# Data weighting in the EPO YFT assessment

Alexandre Aires-da-Silva and Mark Maunder

External review of IATTC yellowfin tuna assessment

La Jolla, USA, 15-19 October, 2012
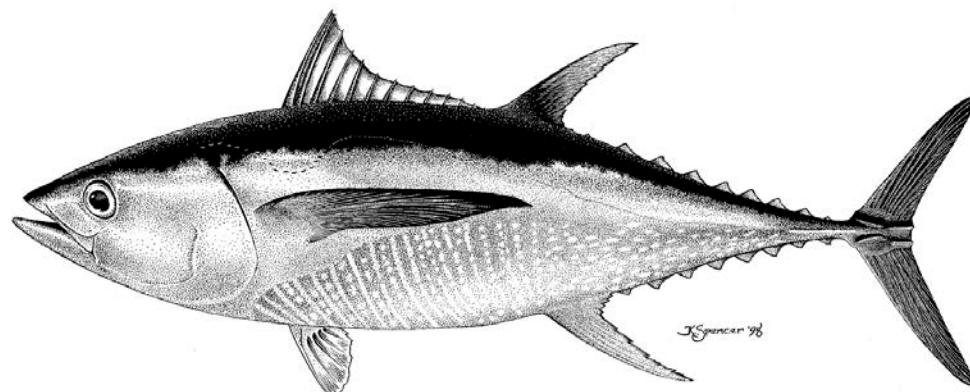
Data sources
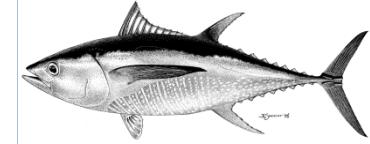
Data by type and year
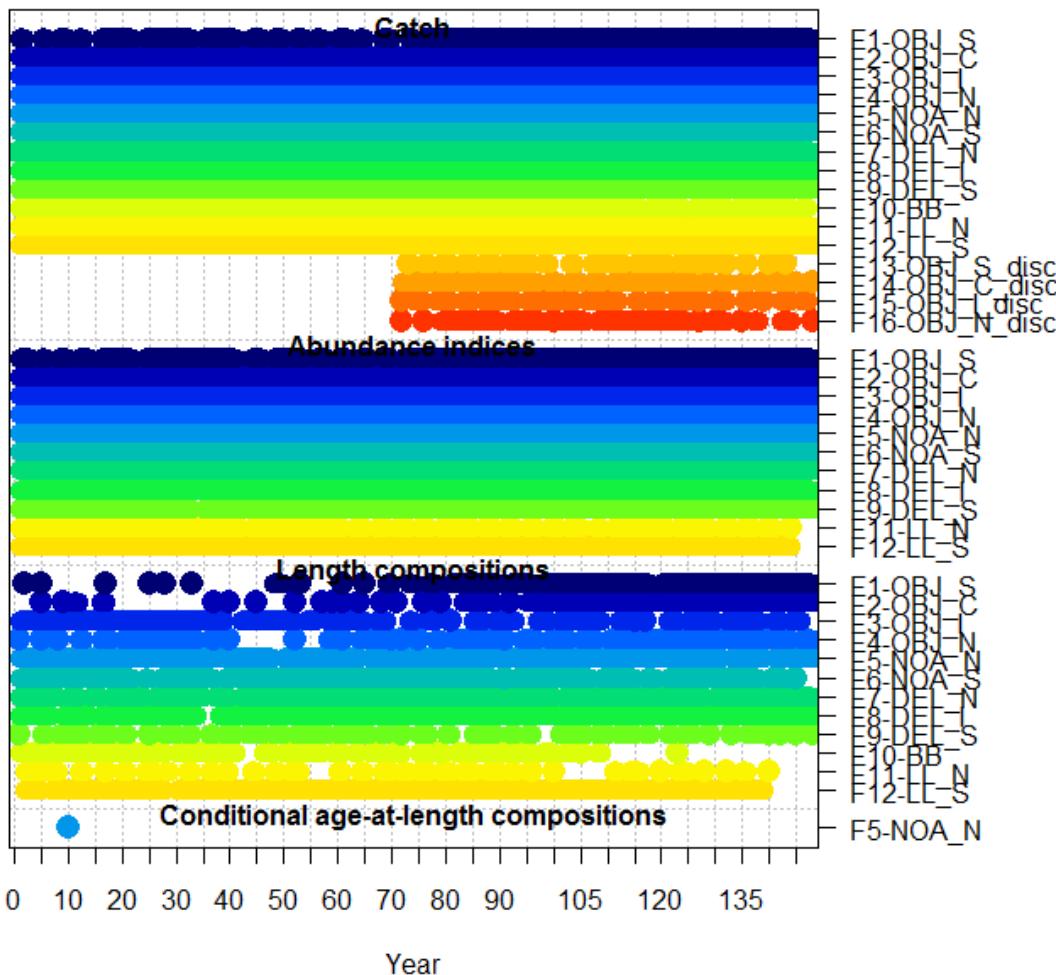
R0 likelihood profile
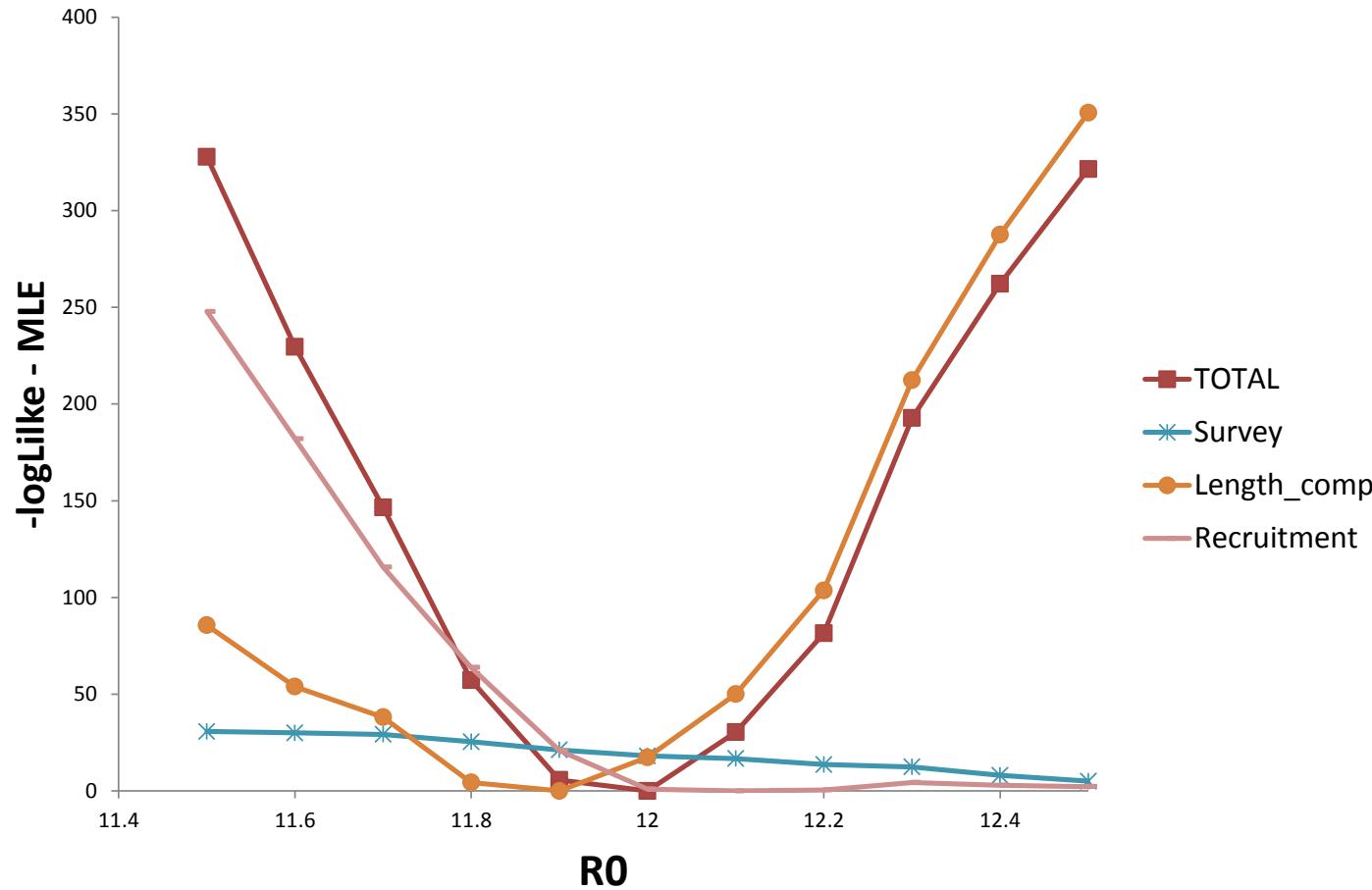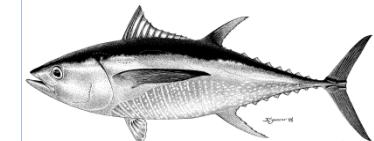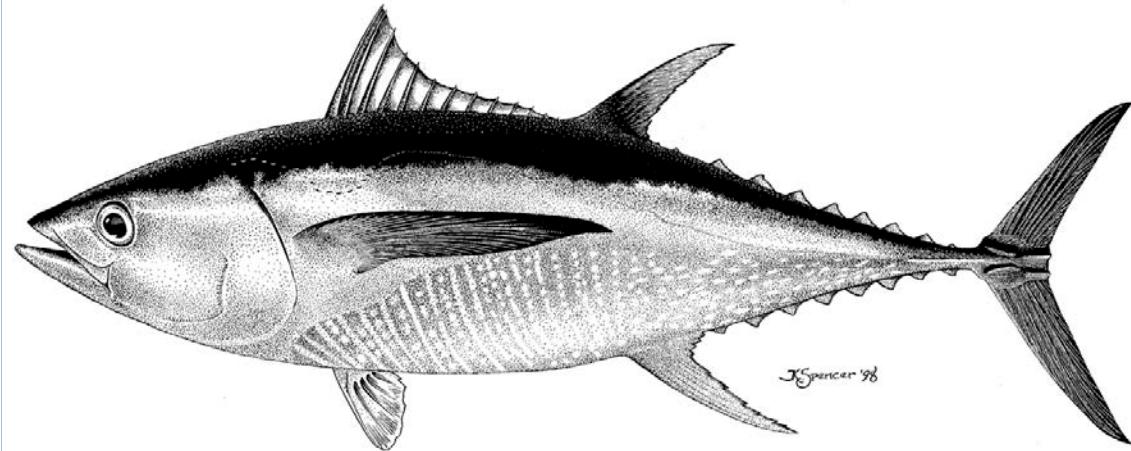
# CPUE WEIGHTING
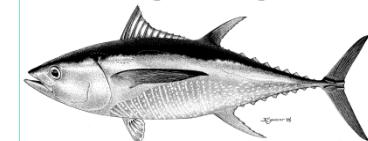
CPUE weighting

- Some CPUE were excluded because catch rates are very low and/or high variability

- Fit to 6 CPUE indices (F5-NOA_N, F6-NOA_S, F7-DEL_N, F8_DEL_I, F12-LL_S)

- Fixed CV of F12-LL_S (CV=0.2)

- Estimate CV of CPUE for all other fisheries. Weighting determined by estimating additive constant on the SD of the likelihood for each fishery

- Catchability (Q) is assumed constant over time

YFT catch-per-unit effort (CPUE)
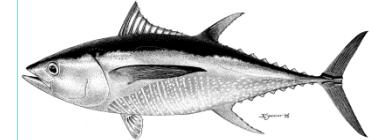
Scaled CPUE-CPUE escalada
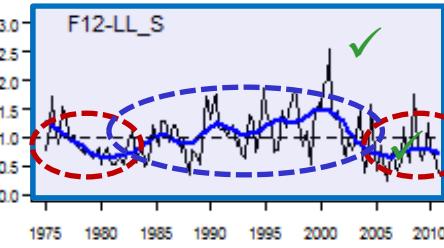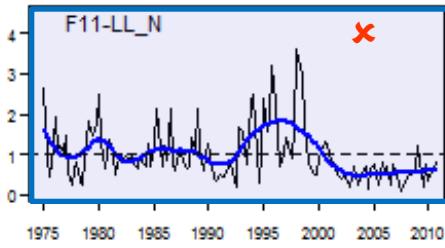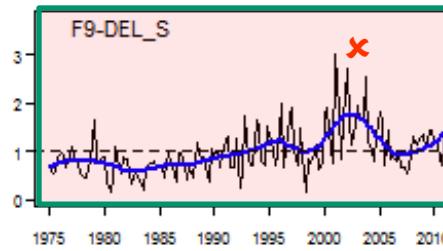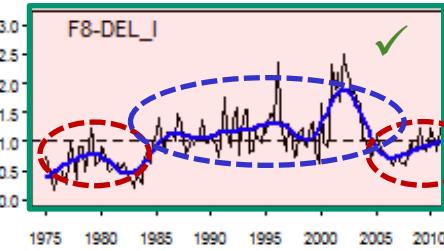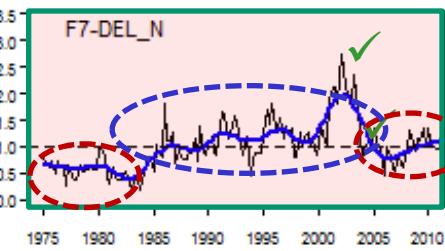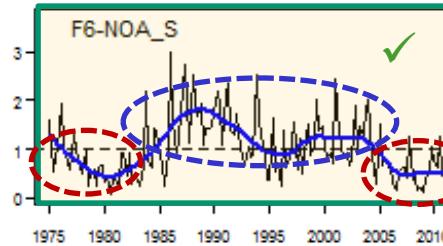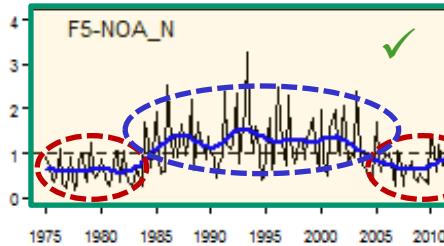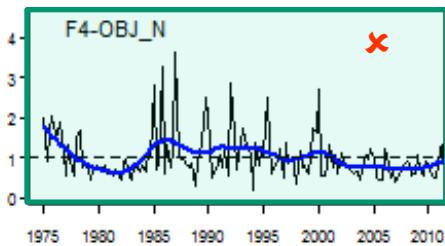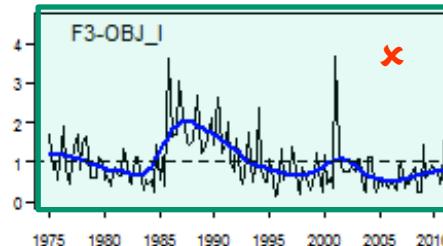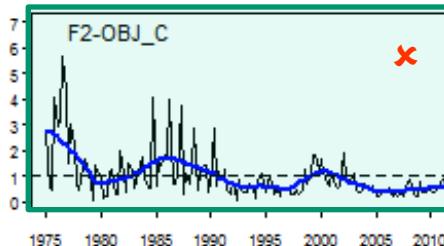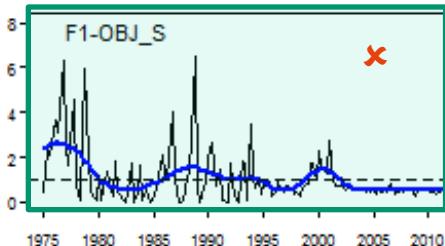
Year-año

OBJ

NOA

DEL

LL

CPUE variance

Fishery	r.m.s.e.	input	Used
F1-OBJ_S	0.35	estimated	No
F2-OBJ_C	0.41	estimated	No
F3-OBJ_I	0.69	estimated	No
F4-OBJ_N	0.41	estimated	No
F5-NOA_N	0.53	estimated	Yes
F6-NOA_S	0.64	estimated	Yes
F7-DEL_N	0.38	estimated	Yes
F8-DEL_I	0.37	estimated	Yes
F9-DEL_S	0.51	estimated	No
F11-LL_N	0.75	estimated	No
F12-LL_S	**0.37**	**0.2 (FIXED)**	**Yes**

LL-S CPUE fit
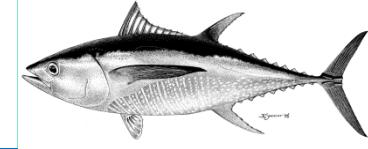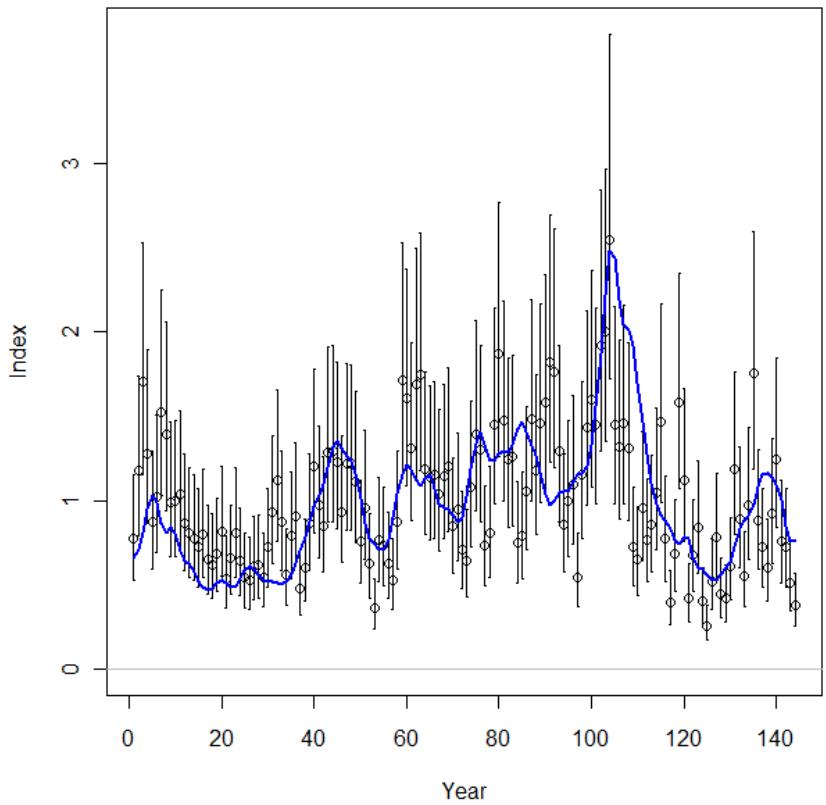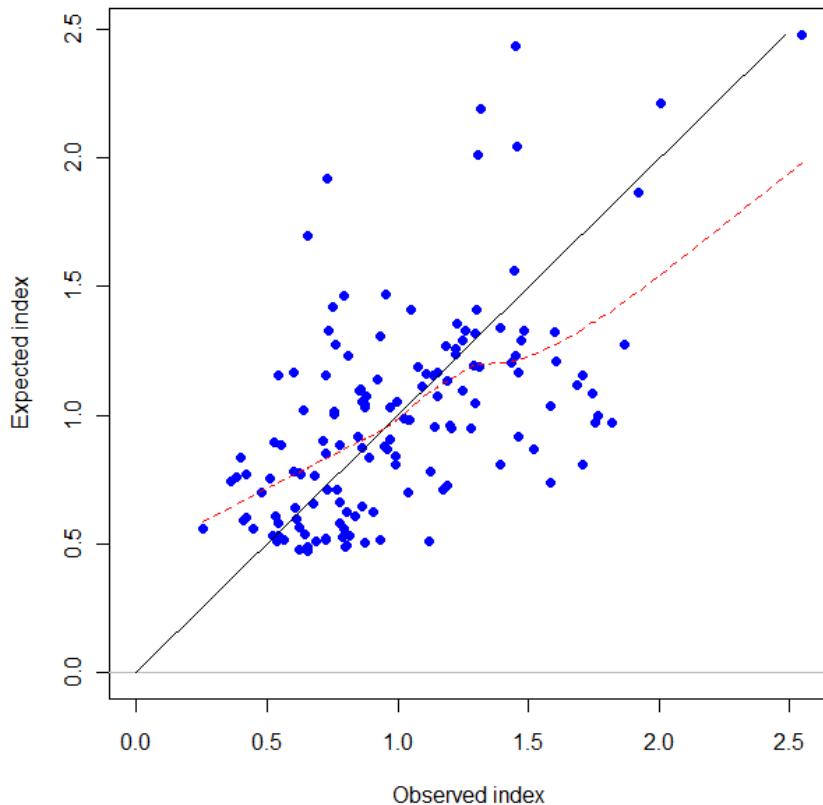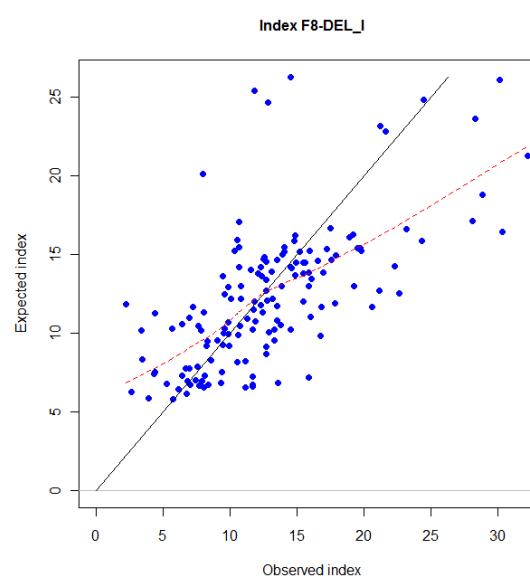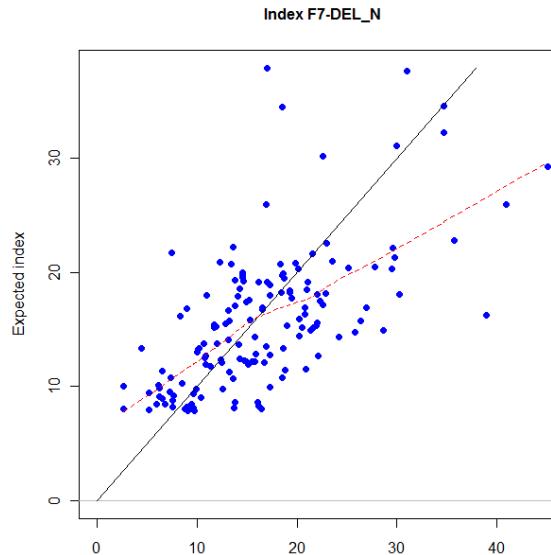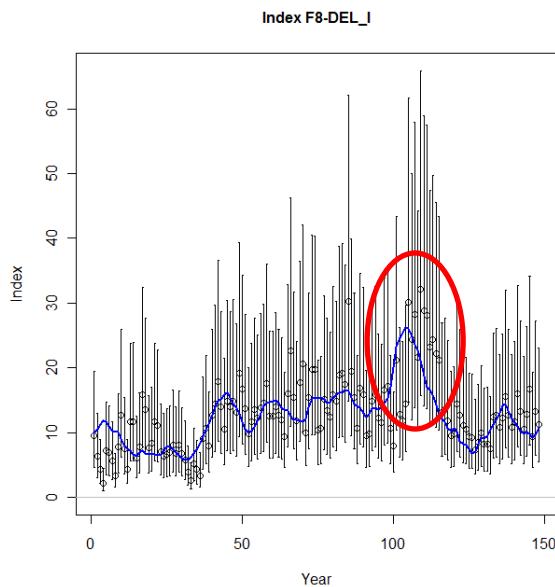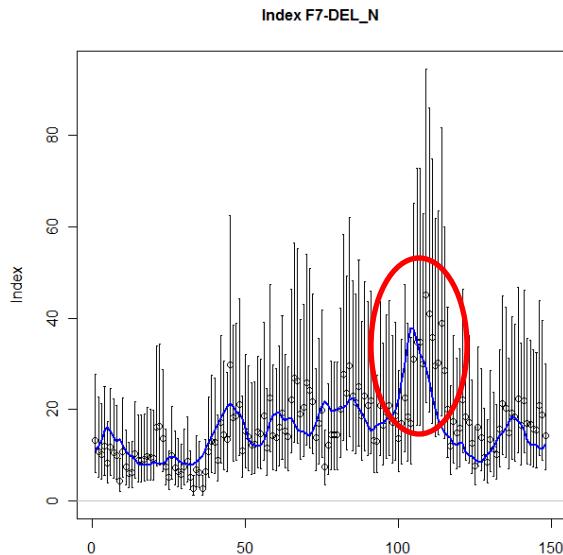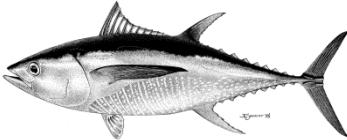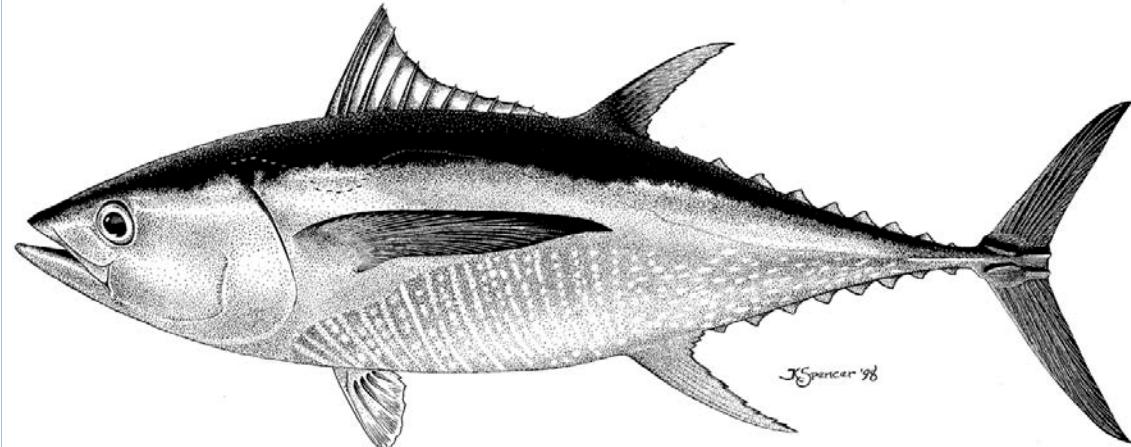
DEL CPUE fit

SENSITIVITIY ANALYSIS

Fitting to CPUE of DEL-N as main index
(fix CV of CPUE to 0.2)

DEL CPUE fits
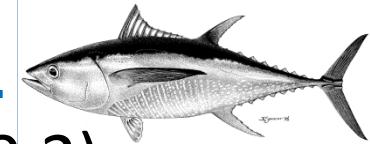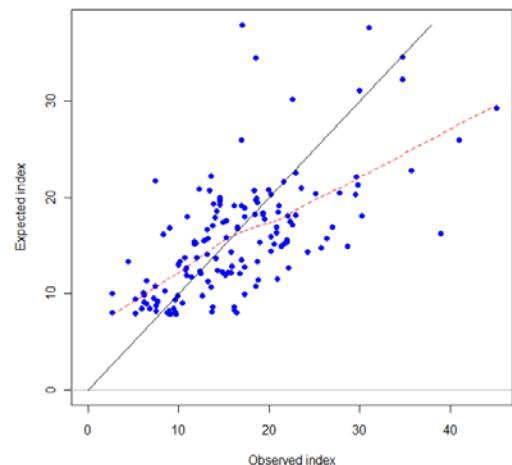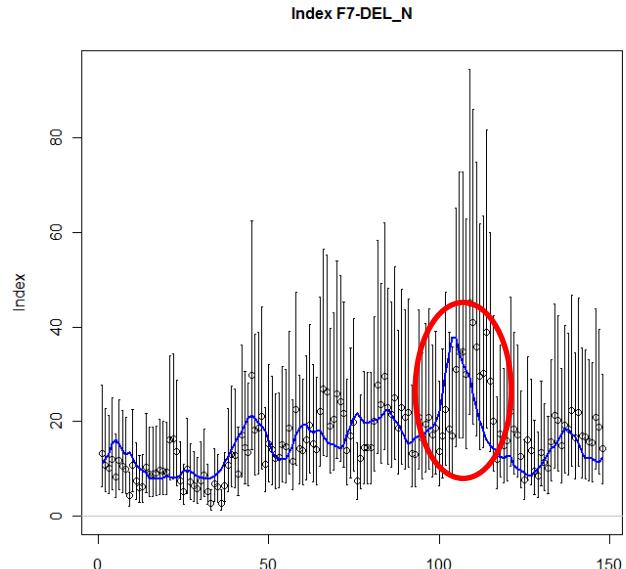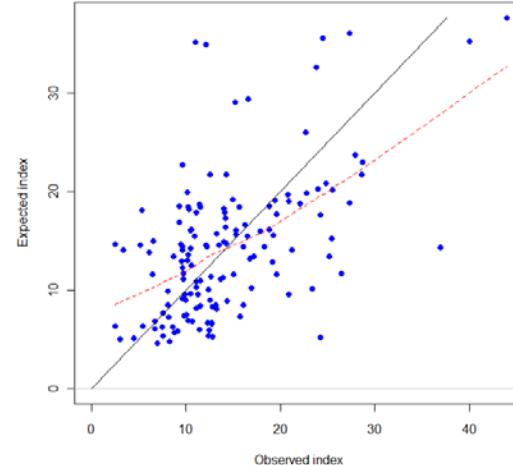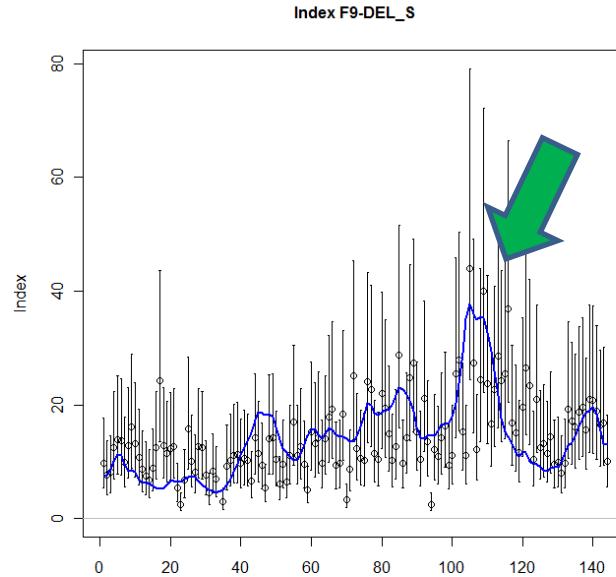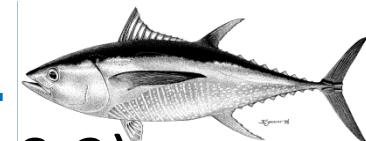
Base case

CPUE DEL-N (CV=0.2)

# LL CPUE fits

Base case
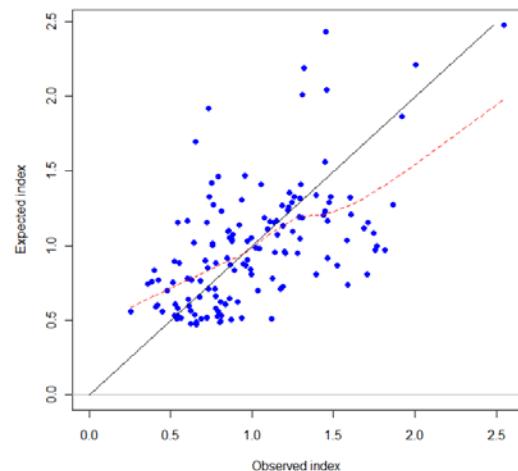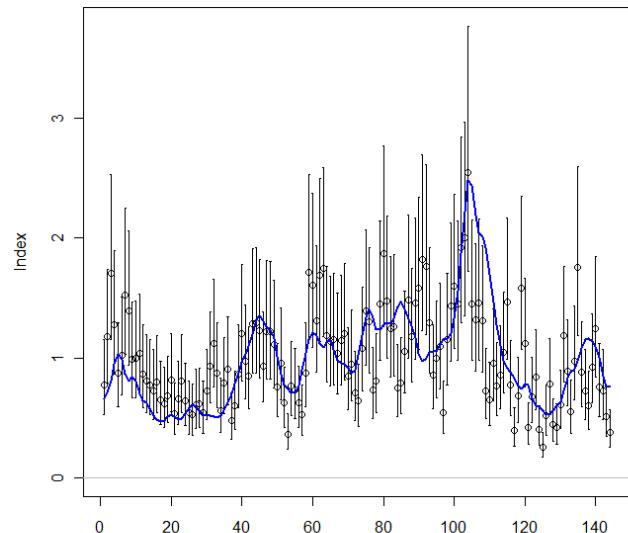
CPUE DEL-N (CV=0.2)
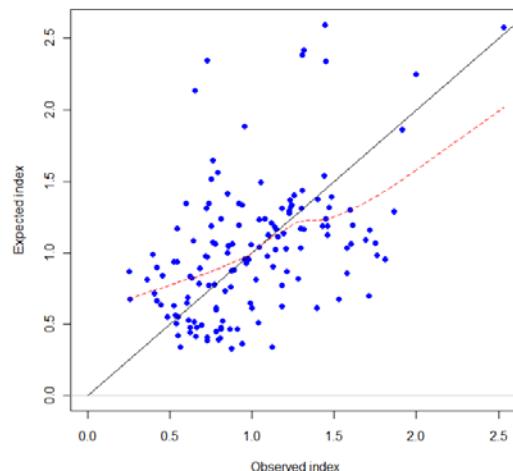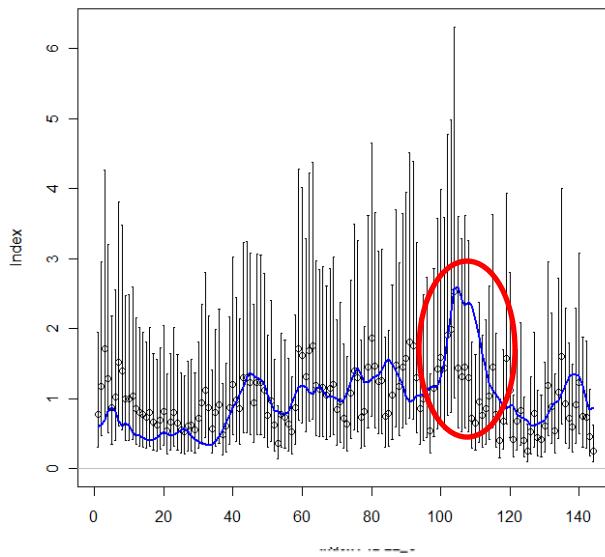
CPUE weighting
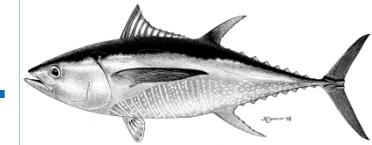
Base case

Fishery	r.m.s.e.	input	Used
F1-OBJ_S	0.35	estimated	No
F2-OBJ_C	0.41	estimated	No
F3-OBJ_I	0.69	estimated	No
F4-OBJ_N	0.41	estimated	No
F5-NOA_N	0.53	estimated	Yes
F6-NOA_S	0.64	estimated	Yes
F7-DEL_N	0.38	estimated	Yes
F8-DEL_I	0.37	estimated	Yes
F9-DEL_S	0.51	estimated	No
F11-LL_N	0.75	estimated	No
F12-LL_S	**0.37**	**0.2 (FIXED)**	**Yes**

CPUE DEL-N (CV=0.2)

Fishery	r.m.s.e.	input	Used
F1-OBJ_S	0.36	estimated	No
F2-OBJ_C	0.41	estimated	No
F3-OBJ_I	0.71	estimated	No
F4-OBJ_N	0.41	estimated	No
F5-NOA_N	0.54	estimated	Yes
F6-NOA_S	0.64	estimated	Yes
F7-DEL_N	**0.32**	**0.2 (FIXED)**	**Yes**
F8-DEL_I	0.34	estimated	Yes
F9-DEL_S	0.50	estimated	No
F11-LL_N	0.82	estimated	No
F12-LL_S	0.47	estimated	Yes

SAR 12 (2012)

Recruitment

SAR 12 (2012)

Summary biomass

SAR 12 (2012)
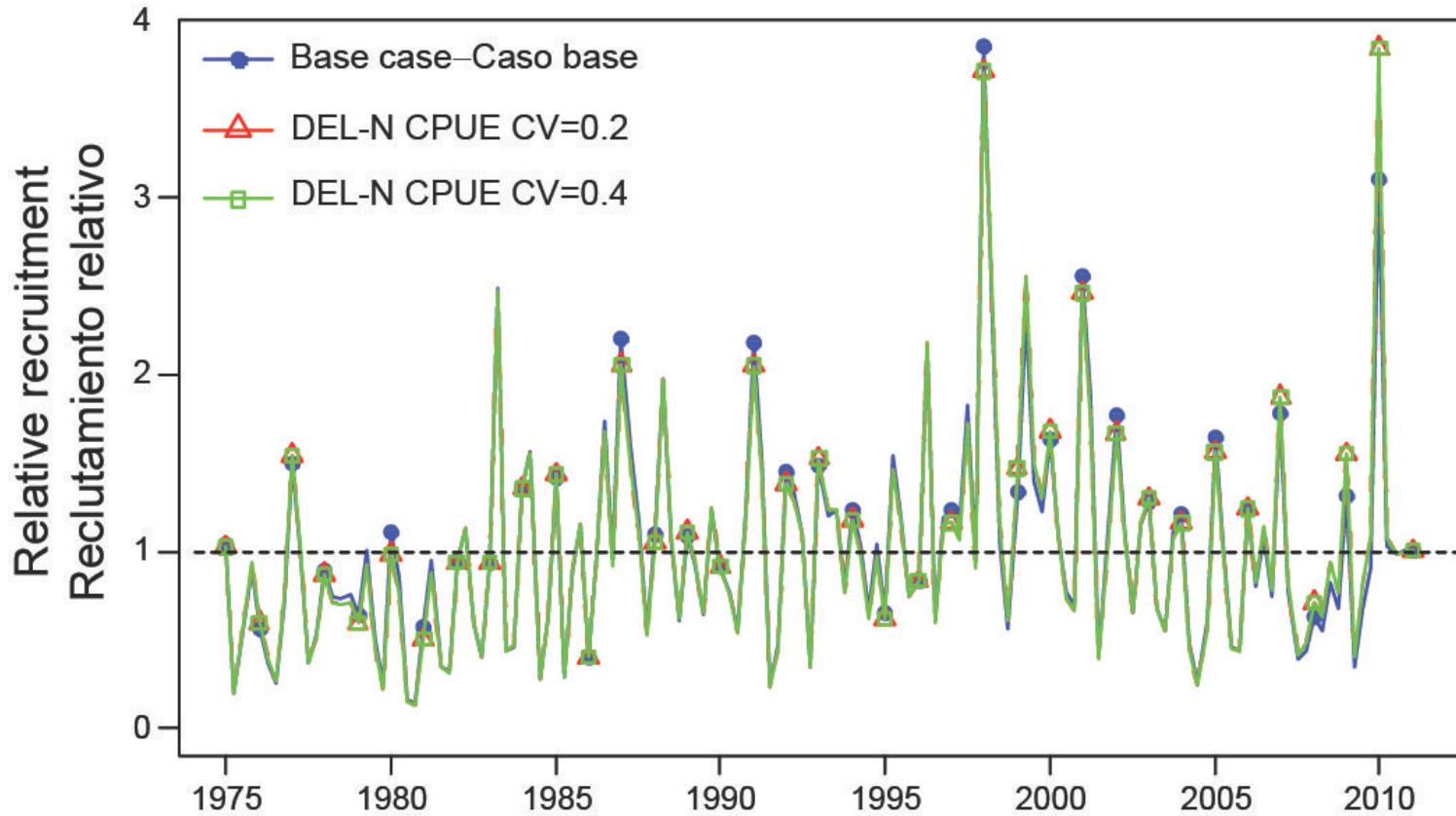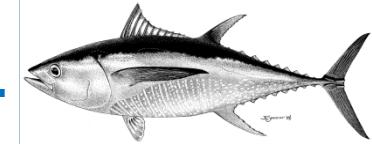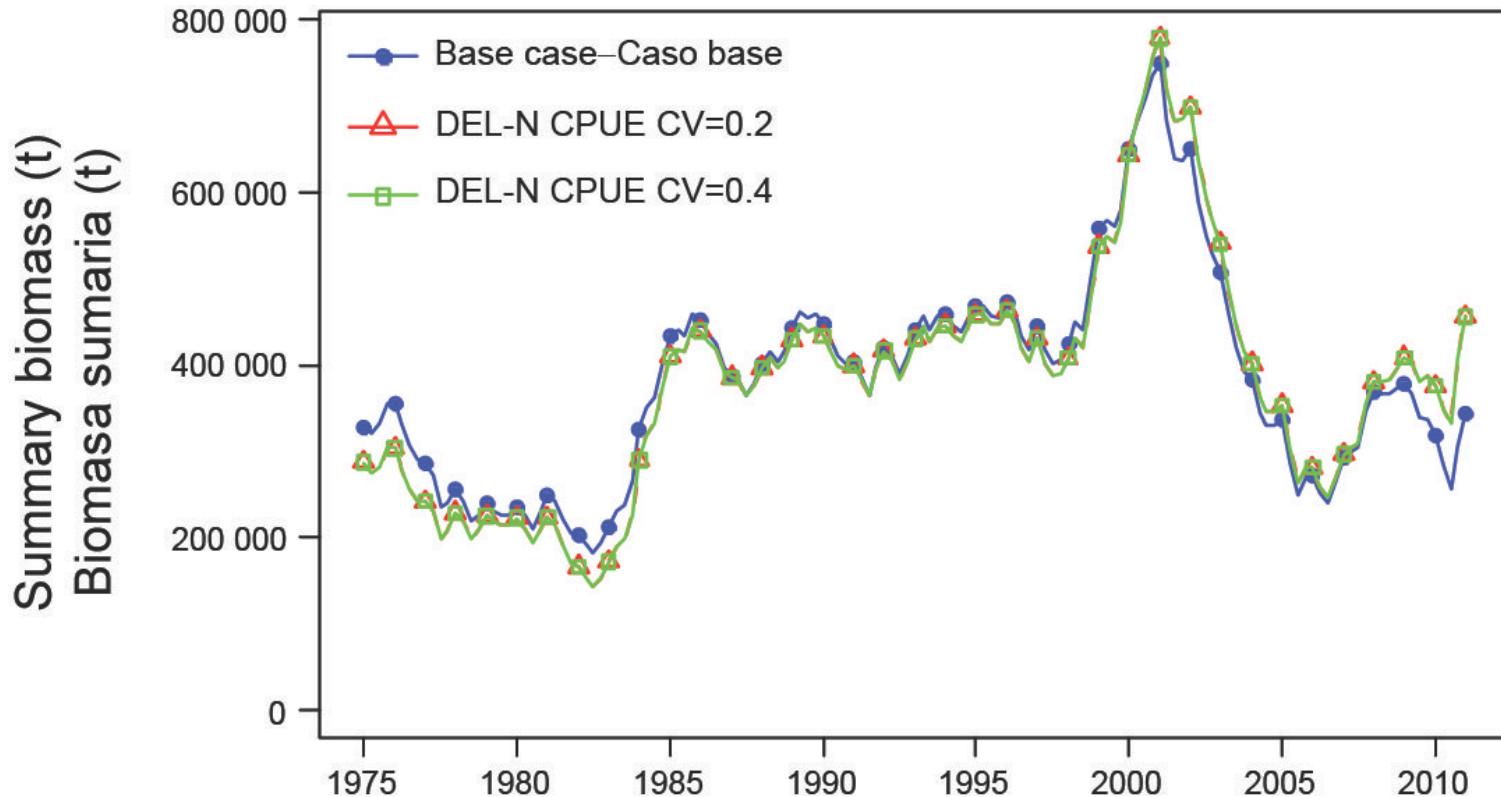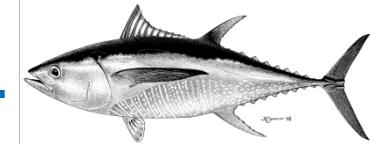
Spawning biomass ratio

SAR 12 (2012)
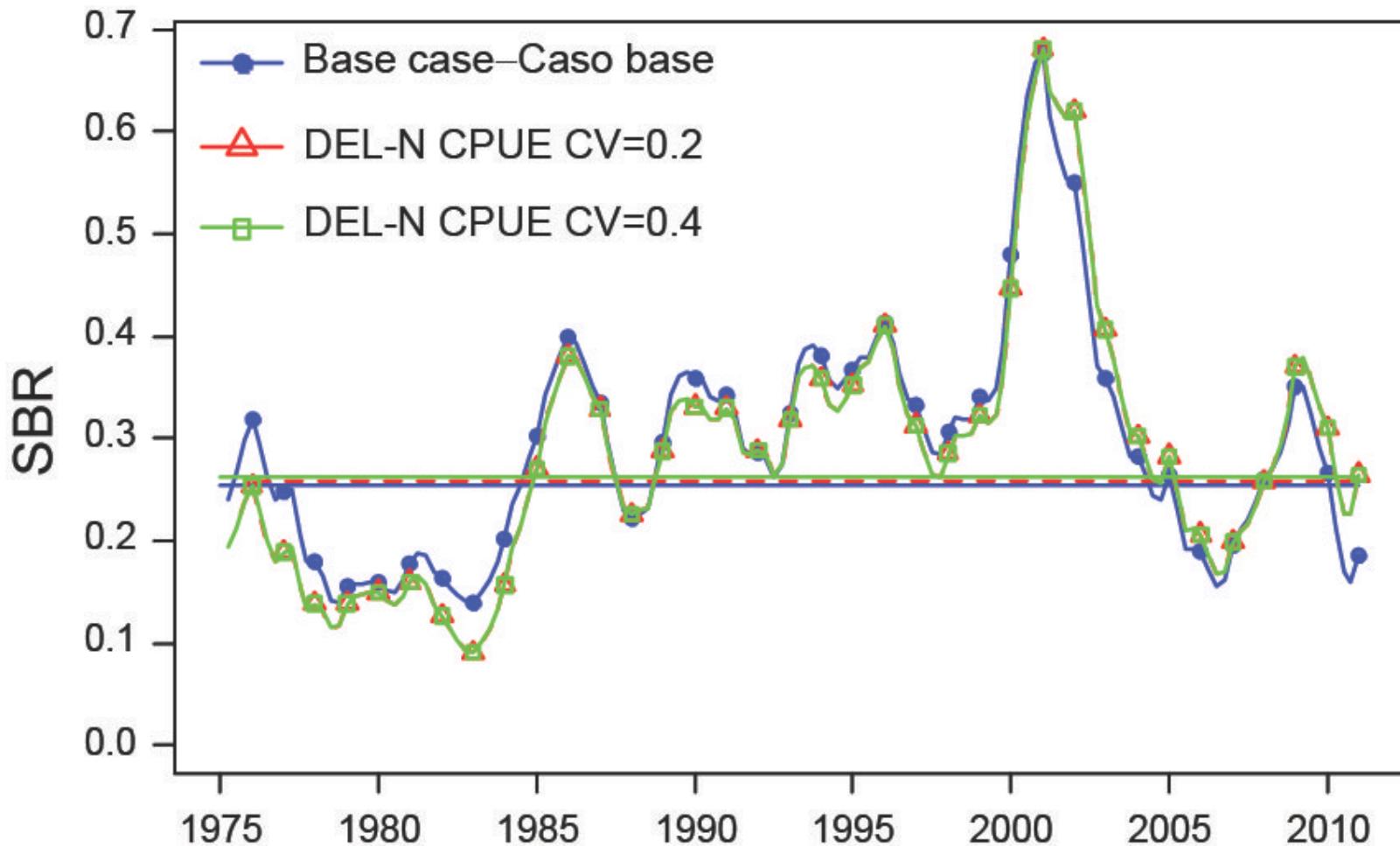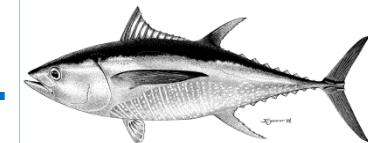
Management quantities
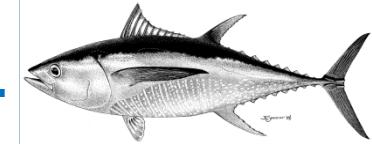
|	Basecase	CPUE DEL-N
MSY	262,857	266,470
Bmsy	354,958	362,808
Smsy	3,305	3,413
Bmsy/B0	0.31	0.32
Smsy/S0	0.26	0.26
Crecent/AMSY	0.88	0.87
Brecent/Bmsy	0.96	1.23
Srecent/Smsy	0.71	0.98
Fmultiplier	1.13	1.29

SAR 12 (2012)
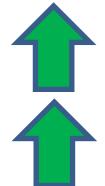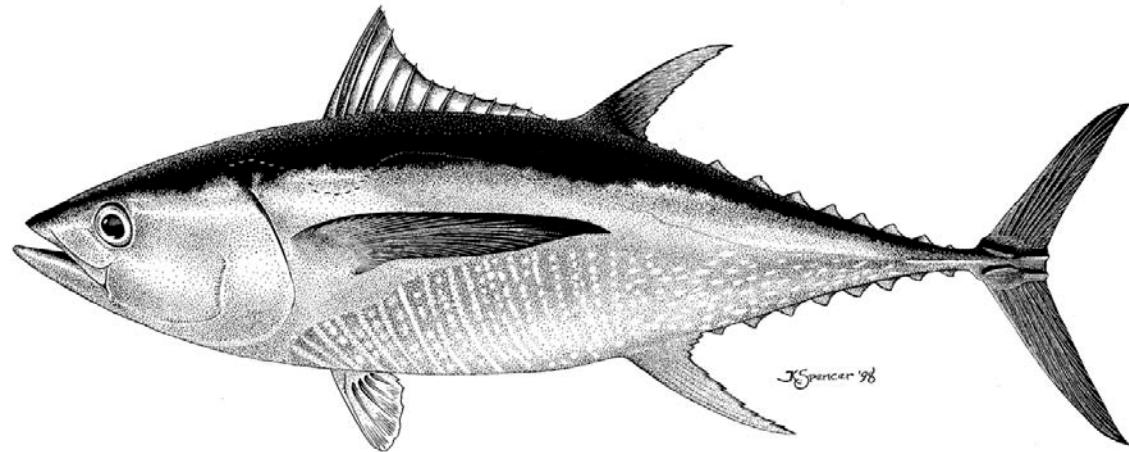
# SIZE-COMPOSITION WEIGHTING
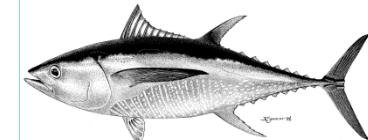
Size-composition weighting

- Aggregated by space (fisheries) and time (quarter) for the assessment

- The number of wells is used as the sample size for the surface fisheries

- The number of fish measured is used as the sample size for longline (LL) fisheries

- The LL sample size is scaled so that the average sample size for the LL-S fishery is the same as the average sample size for the surface fishery that has the greatest average sample size.

Fit to the size compositions
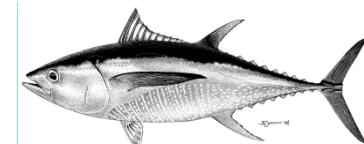
| Fishery	Mean input N	Mean effN	effN/N
F1-OBJ_S	14.3	33.0	2.3
F2-OBJ_C	13.5	28.6	2.1
F3-OBJ_I	13.2	23.9	1.8
F4-OBJ_N	10.9	57.7	5.3
F5-NOA_N	23.0	55.8	2.4
F6-NOA_S	20.5	34.2	1.7
F7-DEL_N	31.7	120.6	3.8
F8-DEL_I	29.6	130.5	4.4
F9-DEL_S	8.7	53.3	6.1
F10-BB	11.9	35.5	3.0
F11-LL_N	1.9	31.1	16.3
F12-LL_S	30.3	105.1	3.5

OBJ sample sizes
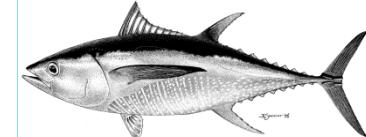
NOA sample sizes
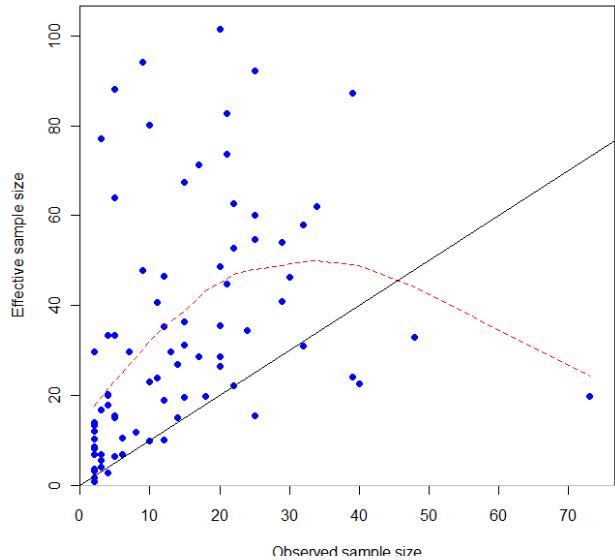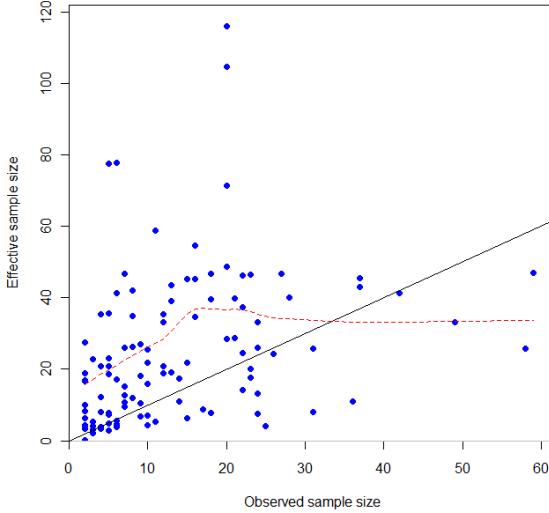
N-EffN comparison, length comps, sexes combined, whole catch, F5-NOA_N
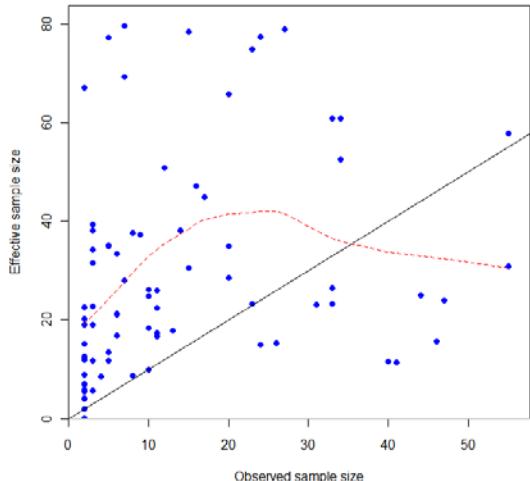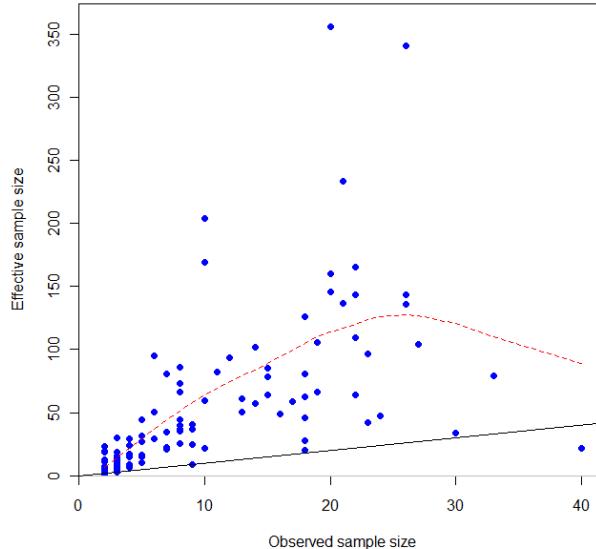
N-EffN comparison, length comps, sexes combined, whole catch, F6-NOA_S
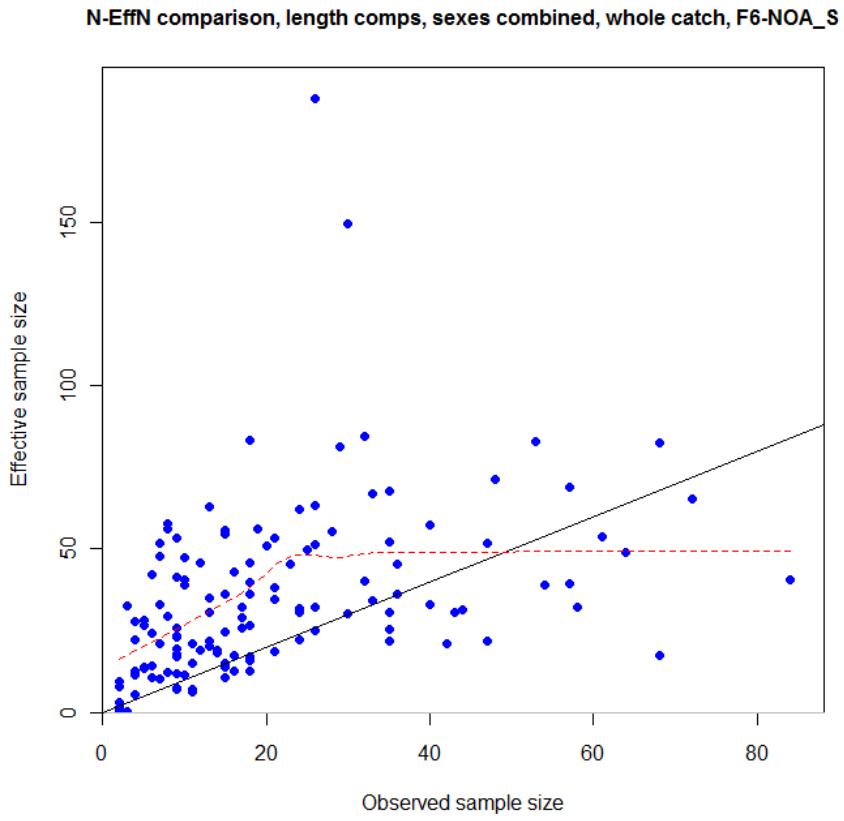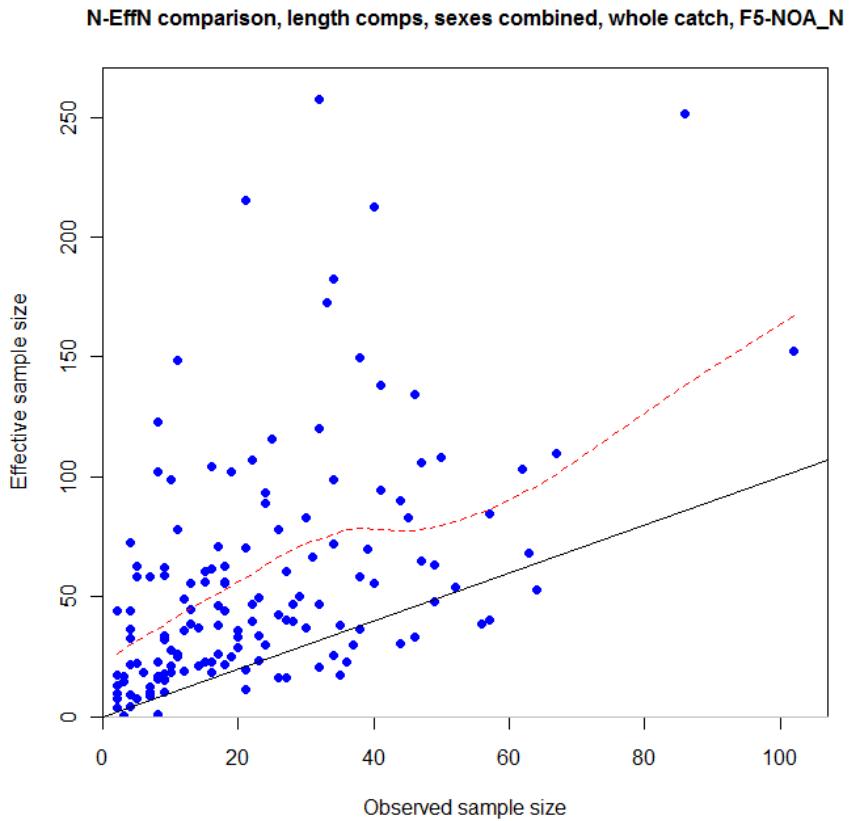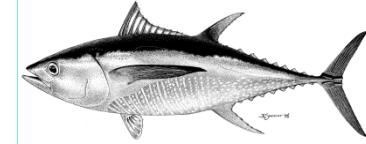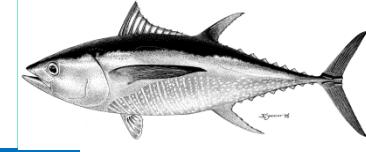
DEL sample sizes

N-EffN comparison, length comps, sexes combined, whole catch, F7-DEL_N
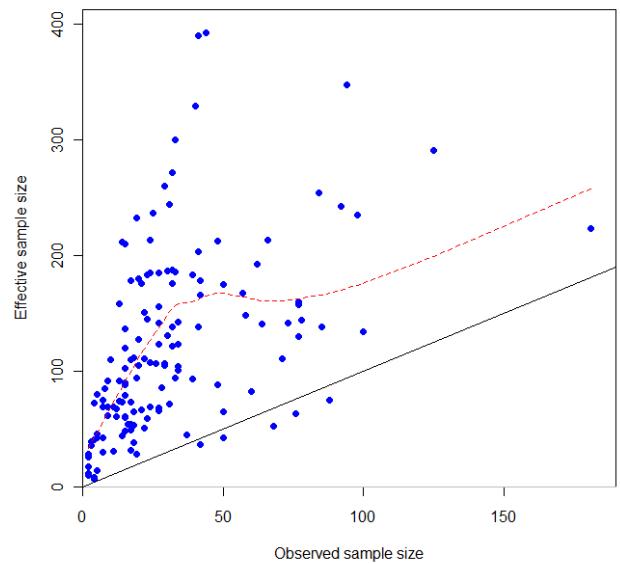
N-EffN comparison, length comps, sexes combined, whole catch, F8-DEL_I
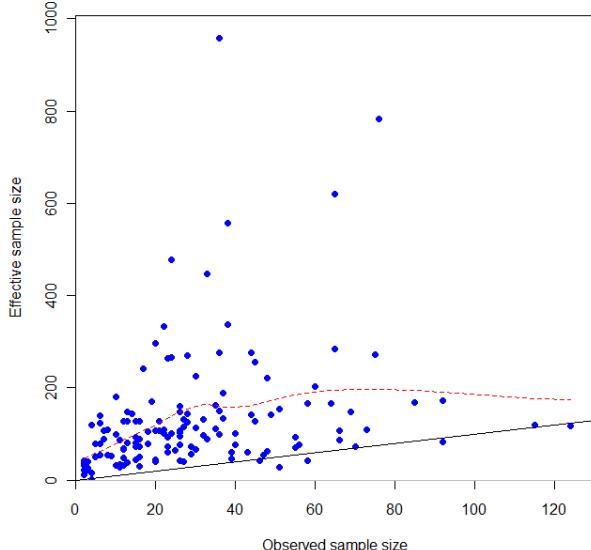
N-EffN comparison, length comps, sexes combined, whole catch, F9-DEL_S
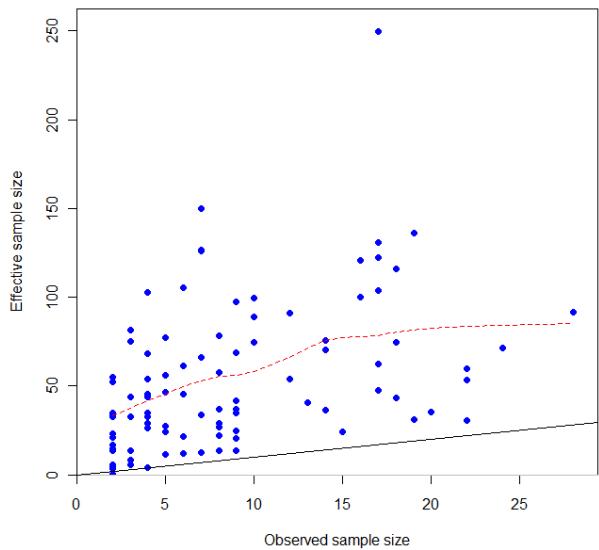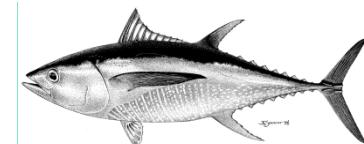
LL sample sizes

N-EffN comparison, length comps, sexes combined, whole catch, F11-LL_N
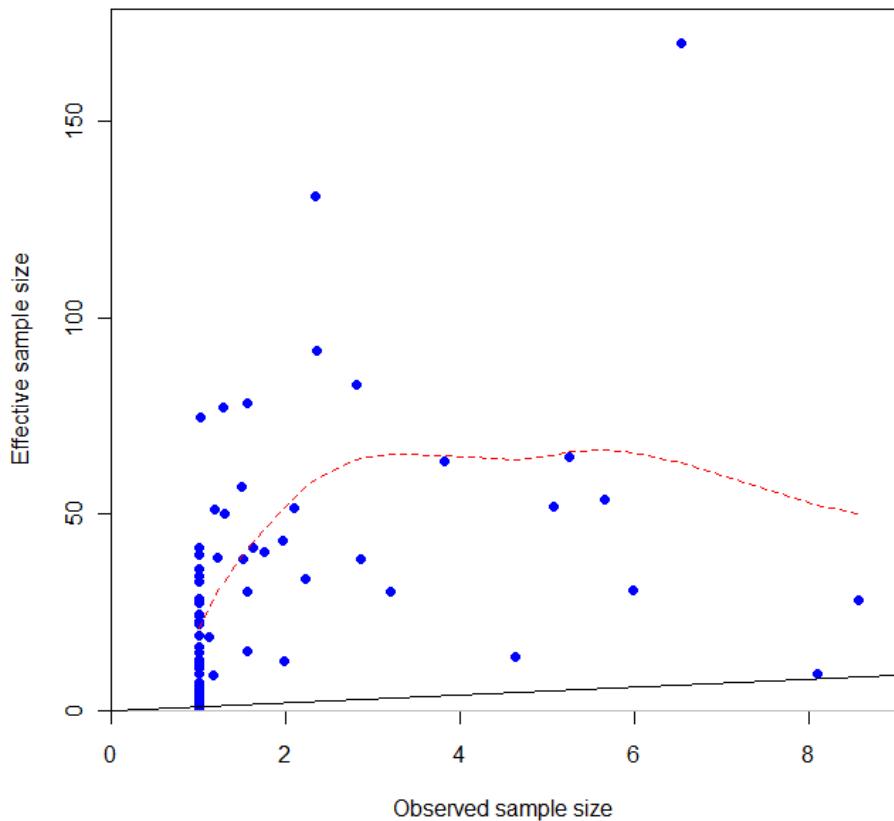
N-EffN comparison, length comps, sexes combined, whole catch, F12-LL_S
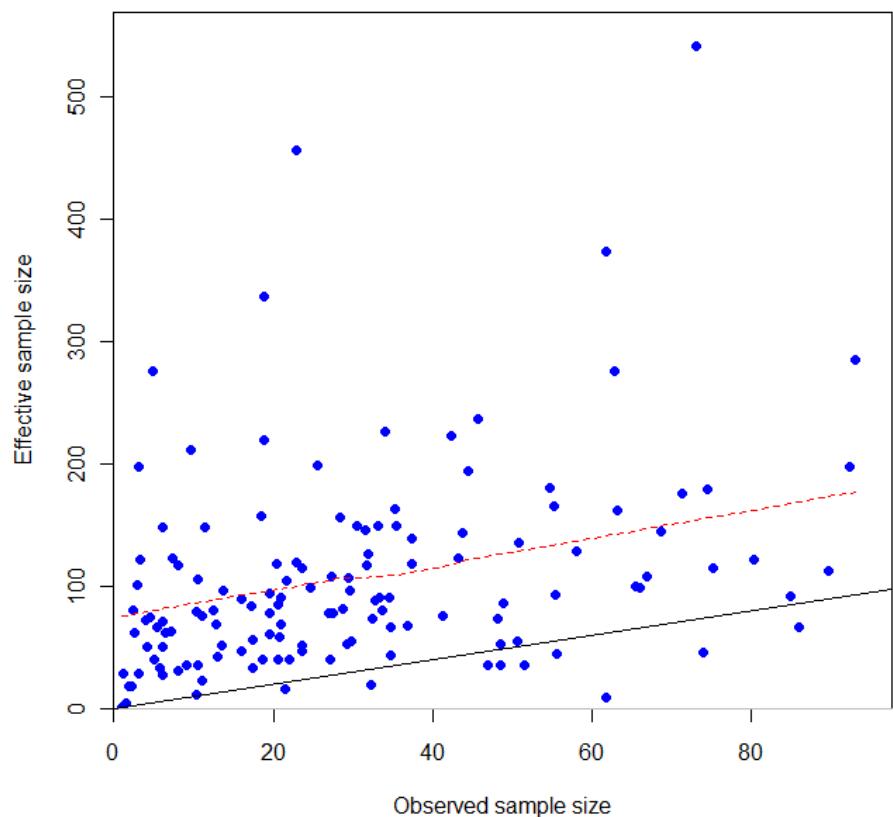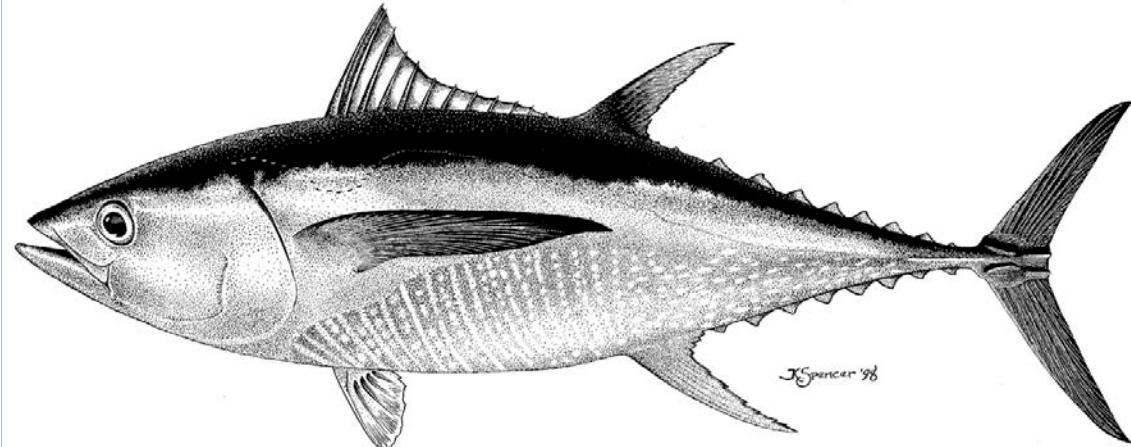
SENSITIVITY ANALYSIS

Iterative reweighting of length-composition sample size

Iterative reweighting of LF
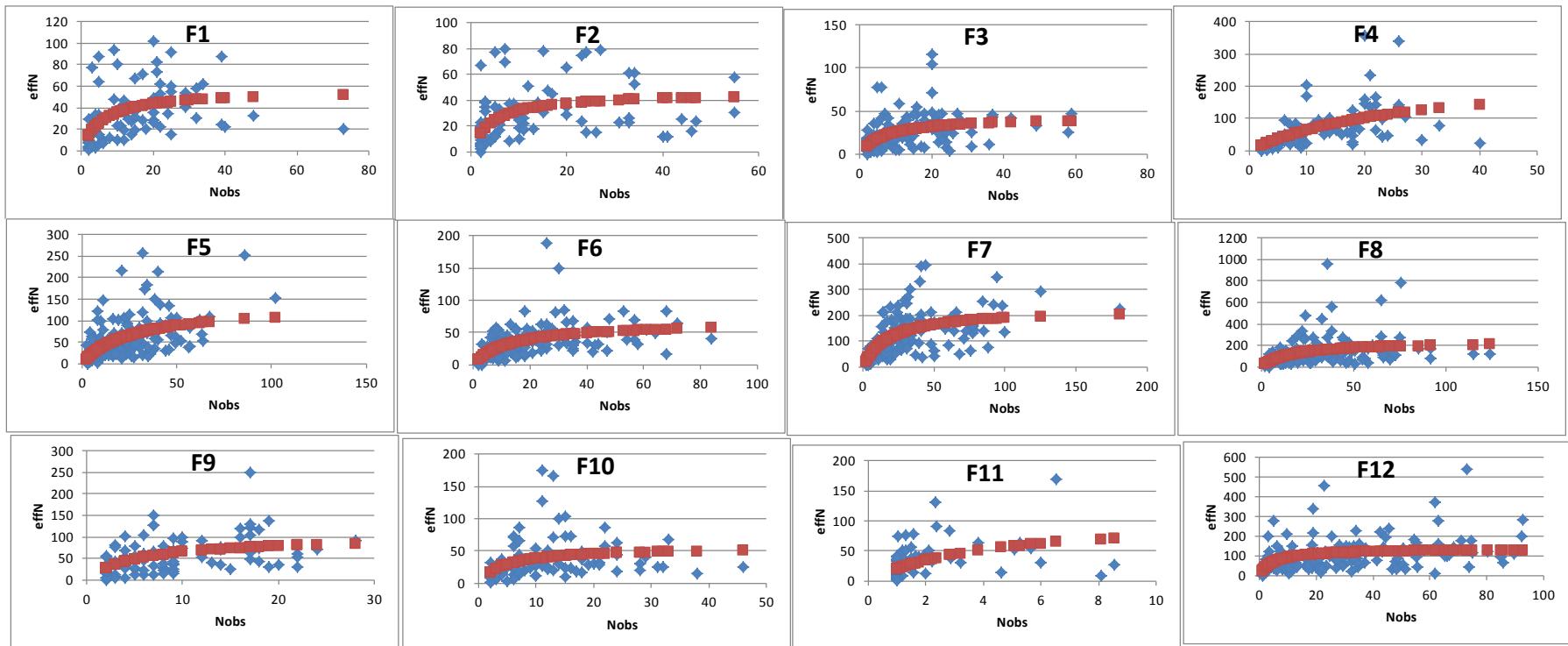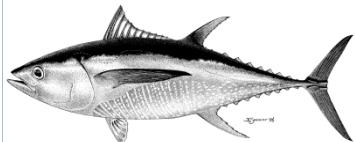
Recruitment
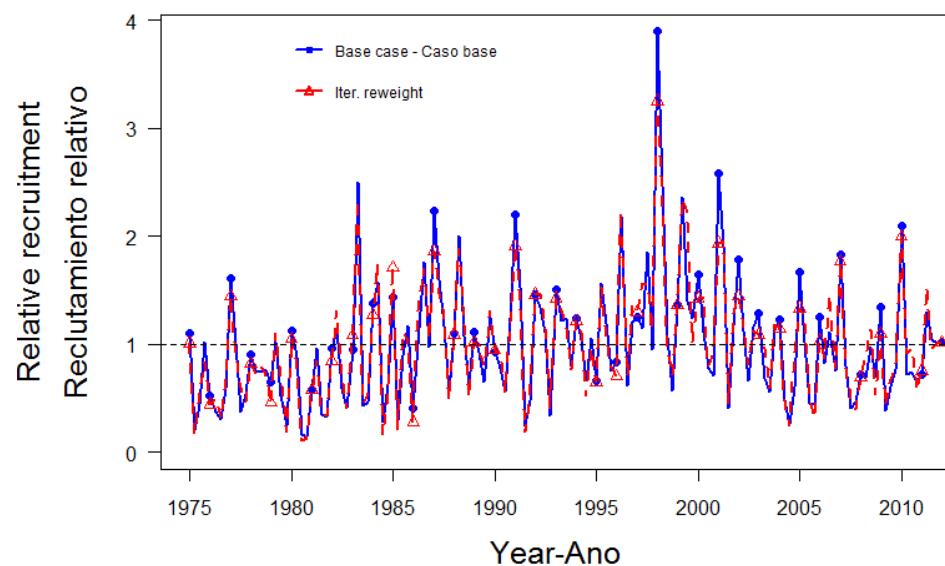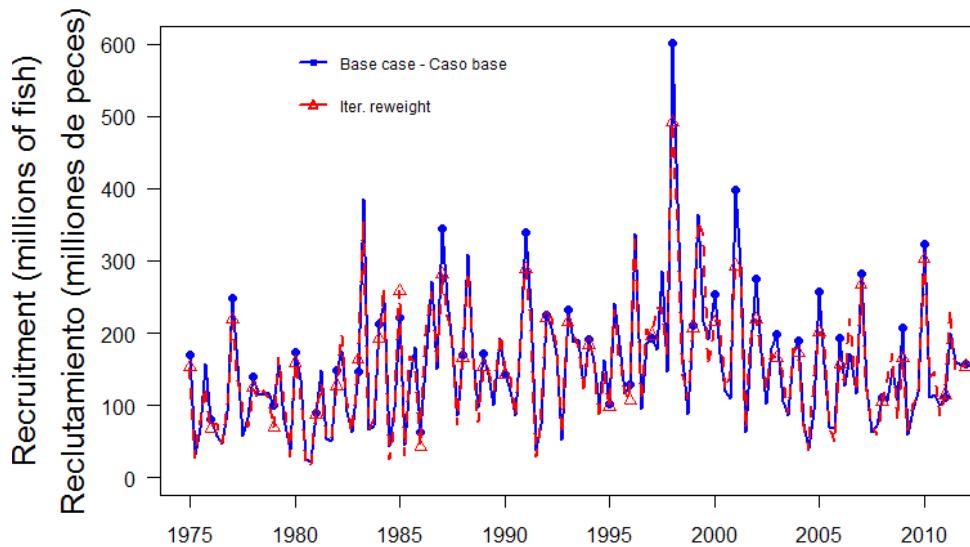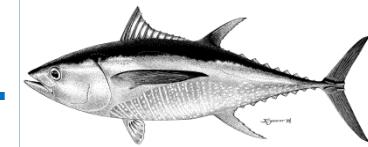
Summary biomass
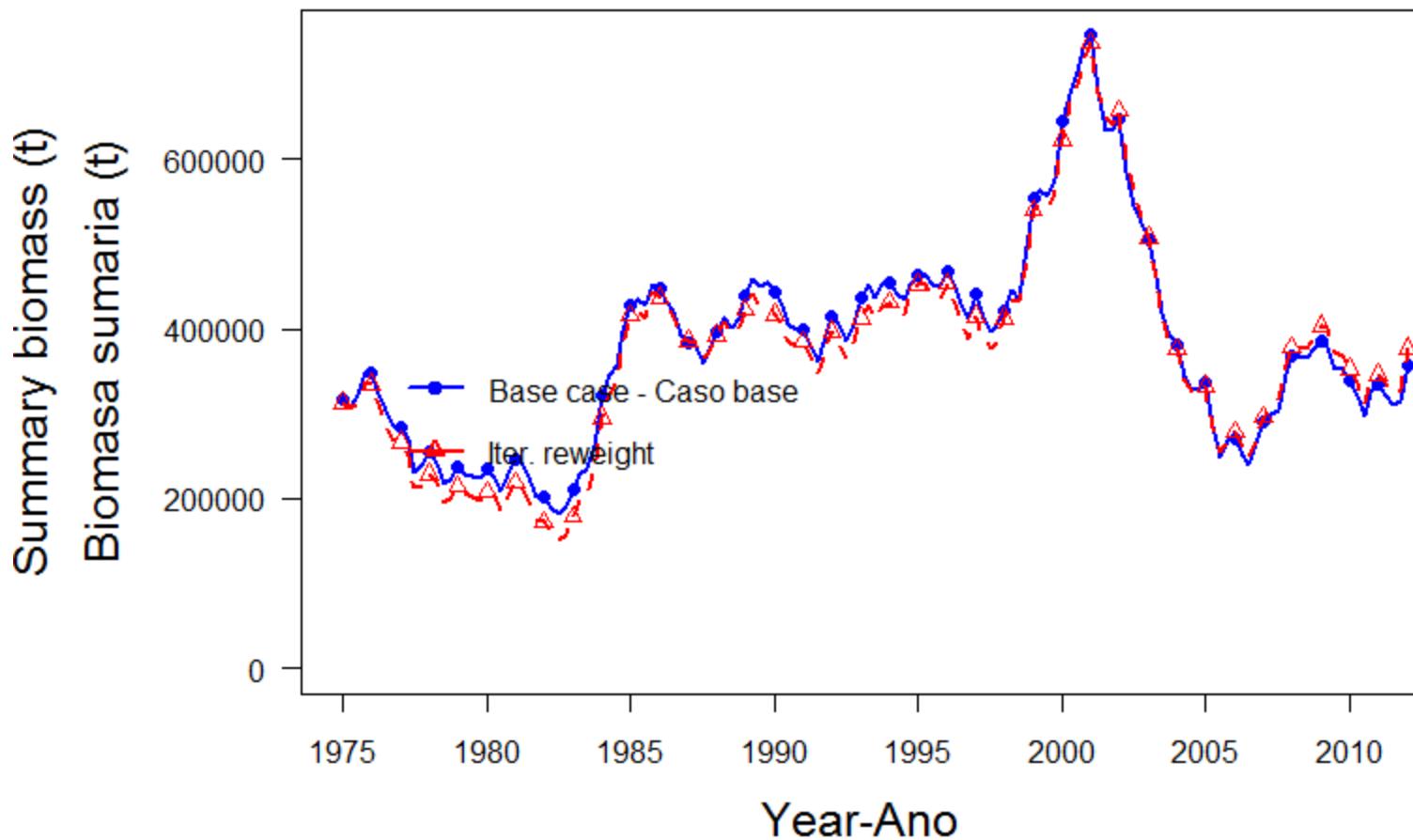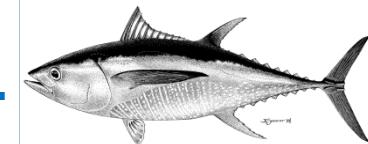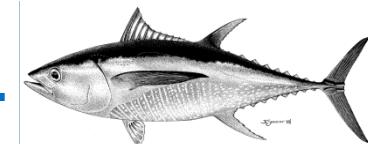
Spawning biomass ratio
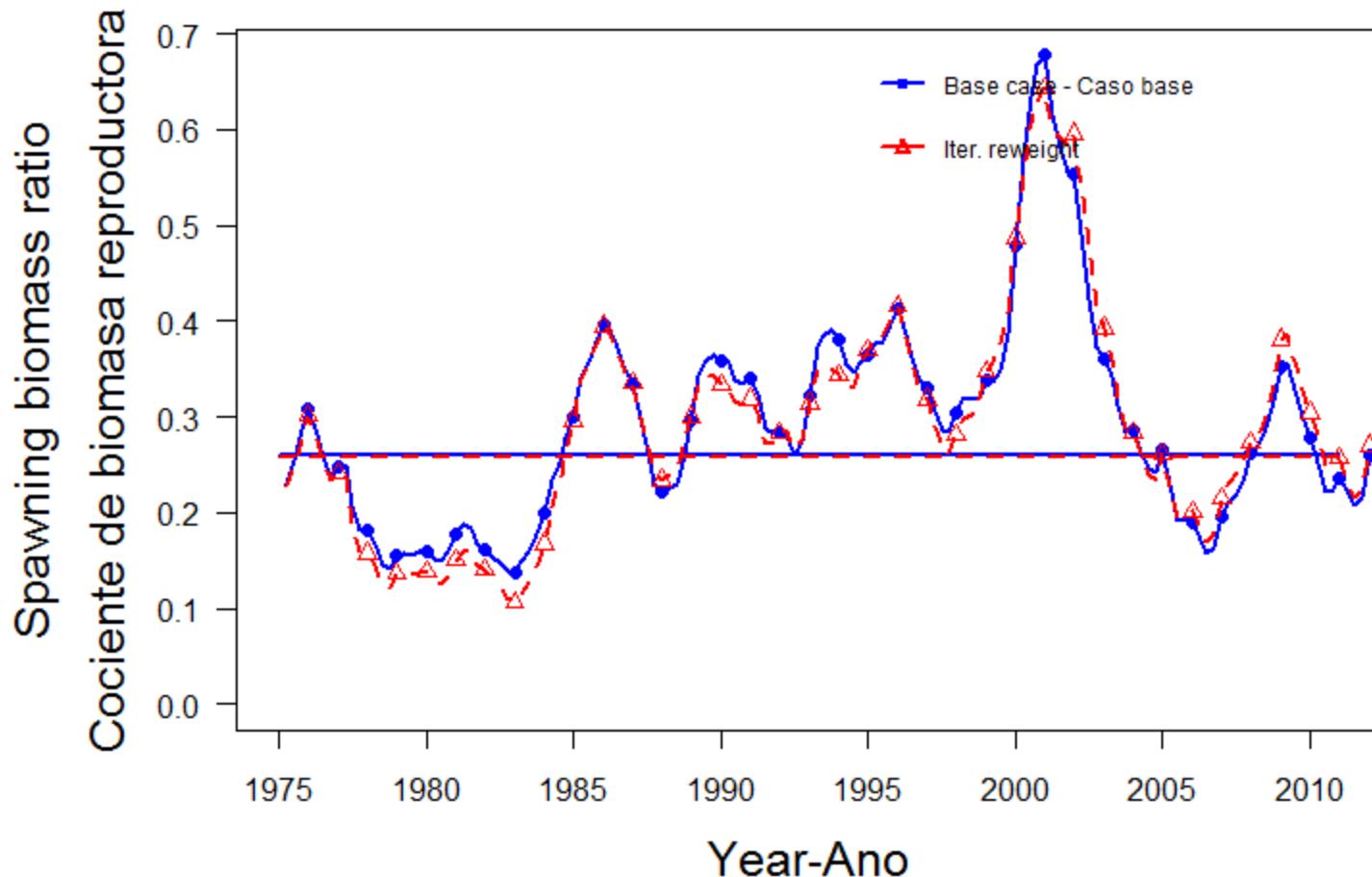
Management quantities
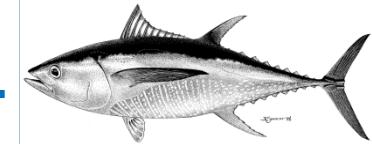
	Base case	Iter. Reweight
msy	262,642	260,386
Bmsy	356,682	349,919
Smsy	3,334	3,263
Bmsy/Bzero	0.31	0.31
Smsy/Szero	0.26	0.26
Crecent/msy	0.79	0.79
Brecent/Bmsy	1.00	1.08
Srecent/Smsy	1.00	1.04
Fmultiplier	1.15	1.23

Questions?