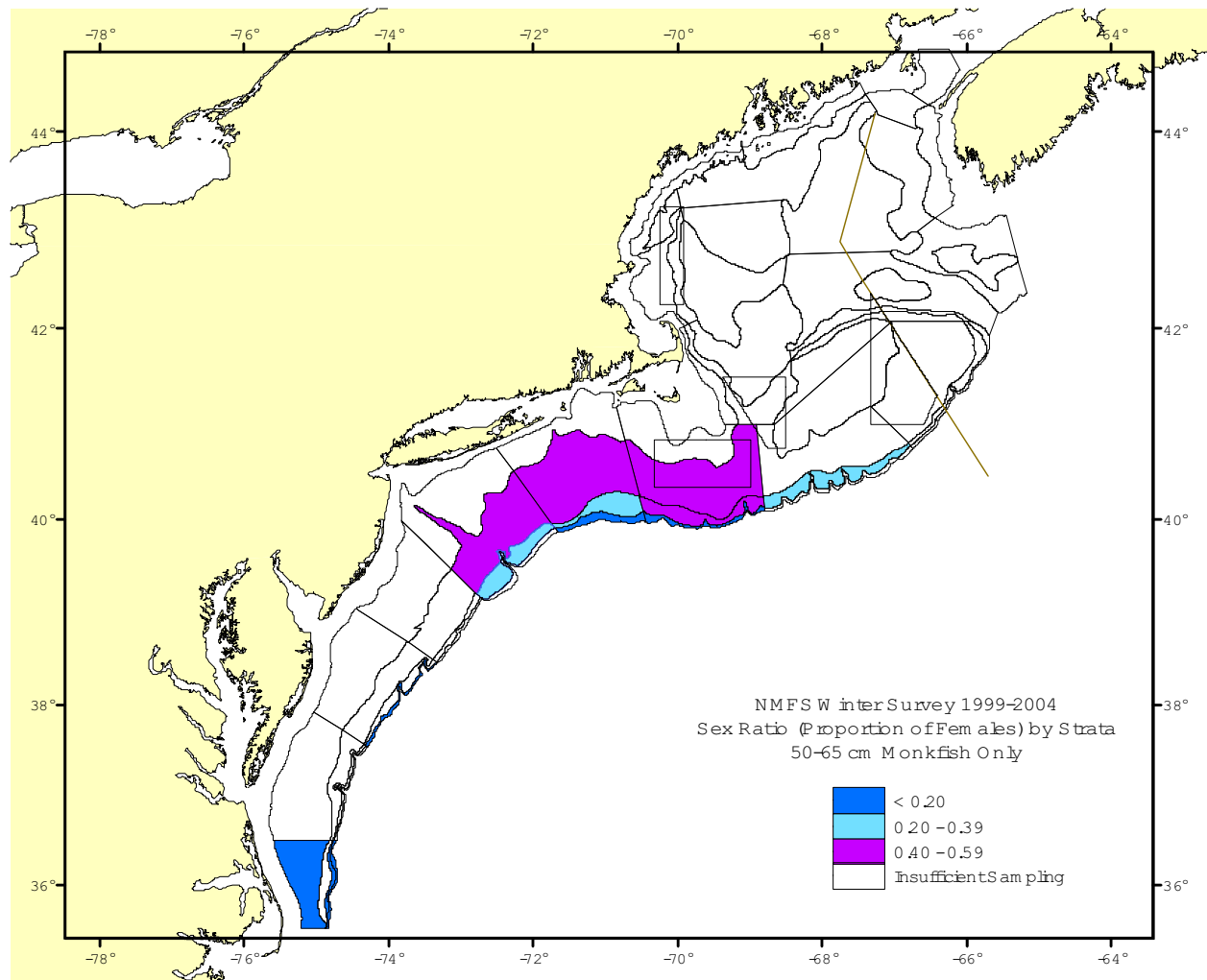Figure A41. Sex ratios at length (proportion female) from 2004 monkfish survey.

Figure A42. Spatial distribution of sex ratios for monkfish 50-65 cm from NEFSC winter surveys, 1999-2004.

**Mean Wingspread vs. Depth
2004 Flat Net**

$y = -6\text{E-}05x^2 + 0.0354x + 19.04$

$R^2 = 0.7623$

**Mean wingspread vs. depth
2004 Rockhopper**

$y = -7\text{E-}05x^2 + 0.0354x + 22.093$
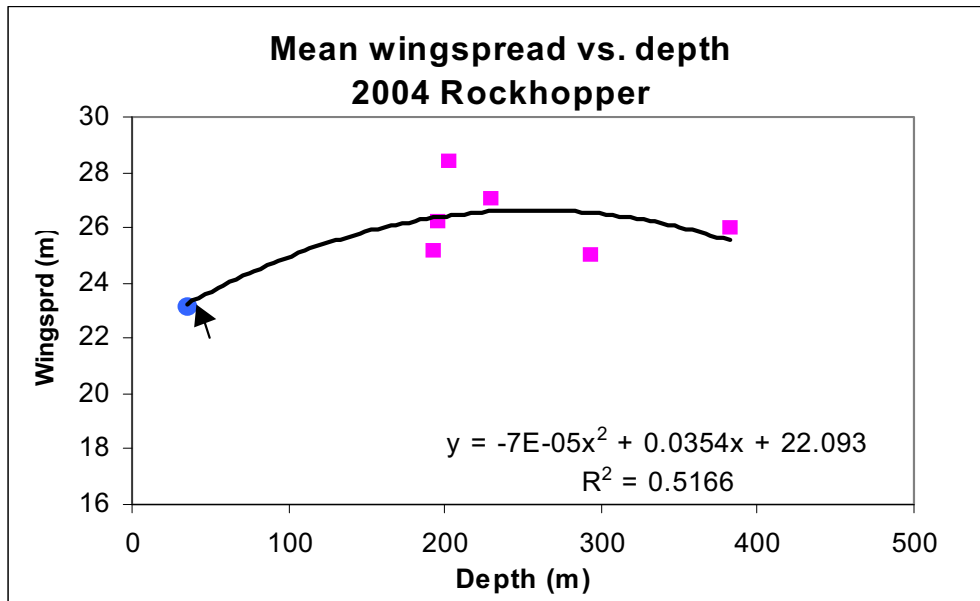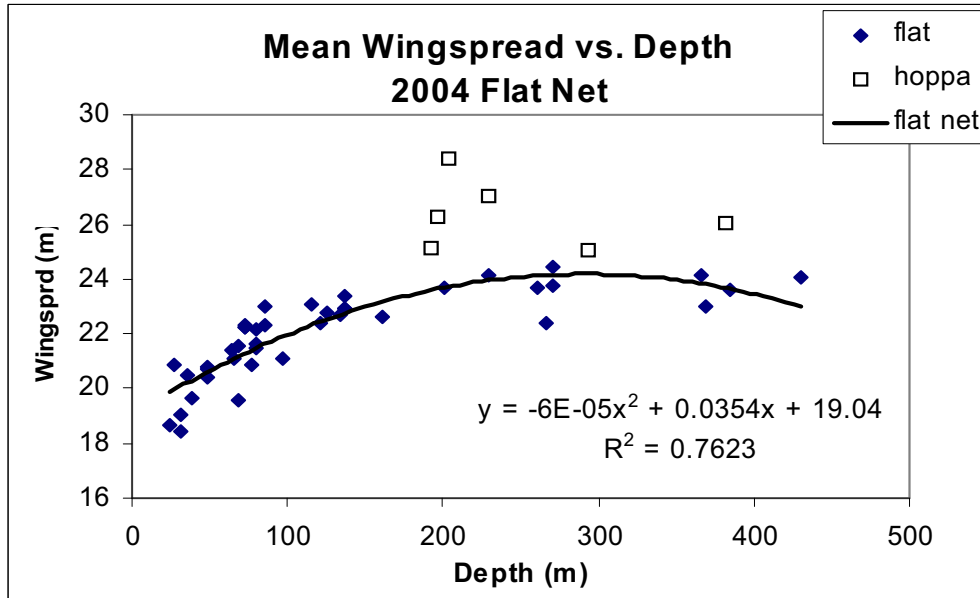
$R^2 = 0.5166$

Figure A43. Relationships between wingspread and depth used to estimate wingspread for each survey tow for the 2004 cooperative goosefish survey.
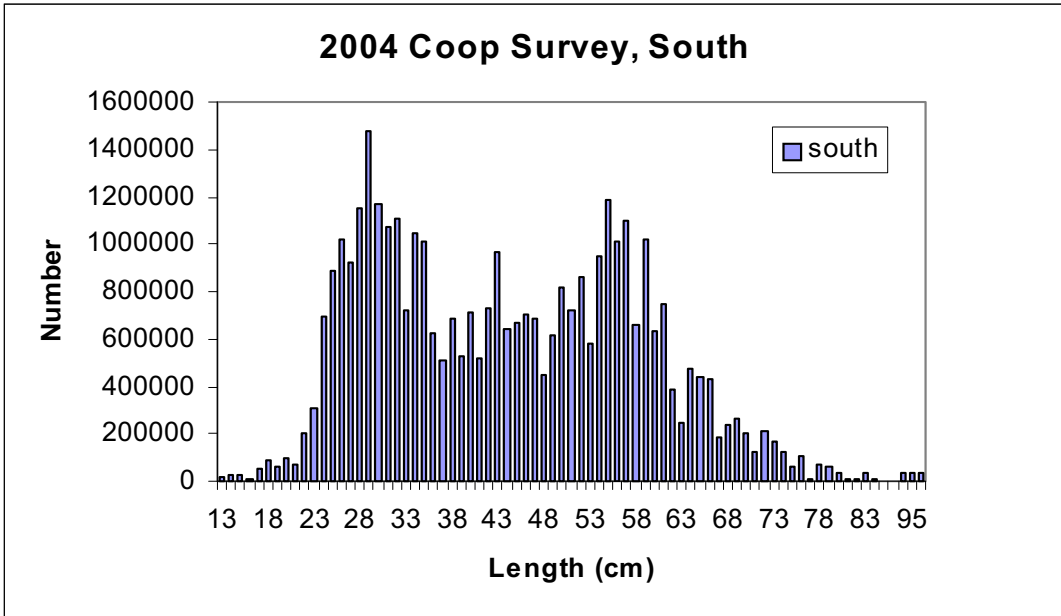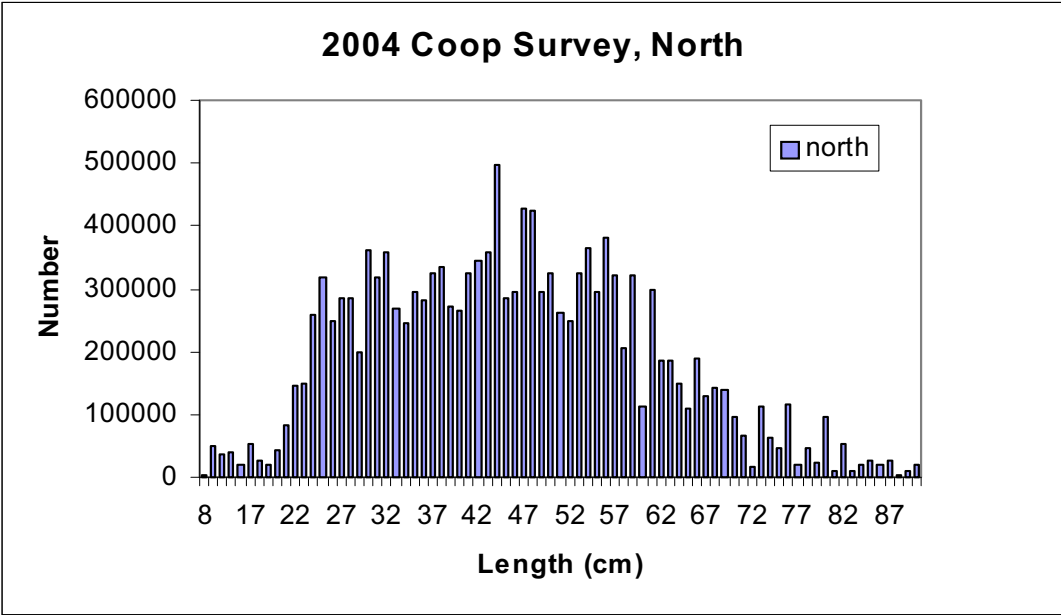
Figure A44. Length frequency distributions for the northern and southern management regions from the 2004 cooperative survey. Numbers at length are based on minimum population size estimates.
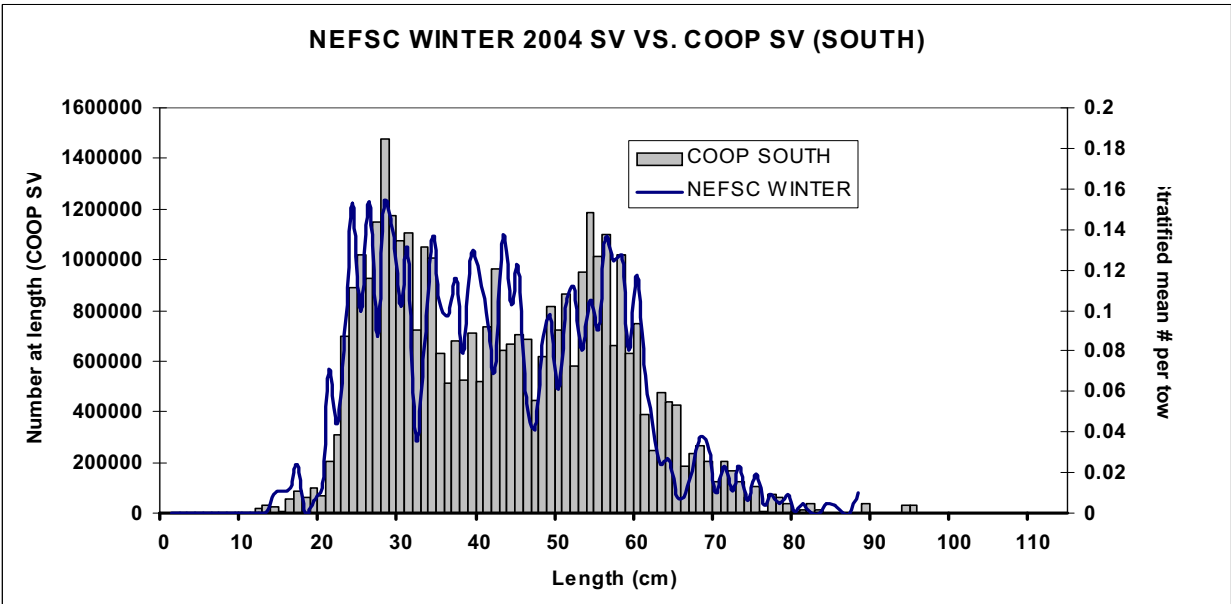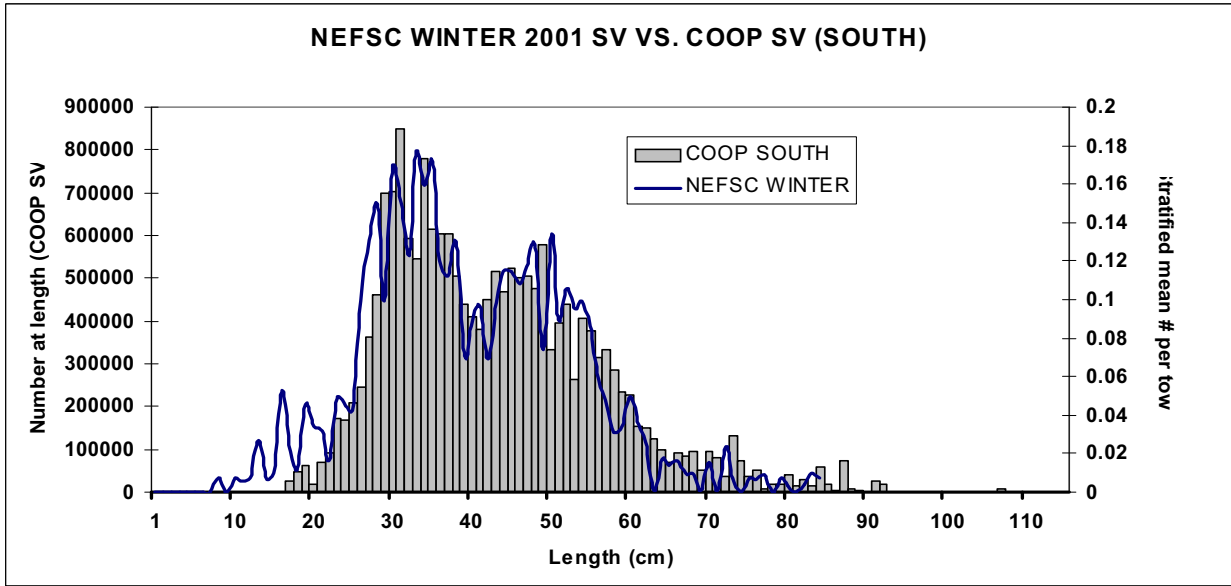
Figure A45. Length frequency distributions of monkfish estimated from NEFSC winter surveys and cooperative surveys, 2001 and 2004. Cooperative survey estimates are minimum numbers at length, NEFSC survey estimates are stratified mean number per tow at length
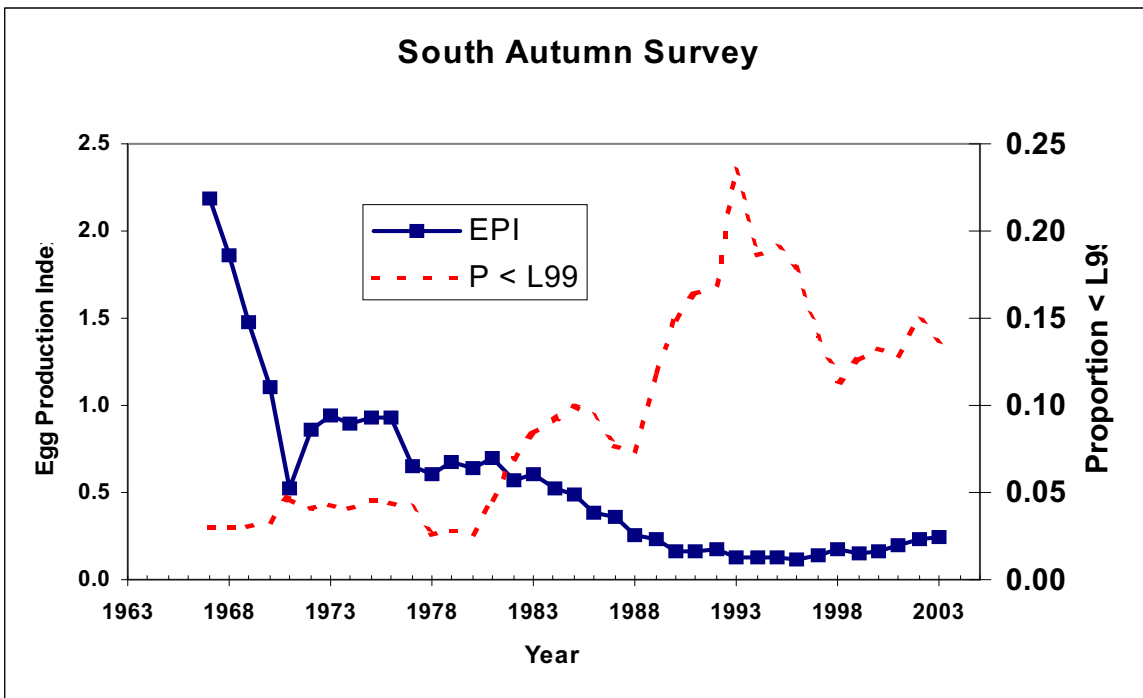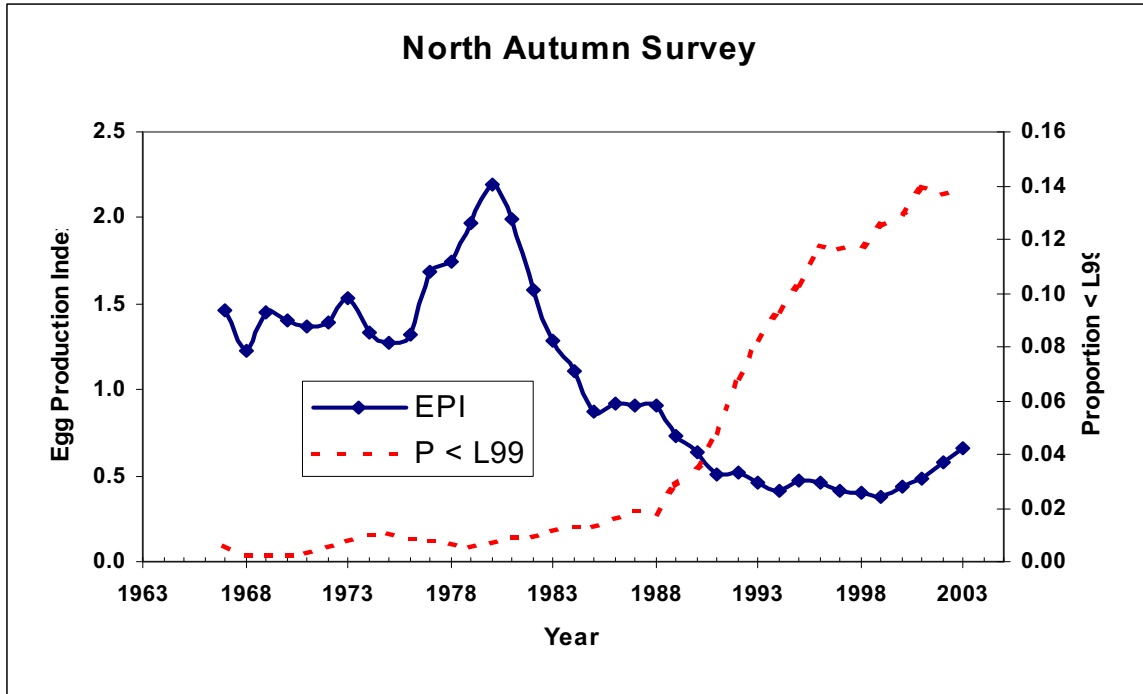
Figure A46. Indices of egg production by goosefish based on composite length
frequency distributions from survey indices (number per tow at length), proportion
mature at length, and fecundity at length. Year represents the terminal year of a 5-year
pooled length frequency sample. Proportion < L99 is the fraction of egg production
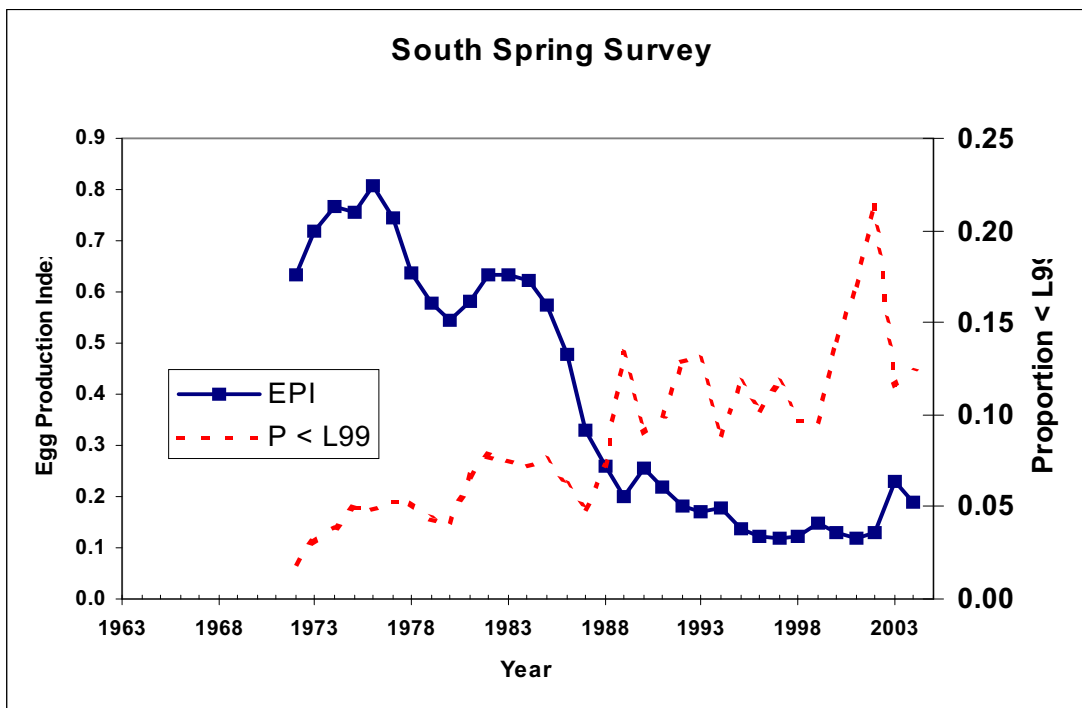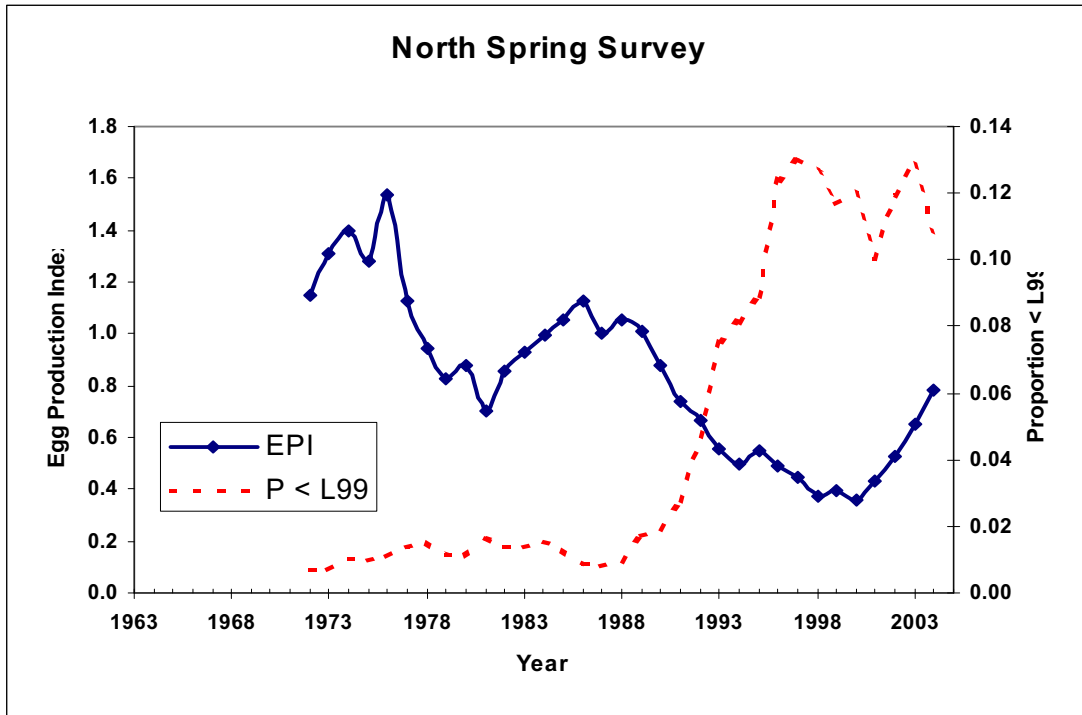from goosefish smaller than the size at 99% maturity.

Figure A47.   Indices of egg production by goosefish based on composite length frequency distributions from survey indices (number per tow at length), proportion mature at length, and fecundity at length. Year represents the terminal year of a 5-year pooled length frequency sample. Proportion < L99 is the fraction of egg production from goosefish smaller than the size at 99% maturity
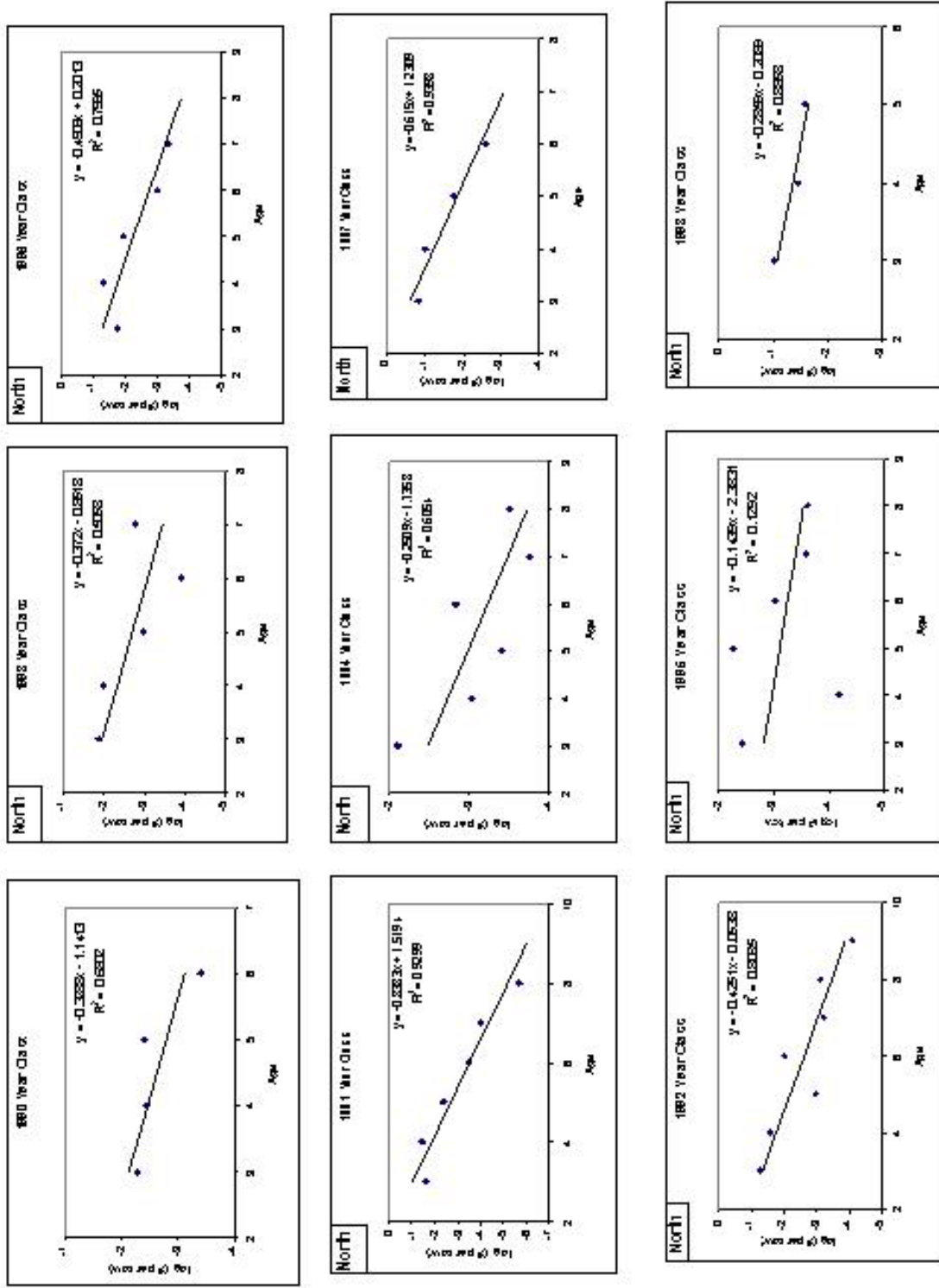
Figure A48. Estimated mortality rates from NEFSC survey abundance at age data using cohort-based catch curves for the northern region.
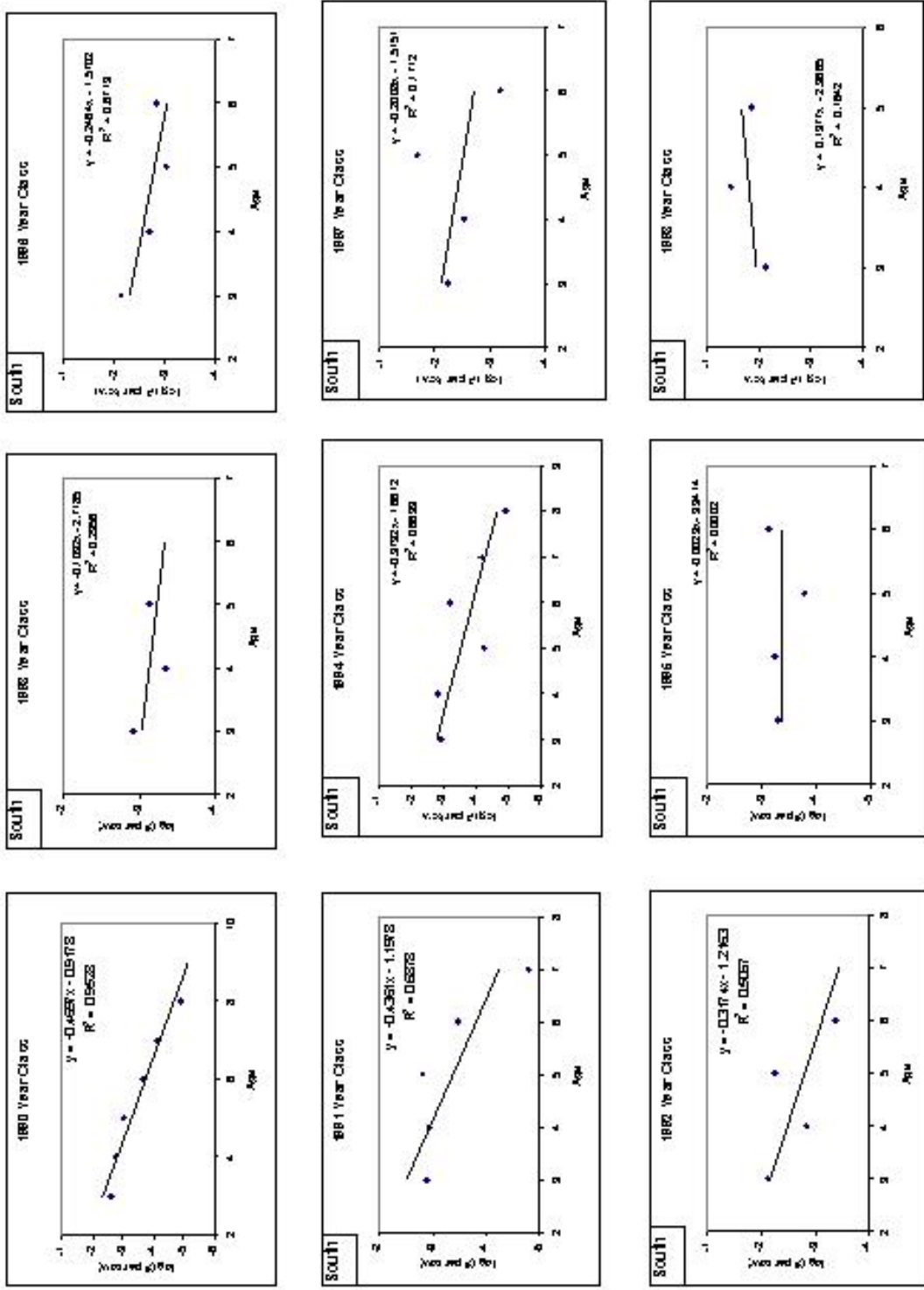
Figure A49. Estimated mortality rates from NEFSC survey abundance at age data using cohort-based catch curves for the southern region.
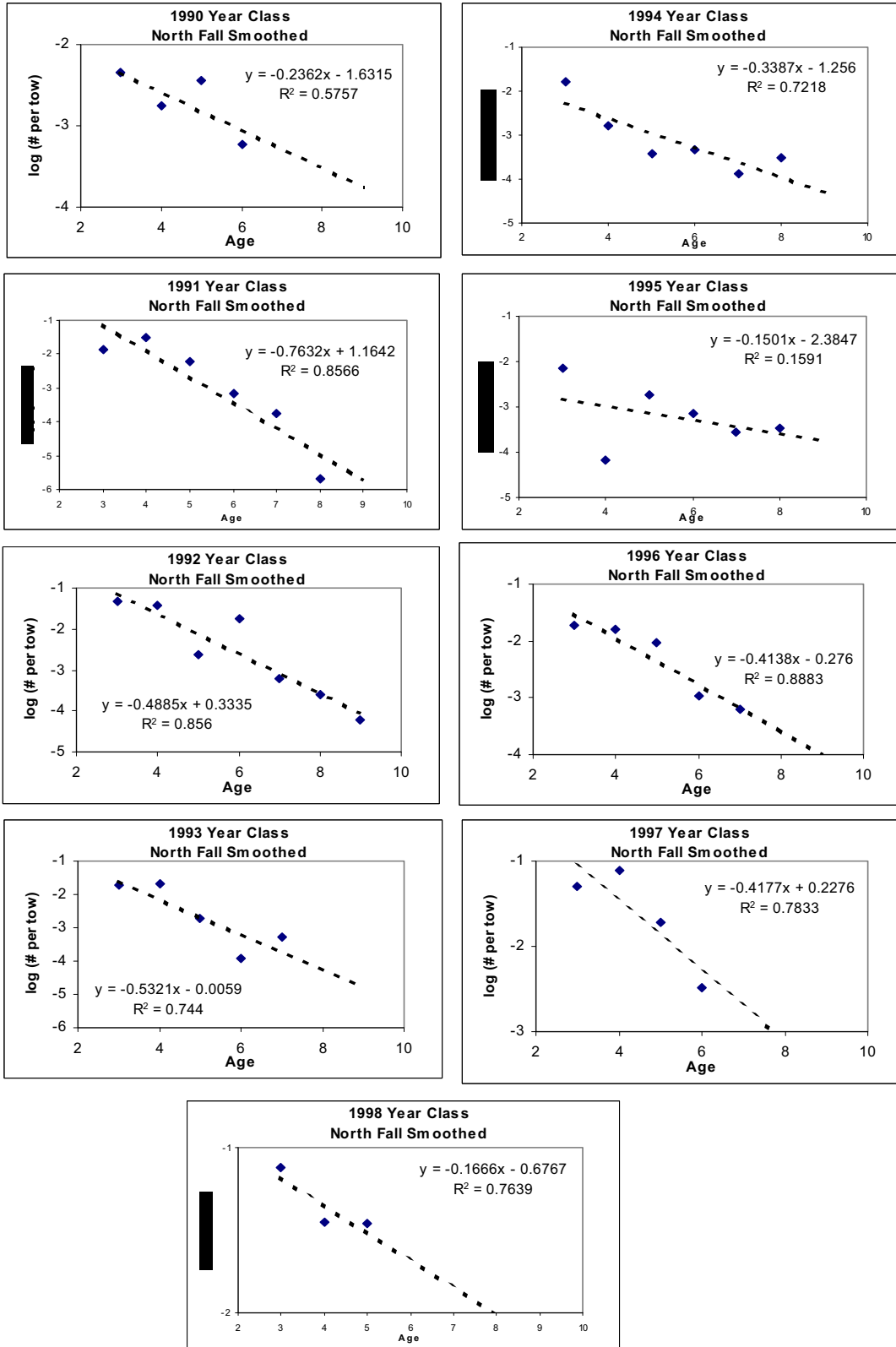
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Figure A50. Estimated mortality rates from NEFSC survey abundance at age data using cohort-based catch curves for the northern region, smoothed survey indices.
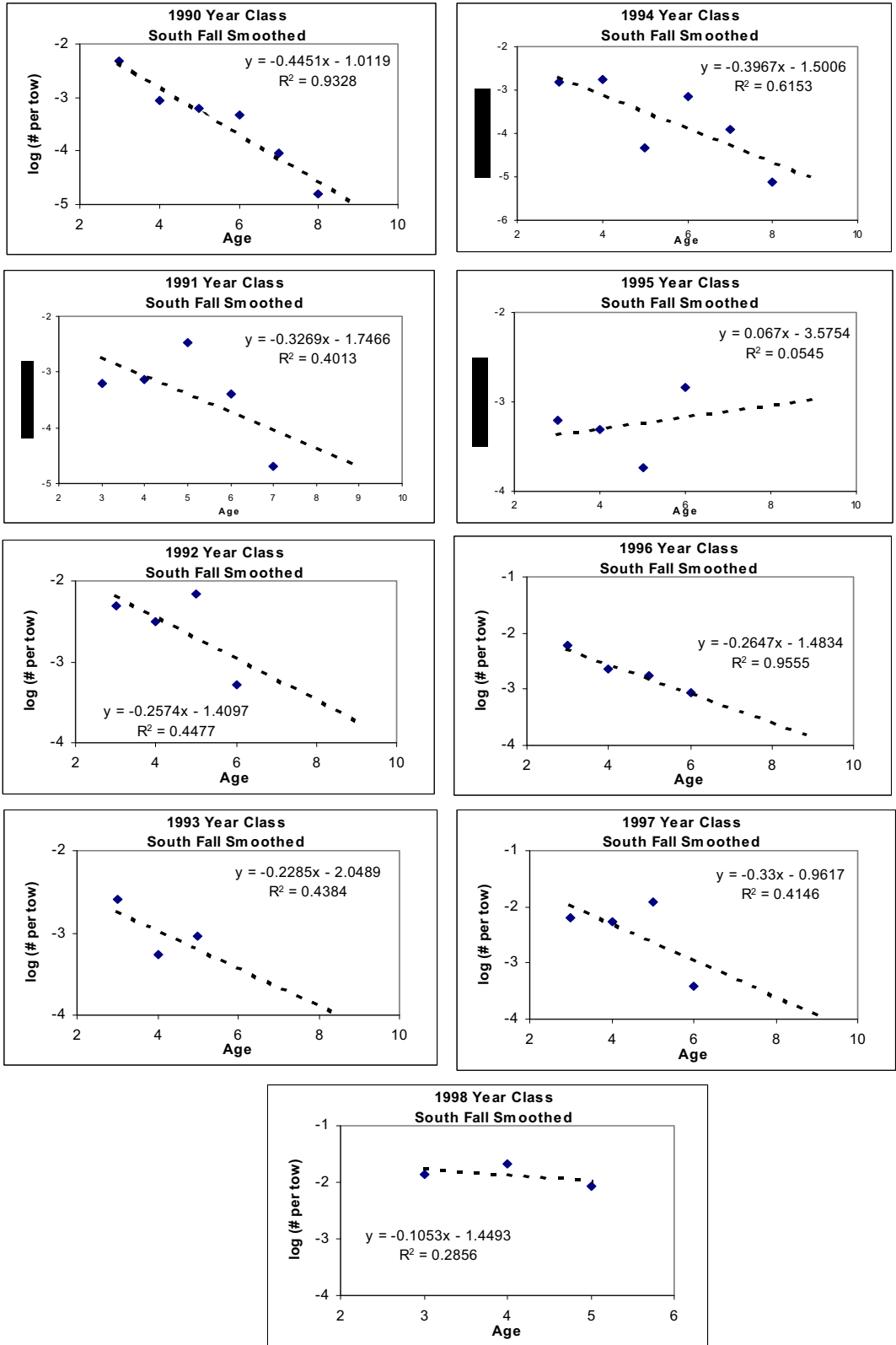
Figure A51. Estimated mortality rates from NEFSC survey abundance at age data using cohort-based catch curves for the southern region, smoothed survey indices.
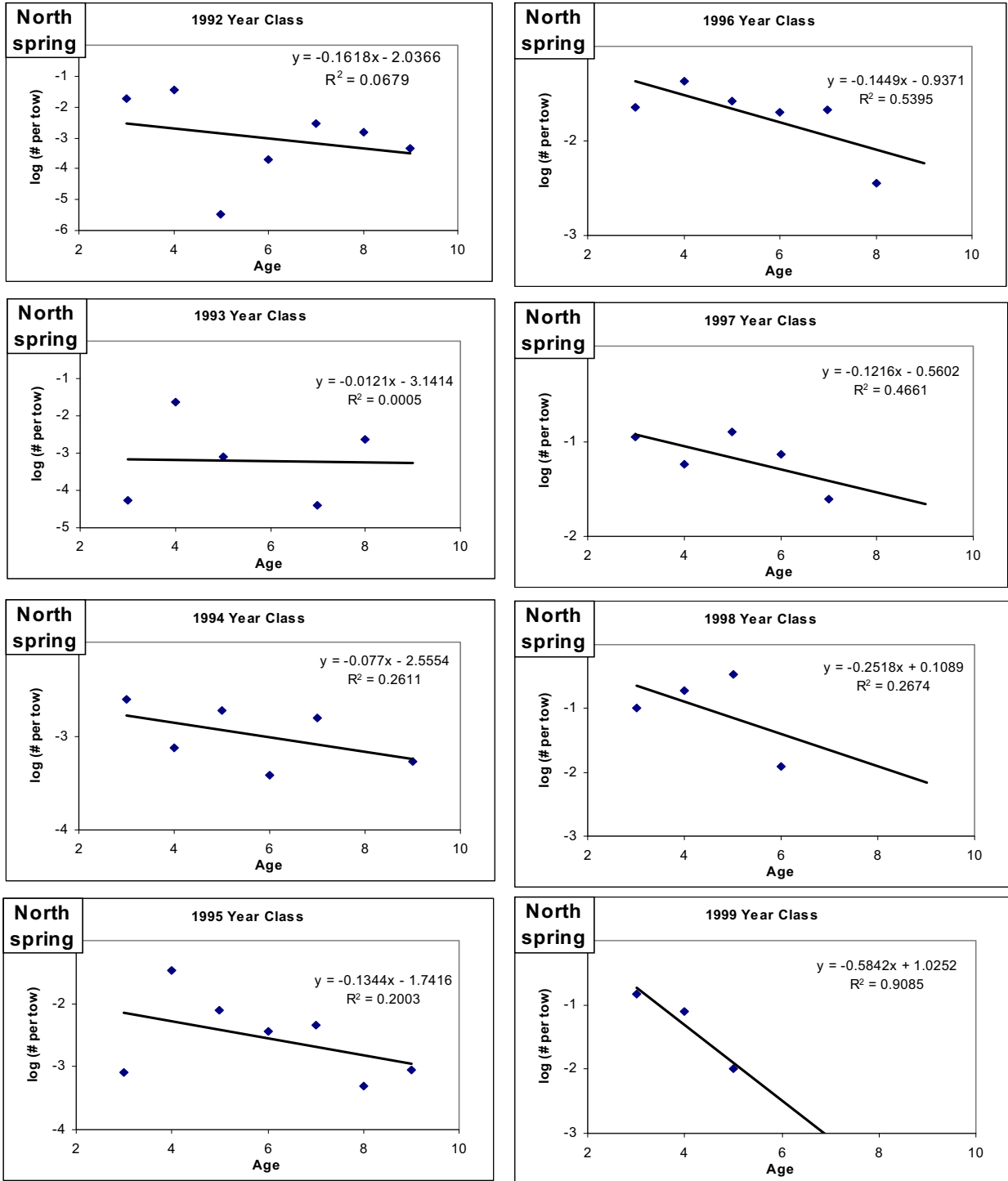
Figure A52. Estimated mortality rates from NEFSC survey abundance at age data using cohort-based catch curves for the northern region, spring.
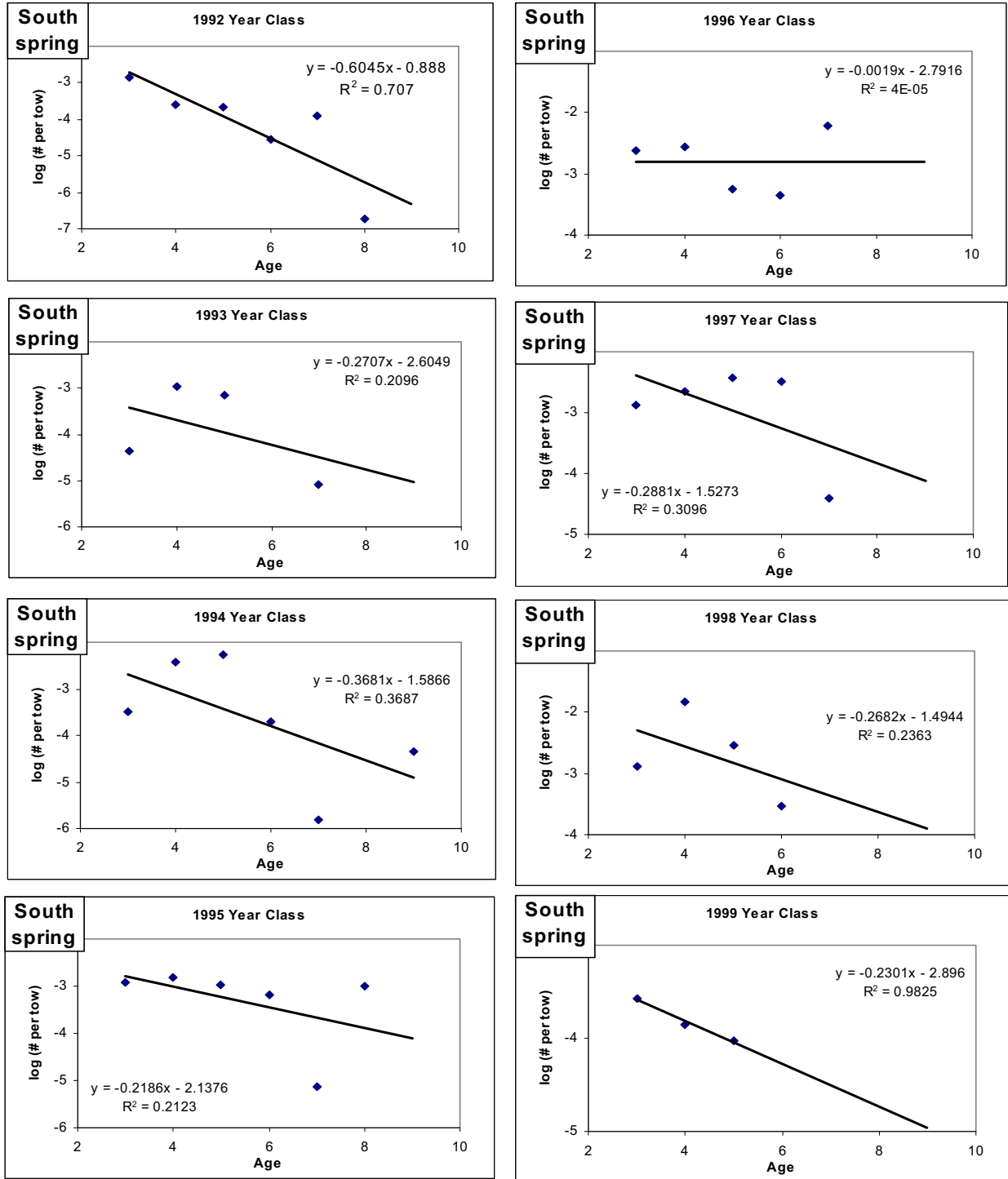
Figure A53. Estimated mortality rates from NEFSC survey abundance at age data using cohort-based catch curves for the southern region, spring.
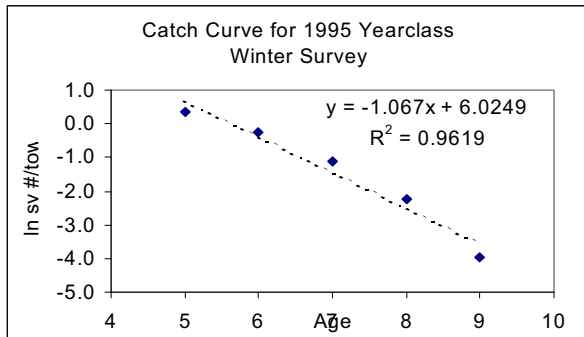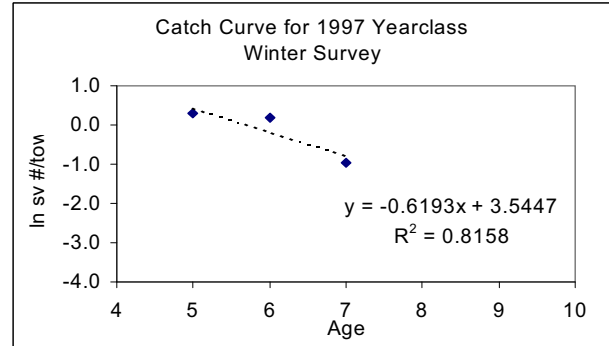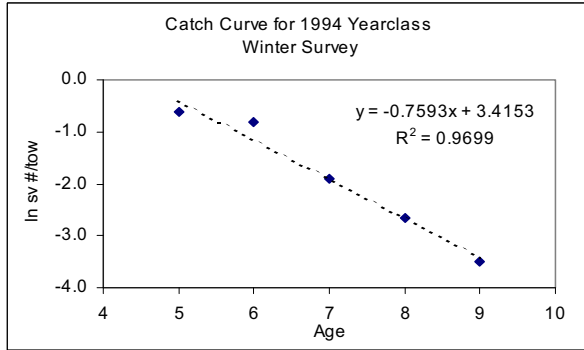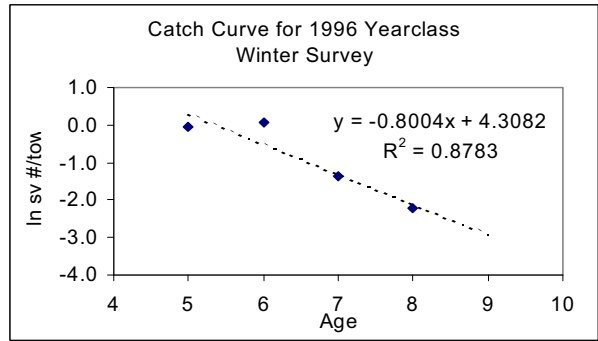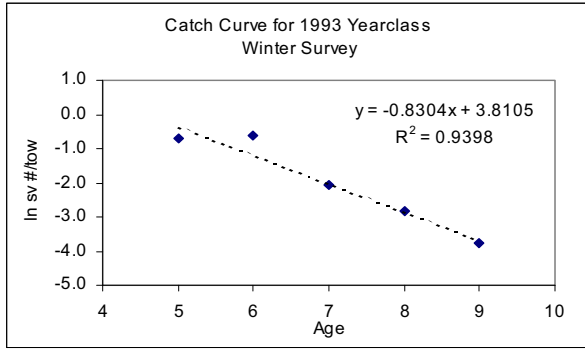
Figure A54. Estimated mortality rates from NEFSC survey abundance at age data using cohort-based catch curves for the southern region, winter.
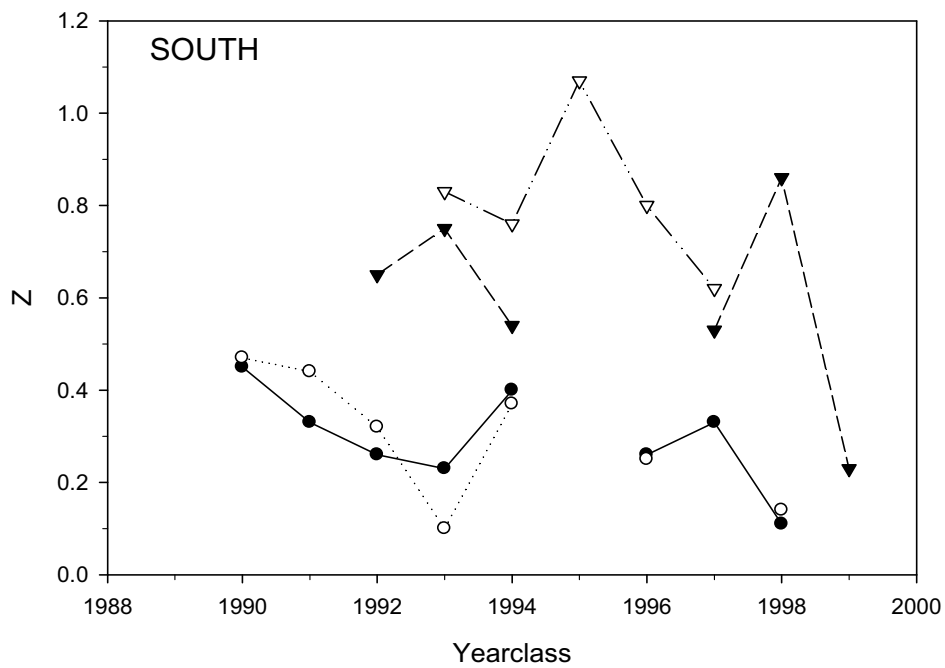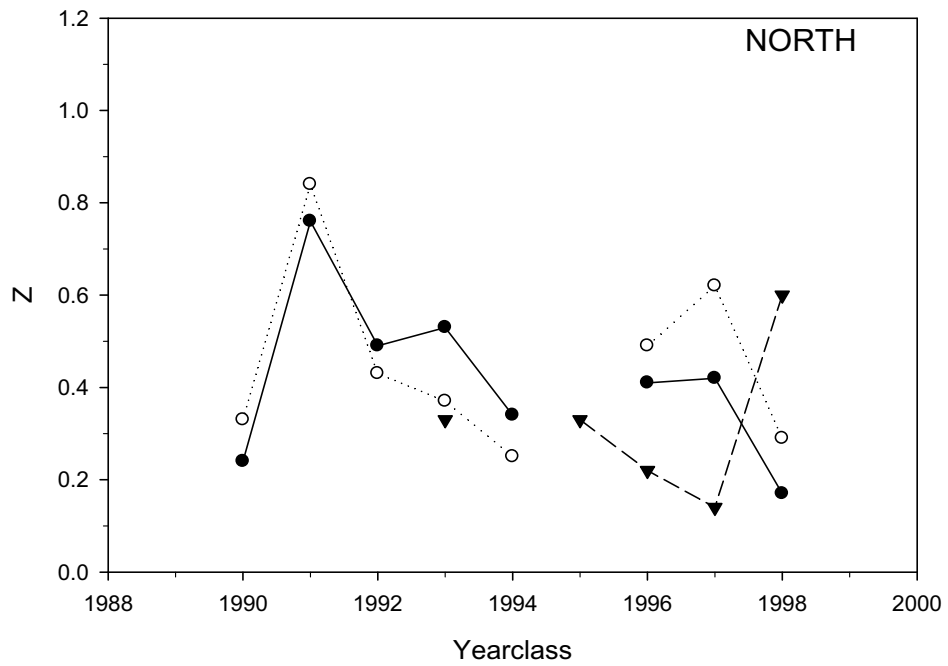
Figure A55. Summary of Z estimates from catch curves based on NEFSC survey indices. Catch curves estimat
with r^2 < 0.20 are not included.

Figure A56. Probability that 2003 3-year running average biomass index is above the biomass threshold (indexed at 1.0), northern region.
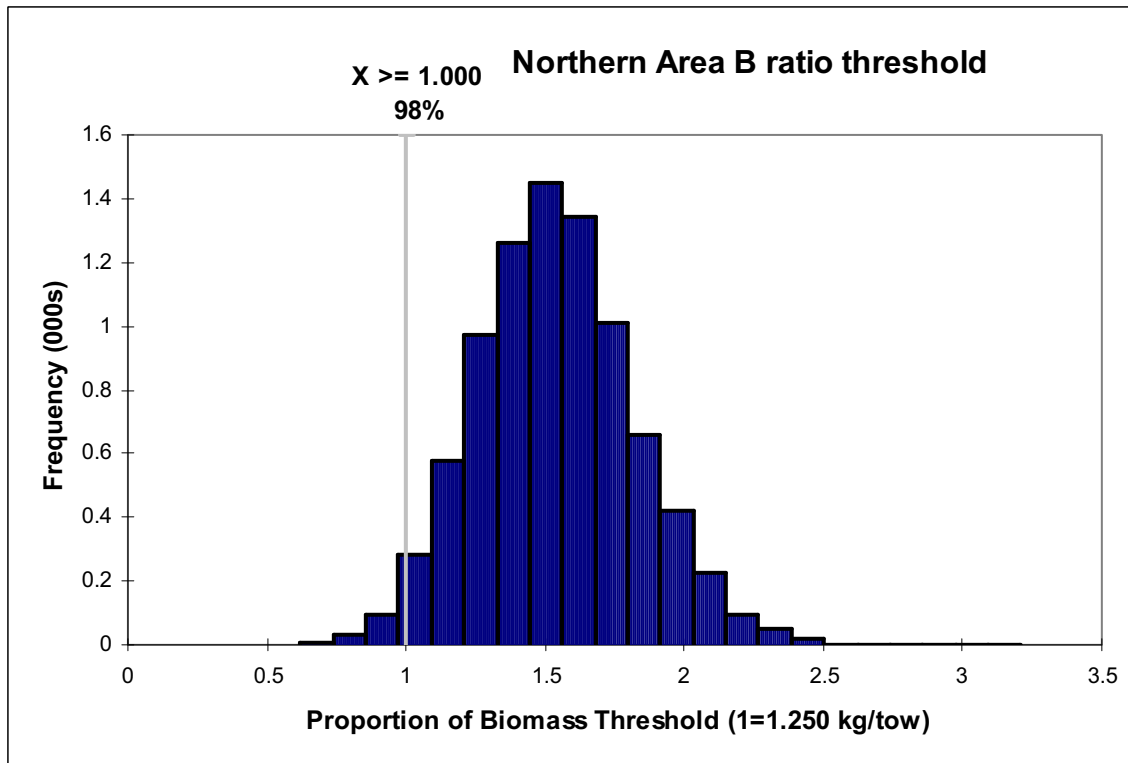

Figure A57. Probability that 2003 3-year running average biomass index is above the biomass threshold (indexed at 1.0), southern region.