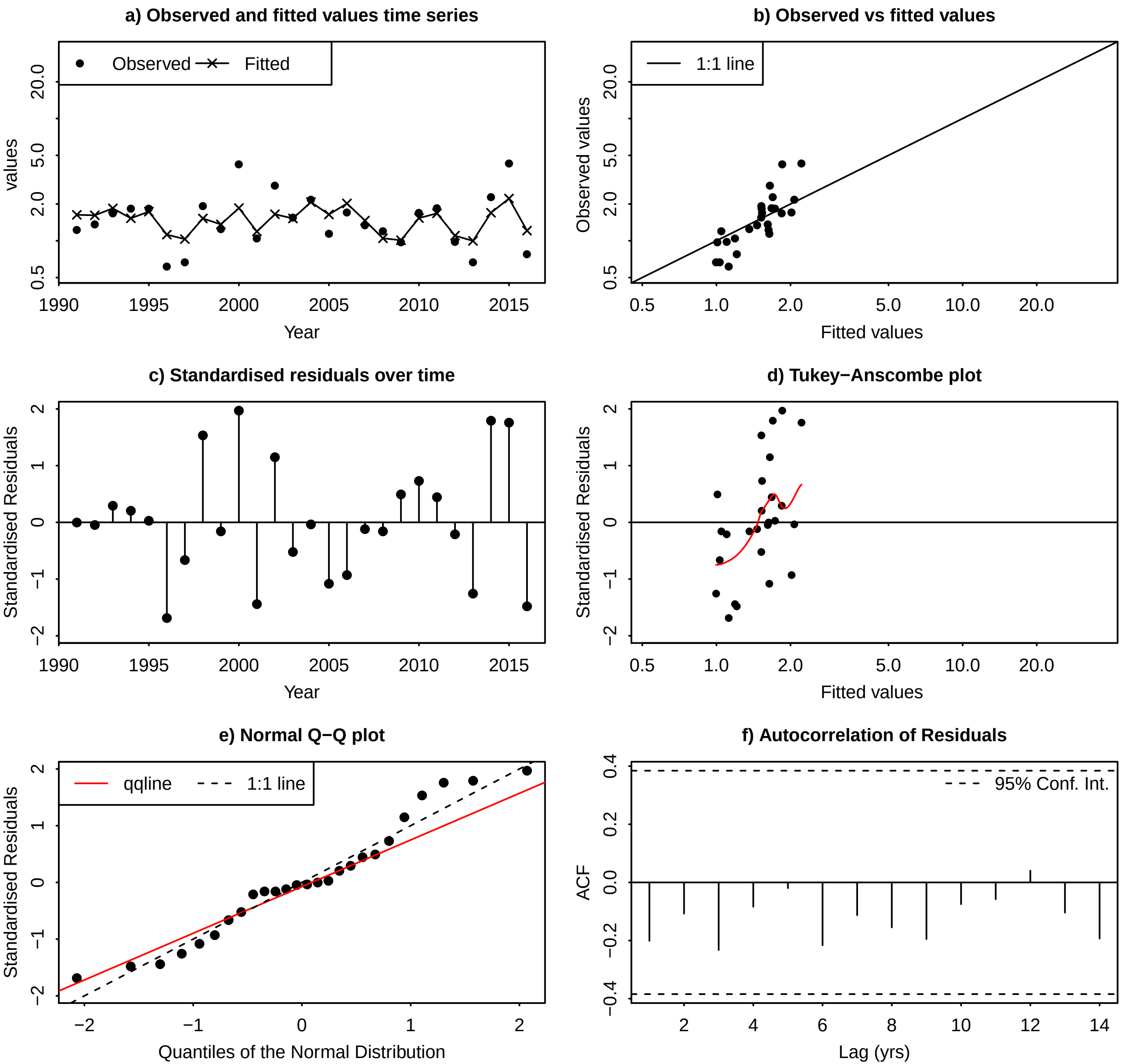
Turbot in IV pg 9 Diagnostics − BTS−ISIS, age 1



a) Observed and fitted values time series

b) Observed vs fitted values

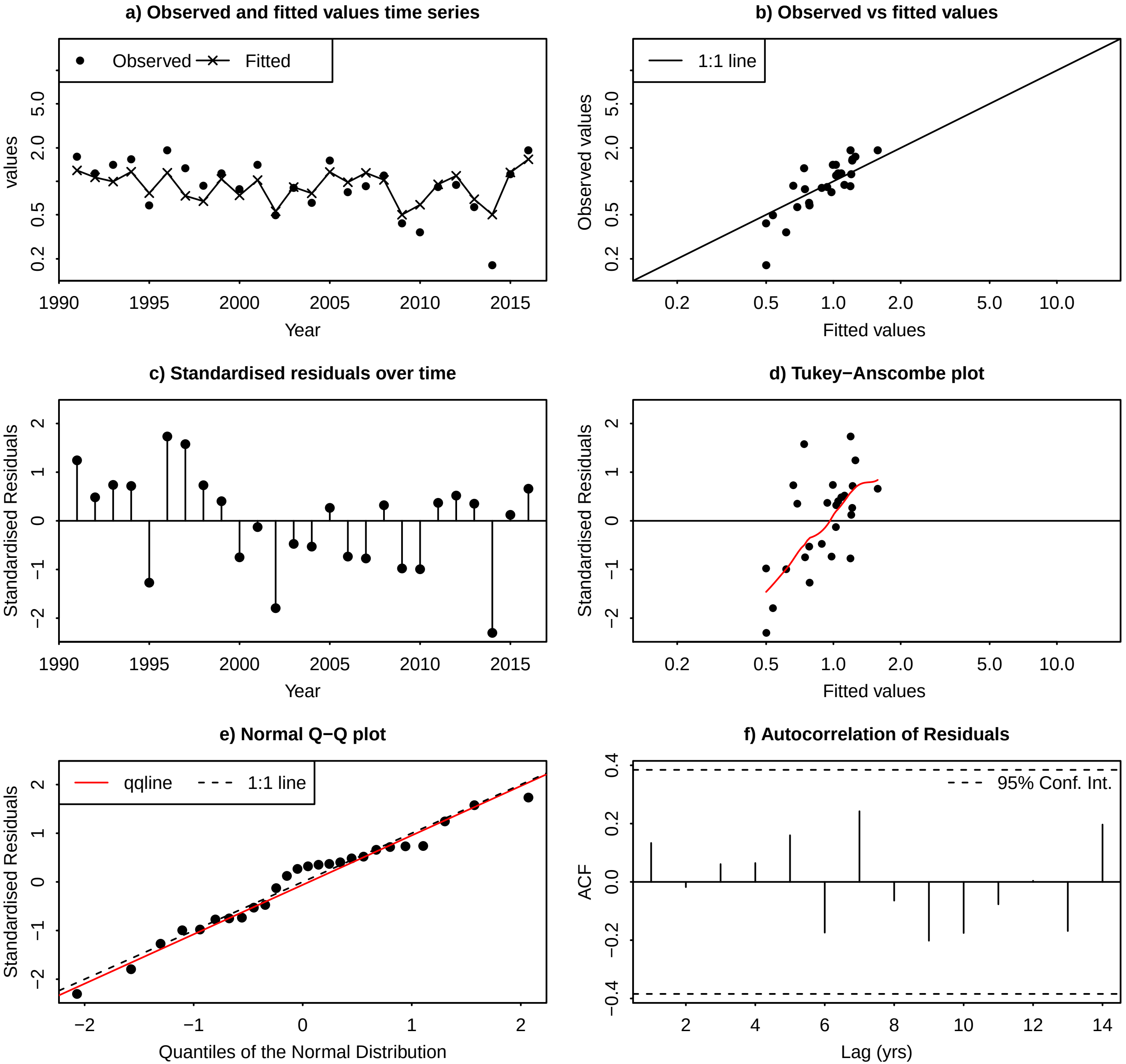
c) Standardised residuals over time

d) Tukey−Anscombe plot

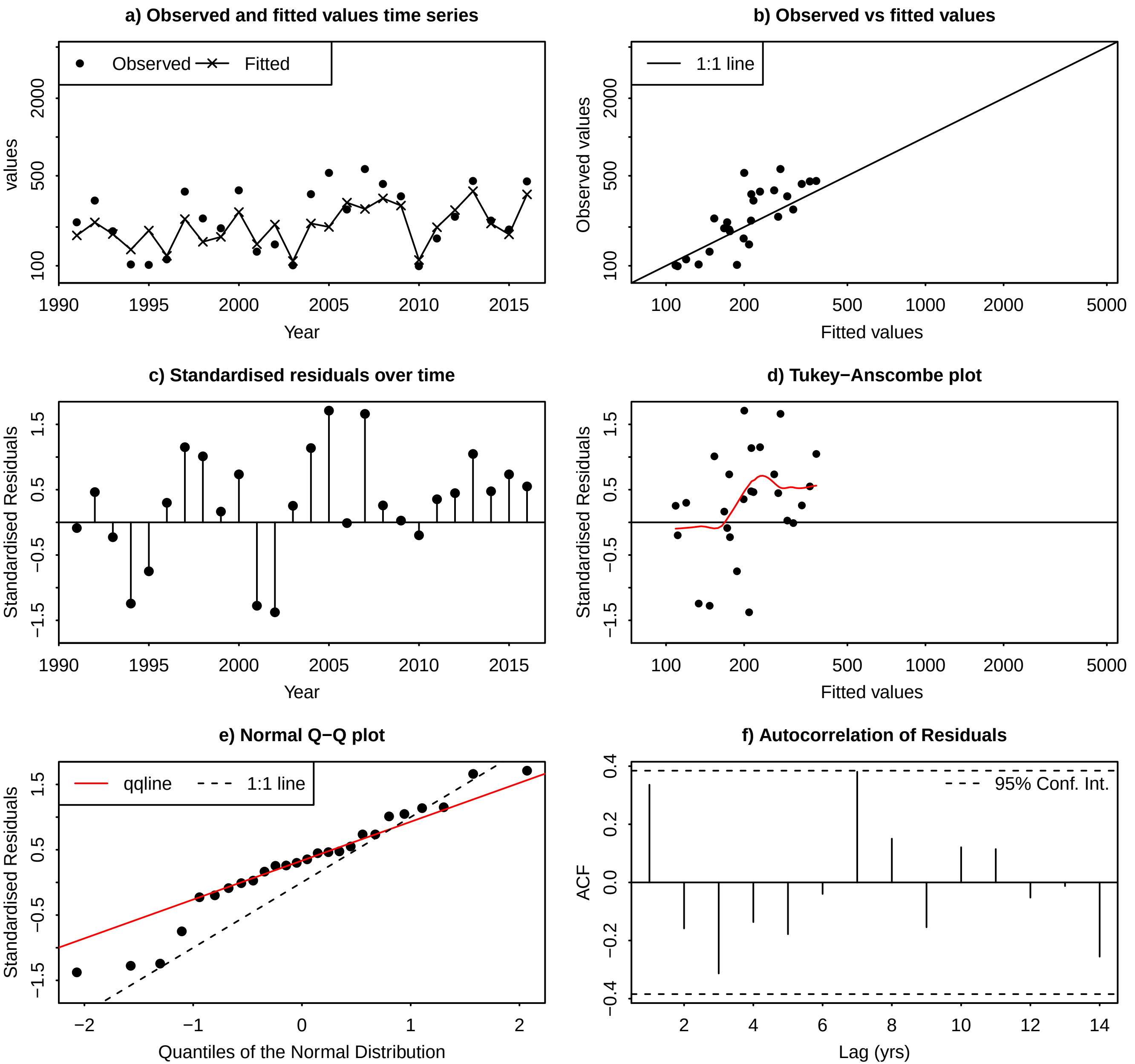
e) Normal Q−Q plot

f) Autocorrelation of Residuals

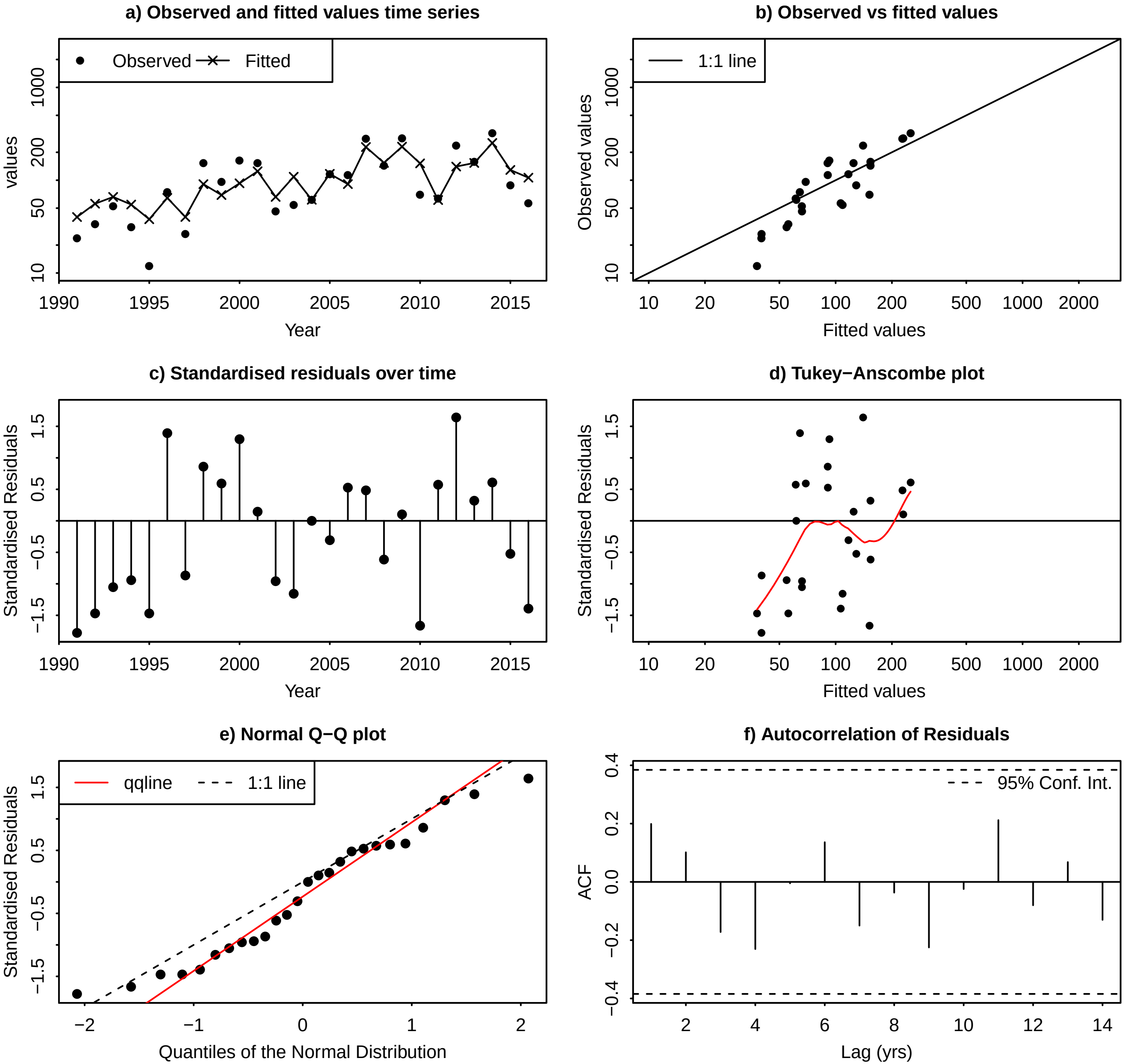
Turbot in IV pg 9 Diagnostics − BTS−ISIS, age 2



Turbot in IV pg 9 Diagnostics − BTS−ISIS, age 3



Turbot in IV pg 9 Diagnostics − BTS−ISIS, age 4



a) Observed and fitted values time series

b) Observed vs fitted values

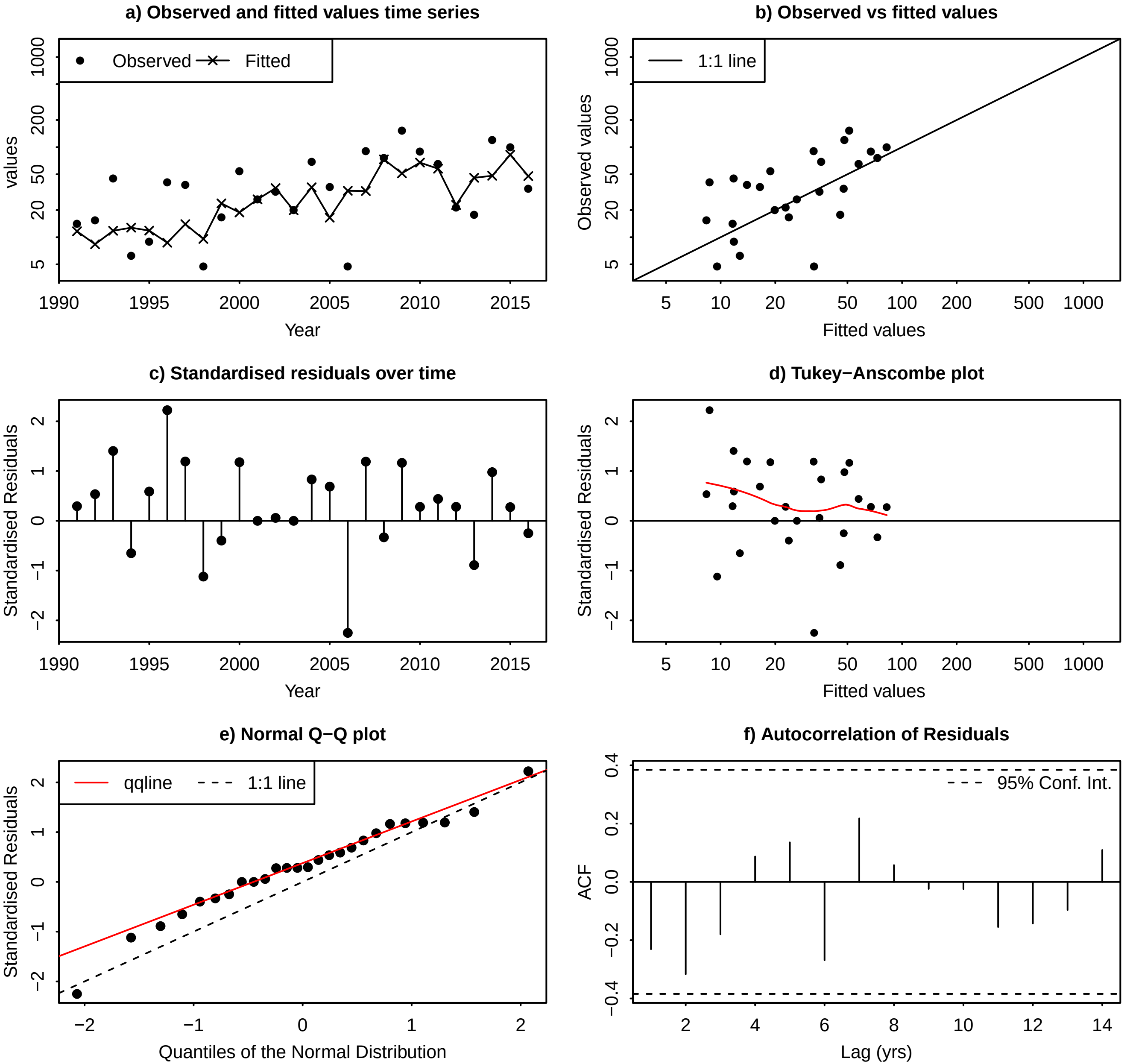
c) Standardised residuals over time

d) Tukey−Anscombe plot

e) Normal Q−Q plot

f) Autocorrelation of Residuals

Turbot in IV pg 9 Diagnostics − BTS−ISIS, age 5



a) Observed and fitted values time series

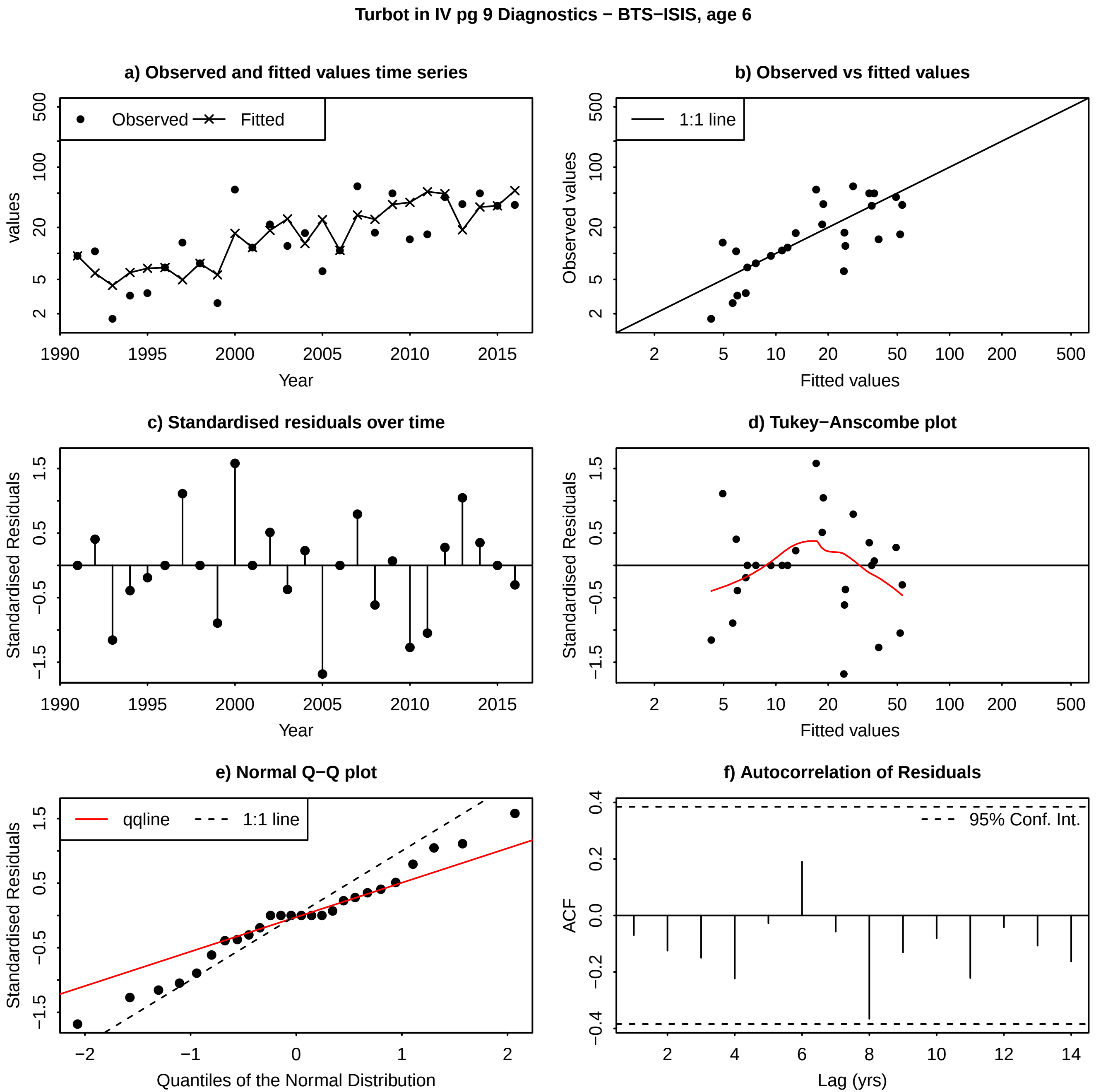
b) Observed vs fitted values

c) Standardised residuals over time

d) Tukey−Anscombe plot

e) Normal Q−Q plot

f) Autocorrelation of Residuals



Turbot in IV pg 9 Diagnostics − BTS−ISIS, age 6

a) Observed and fitted values time series

b) Observed vs fitted values

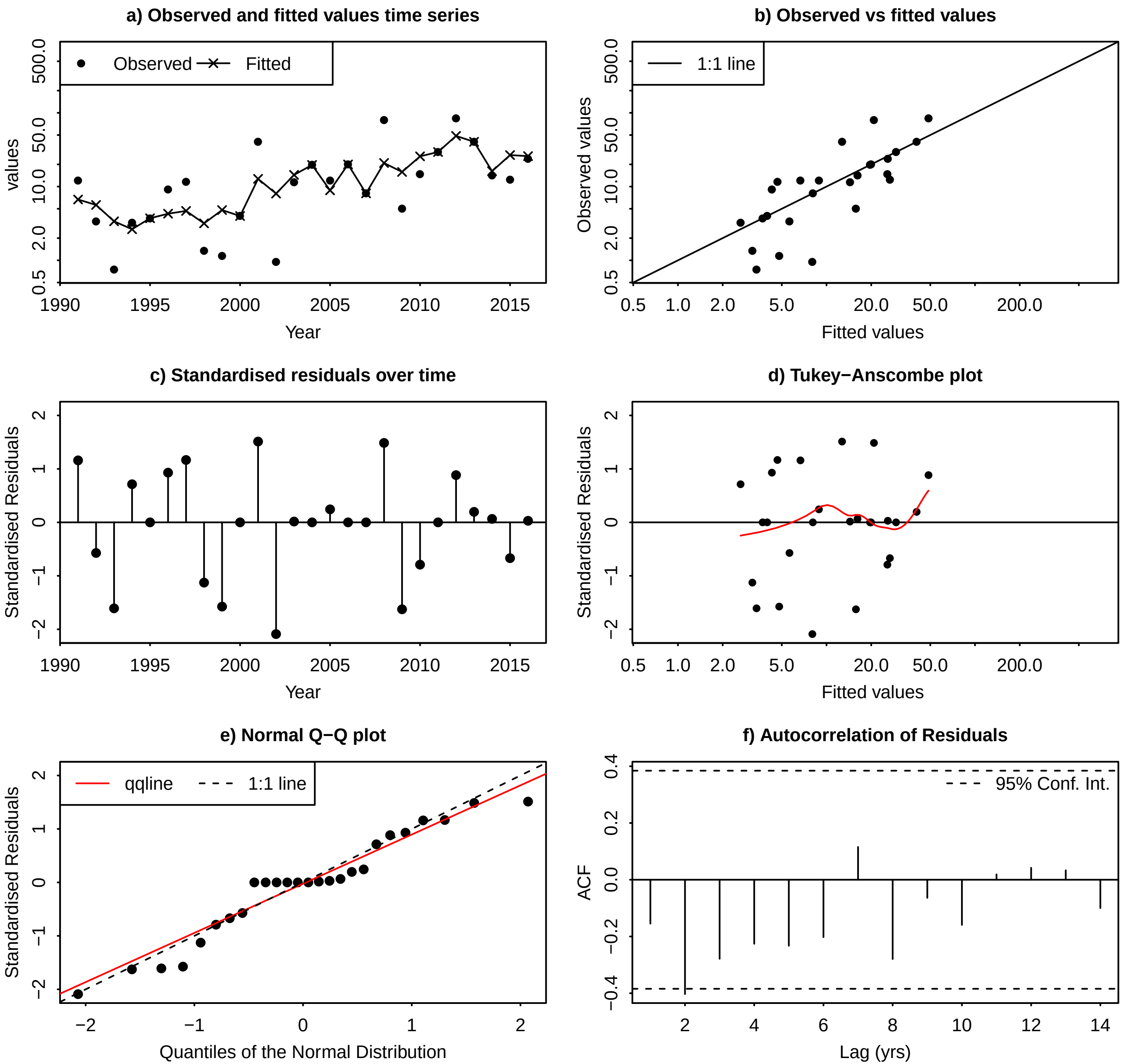
c) Standardised residuals over time

d) Tukey−Anscombe plot

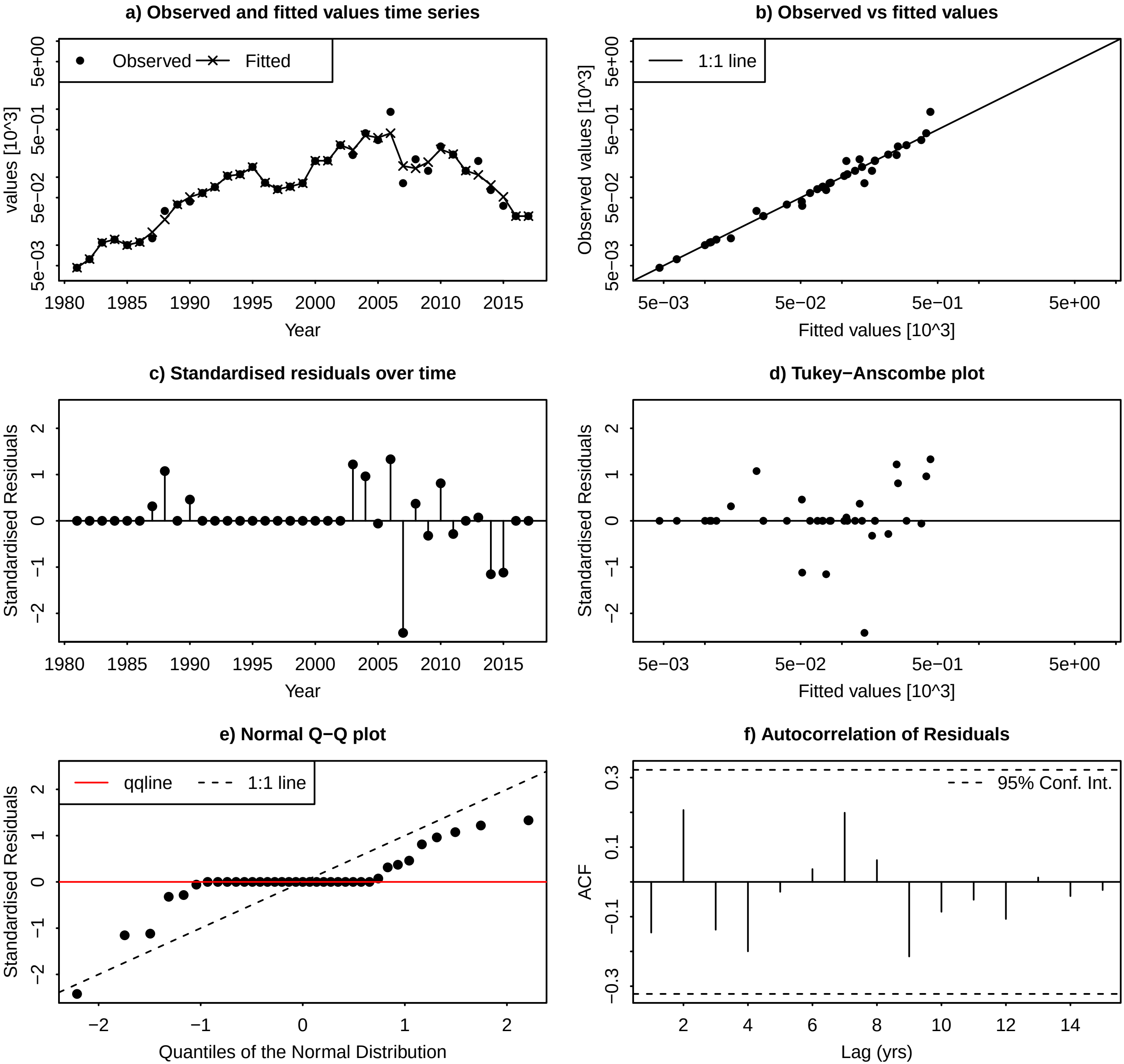
e) Normal Q−Q plot

f) Autocorrelation of Residuals

Turbot in IV pg 9 Diagnostics − BTS−ISIS, age 7



Turbot in IV pg 9 Diagnostics − catch, age 1



a) Observed and fitted values time series

b) Observed vs fitted values

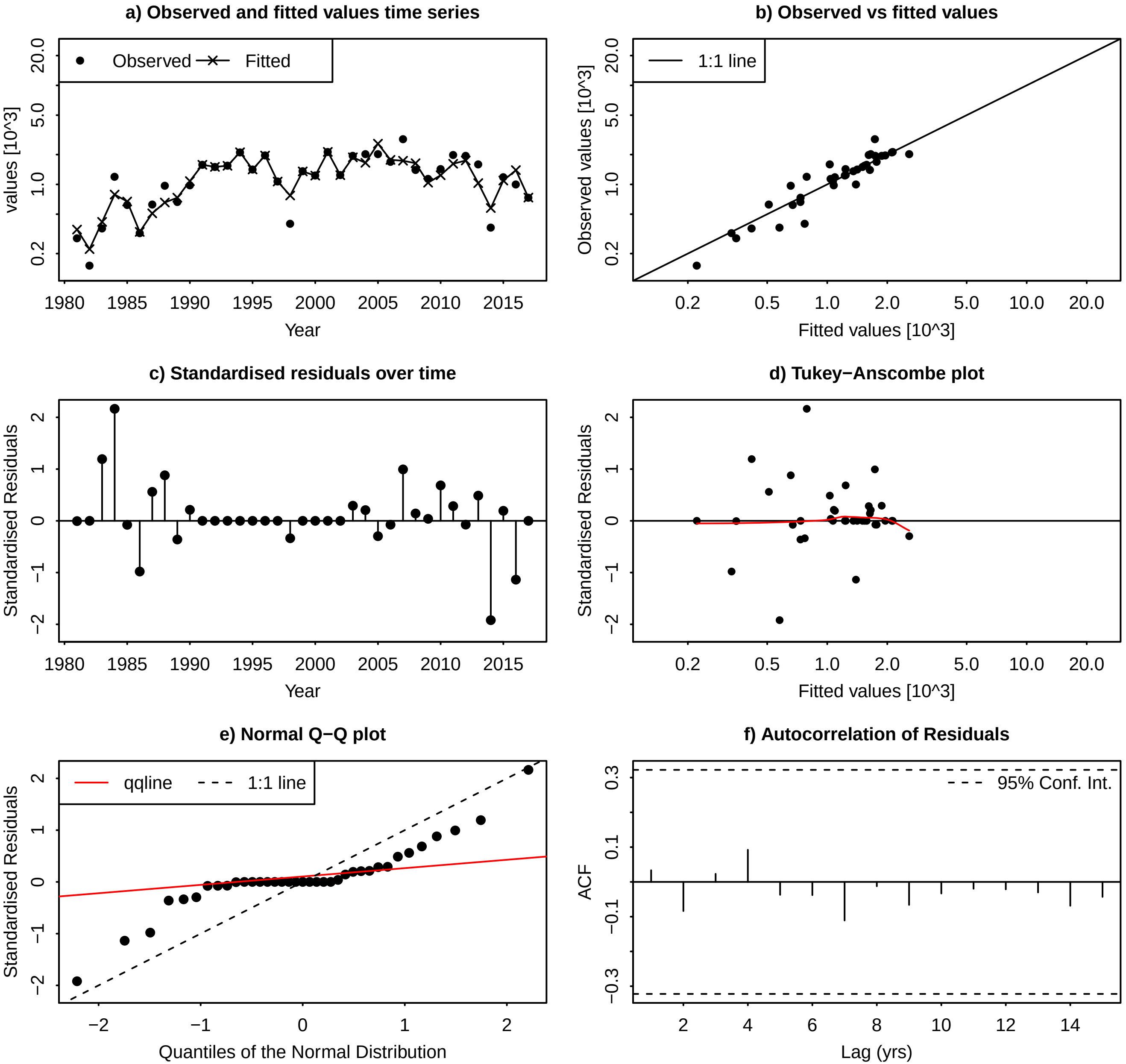
c) Standardised residuals over time

d) Tukey−Anscombe plot

e) Normal Q−Q plot

f) Autocorrelation of Residuals

Turbot in IV pg 9 Diagnostics − catch, age 2



a) Observed and fitted values time series

b) Observed vs fitted values

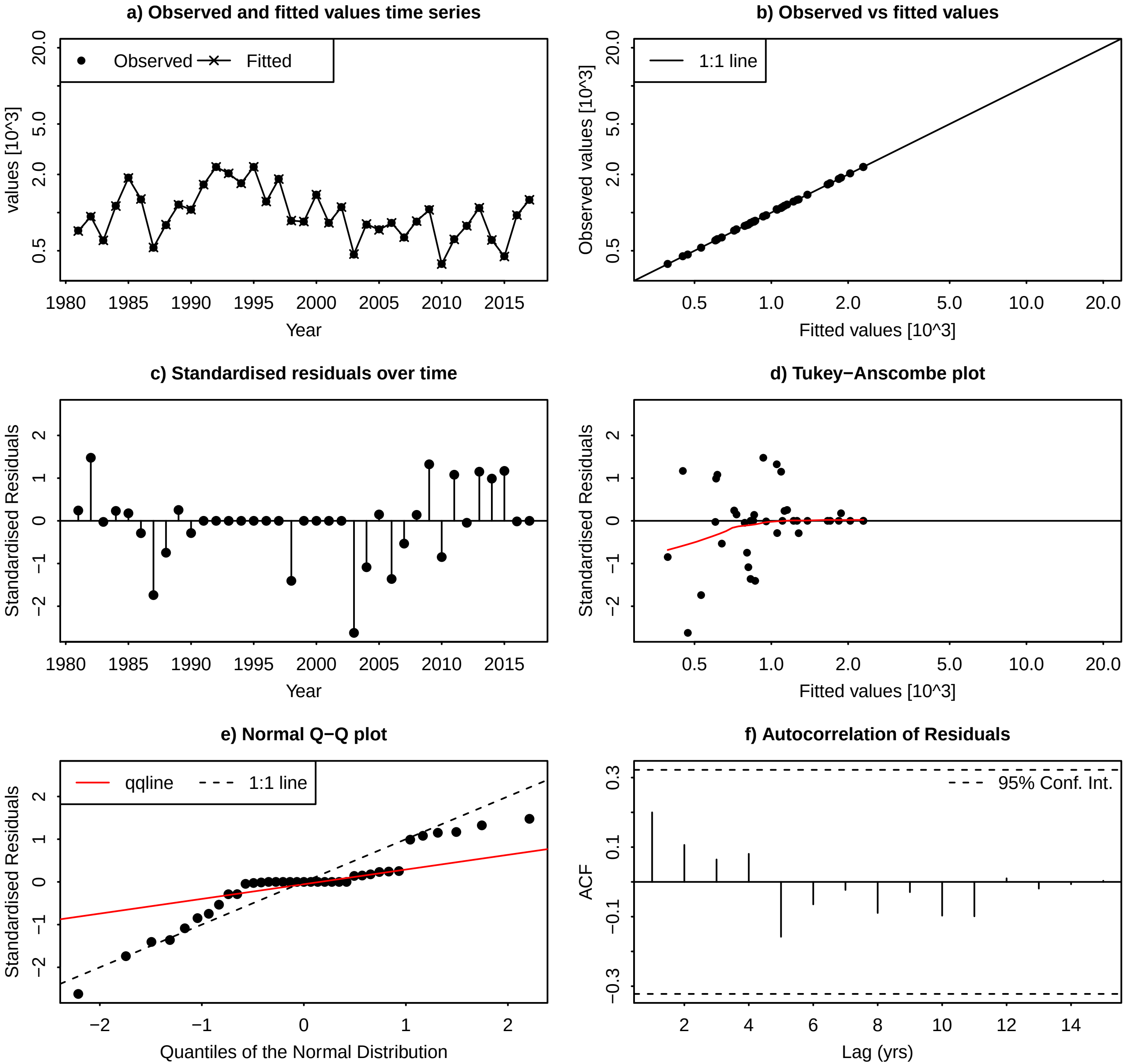
c) Standardised residuals over time

d) Tukey−Anscombe plot

e) Normal Q−Q plot

f) Autocorrelation of Residuals

Turbot in IV pg 9 Diagnostics − catch, age 3



a) Observed and fitted values time series

b) Observed vs fitted values

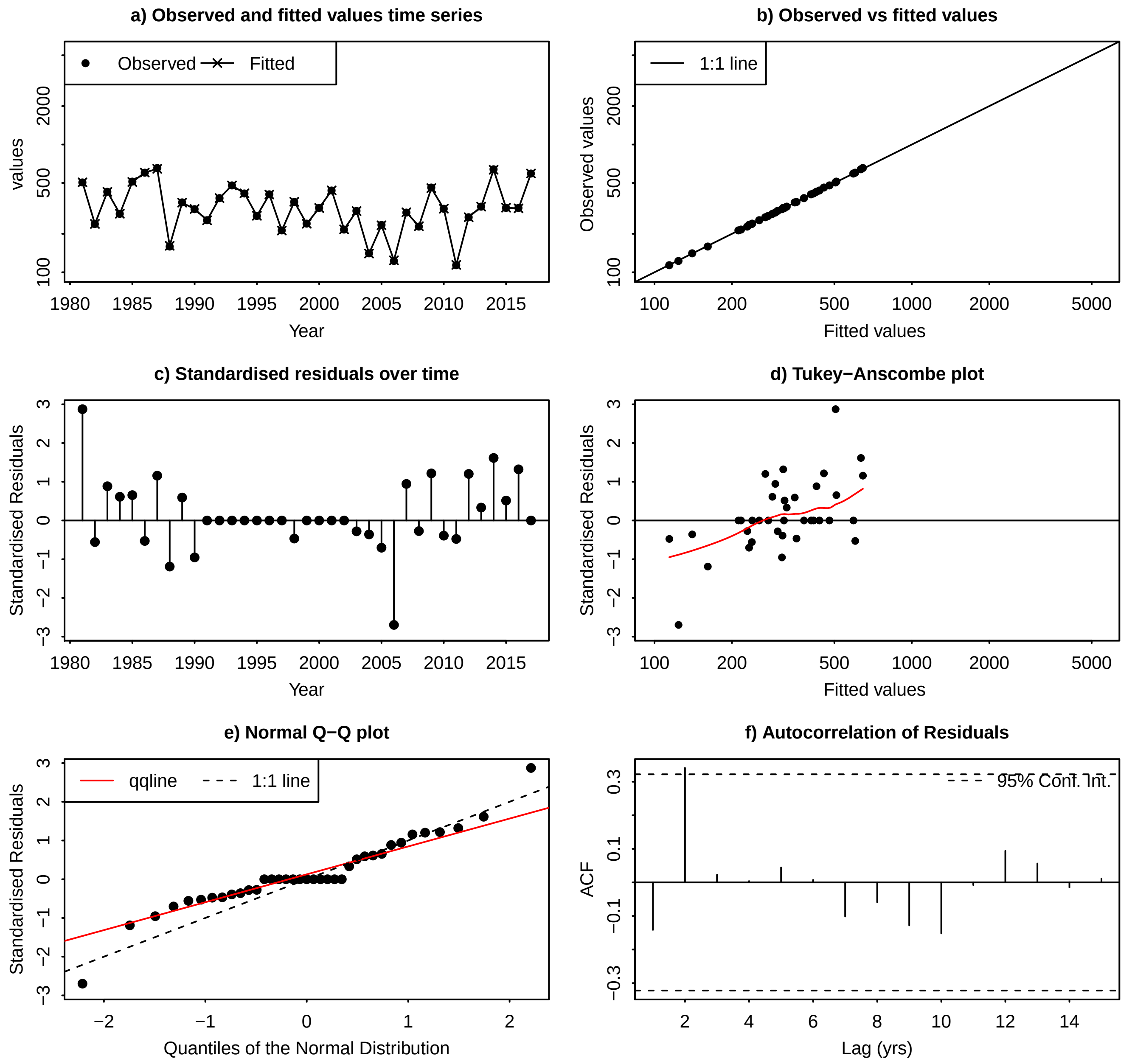
c) Standardised residuals over time

d) Tukey−Anscombe plot

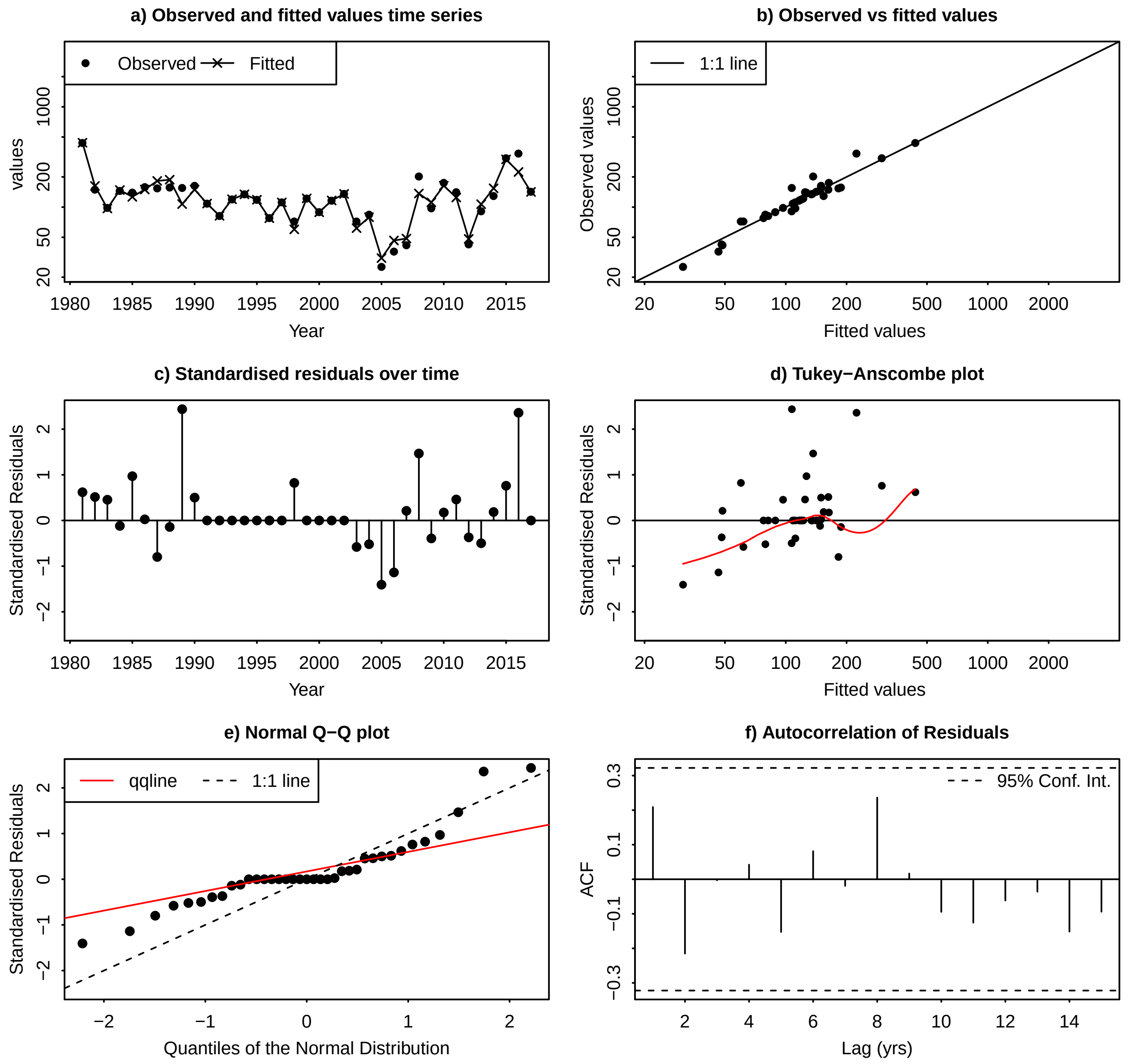
e) Normal Q−Q plot

f) Autocorrelation of Residuals

Turbot in IV pg 9 Diagnostics − catch, age 4



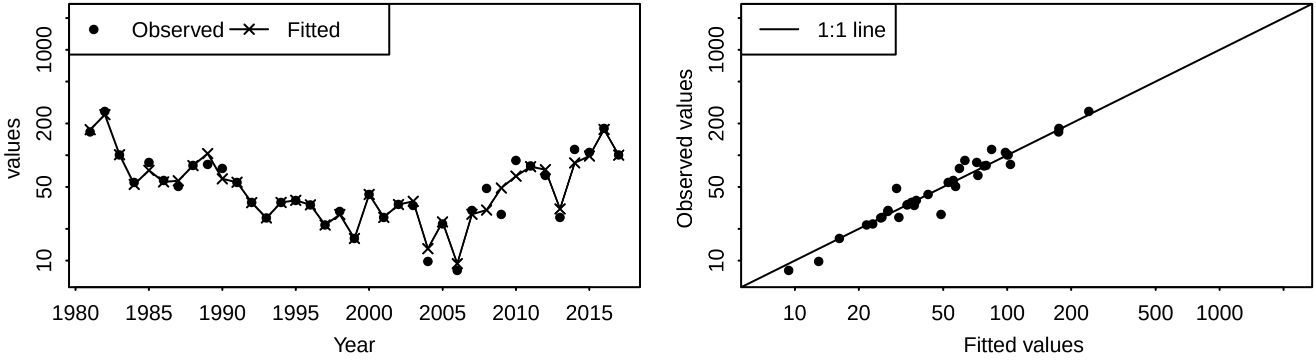
Turbot in IV pg 9 Diagnostics − catch, age 5



Turbot in IV pg 9 Diagnostics − catch, age 6

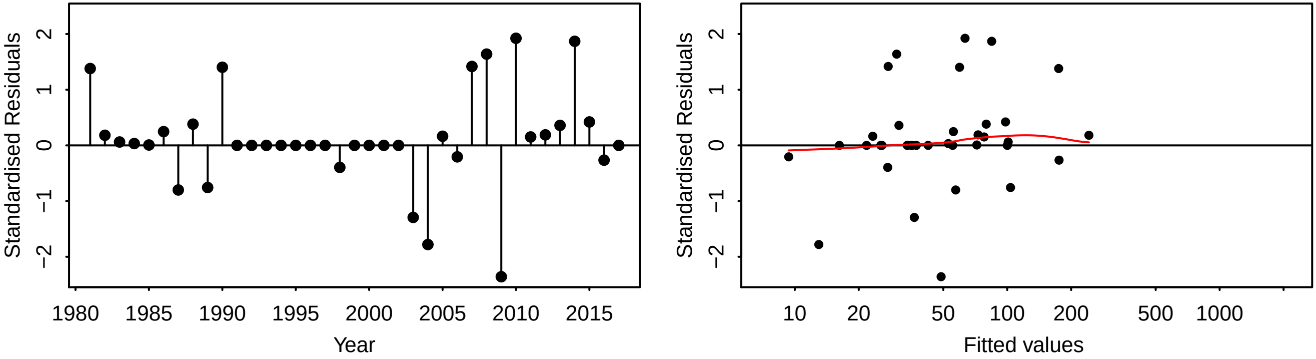
a) Observed and fitted values time series

b) Observed vs fitted values



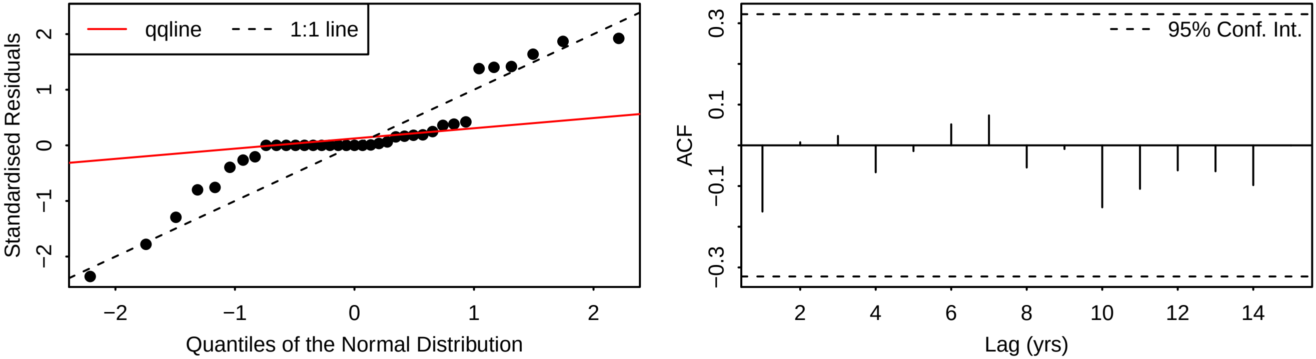
c) Standardised residuals over time

d) Tukey−Anscombe plot

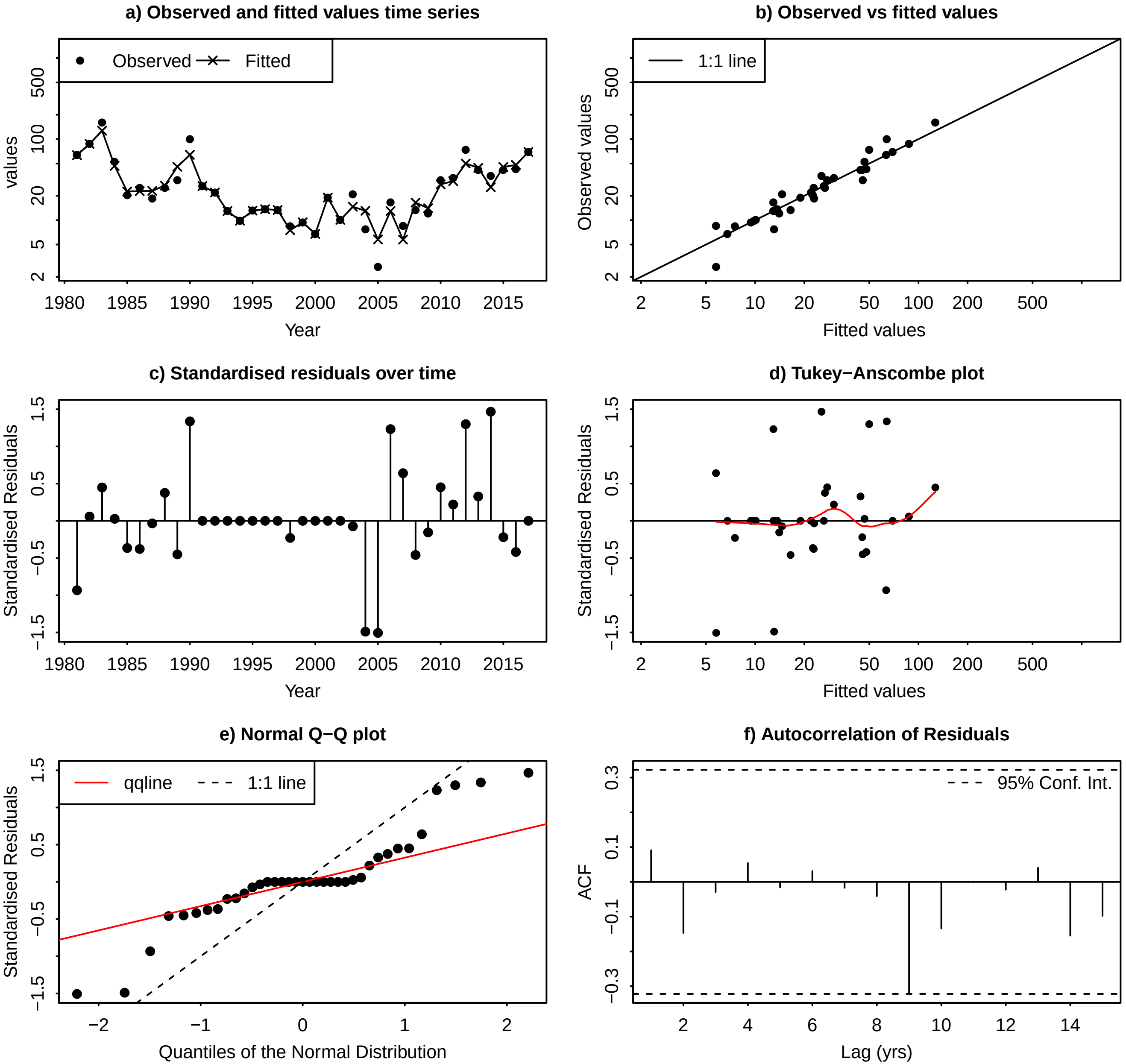


e) Normal Q−Q plot

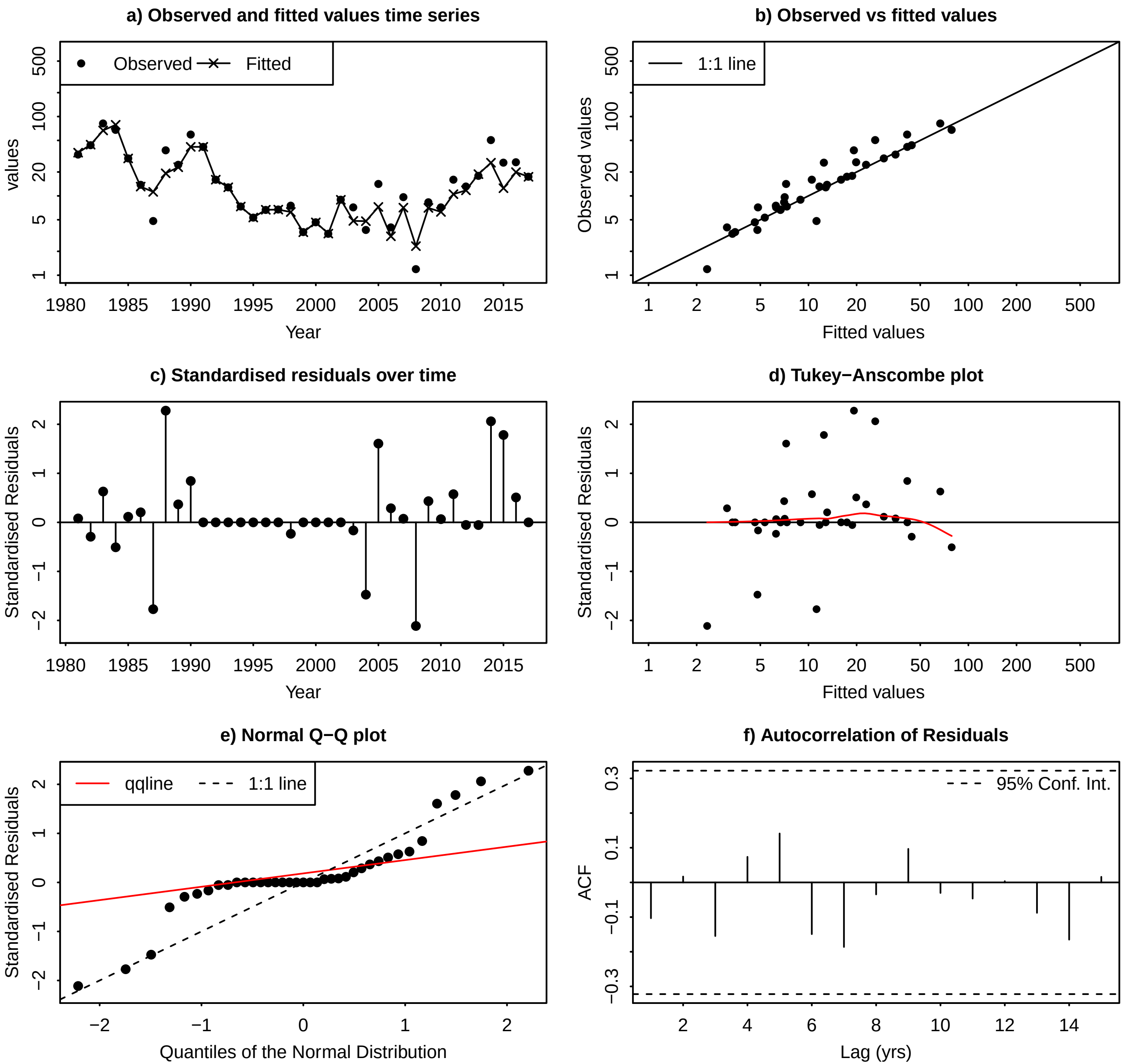
f) Autocorrelation of Residuals



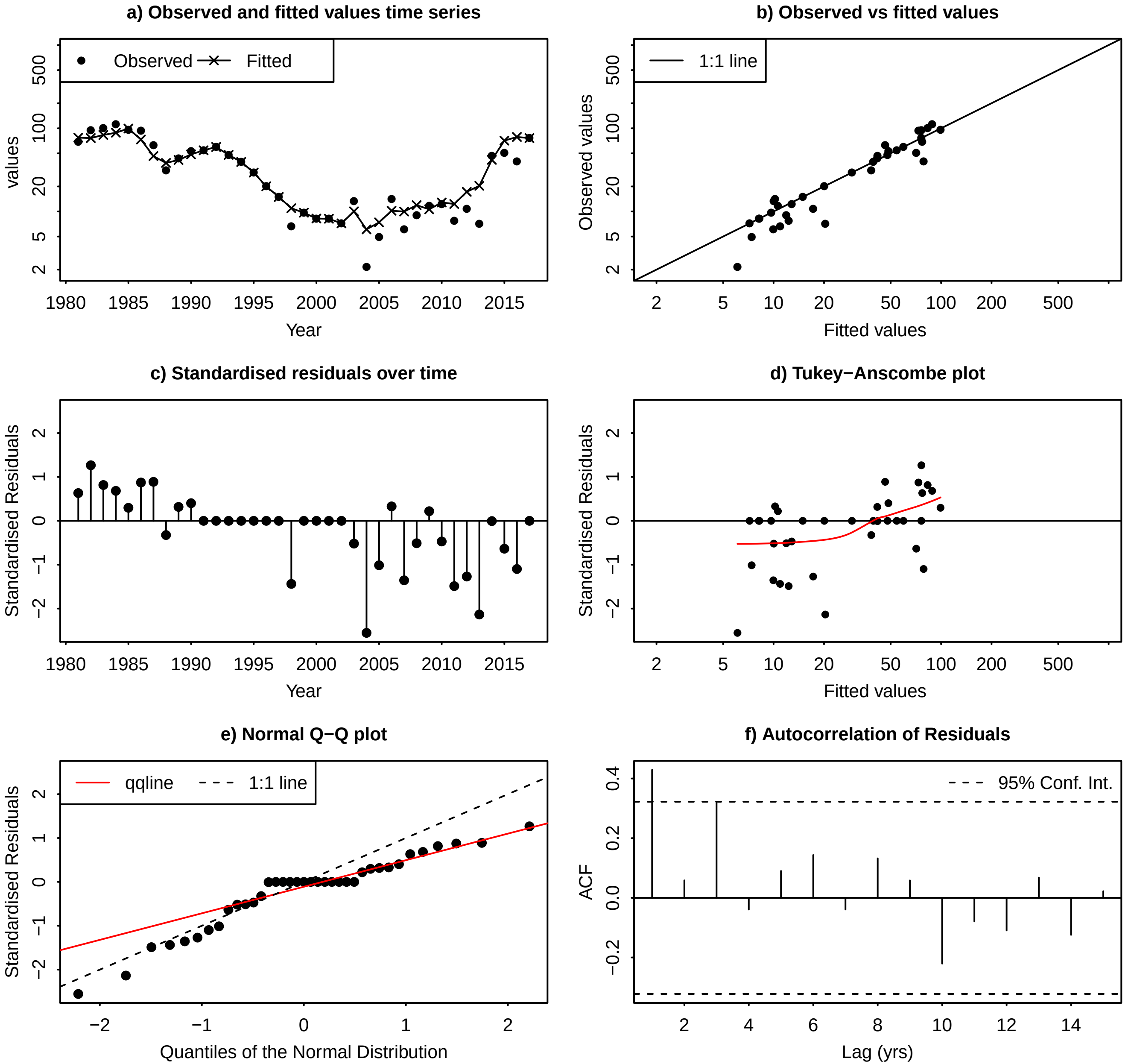
Turbot in IV pg 9 Diagnostics − catch, age 7



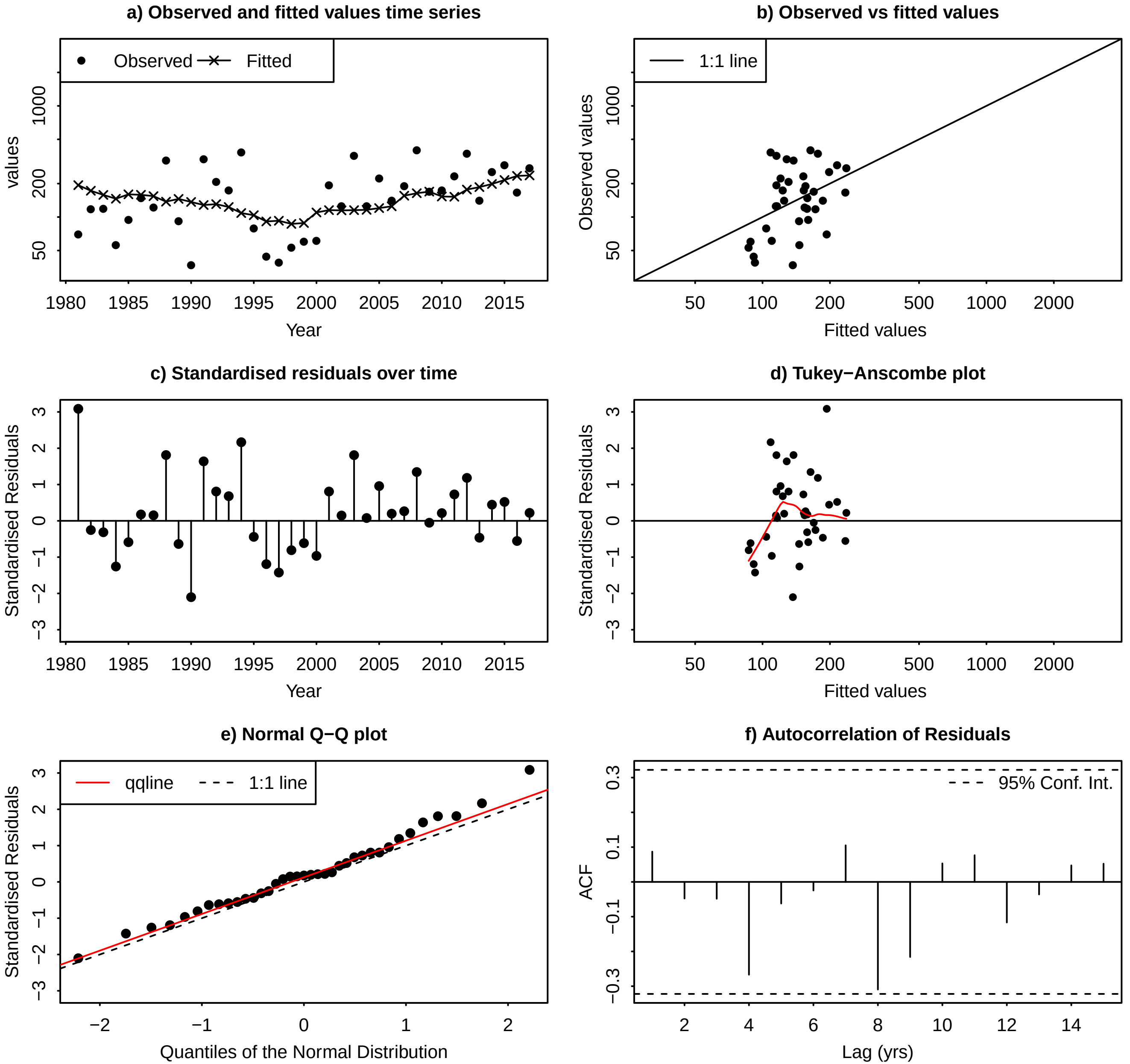
Turbot in IV pg 9 Diagnostics − catch, age 8



Turbot in IV pg 9 Diagnostics − catch, age 9



Turbot in IV pg 9 Diagnostics − IBTS_Q1, age −1



a) Observed and fitted values time series

b) Observed vs fitted values

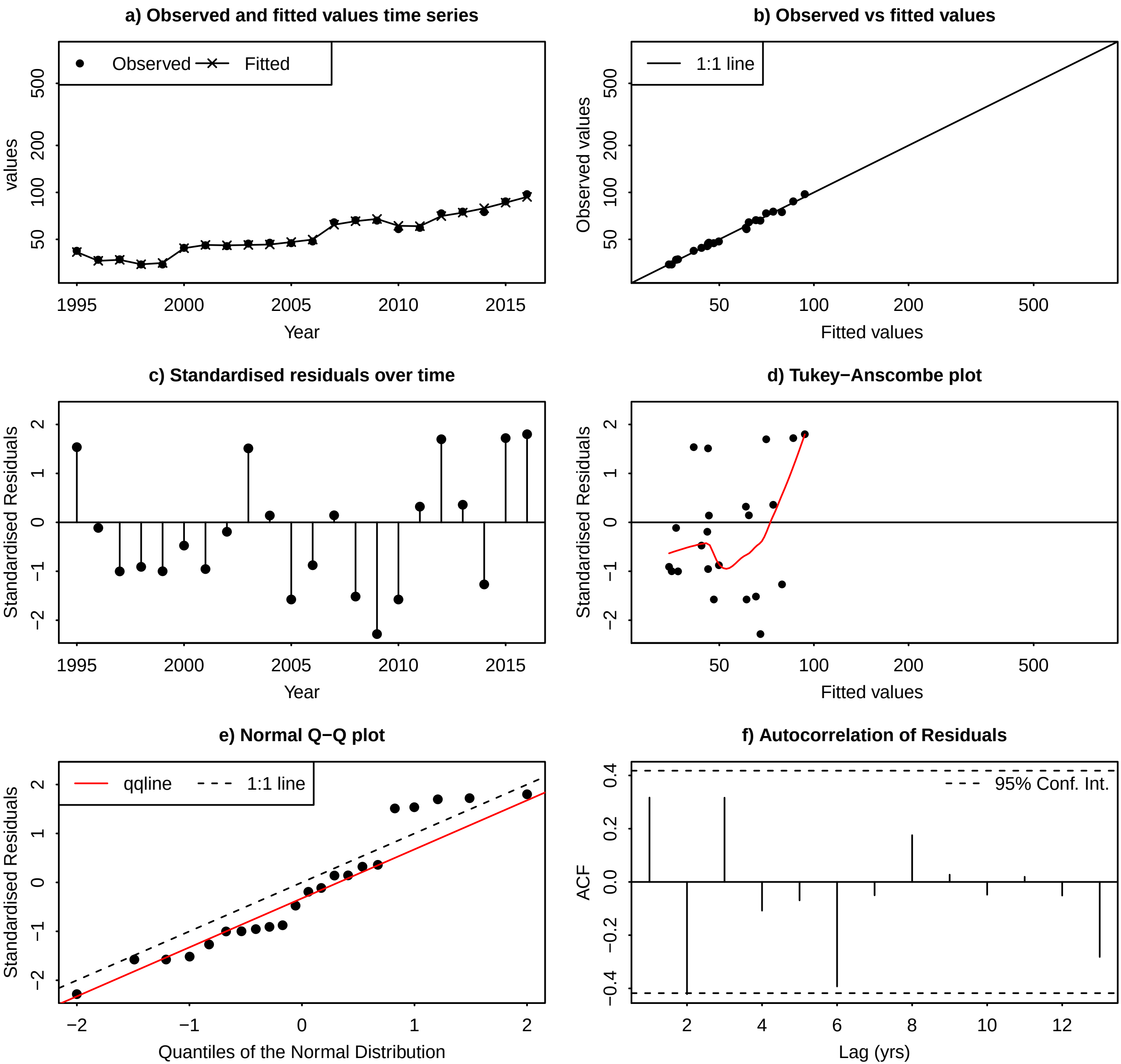
c) Standardised residuals over time

d) Tukey−Anscombe plot

e) Normal Q−Q plot

f) Autocorrelation of Residuals

Turbot in IV pg 9 Diagnostics − NL_LPUE, age −1



a) Observed and fitted values time series

b) Observed vs fitted values

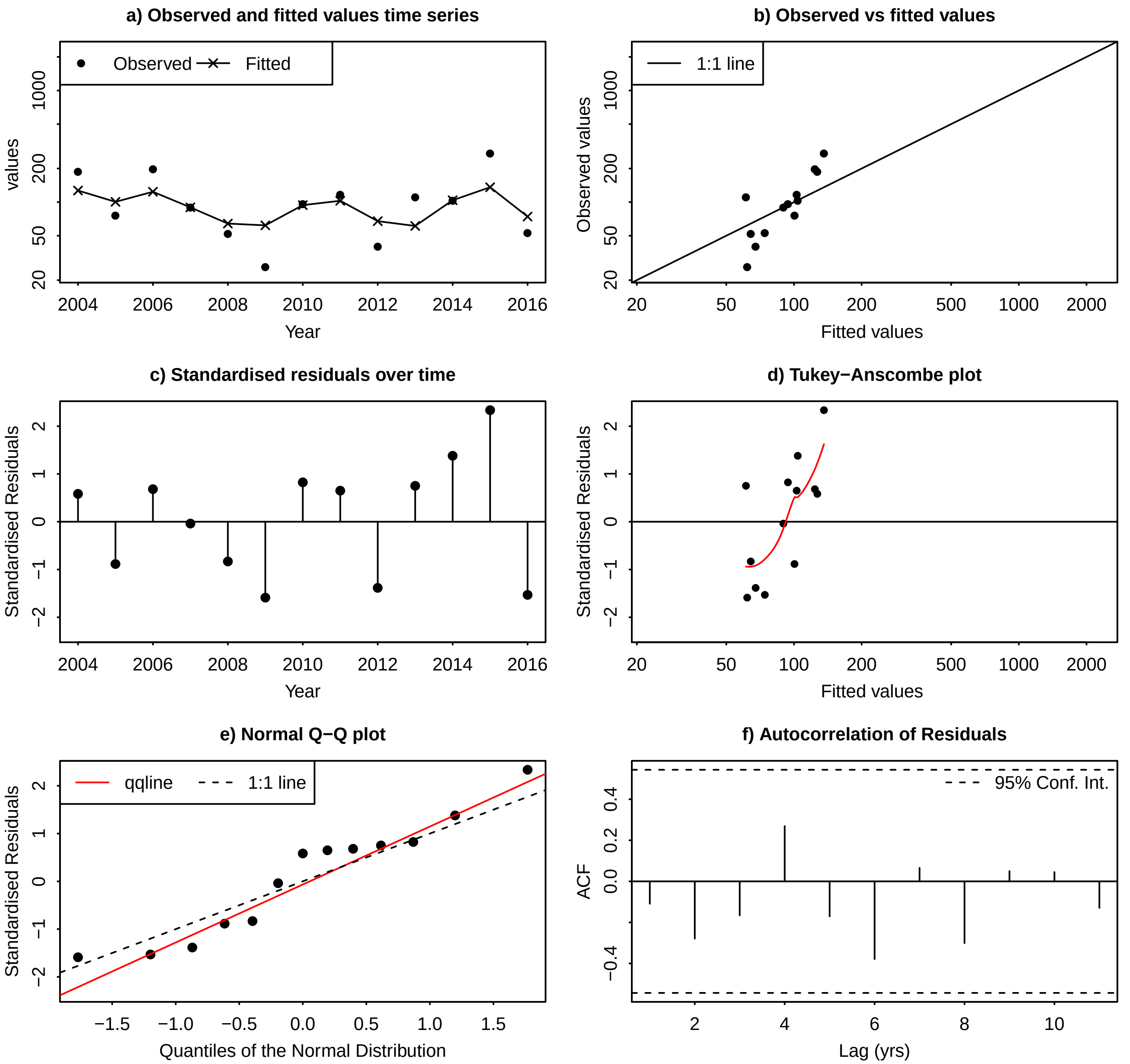
c) Standardised residuals over time

d) Tukey−Anscombe plot

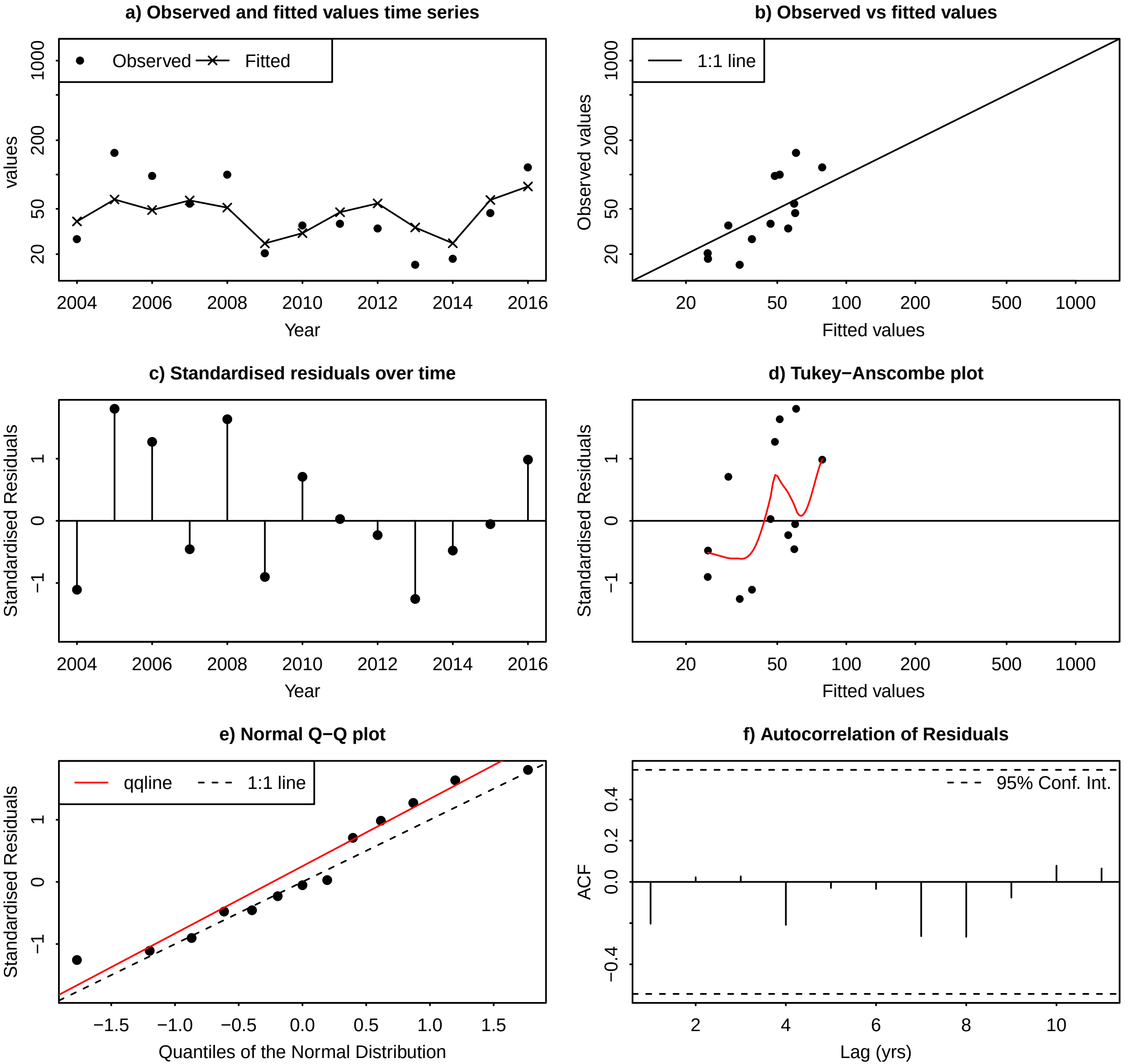
e) Normal Q−Q plot

f) Autocorrelation of Residuals

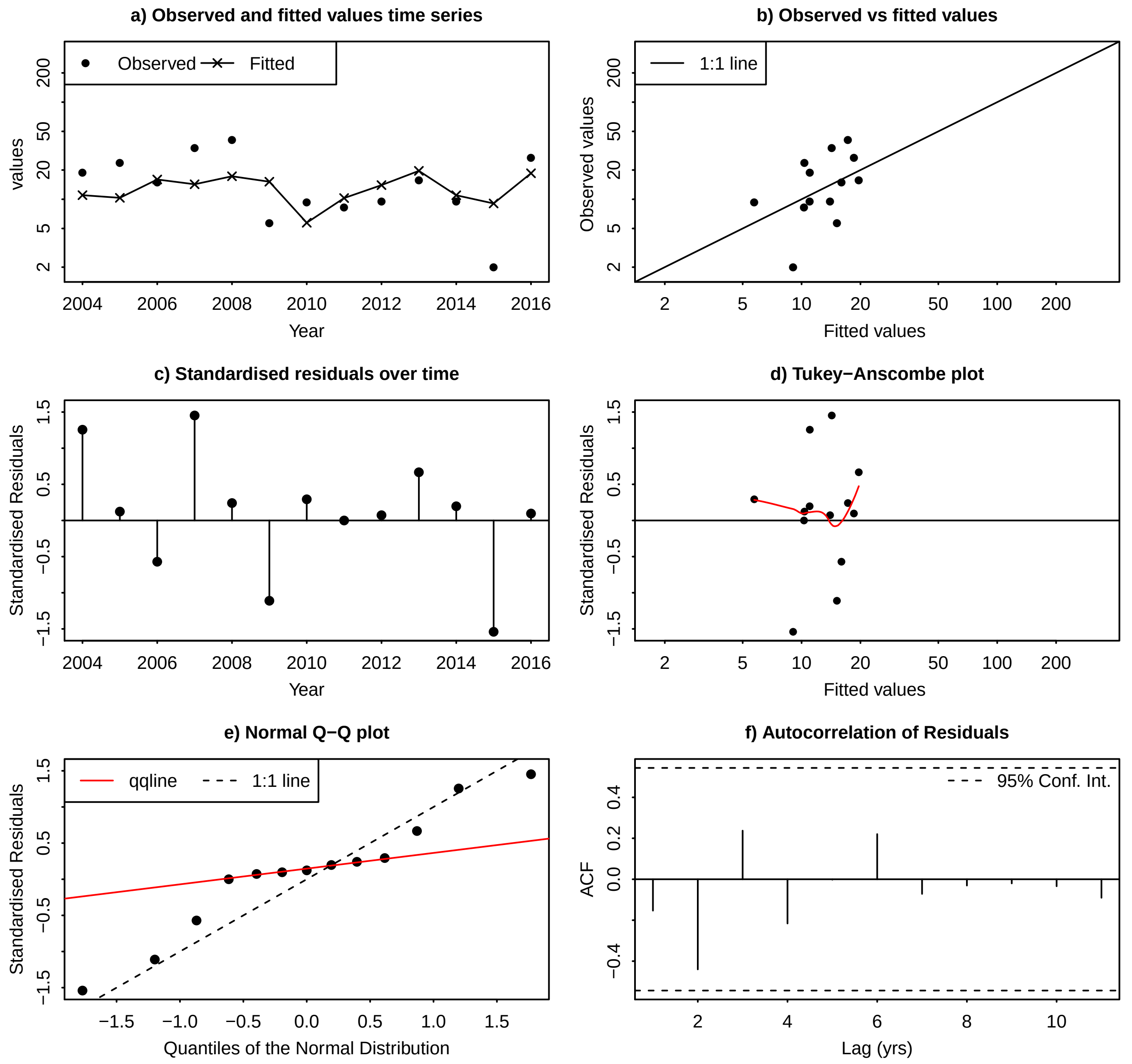
Turbot in IV pg 9 Diagnostics − SNS, age 1



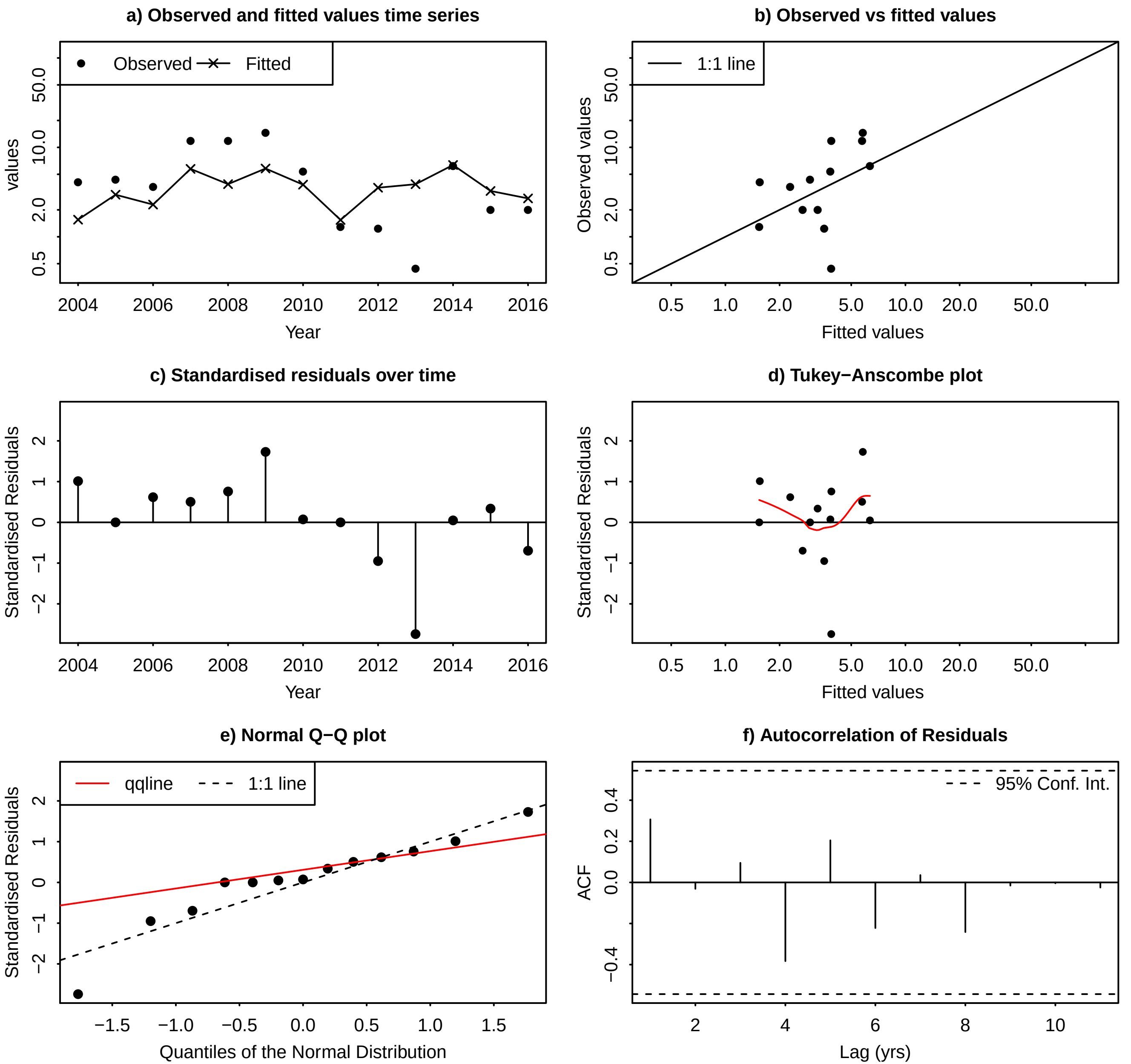
Turbot in IV pg 9 Diagnostics − SNS, age 2



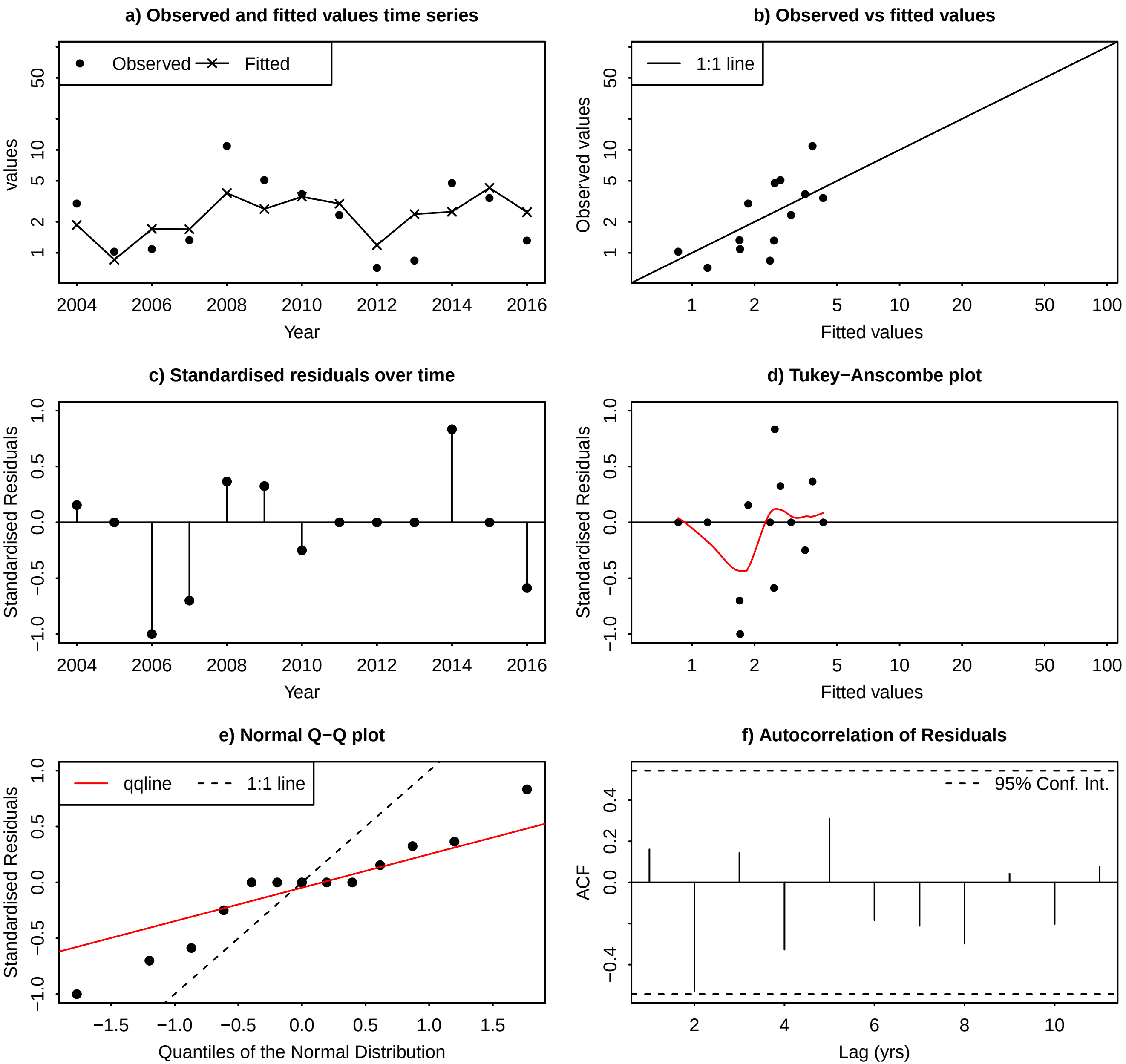
Turbot in IV pg 9 Diagnostics − SNS, age 3



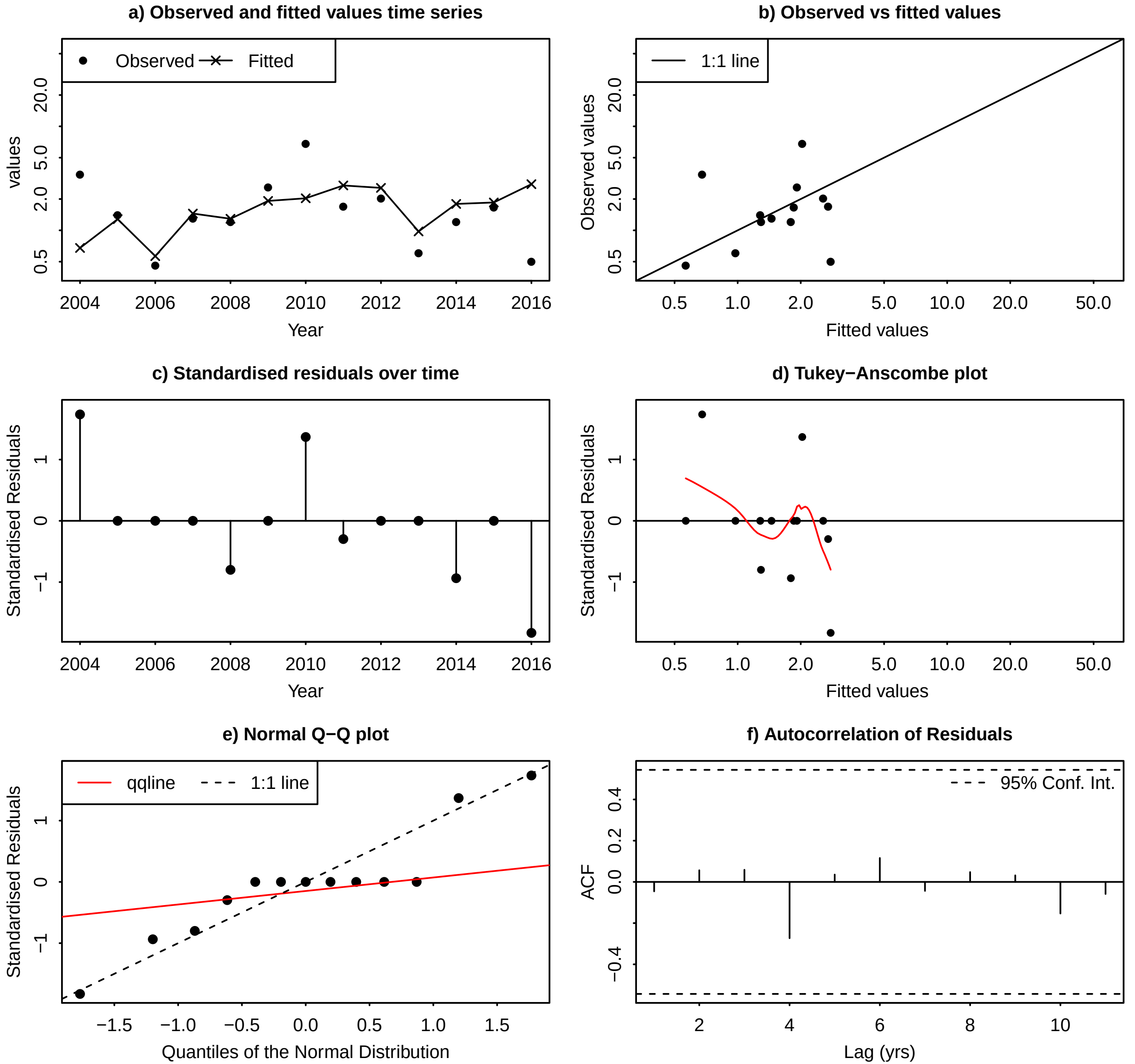
Turbot in IV pg 9 Diagnostics − SNS, age 4



Turbot in IV pg 9 Diagnostics − SNS, age 5



Turbot in IV pg 9 Diagnostics − SNS, age 6



a) Observed and fitted values time series

b) Observed vs fitted values

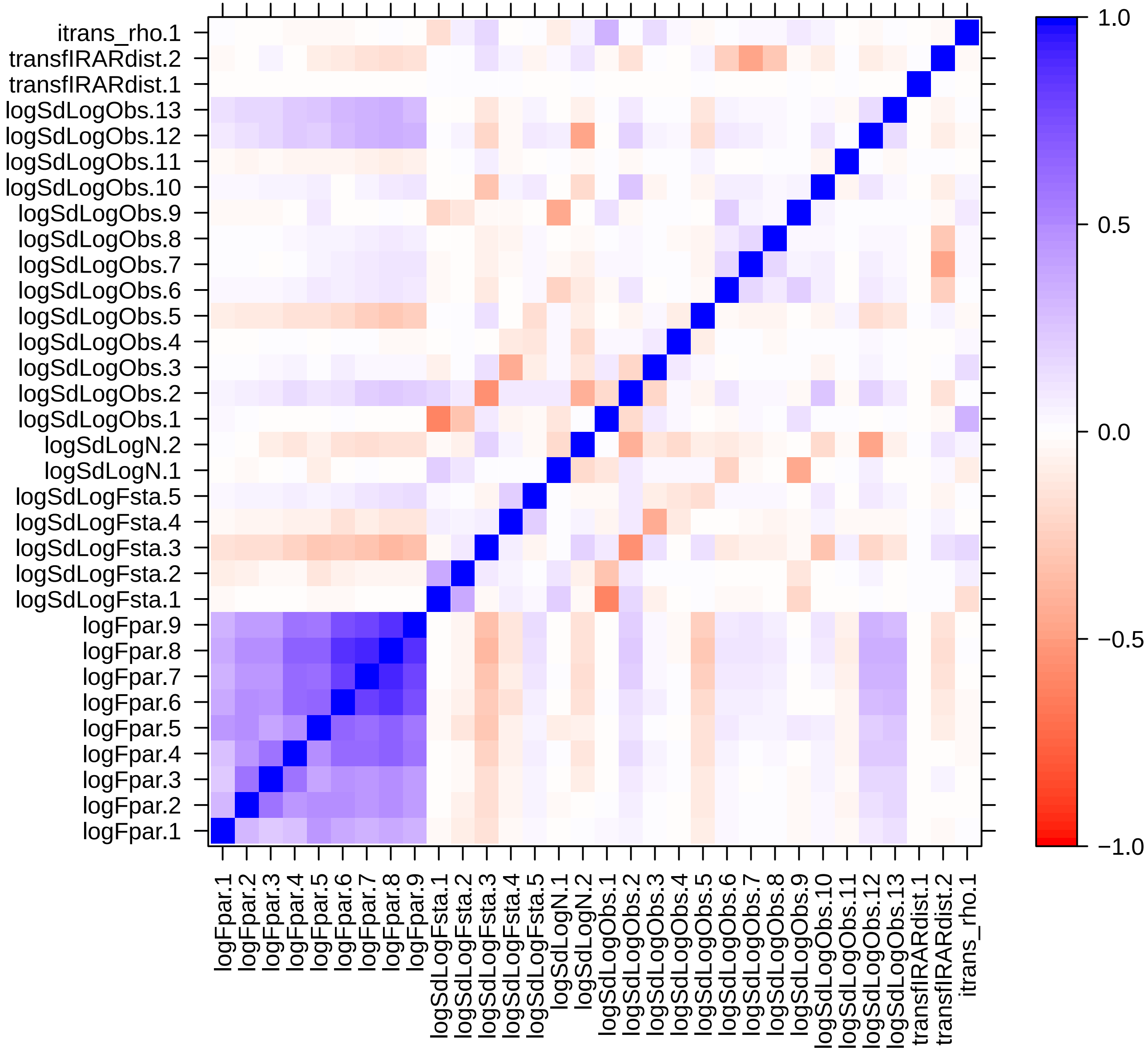
c) Standardised residuals over time

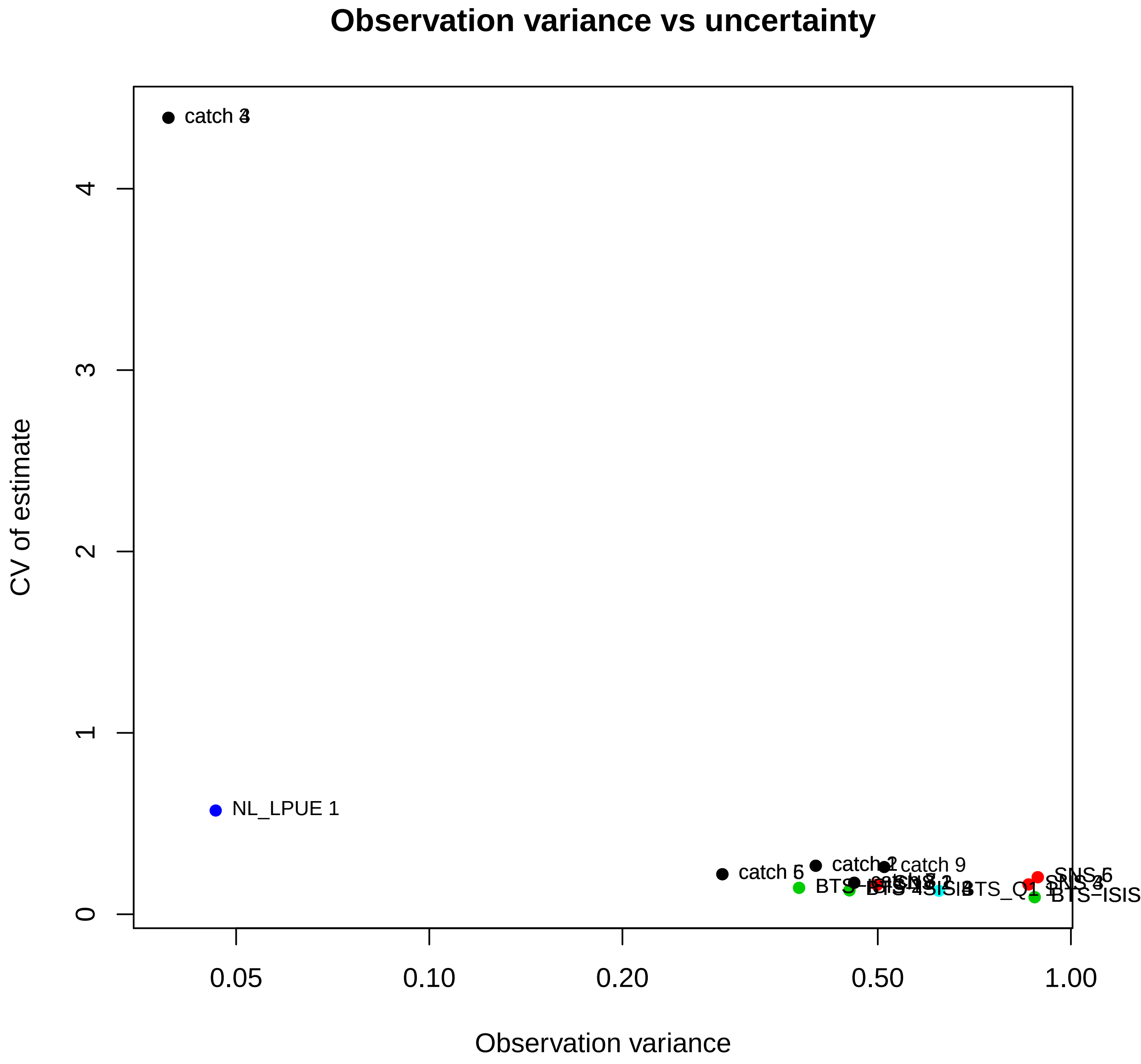
d) Tukey−Anscombe plot

e) Normal Q−Q plot

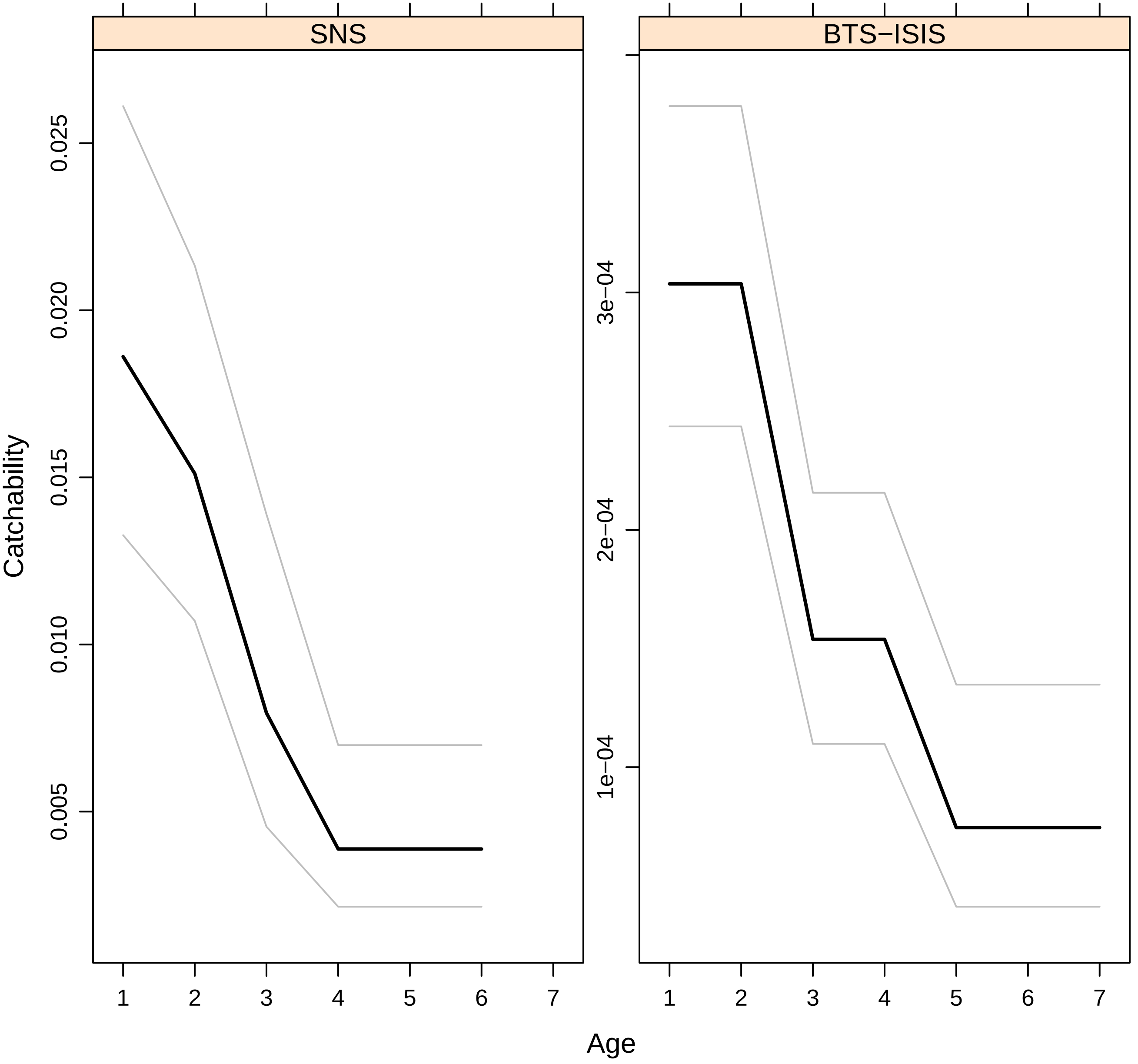
f) Autocorrelation of Residuals

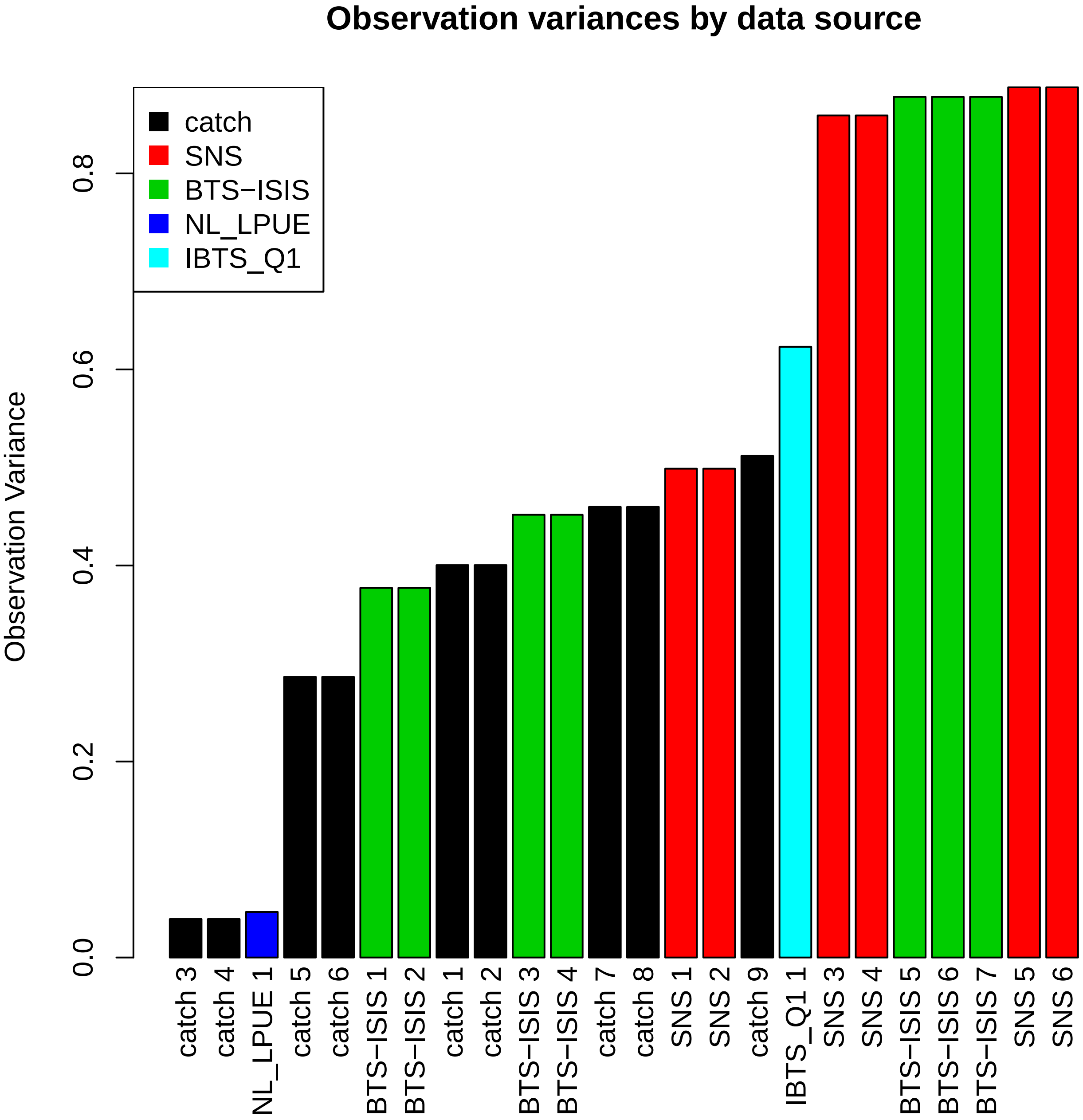
Turbot in IV pg 9



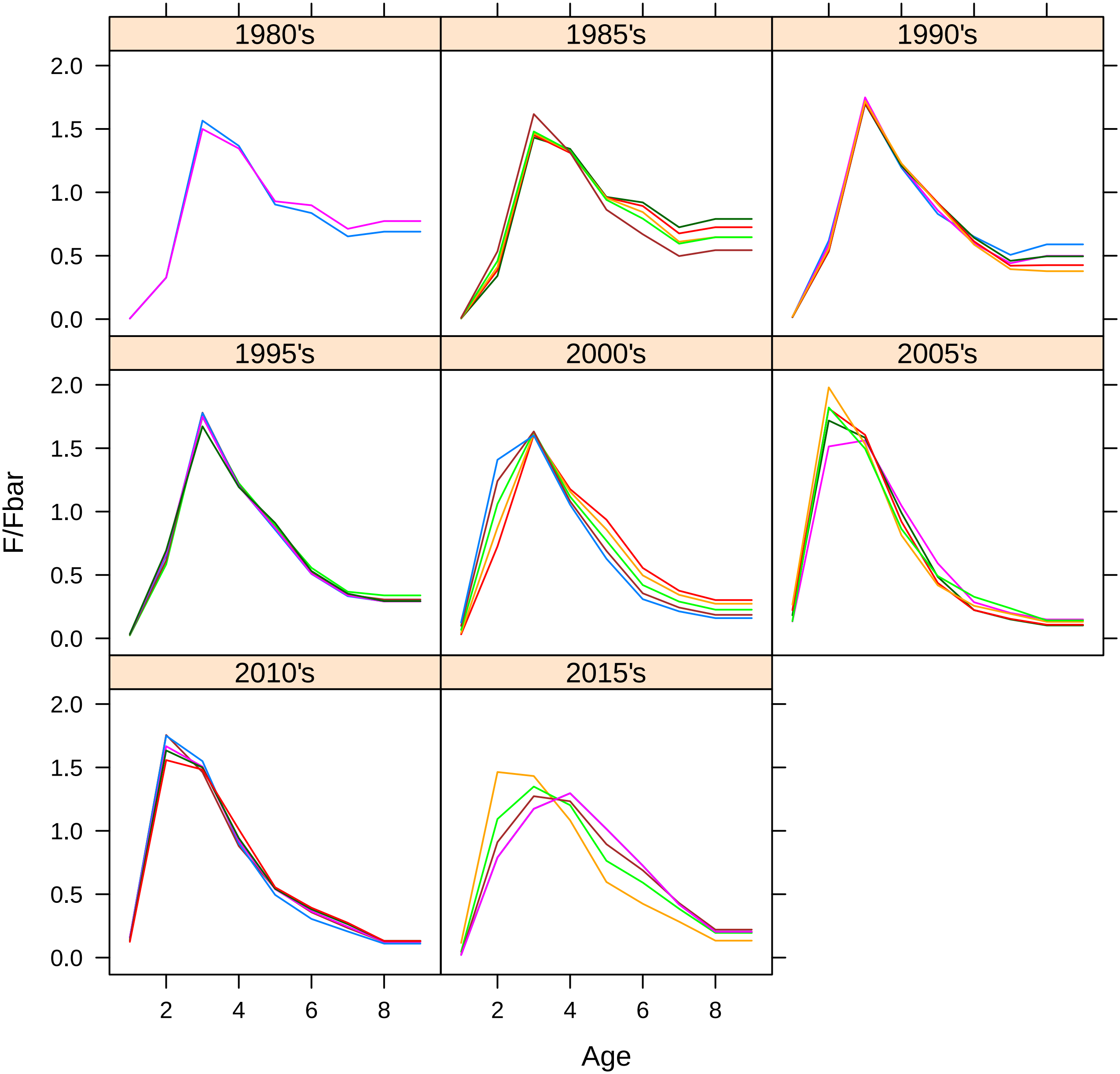

Observation variance vs uncertainty
CV of estimate
0
1
2
3
4
Observation variance
0.05
0.10
0.20
0.50
1.00
catch 3
catch 4
NL_LPUE 1
catch 5
catch 6
catch 1
catch 2
catch 9
catch 7
catch 8
BTS-ISIS
SNS 1
SNS 2
BTS_Q1 1
SNS 3
SNS 4
SNS 5
SNS 6
BTS-ISIS

Survey catchability parameters

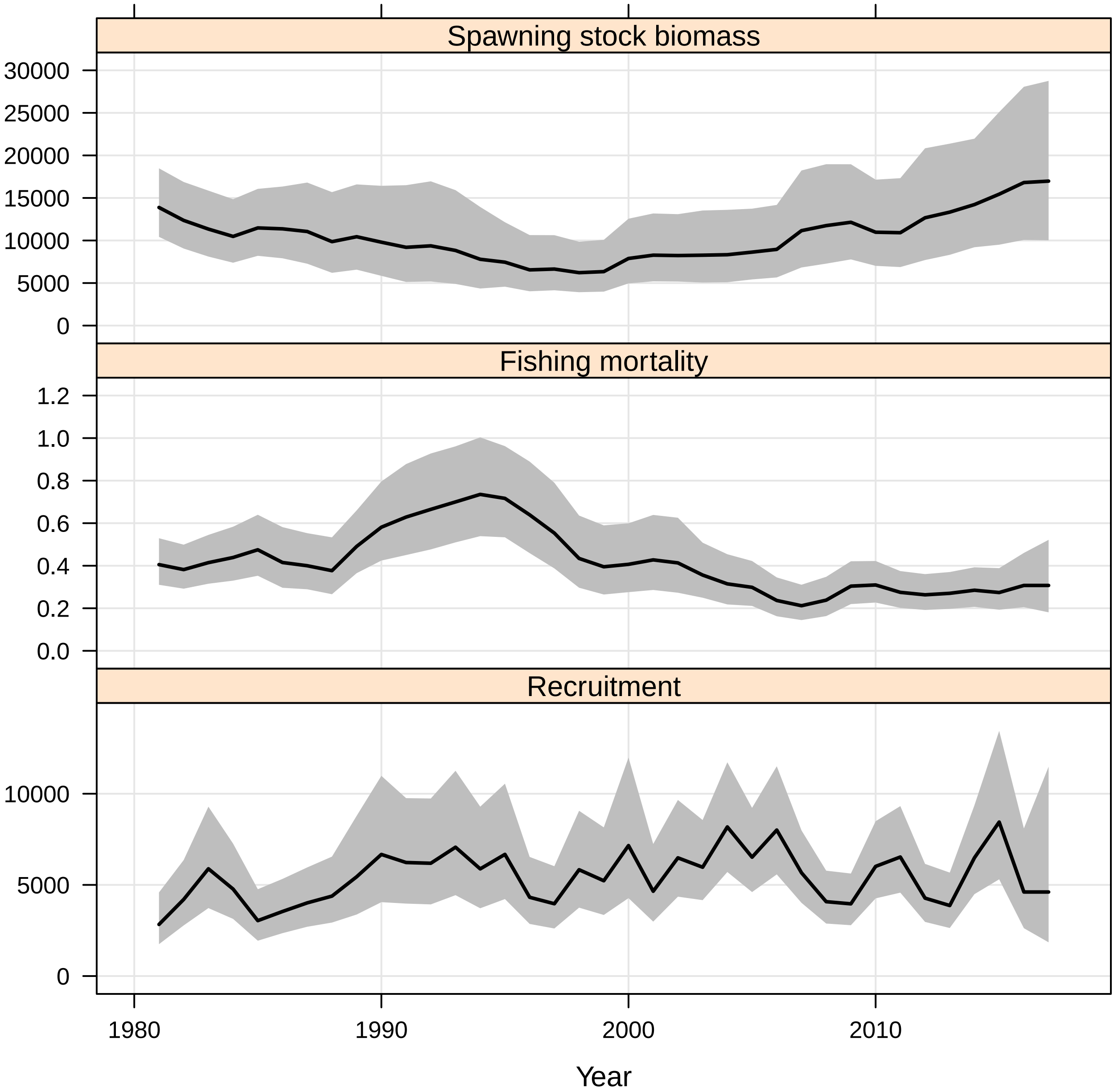



Observation variances by data source
Observation Variance
0.0
0.2
0.4
0.6
0.8
catch
SNS
BTS−ISIS
NL_LPUE
IBTS_Q1
catch 3
catch 4
NL_LPUE 1
catch 5
catch 6
BTS−ISIS 1
BTS−ISIS 2
catch 1
catch 2
BTS−ISIS 3
BTS−ISIS 4
catch 7
catch 8
SNS 1
SNS 2
catch 9
IBTS_Q1 1
SNS 3
SNS 4
BTS−ISIS 5
BTS−ISIS 6
BTS−ISIS 7
SNS 5
SNS 6

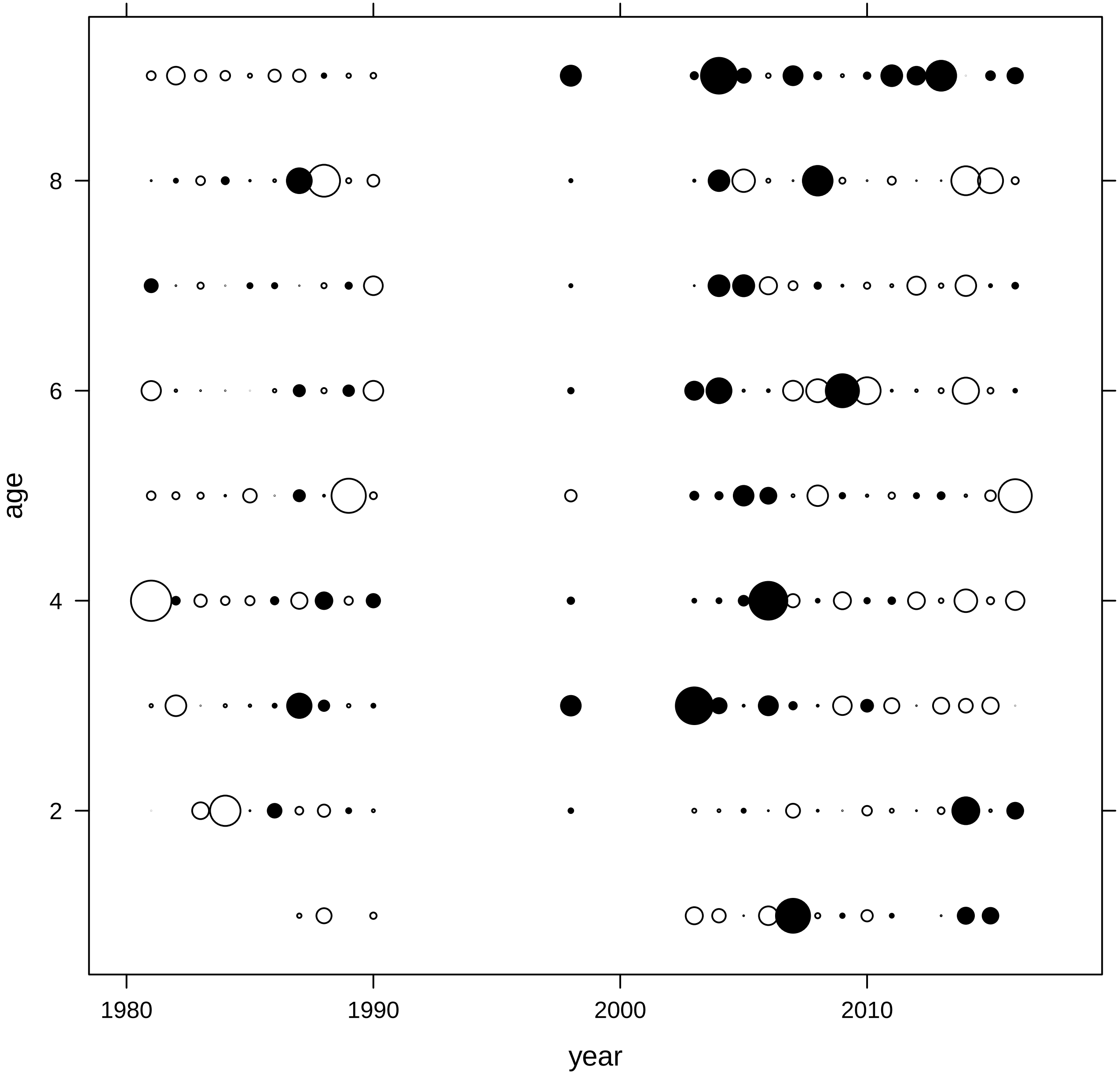
Selectivity of the Fishery by Pentad



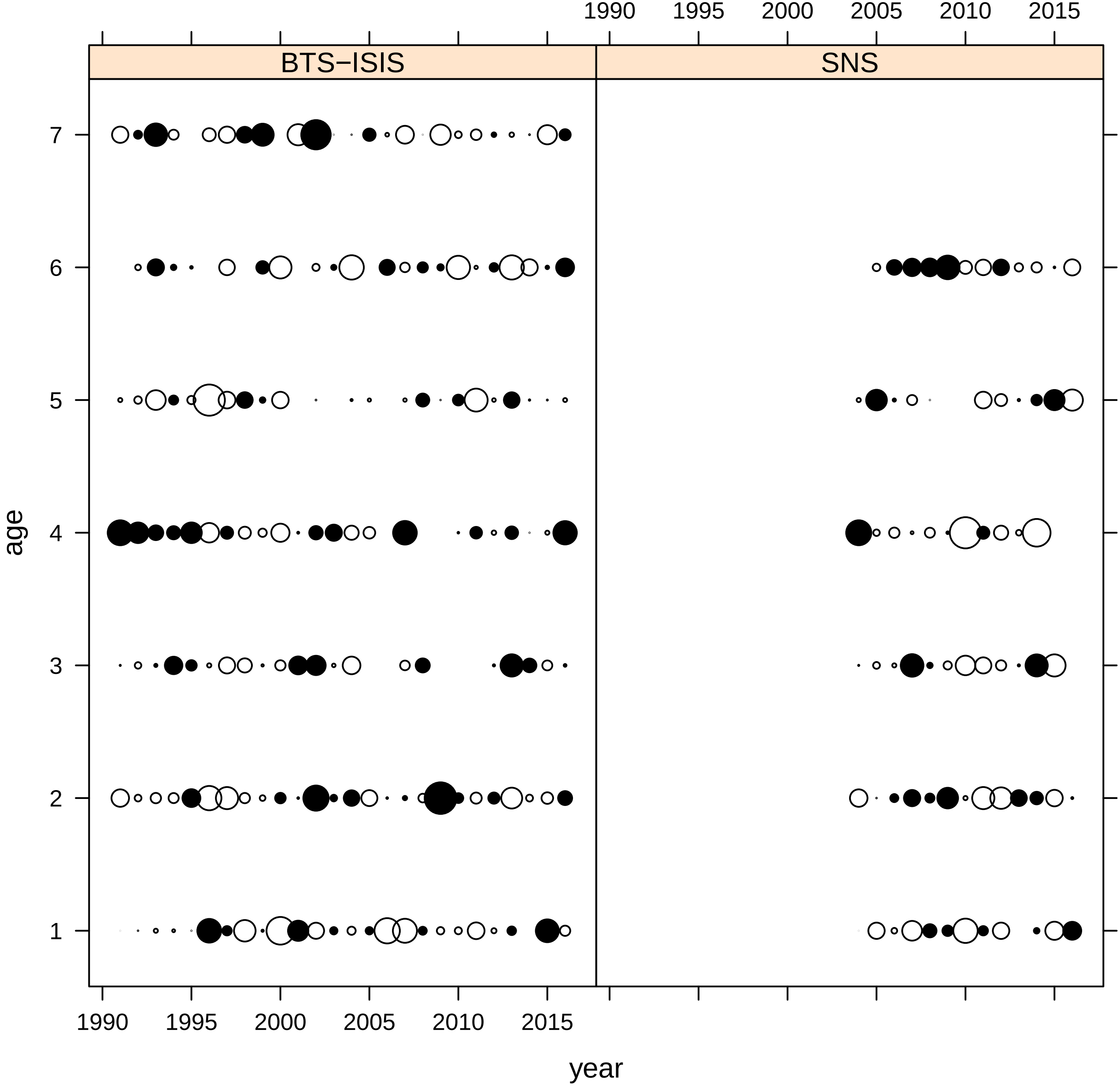
Turbot in IV pg 9



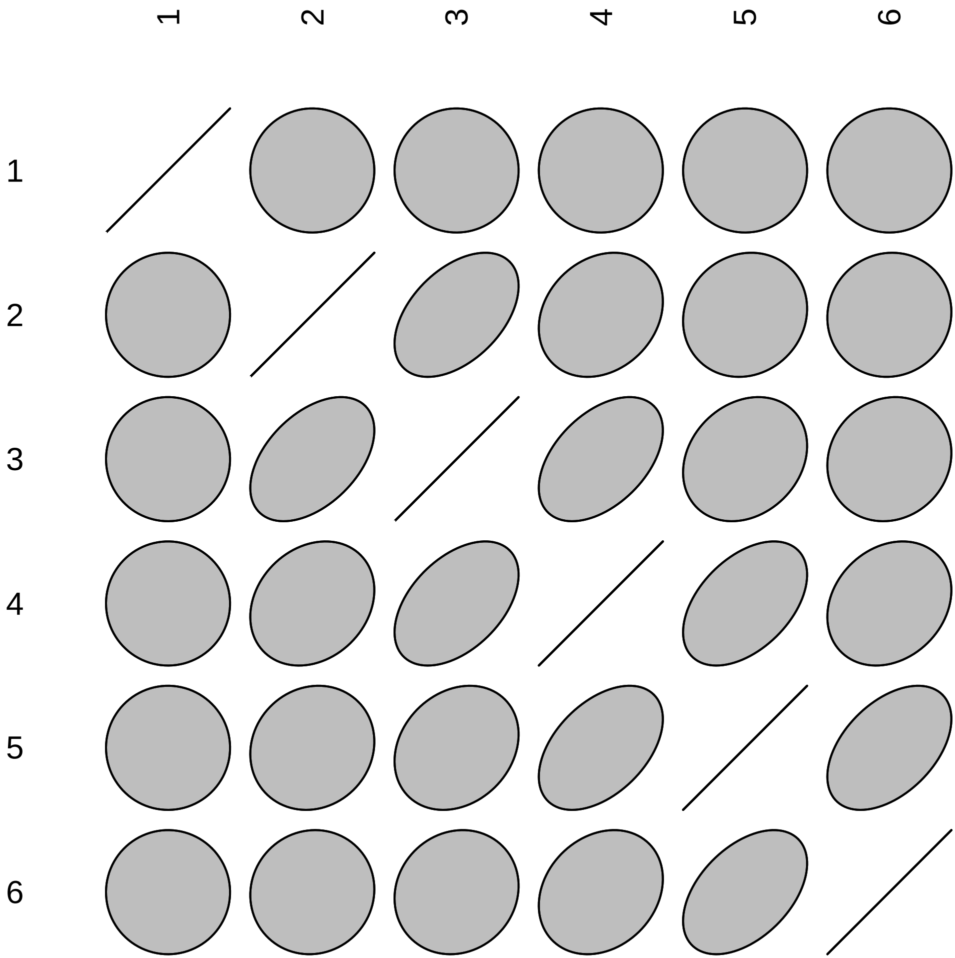
Residuals by year Catch

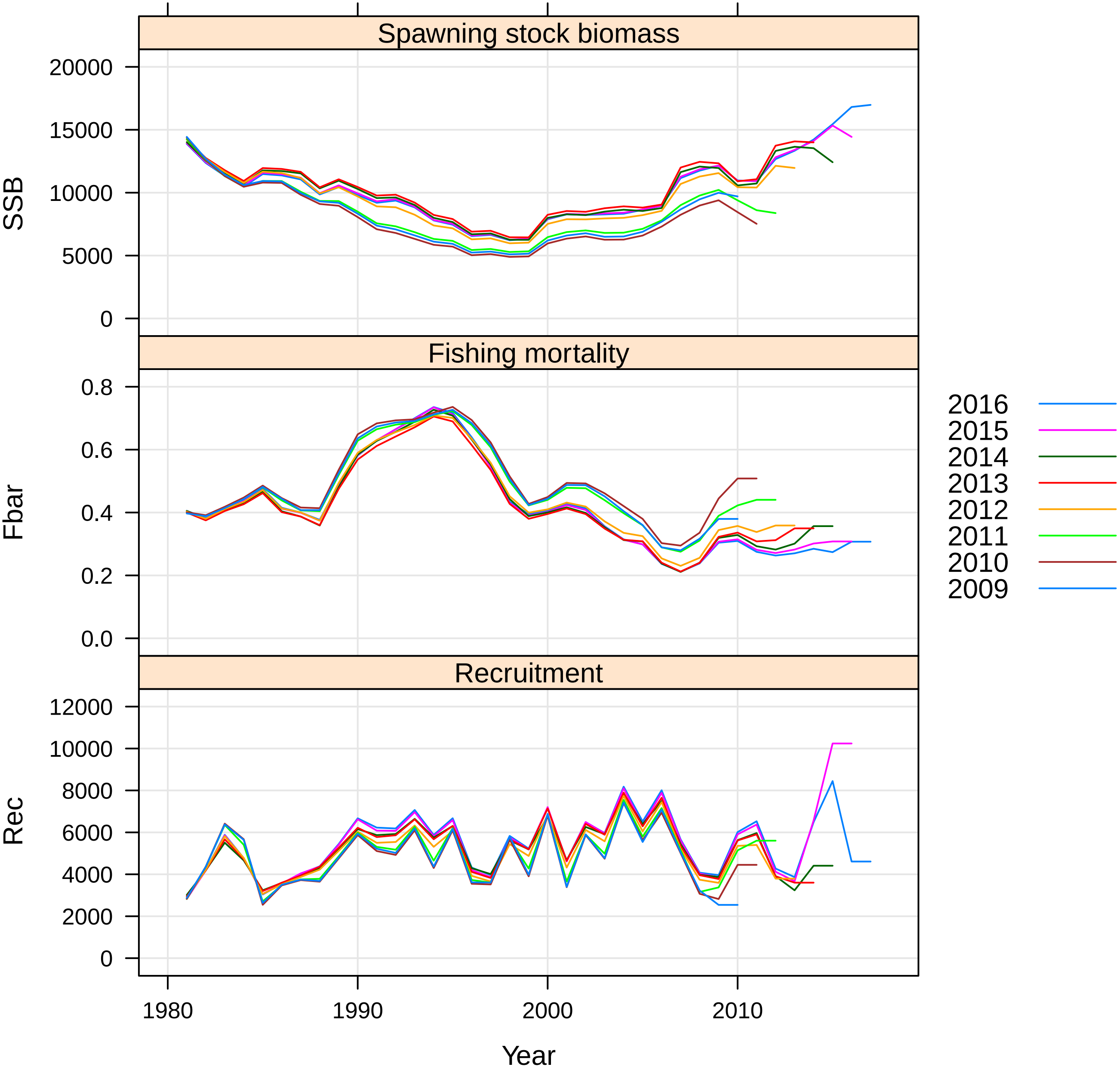


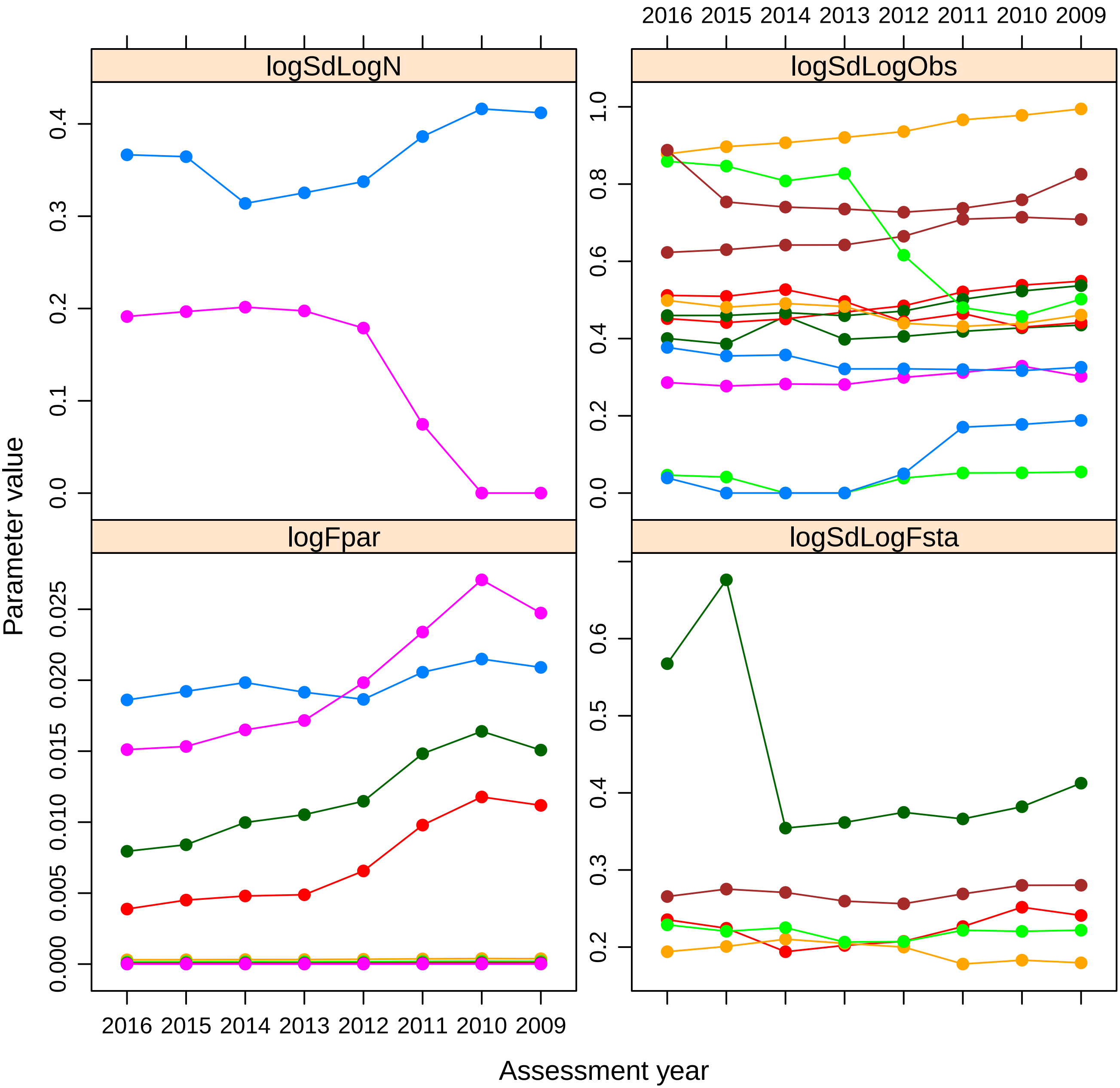
Residuals by survey

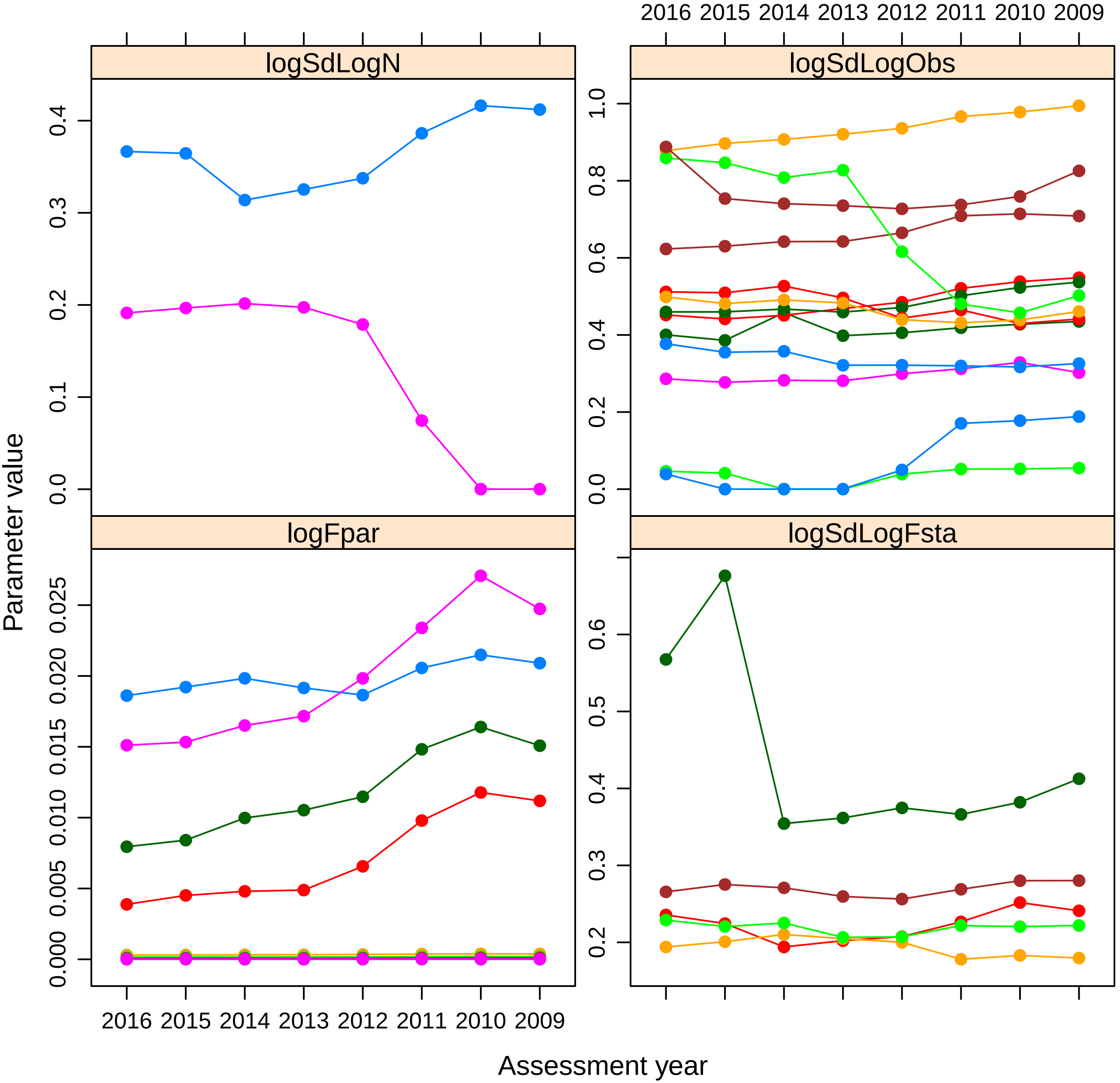


SNS

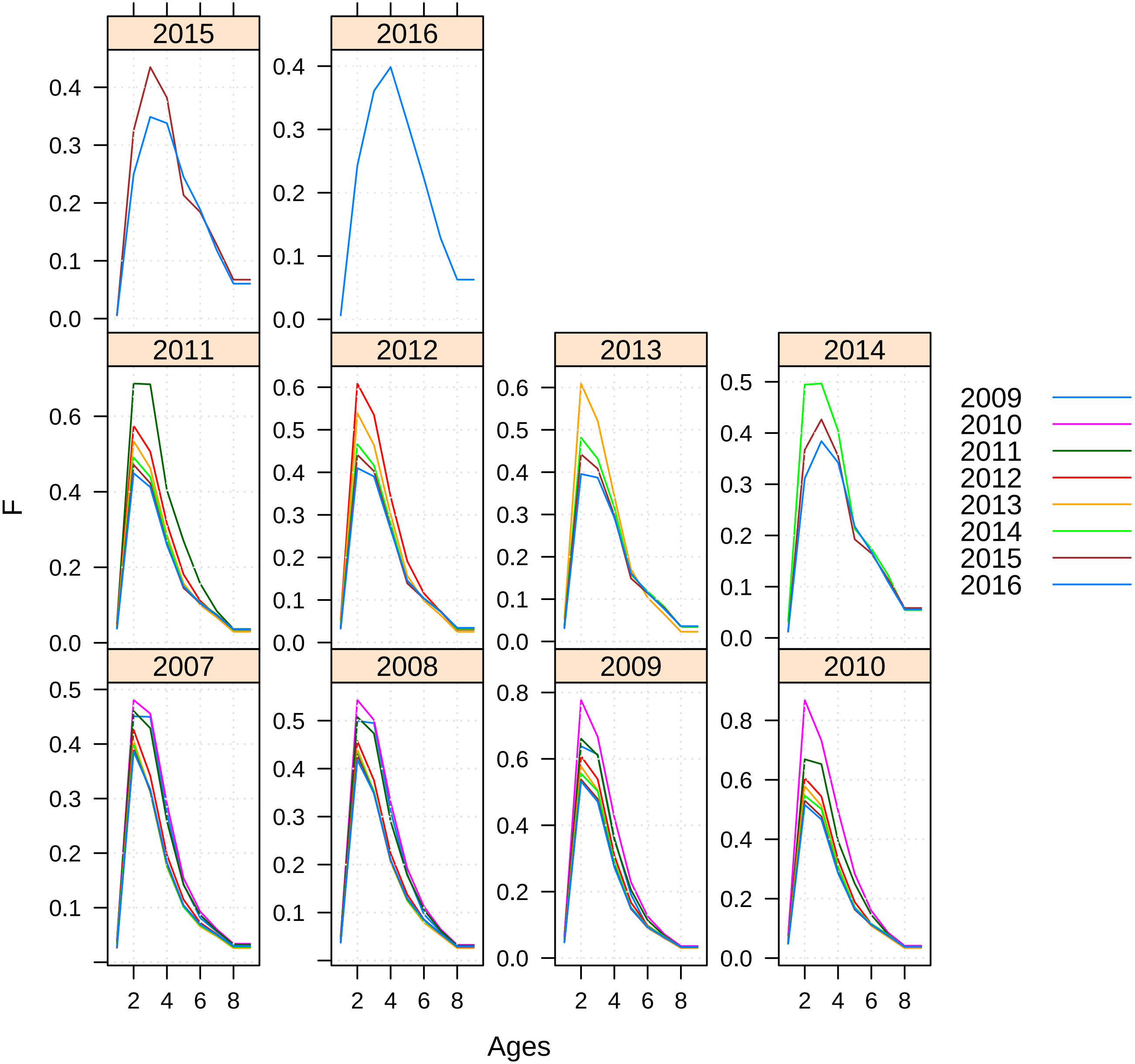


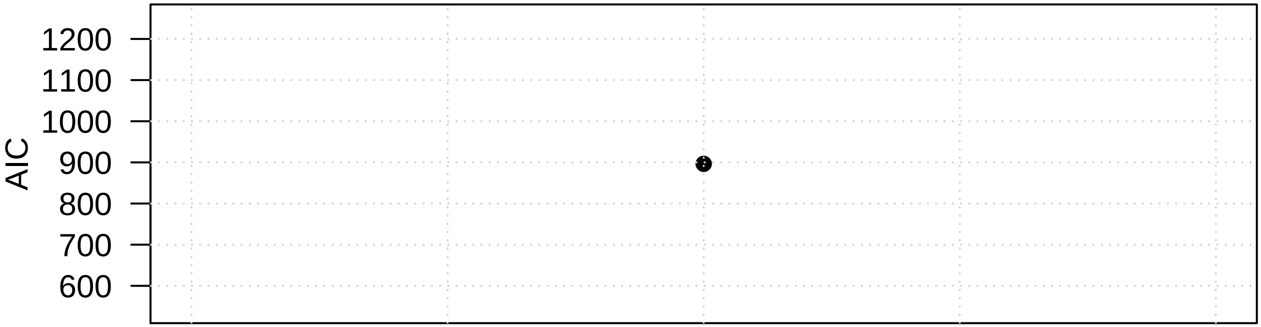

Spawning stock biomass
SSB
20000
15000
10000
5000
0
Fishing mortality
Fbar
0.8
0.6
0.4
0.2
0.0
Recruitment
Rec
12000
10000
8000
6000
4000
2000
0
1980
1990
2000
2010
Year
2016
2015
2014
2013
2012
2011
2010
2009

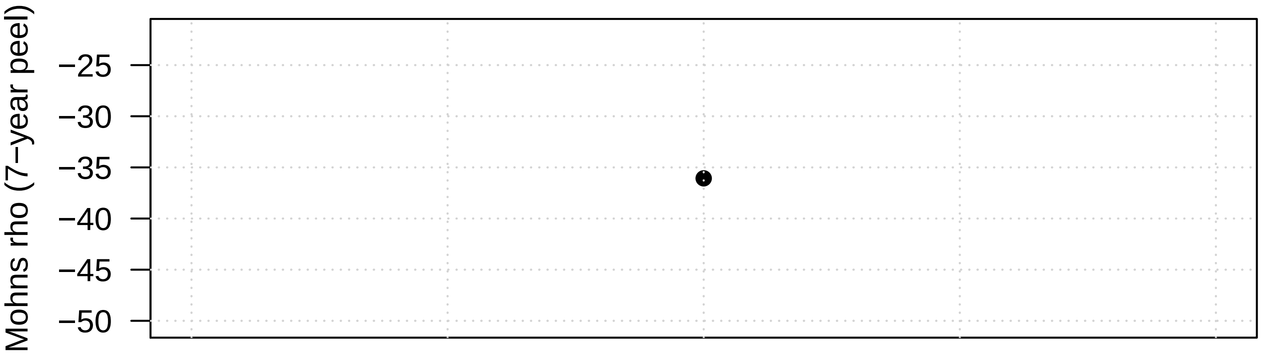

logSdLogN
logSdLogObs
logFpar
logSdLogFsta
Parameter value
Assessment year
2016 2015 2014 2013 2012 2011 2010 2009
2016 2015 2014 2013 2012 2011 2010 2009
0.0
0.1
0.2
0.3
0.4
0.0
0.2
0.4
0.6
0.8
1.0
0.000
0.005
0.010
0.015
0.020
0.025
0.2
0.3
0.4
0.5
0.6


logSdLogN
logSdLogObs
logFpar
logSdLogFsta
Parameter value
Assessment year
2016
2015
2014
2013
2012
2011
2010
2009
0.0
0.1
0.2
0.3
0.4
0.6
0.8
1.0
0.000
0.005
0.010
0.015
0.020
0.025
0.5

Retrospective pattern in F at age




AIC
1200
1100
1000
900
800
700
600


Mohns rho (7−year peel)
−25
−30
−35
−40
−45
−50