# Summary of Atlantic Herring SAW/SARC 54 Assessment

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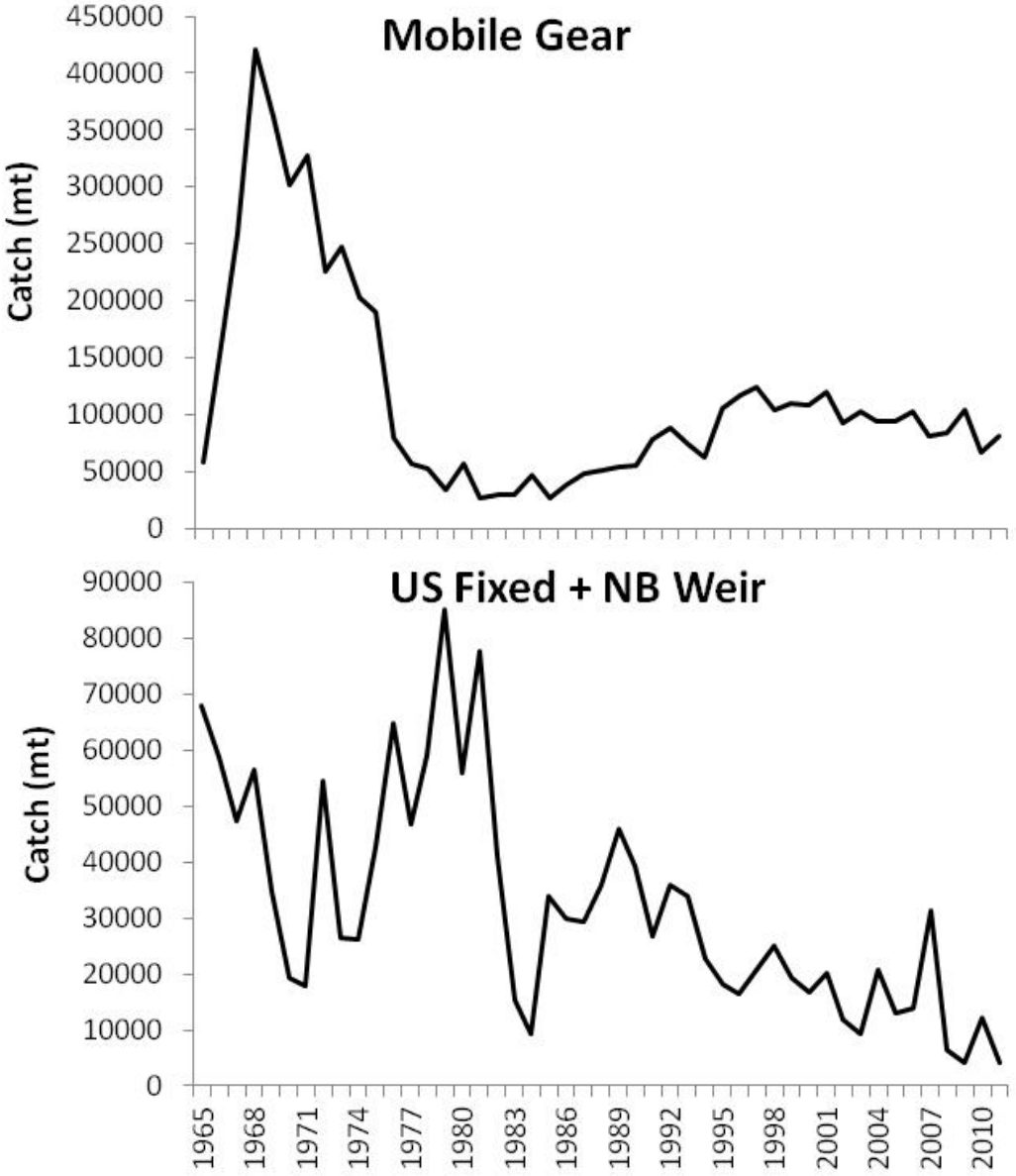
For SSC September 4, 2012

# TOR 4 – Stock Definition

Necessary to assess as single complex

- Topic of future research

# TOR 1 – Catch

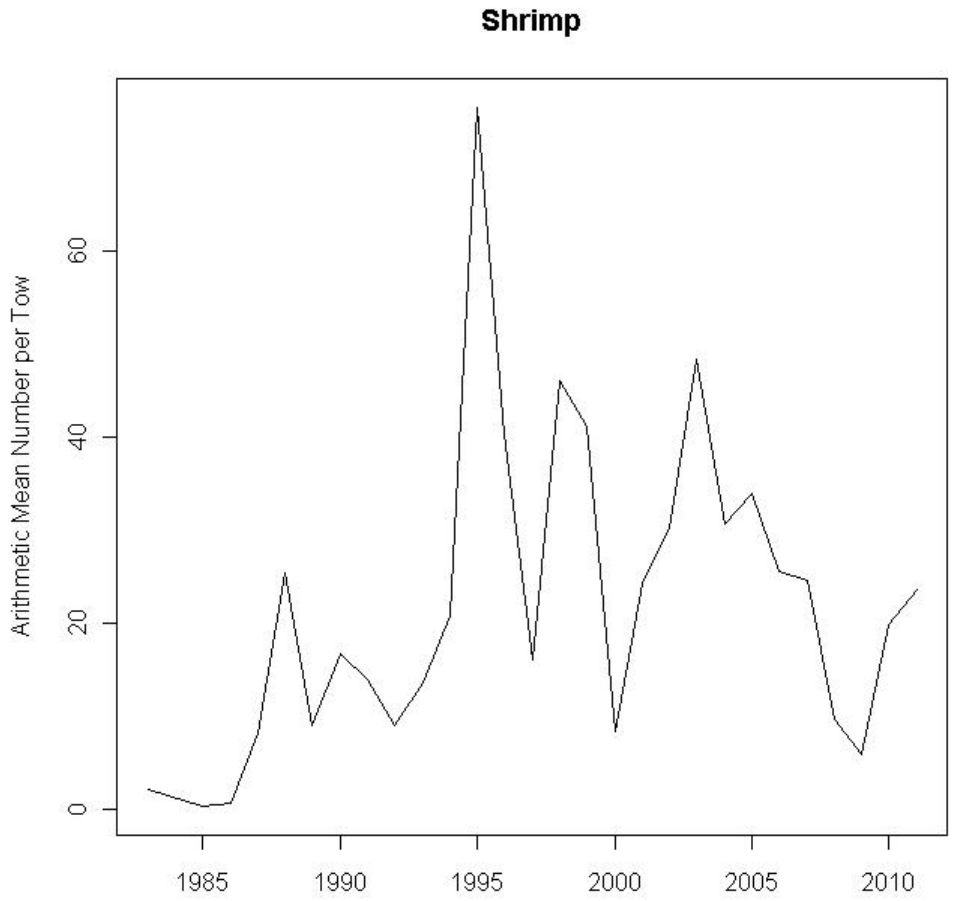



Discards included since 96, but <1% of landings

# TOR 2 – Surveys

Included:

- spring split in 84-85 and calibrated
- fall split in 84-85 and calibrated
- shrimp

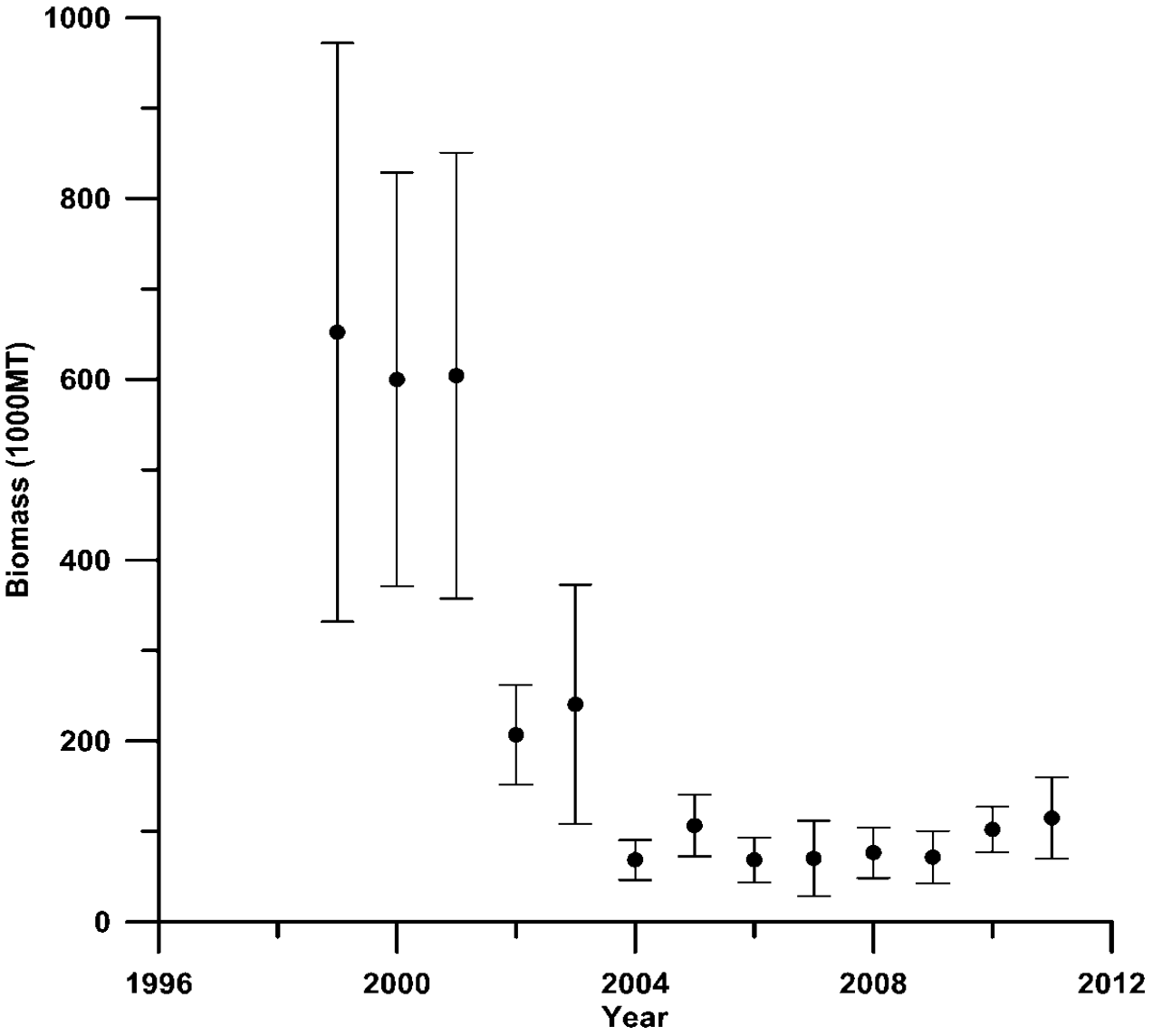


# TOR 2 – Surveys

Excluded:

- winter survey (spatial coverage, fit)
- larval survey (spatial and temporal coverage, fit, appropriate use)
- state surveys (spatial coverage)

# TOR 3 – Acoustic Survey



# TOR 3 – Acoustic Survey

Standardized spatial and temporal coverage

No evidence of shift in spawning

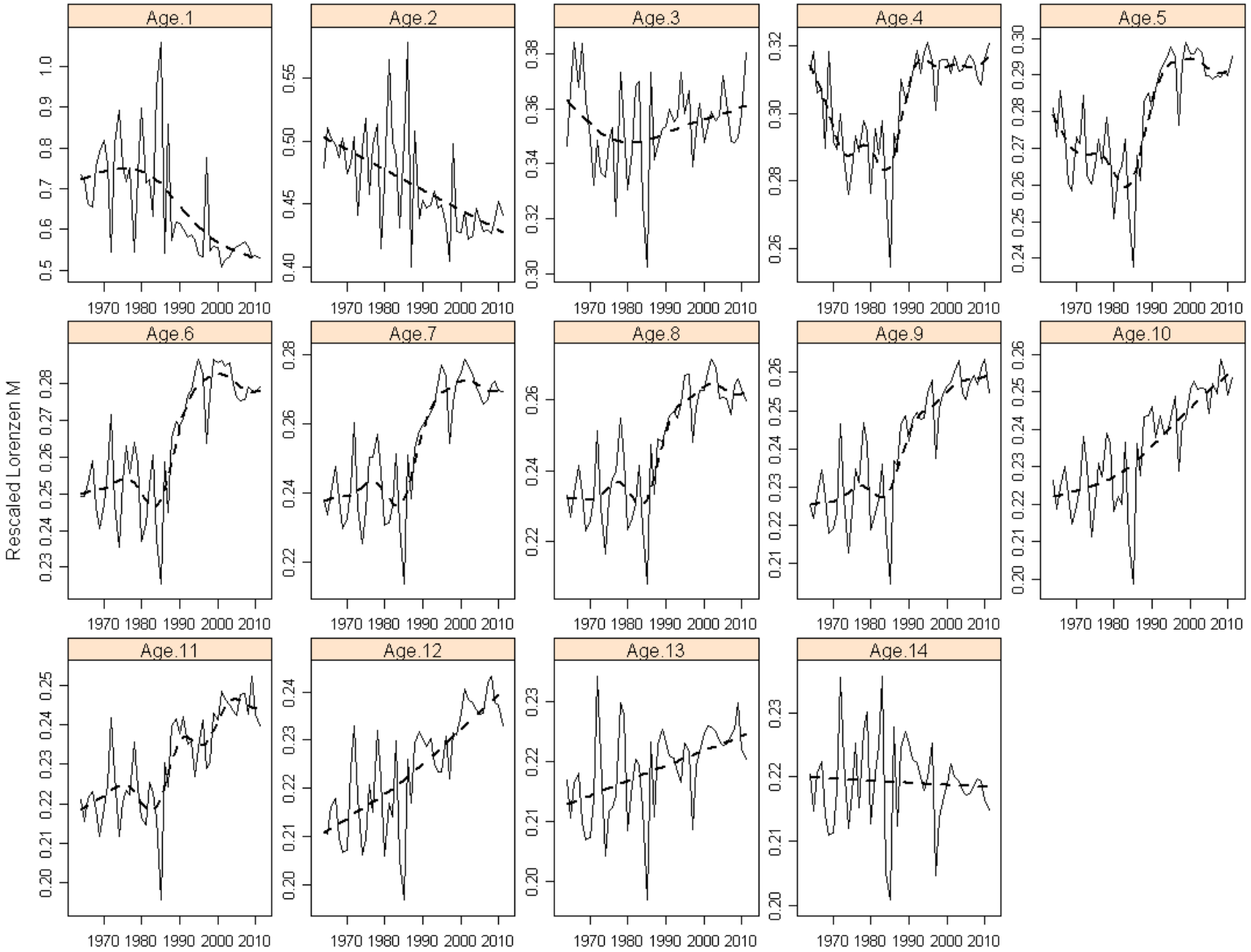
Excluded:

- inexplicable trend unlikely to have been caused by random noise
- coverage of variable proportion of stock
- Poor fit

# TOR 6 – Importance as Prey

1) $M_{a,y}$ based on Lorenzen/Hoenig

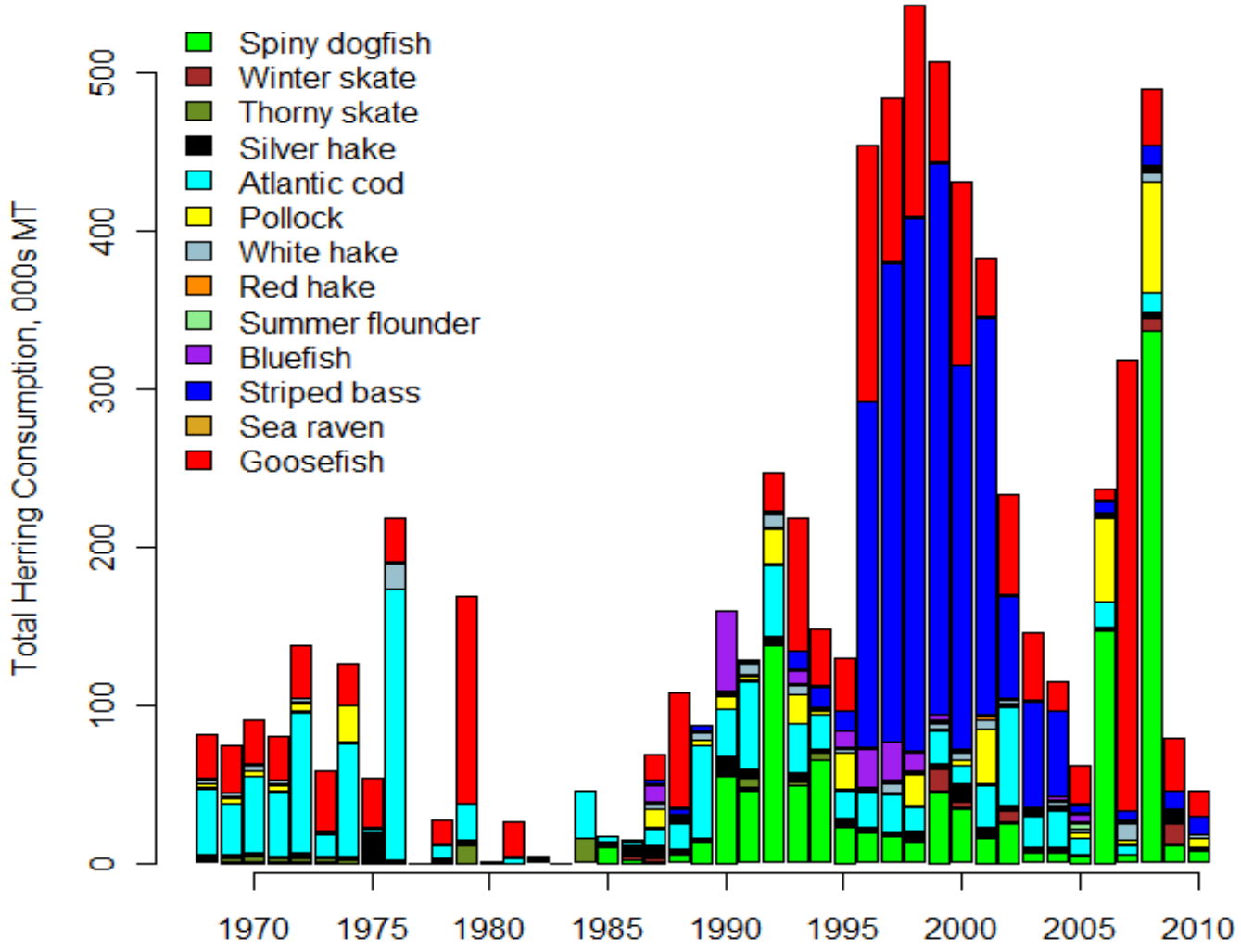
# TOR 6 – Importance as Prey



# TOR 6 – Importance as Prey

1) $M_{a,y}$ based on Lorenzen/Hoenig
2) Estimates of consumption

# TOR 6 – Importance as Prey



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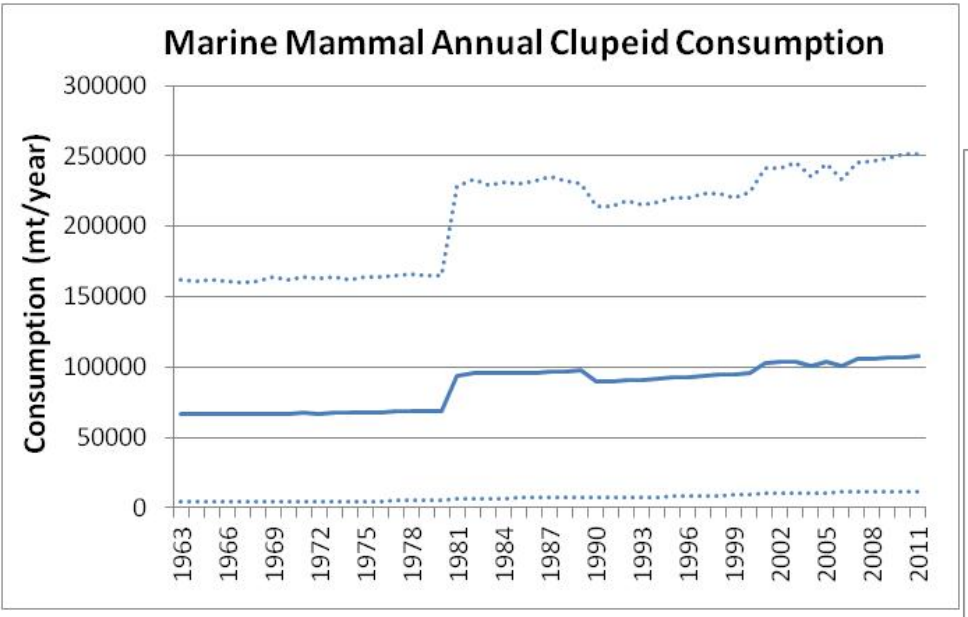
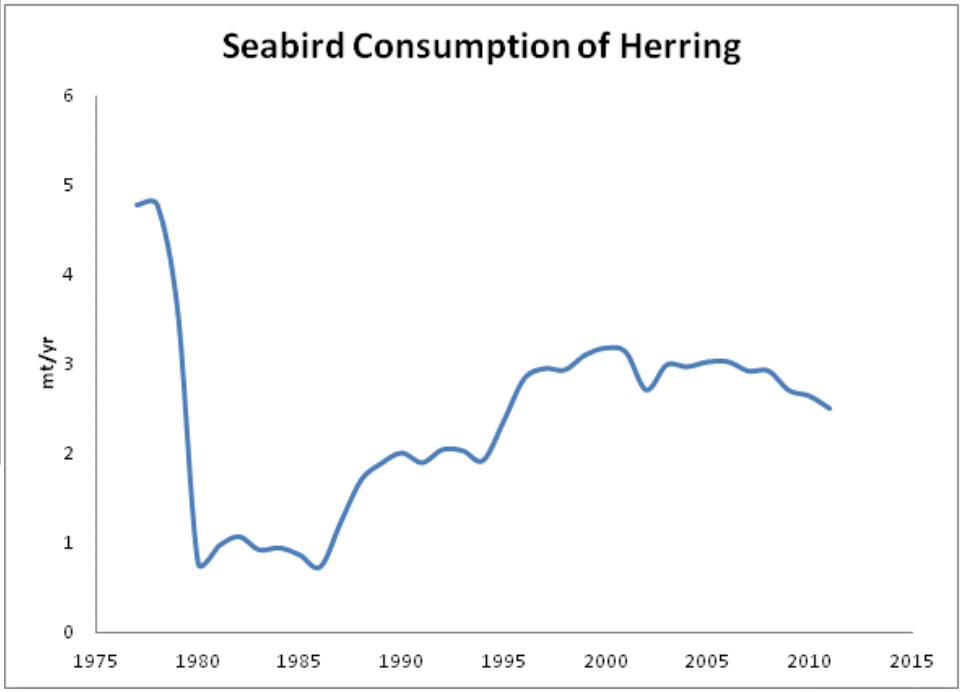
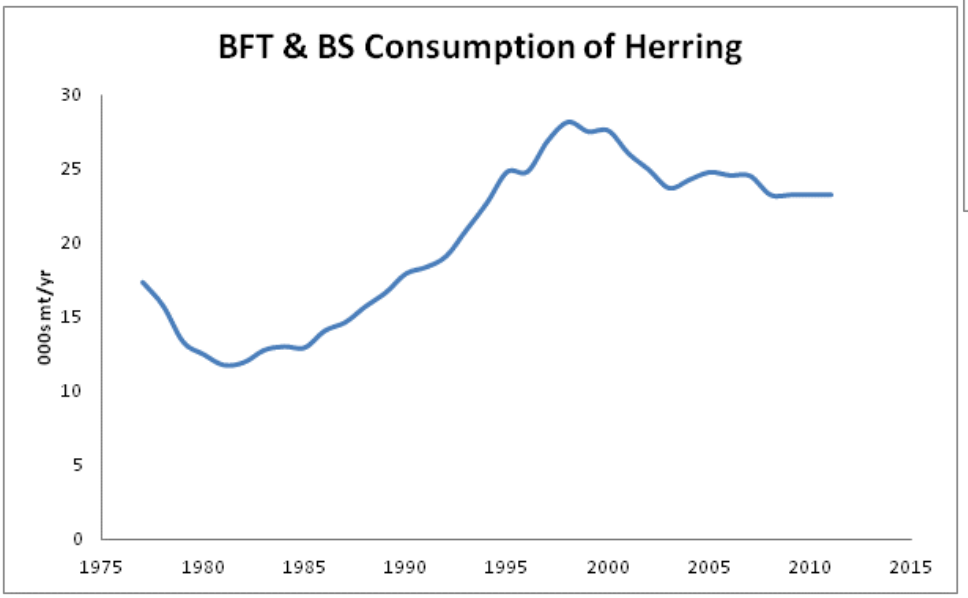


# TOR 6 – Importance as Prey

1) $M_{a,y}$ based on Lorenzen/Hoenig
2) Estimates of consumption
   - Concern over interannual variation
   - Not modeled explicitly, but informed M…

# TOR 5 – The Assessment

Continued use of ASAP

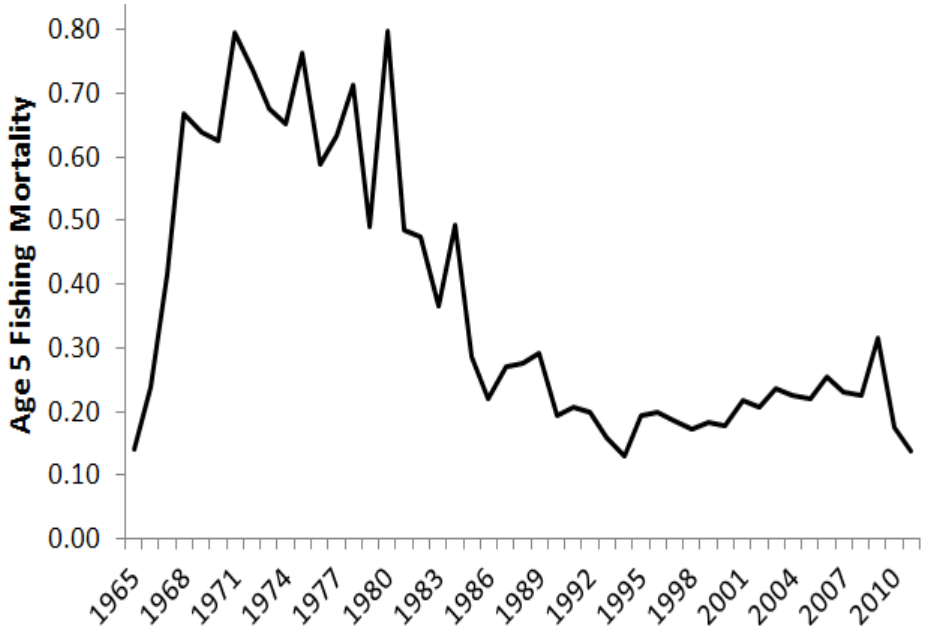
Major Changes from Previous:

- M = 0.2 to $M_{a,y}$
- One Fleet to Fixed and Mobile Gears
- Selectivity = 1 to Estimated
- Maturity constant to Maturity time variable

Interesting features:

- 50% increase in M during 1996-2011
- Estimated SR curve

# TOR 5 – The Assessment

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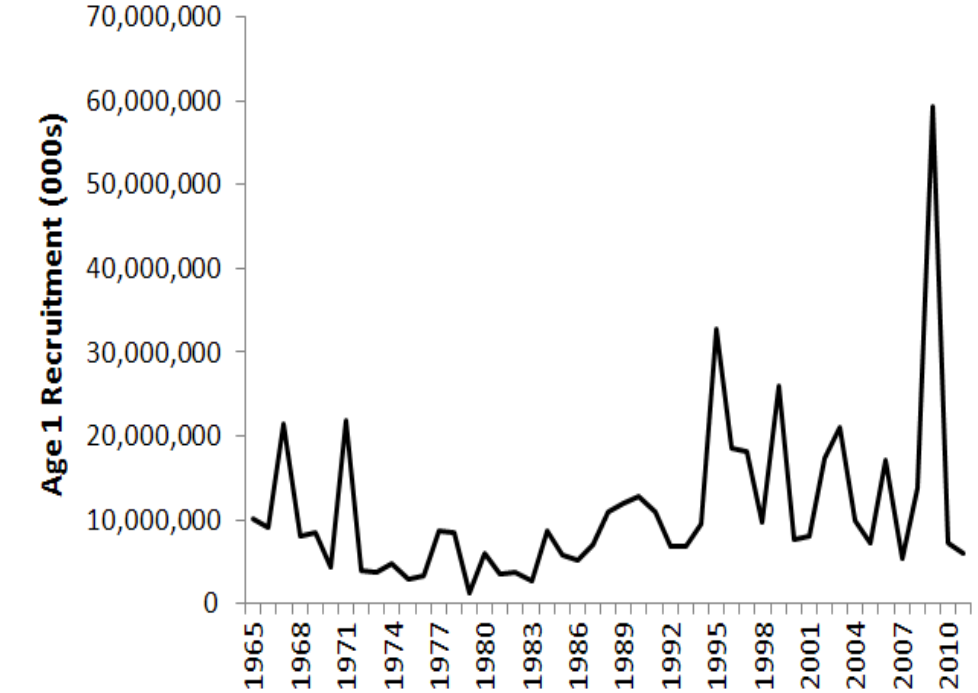


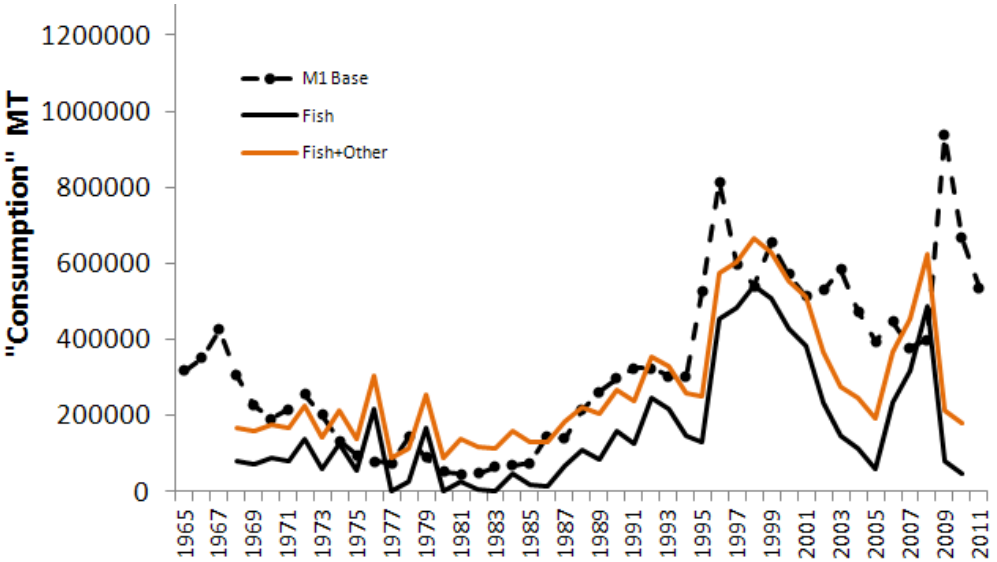

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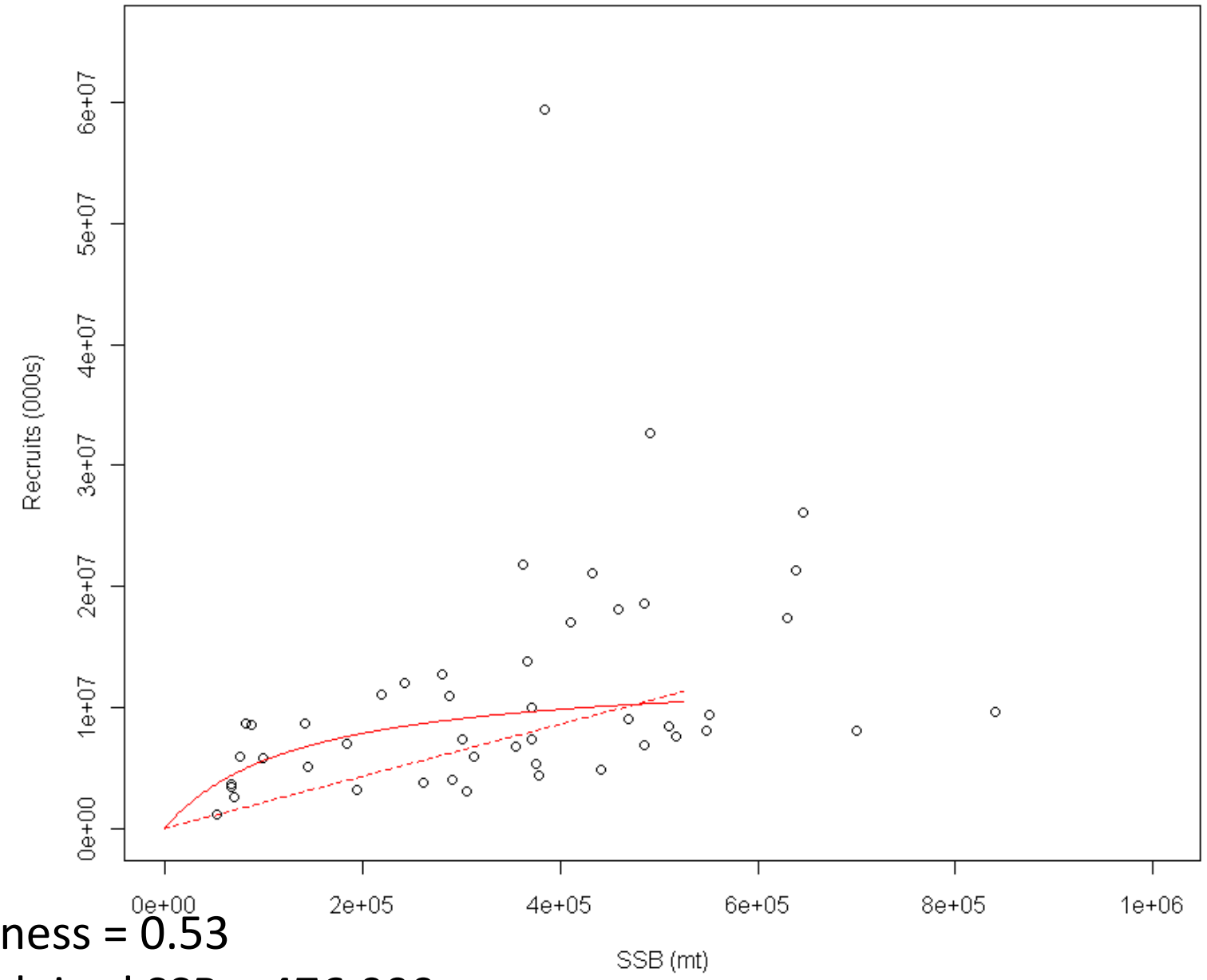
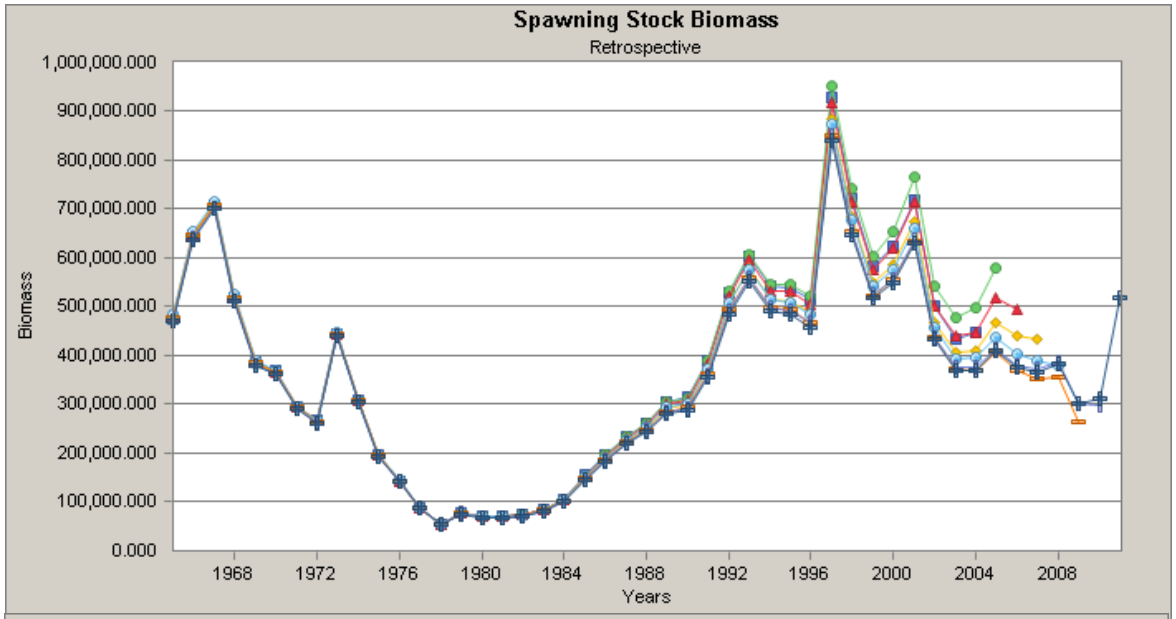
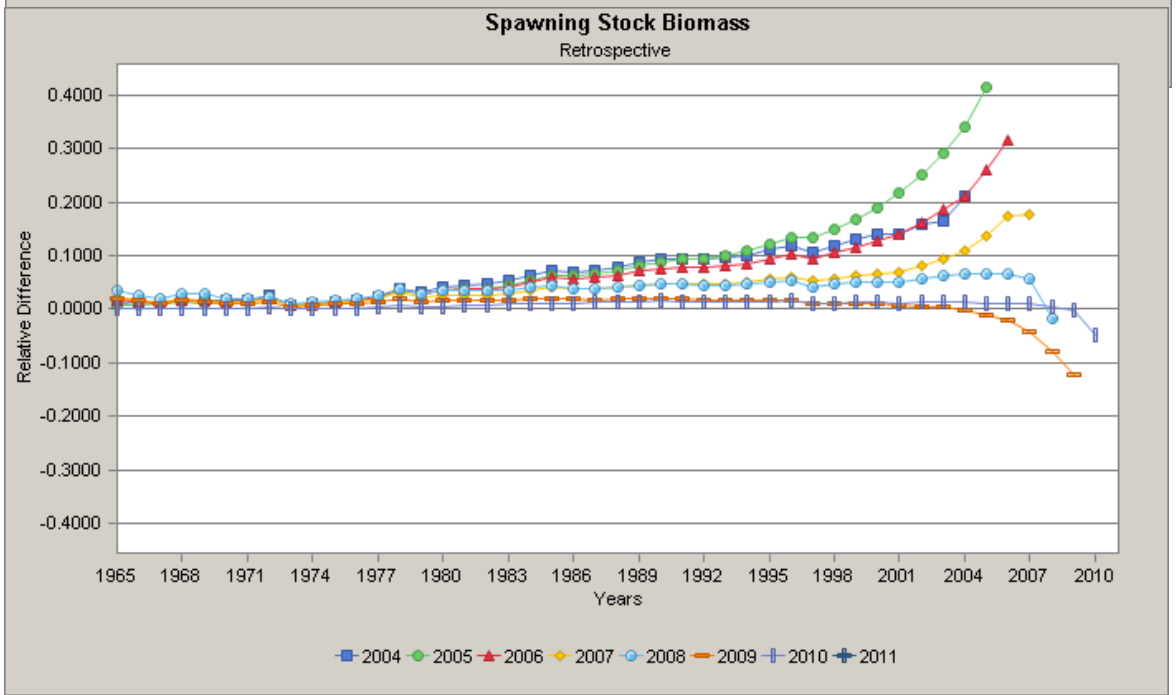



Steepness = 0.53

Unexploited SSB = 476,000 mt

# TOR 5 – The Assessment



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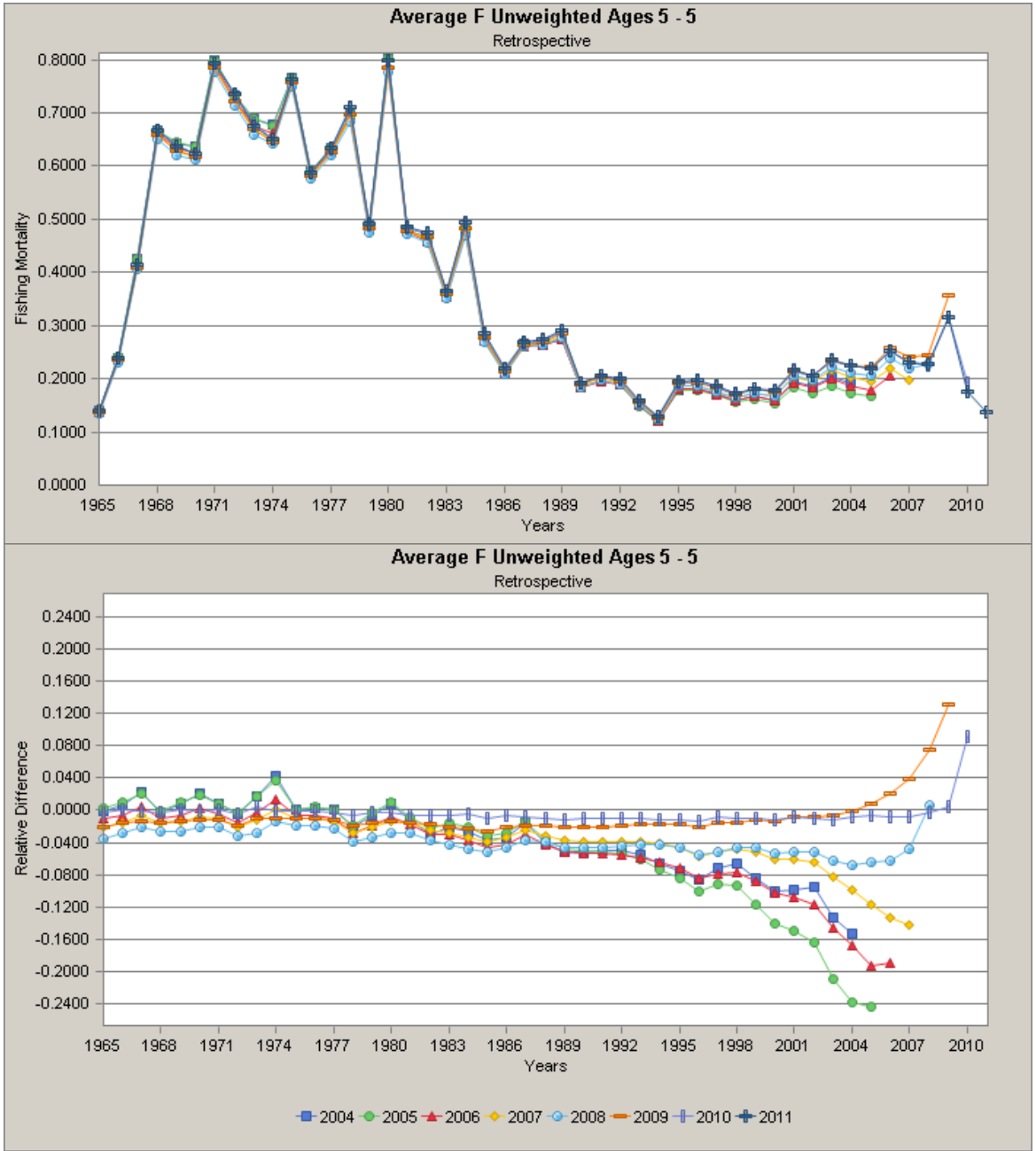

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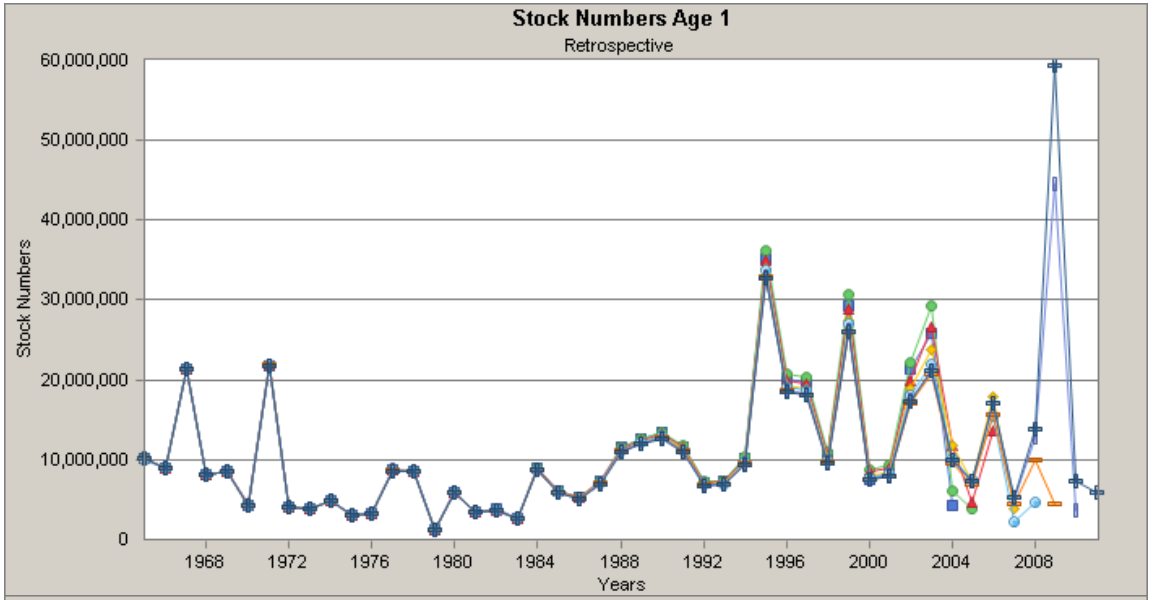
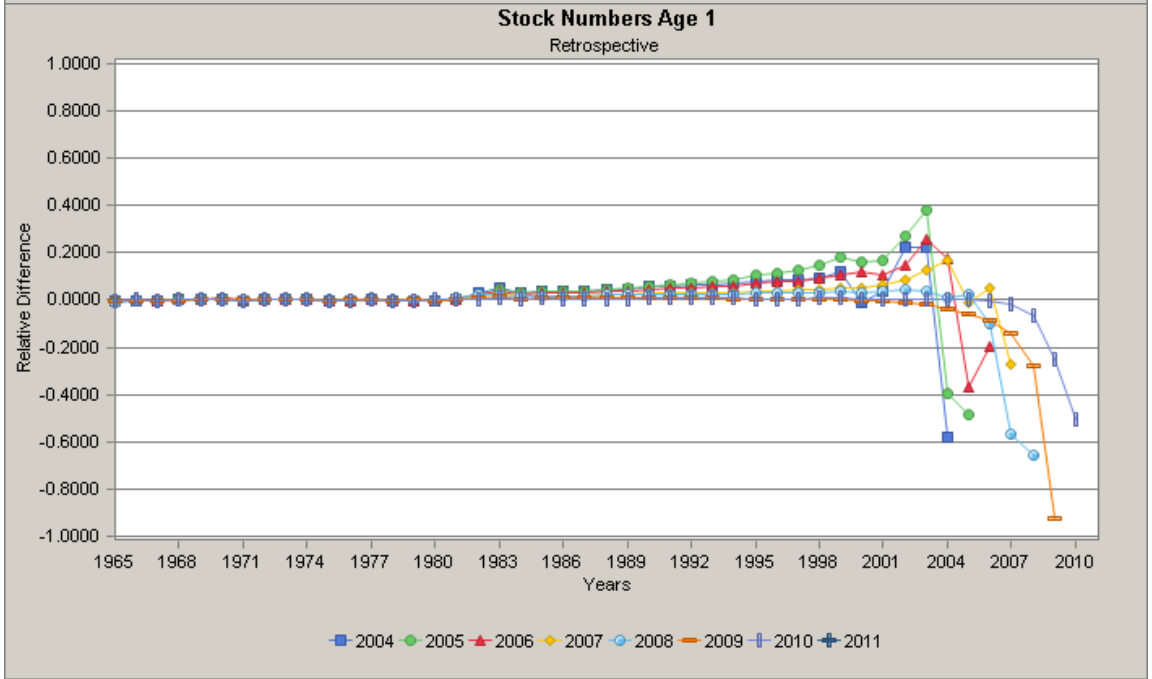


# TOR 7 & 8 – BRPs and stock status

2009:

Fmsy = 0.27

SSBmsy = 670,600 mt

MSY = 178,000 mt

2012:

Fmsy = 0.27

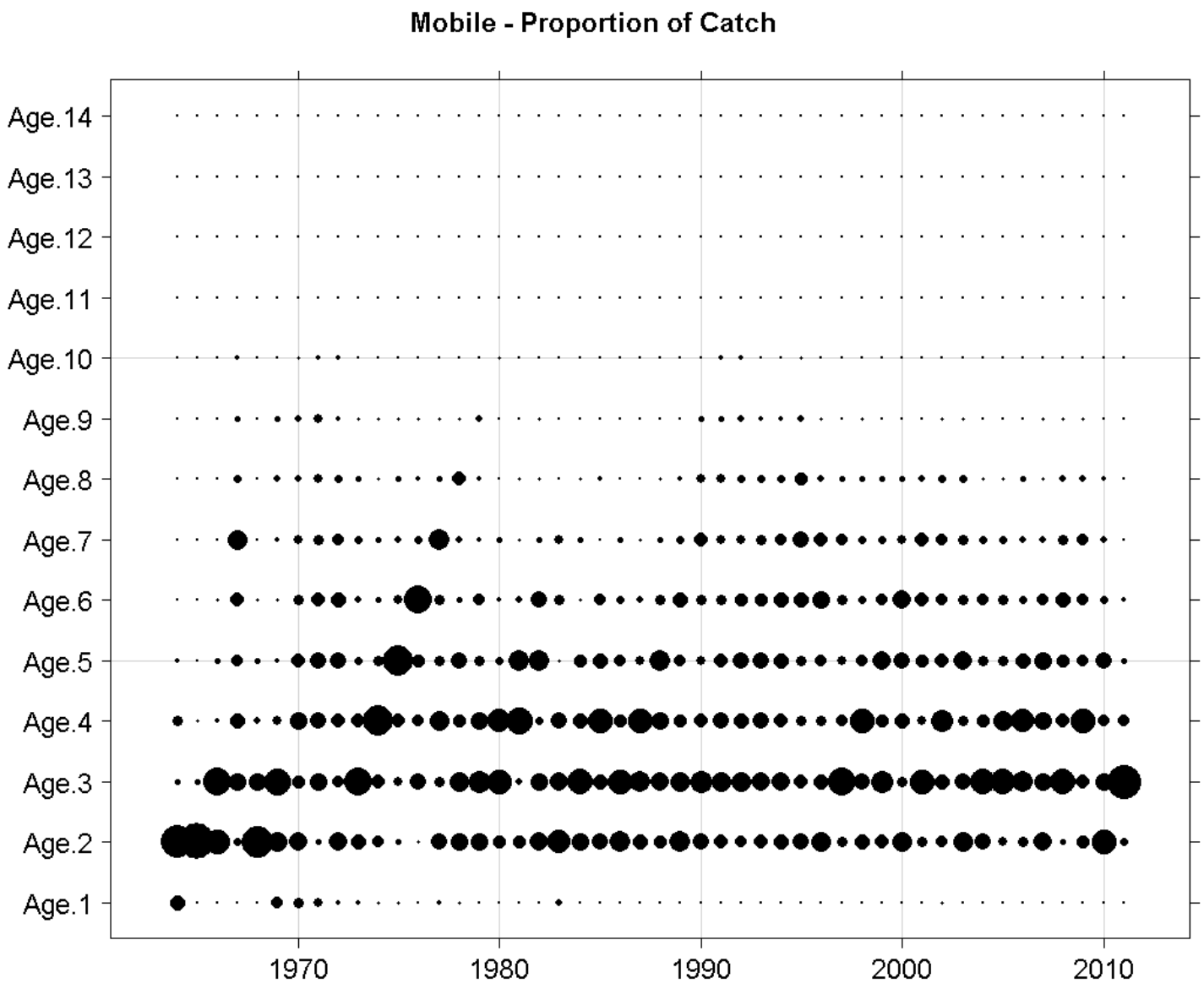
SSBmsy = 157,000 mt

MSY = 53,000 mt

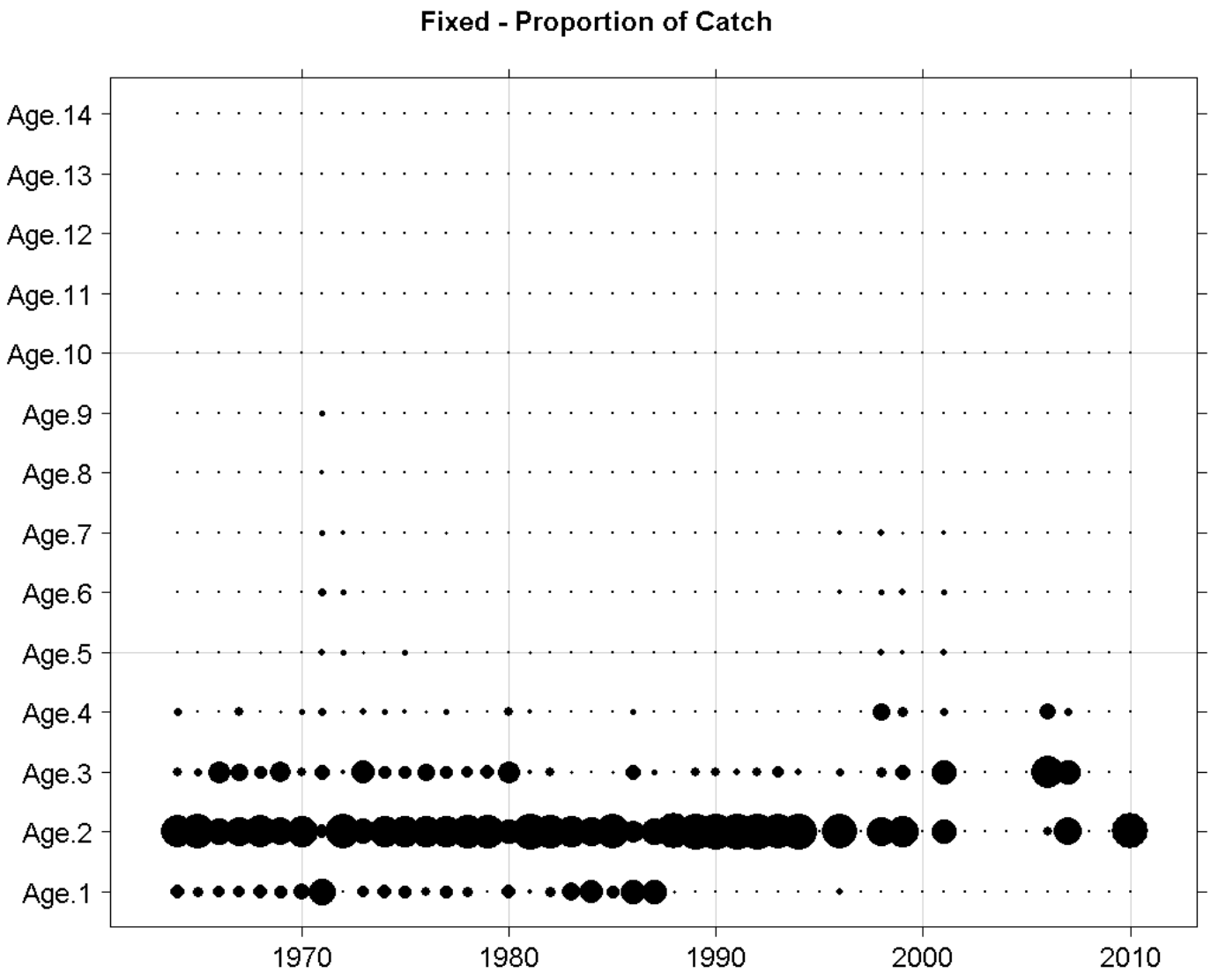
2011 SSB = 518,000 mt and F5 = 0.14

# Questions?

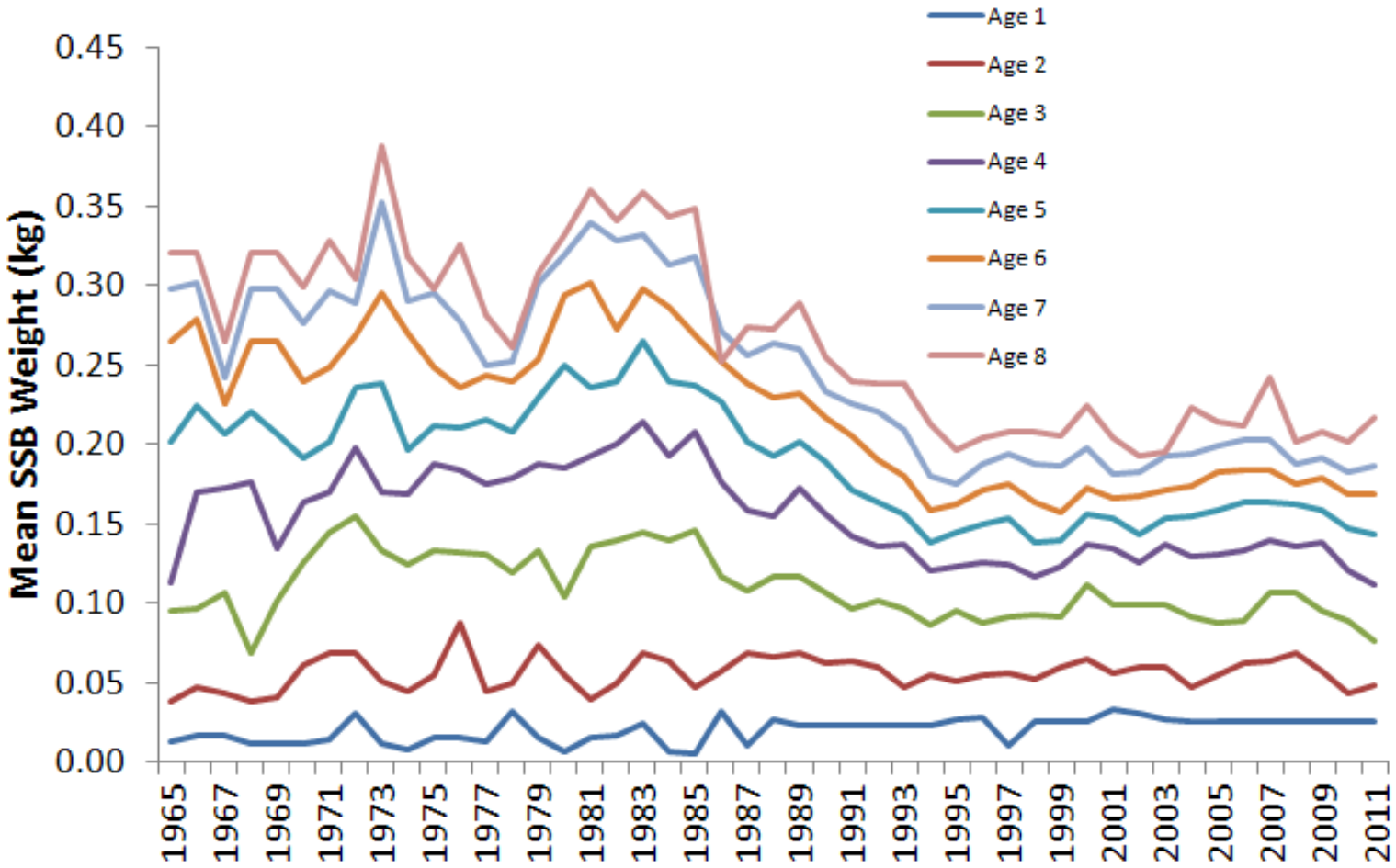
# TOR 1 – Catch


Mobile - Proportion of Catch
Age.14
Age.13
Age.12
Age.11
Age.10
Age.9
Age.8
Age.7
Age.6
Age.5
Age.4
Age.3
Age.2
Age.1
1970
1980
1990
2000
2010

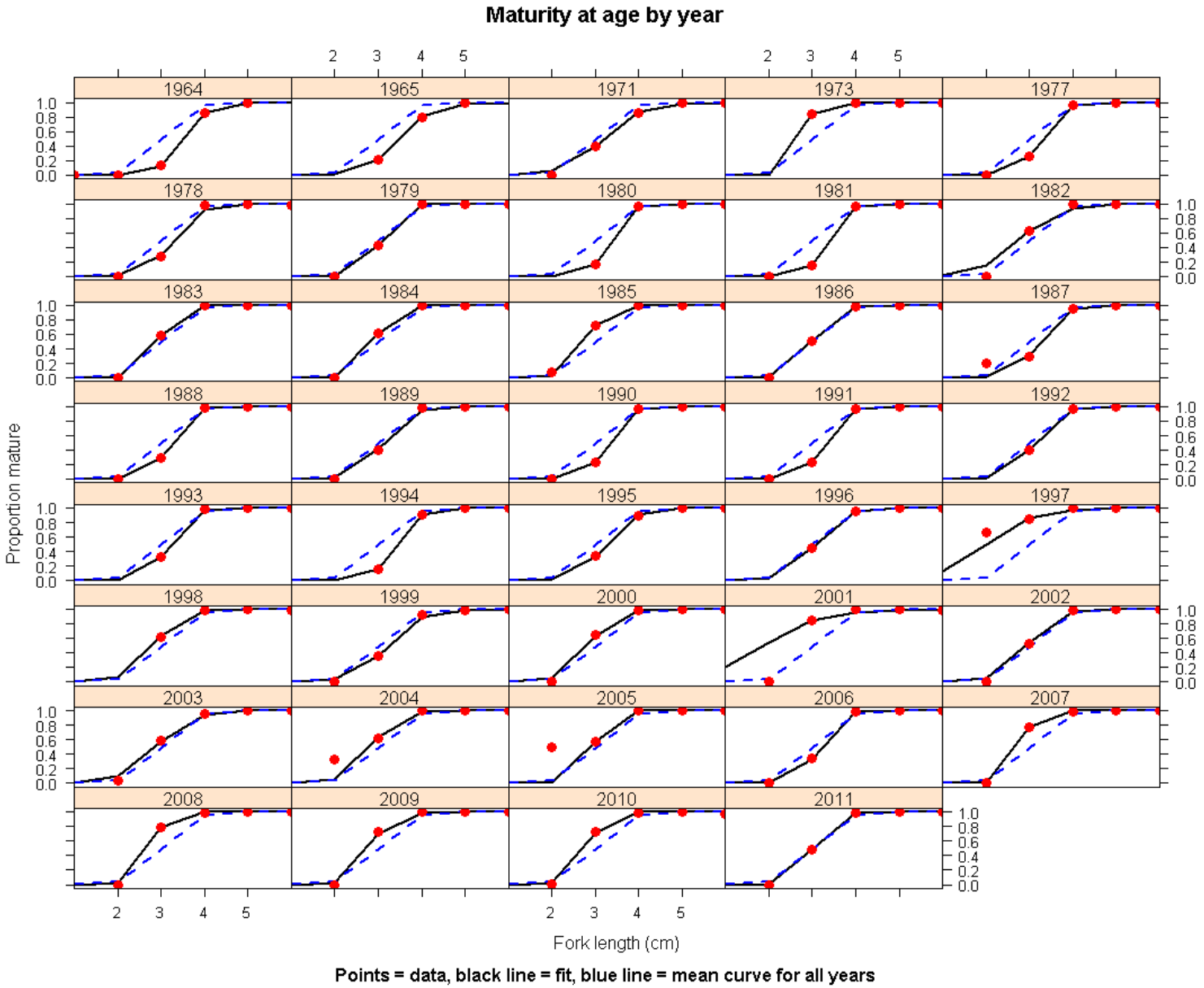
# TOR 1 – Catch


Fixed - Proportion of Catch
Age.14
Age.13
Age.12
Age.11
Age.10
Age.9
Age.8
Age.7
Age.6
Age.5
Age.4
Age.3
Age.2
Age.1
1970
1980
1990
2000
2010

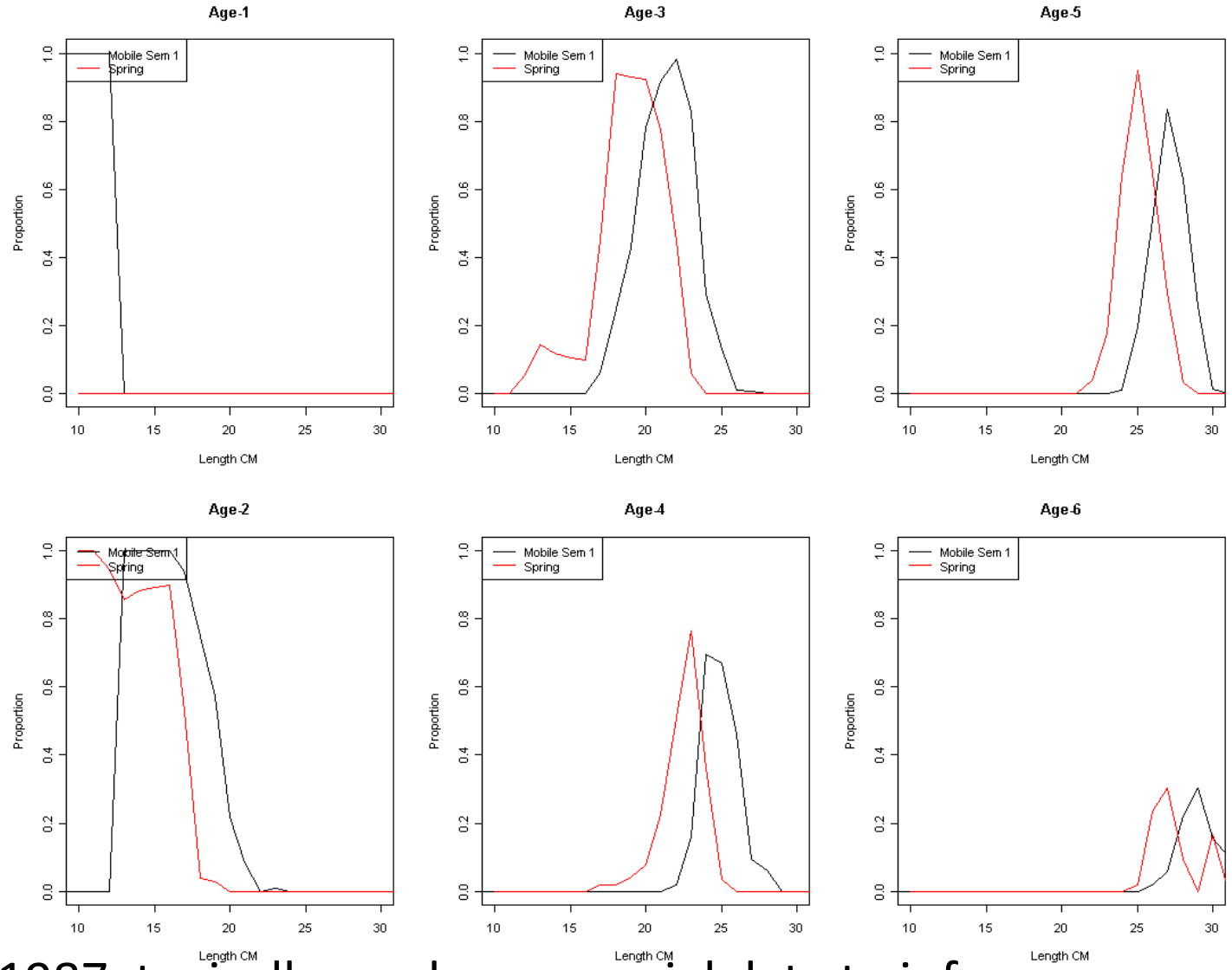
# TOR 1 – Catch


Mean SSB Weight (kg)
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
1965
1967
1969
1971
1973
1975
1977
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
Age 1
Age 2
Age 3
Age 4
Age 5
Age 6
Age 7
Age 8

# TOR 1 – Catch

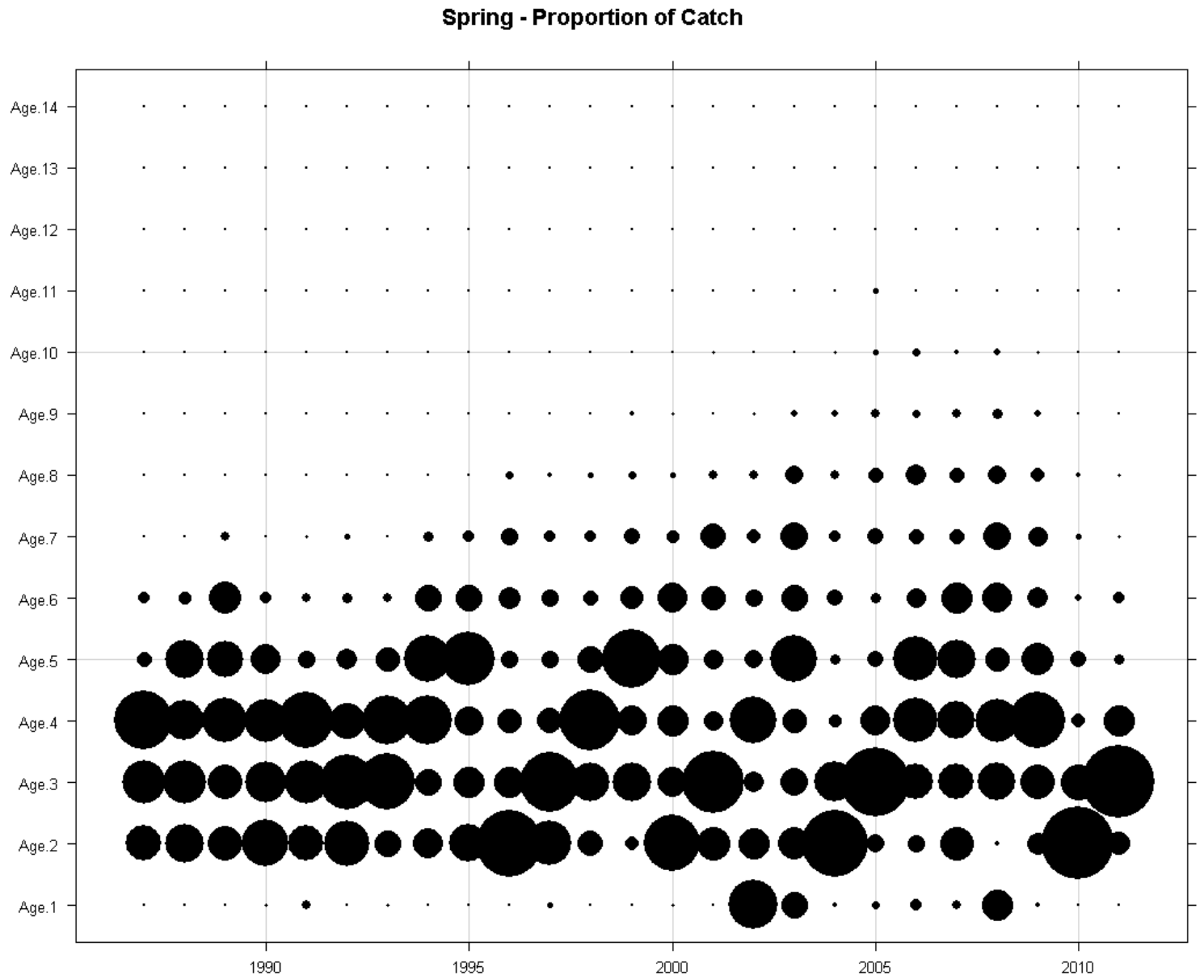

Maturity at age by year
1964
1965
1971
1973
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Proportion mature
Fork length (cm)
Points = data, black line = fit, blue line = mean curve for all years

# TOR 2 – Surveys




Prior to 1987, typically used commercial data to infer survey age structure. No more!

# TOR 2 – Surveys



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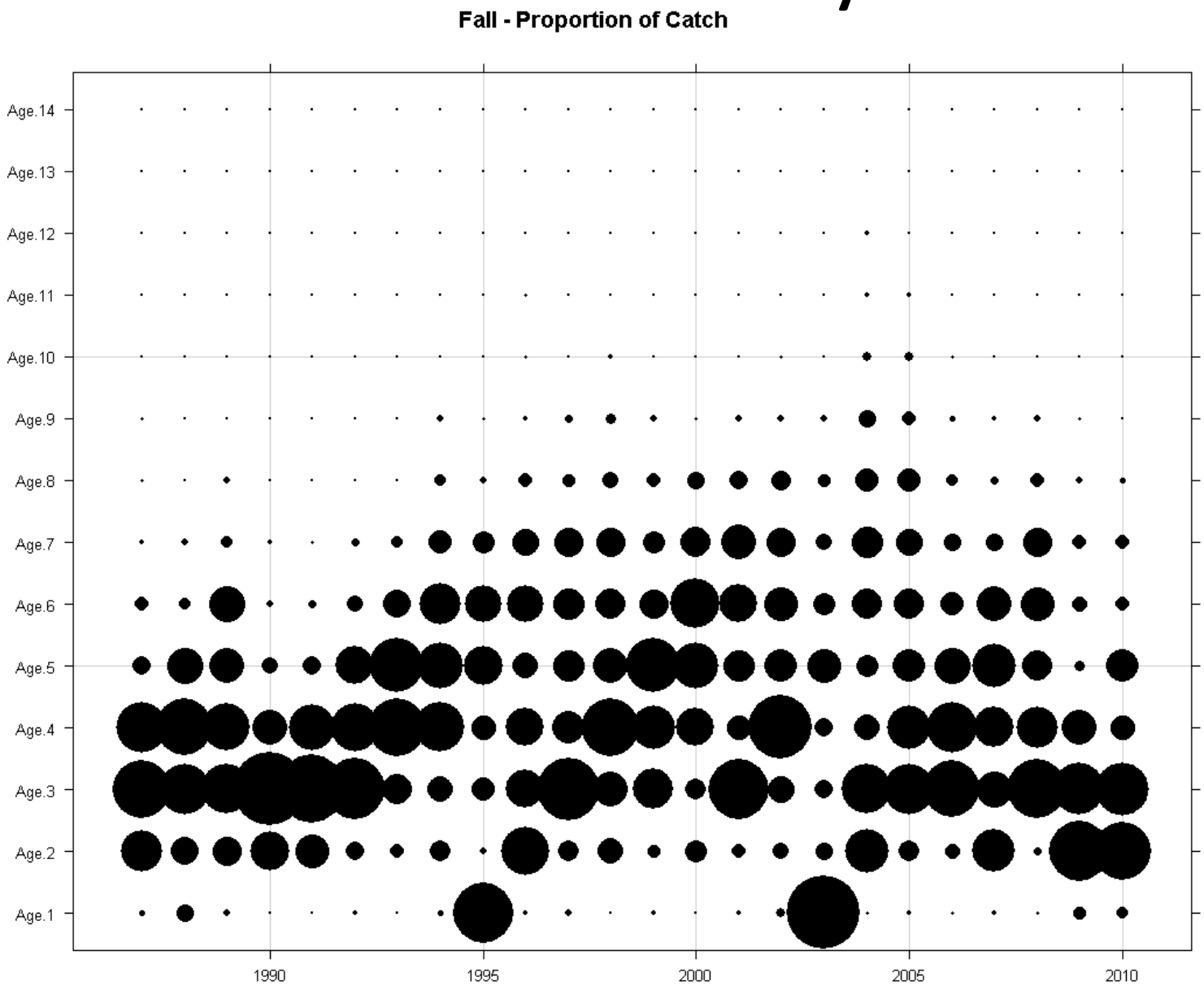
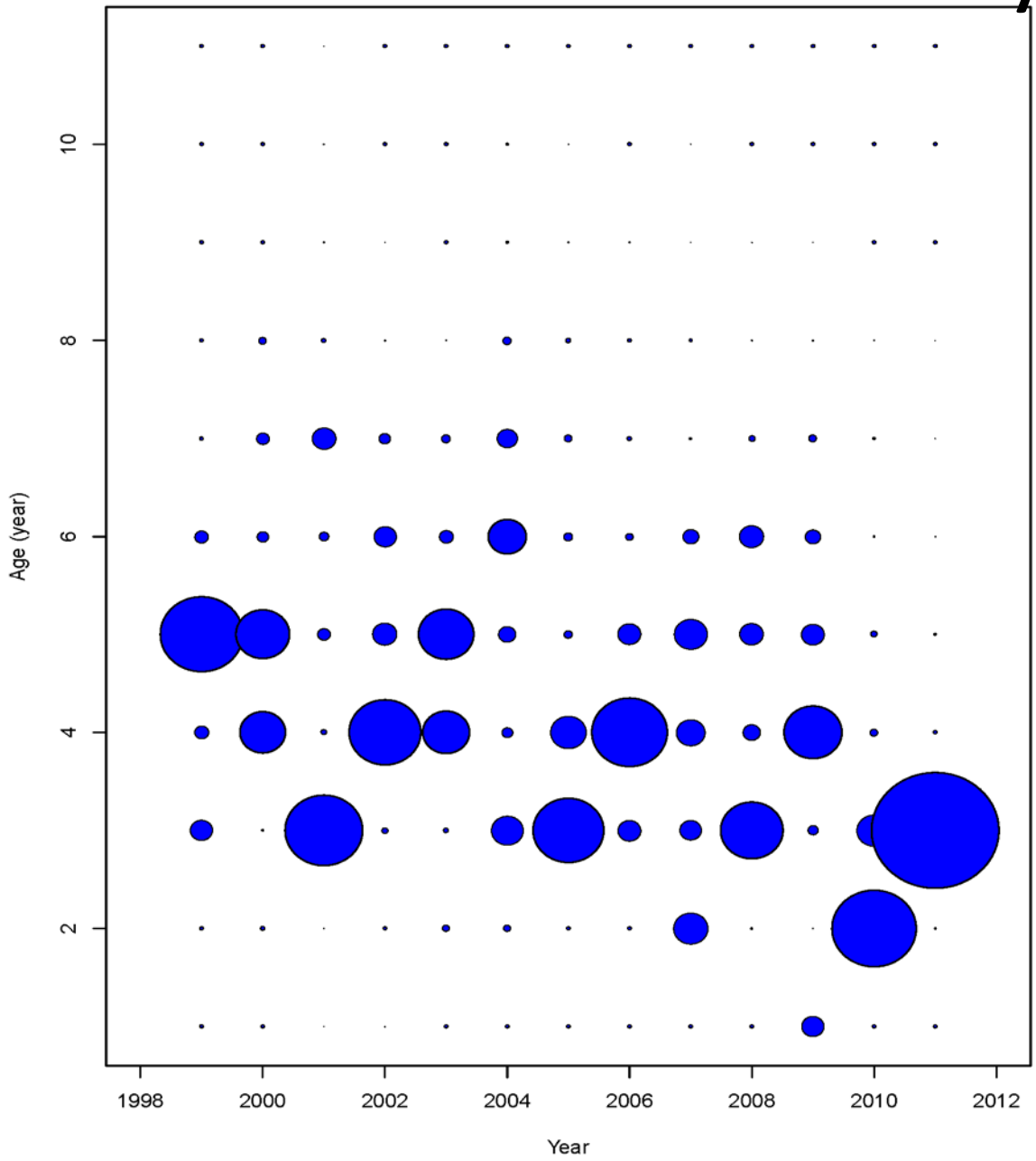
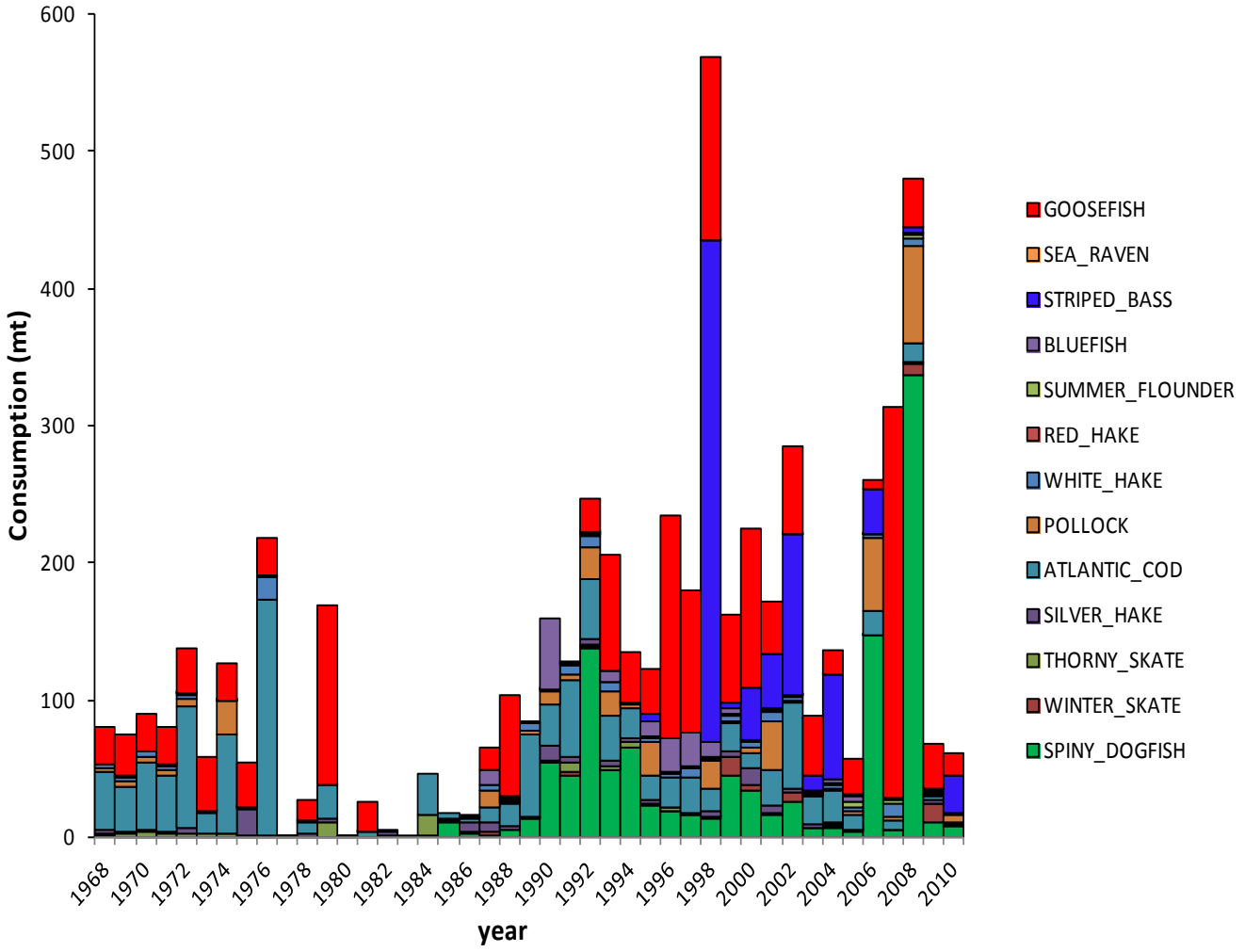


# TOR 3 – Acoustic Survey



# TOR 6 – M and Consumption

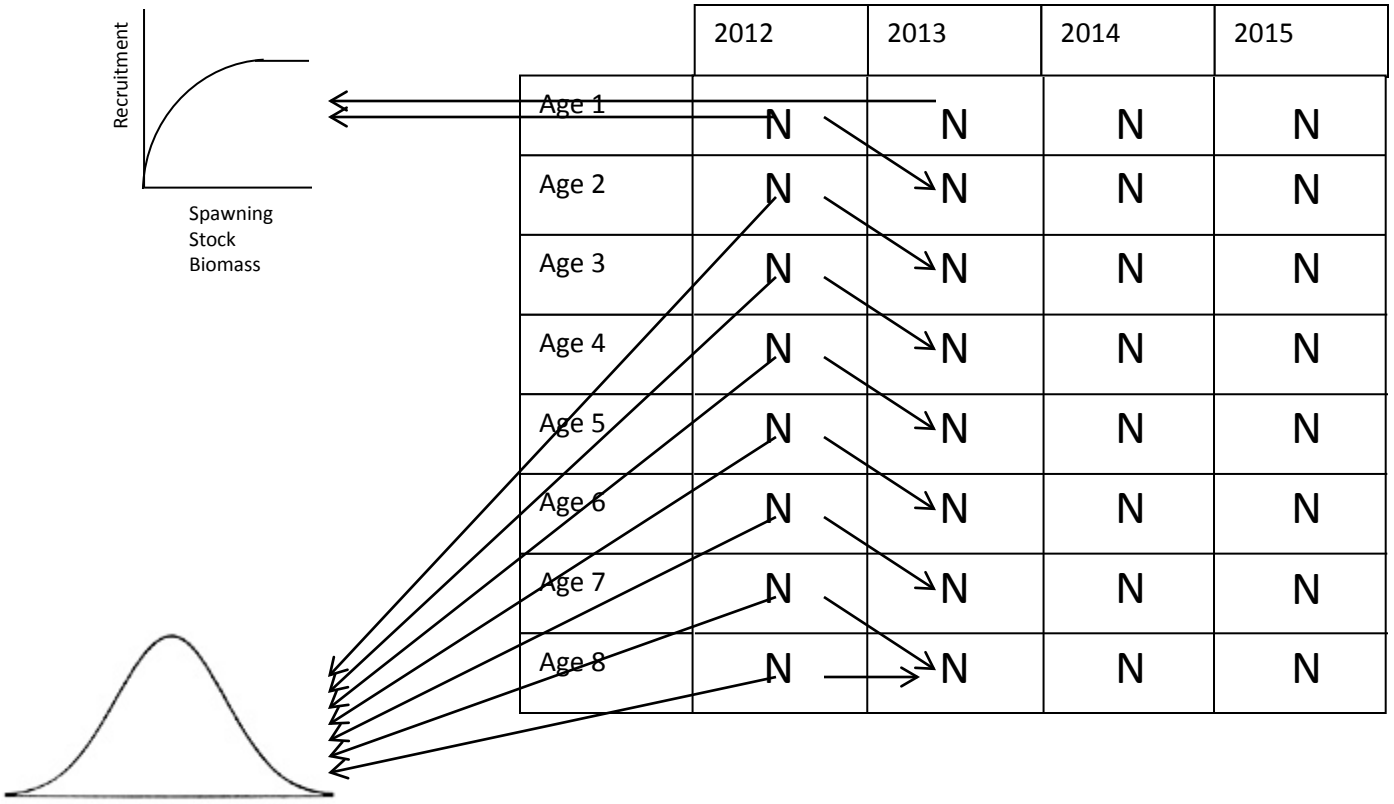


# TOR 9 - Simulations

Working papers and projects underway

Generally did not inform assessment

# TOR 10 – Projections




Repeat 1,000 times

# TOR 10 – Projections

| | 2013 | 2014 | 2015 |
|---|---|---|---|
| | $F_{msy}$ | | |
| F | 0.267 | 0.267 | 0.267 |
| SSB | 496,064 mt | 368,501 mt | 308,949 mt |
| 80% CI | 362,965 - 688,585 mt | 275,695 - 517-815 mt | 237,755 - 411,808 mt |
| Prob < SSBmsy/2 | 0 | 0 | 0 |
| catch | 168,775 mt | 126,589 mt | 104,430 mt |
| 80% CI | 124,868 - 230,764 mt | 95,835 - 171,145 mt | 79,505 - 139,925 mt |