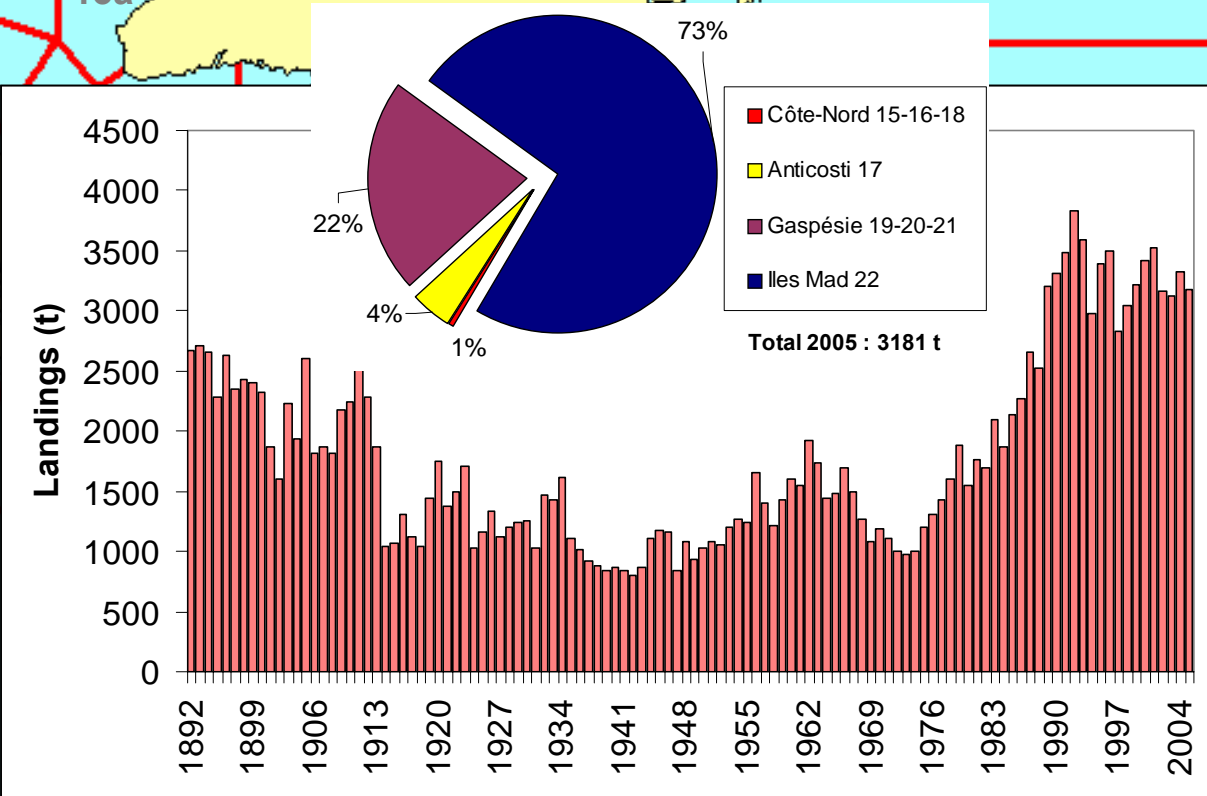
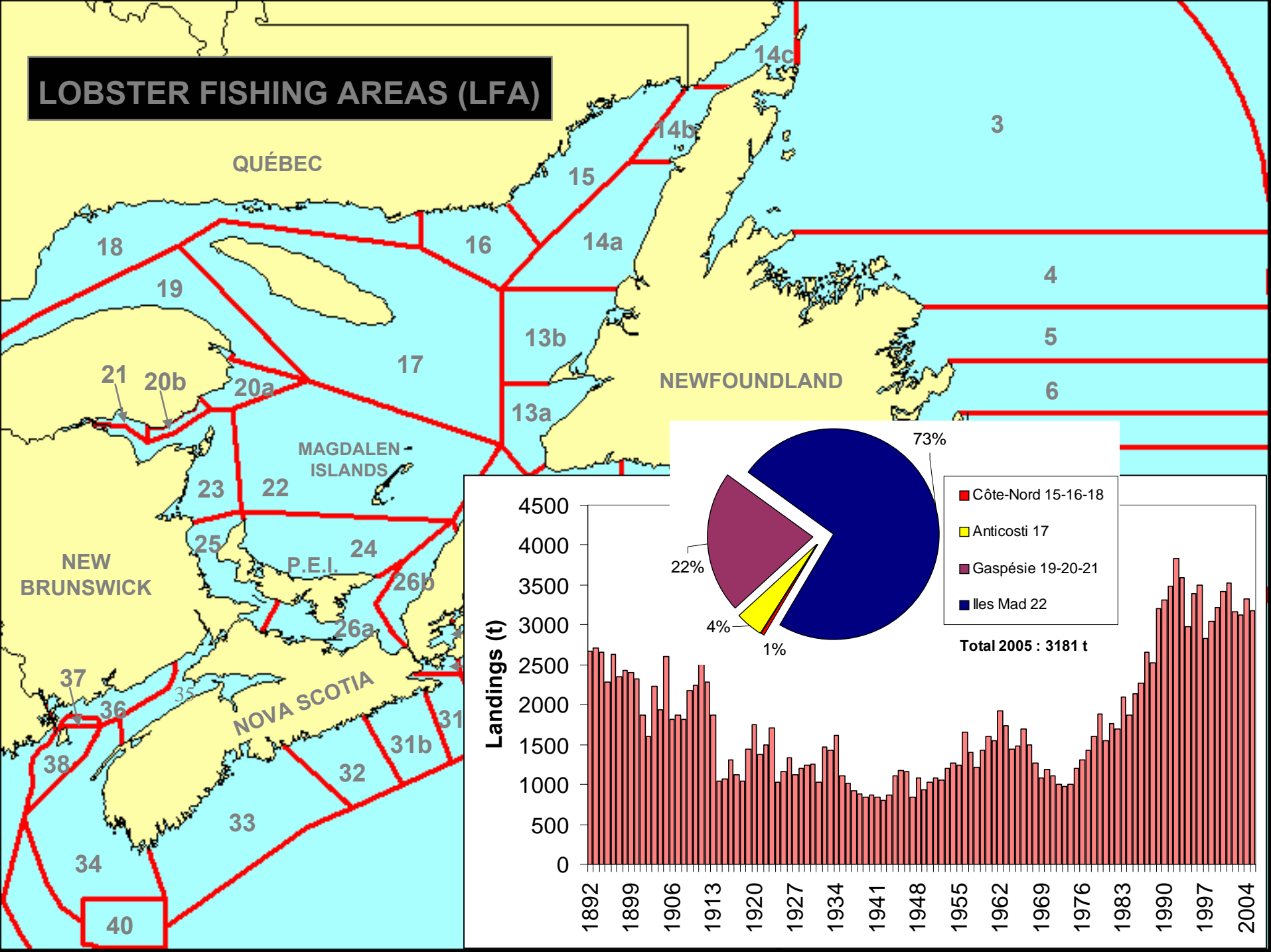


LOBSTER FISHING AREAS (LFA)



L

	15	16	17	18	19	20	21	22
Number fishers	31	6	15+1E	3	8	192	12+1B	325
Sub-areas	-	-	2	9	6	20	2	-
Number of traps	250 or 175	250or 175	300 or 210	250	250	250	250 +50 (fall)	300
Size of traps	92 x 71 x 50 or 124 x 92 x 50	92 x 71 x 50 or 124 x 92 x 50	92 x 71 x 50 or 124 x 92 x 50	92 x 71 x 50	92 x 61 x 50	92 x 61 x 50	92 x 61 x 50	81 x 61 x 50
Escape gap	127 x 47 mm	127 x 47 mm	127 x 47 mm	127 x 47 mm	127 x 46 mm	127 x 46 mm	127 x 46 mm	127 x 47 mm
Season	Spring 11 weeks	Spring 11 weeks	Spring 10 weeks	Spring 11 weeks	Spring 10 weeks	Spring 10 weeks	Spring 10 weeks + Fall 3 weeks	Spring 9 weeks
Minimum size in 2005	82 mm	82 mm	83 mm	82 mm	82 mm	82 mm	82 mm	83 mm
Total size increase since 1996	6 mm	6 mm	7 mm	7 mm	6 mm	6 mm	6 mm	7 mm
Other measures						V-notch		

es

Gaspé subareas



Fisheries Resource Conservation Council Report 1995 - Conservation Objectives

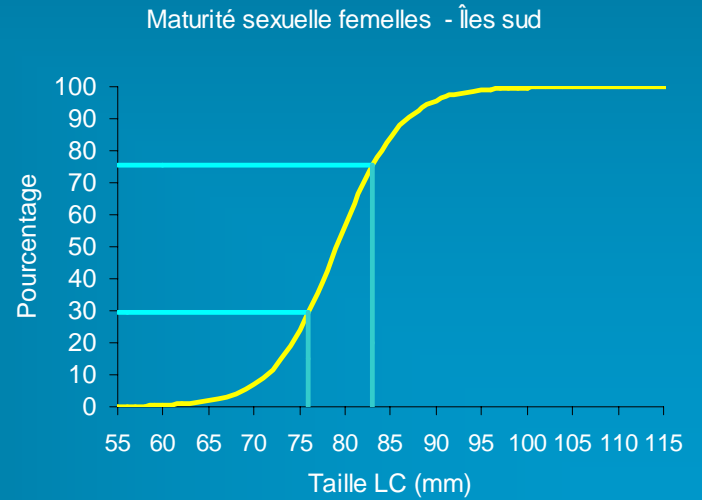
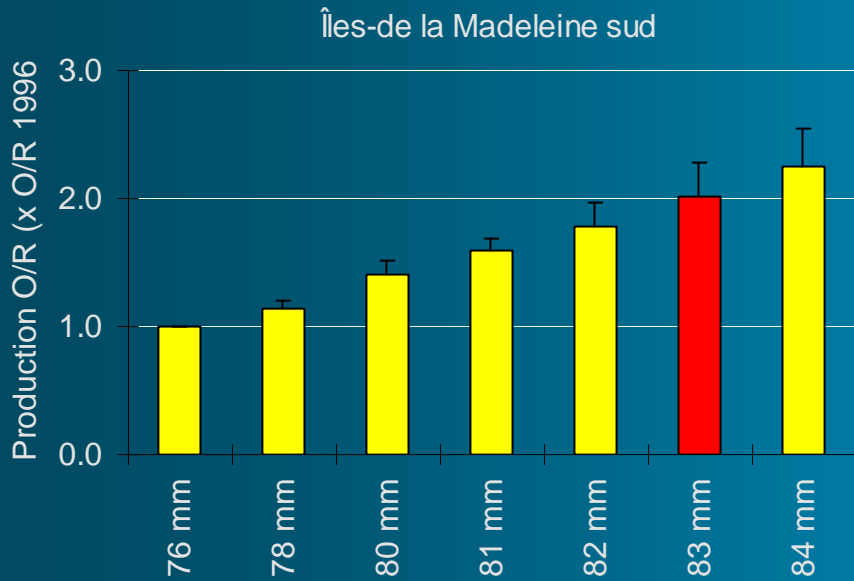
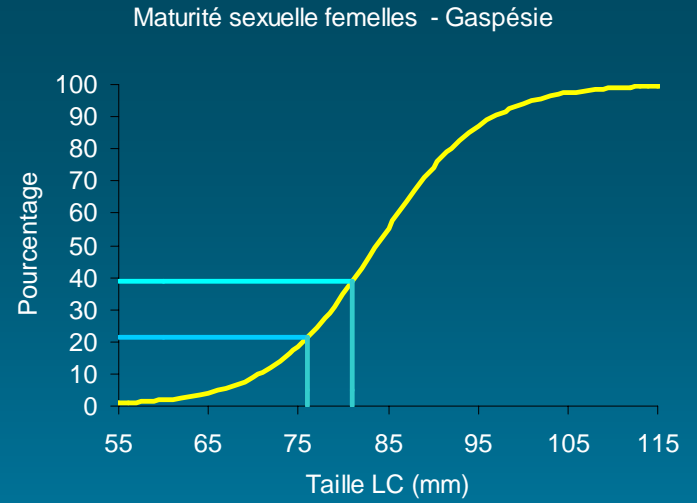
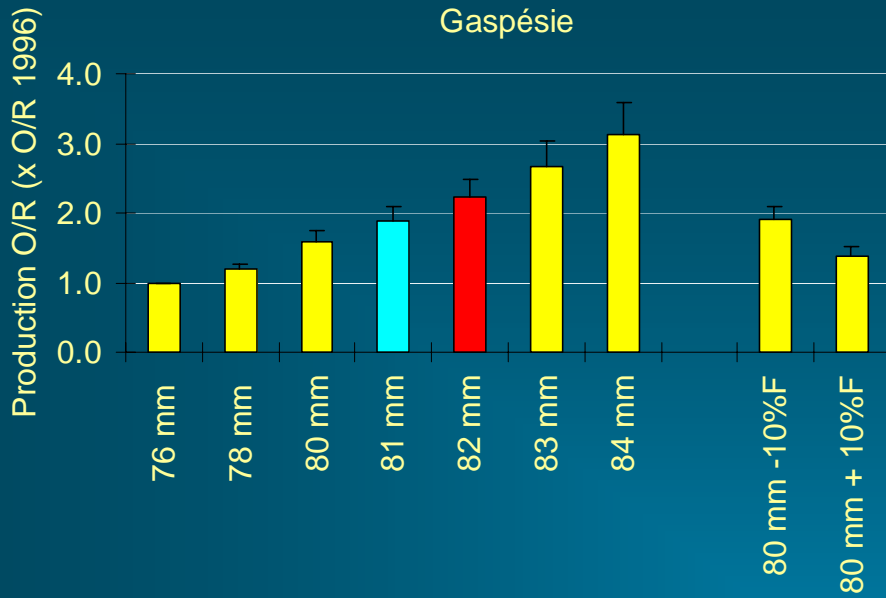
- Increase egg production

Biological Reference Point Egg-per-recruit
production EPR

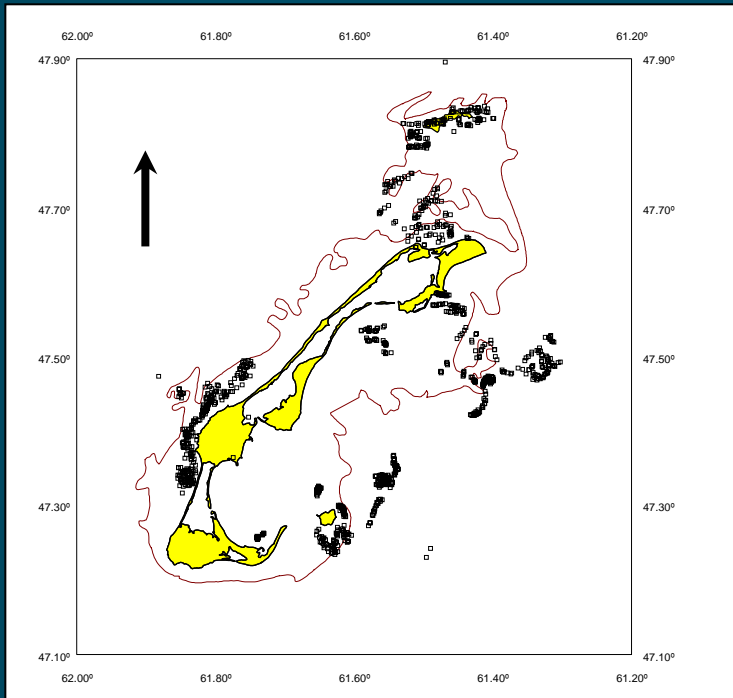
- Target of doubling EPR relative to 1995 levels
- Improve stock structure
- Reduce fishing mortality and fishing effort

Implementation of FRCC recommendations Conservation Plans 1997-2004

- **OBJECTIVE** Increase spawning
- **TARGET** Double egg per recruit production relative to 1996 levels
- **EVALUATION OF TOOLS** Simulation model of egg per recruit production
- **CHOICE AND IMPLEMENTATION OF TOOLS** Increase minimum legal size
- **TIME TABLE**
6 mm in 8 years -76 à 82 mm G NS
7 mm in 7 years -76 à 83 mm MI
- **MEASURE OF IMPACTS** Assessment of stock status - Indicators



Measure of the impacts of MLS increase



At-sea sampling program - fishery
since 1985 (MI) 1986 (GAS) 1993 (NS)

2-4 areas x 2 boats x 3 periods

≈10,000 lobsters measured (MI)

Trawl sampling since 1995 (MI)

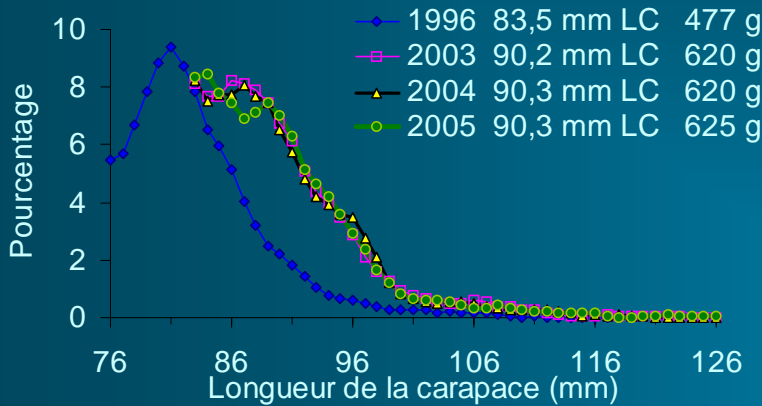
Indicators

- Size structure
- mean size
- Abundance and size of berried females
- Index of egg production

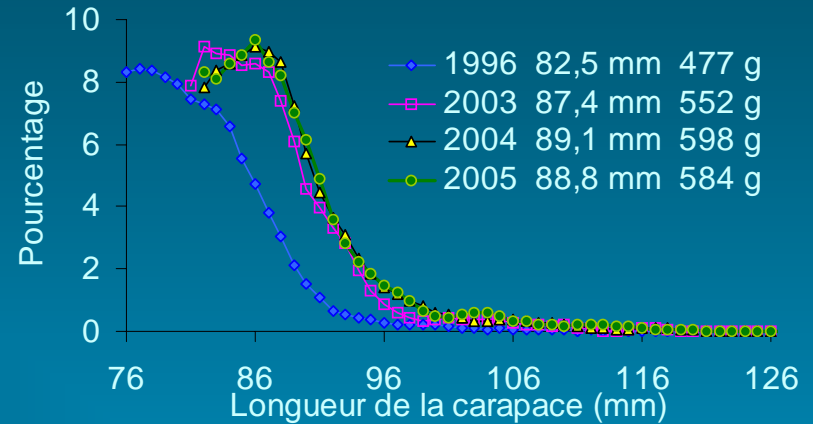


Population size structure

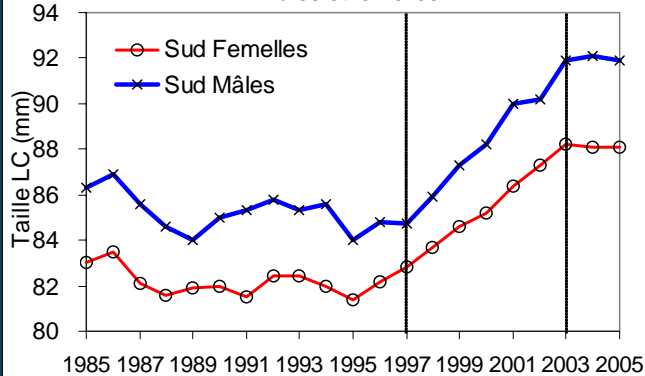
Îles-de-la-Madeleine sud



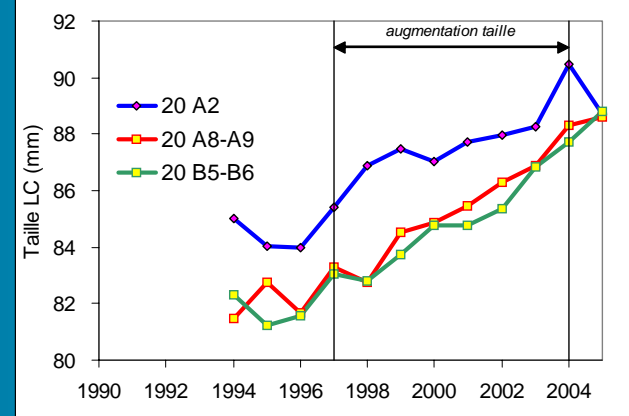
Gaspésie 20AB



Îles de la Madeleine Sud
Taille moyenne des homards débarqués
mâles et femelles

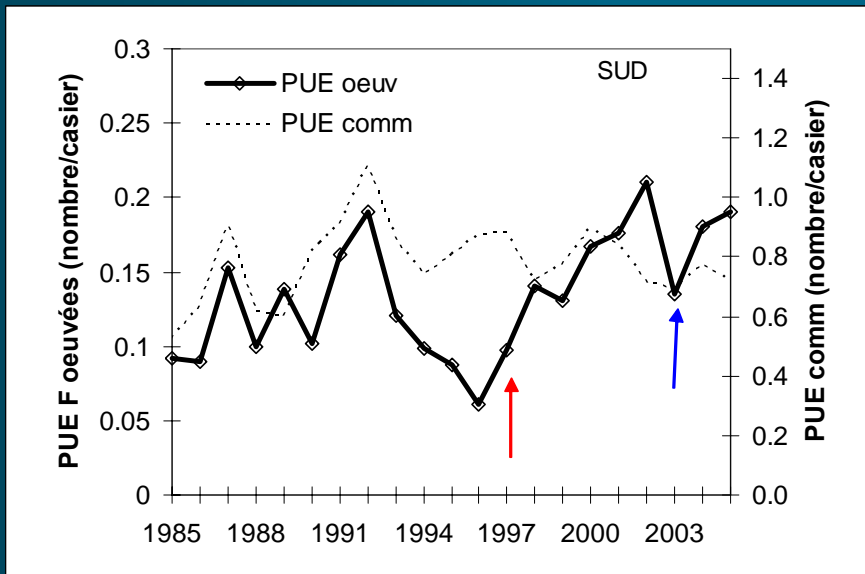


Gaspésie
Taille moyenne (fraction commerciale)

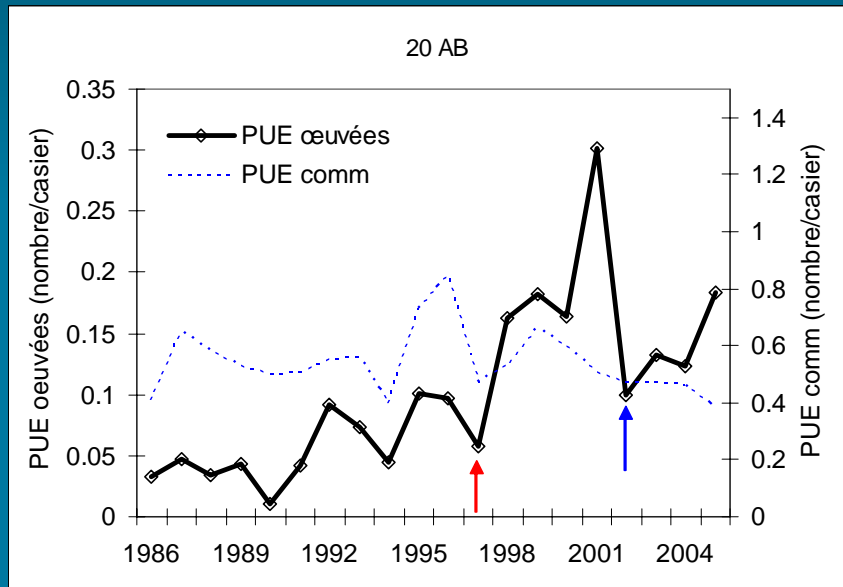


Berried females - Abundance

Magdalen Islands (south)



Gaspé



Red arrow : start of the increase in minimum size

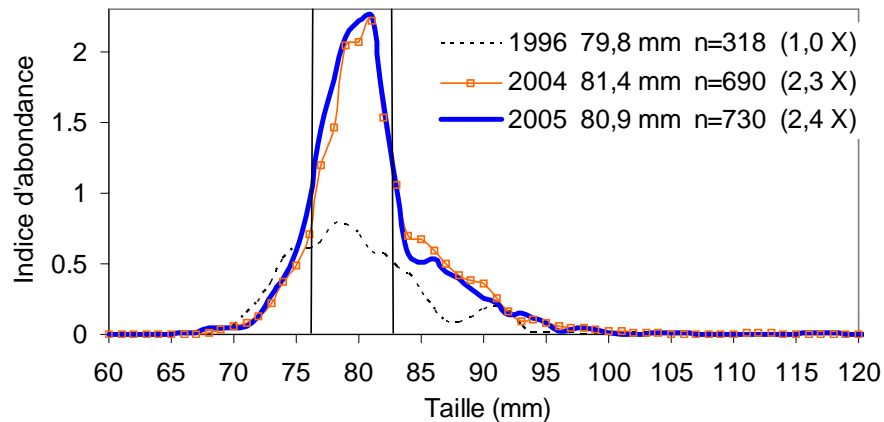
Blue arrow : increase in the escape gap

Berried females - Size

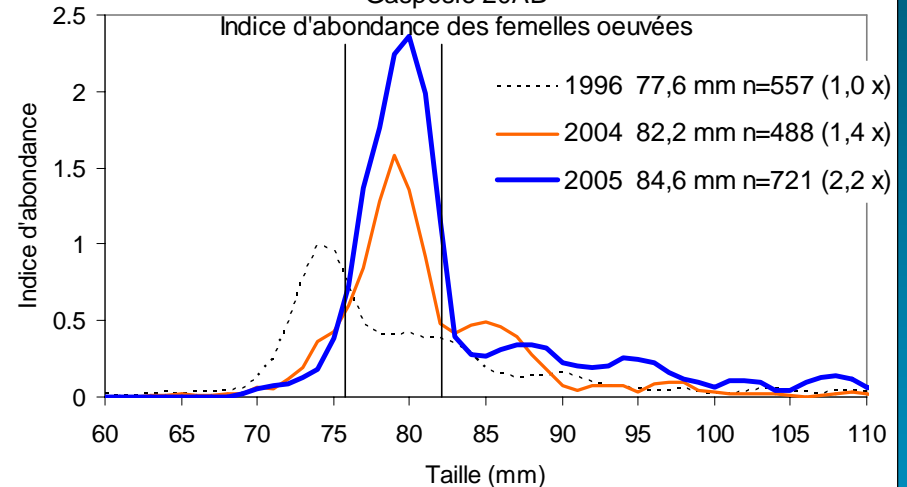
Magdalen Islands (south)

Gaspé

Femelles oeuvées Îles sud 1996, 2004 et 2005
données pondérées par PUE et indice production d'oeufs



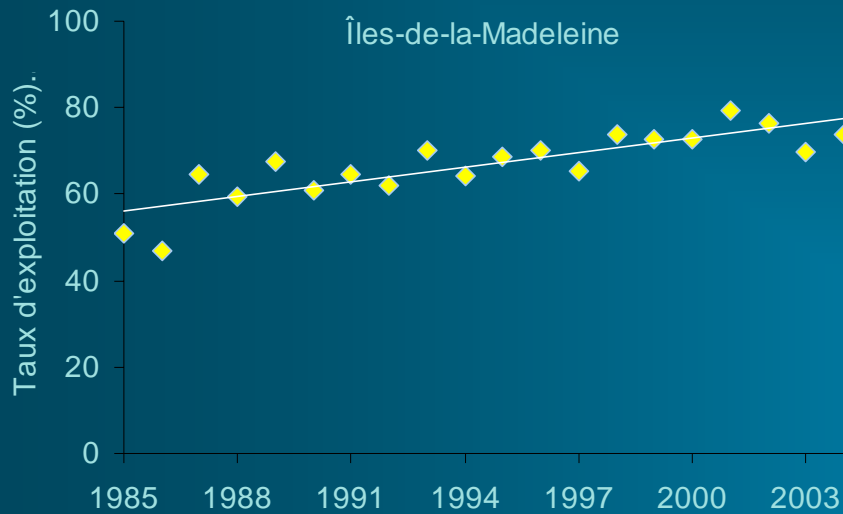
Gaspésie 20AB



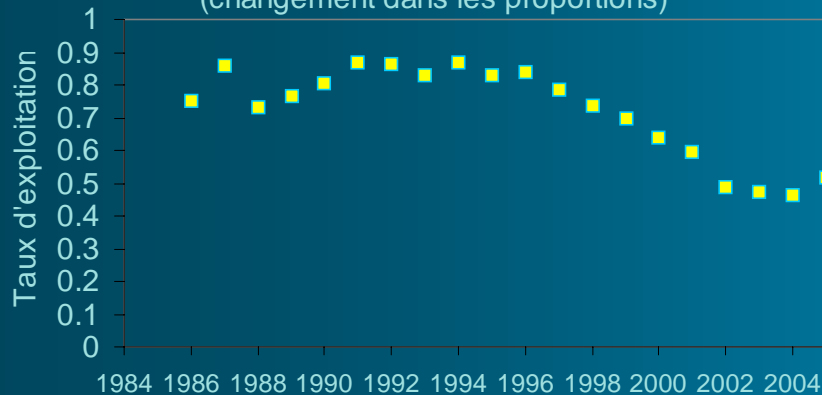
Index of egg production = (CPUE x size structure x fecundity)

Exploitation rates

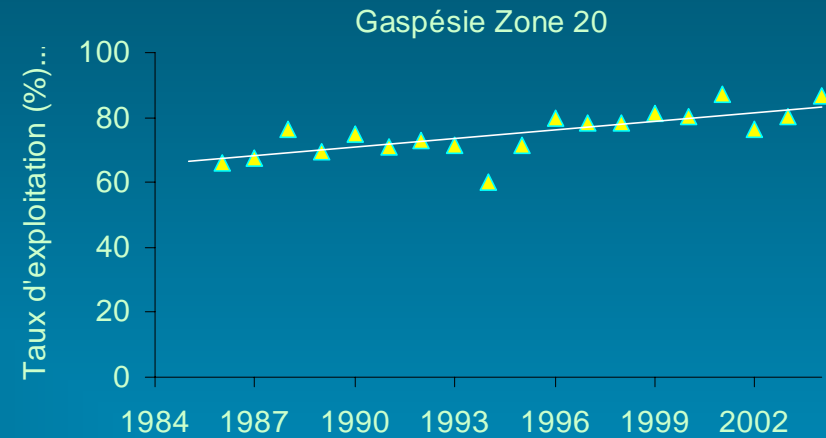
Magdalen Islands (south)



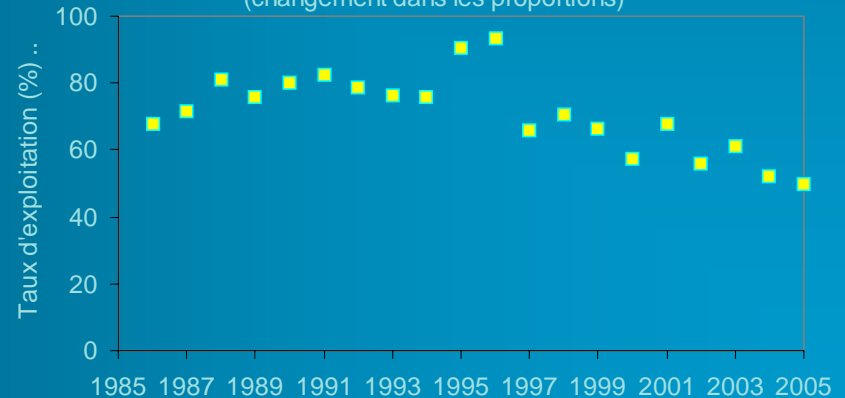
IDM sud - taux d'exploitation
(changement dans les proportions)



Gaspé



Gaspésie 20A8-A9 - taux d'exploitation
(changement dans les proportions)



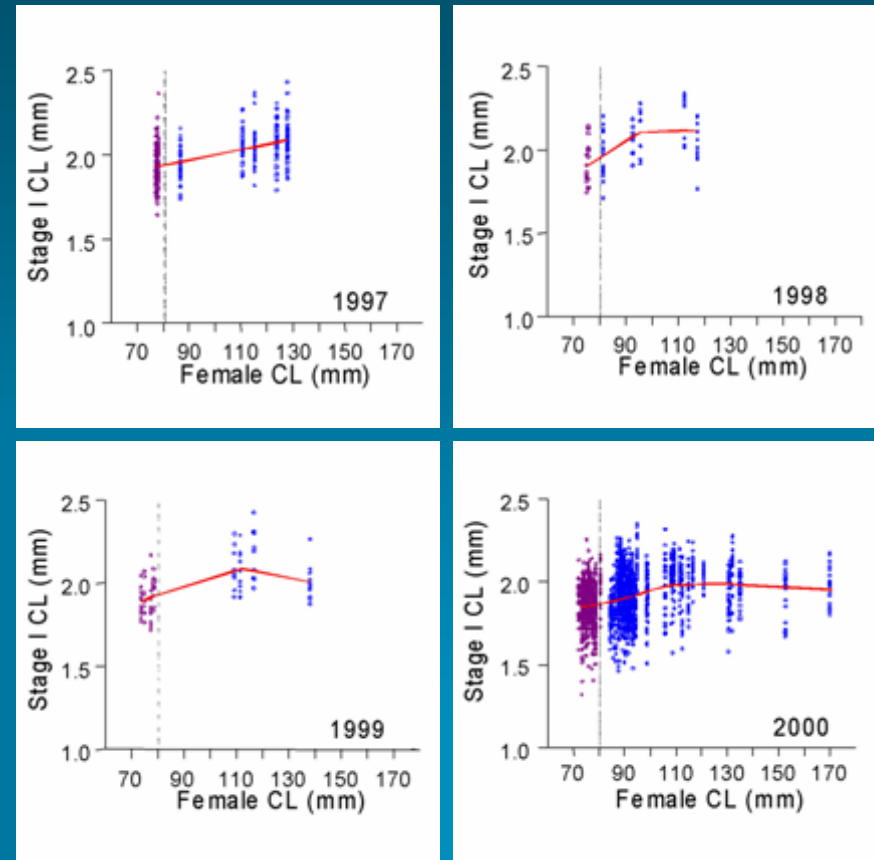
FRCC Report 1995

Conservation Objectives

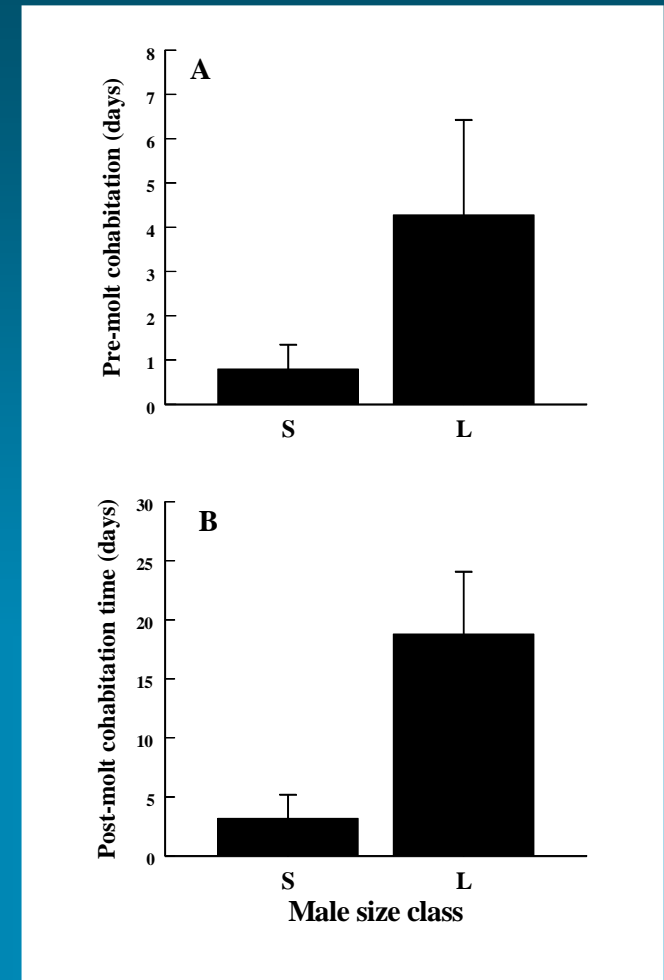
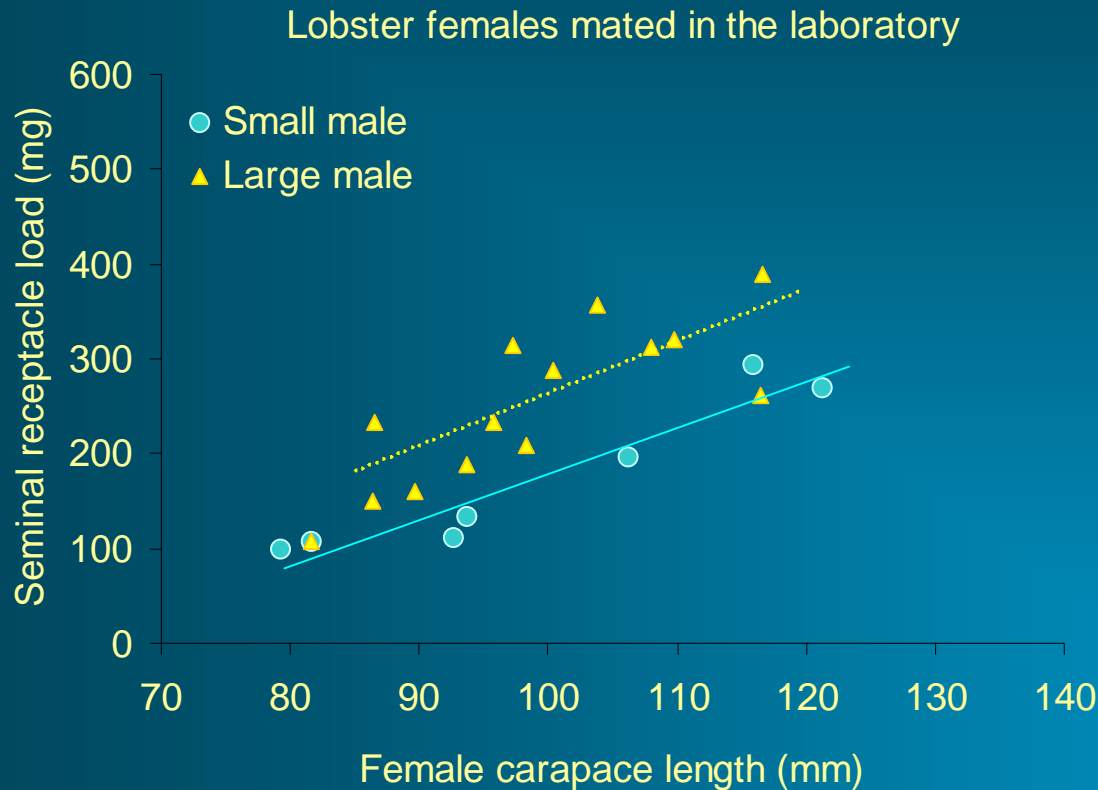
- Increase egg production
 - *yes,*
 - *production mainly by first-spawners - egg quality*
- Improve stock structure
 - *yes, reduction of growth overfishing*
 - *no, still one molt class, recruitment fishery*
- Reduce fishing mortality and fishing effort
 - *yes, for females*
 - *no, for males (high and increasing exploitation rates)*
 - *asymmetry in exploitation rates between males and females*
 - *Potential problem of sperm limitation*

Maternal effect on egg and larvae quality

- Hatching stage I larvae CL from small females (primiparous) are significantly smaller than from large females (multiparous)



Impact of skewed sex ratios - Sperm limitation



Gosselin, Sainte-Marie and Bernatchez. 2003. Behav. Ecol. Sociobiol. 55:151-160

Gosselin, Sainte-Marie and Bernatchez. 2005. Molecular Ecology 14(5):1517-1526

FRCC Report 1995

Conservation Objectives

- Increase egg production
 - *yes, production mainly by first-spawners - egg quality*
- **Improve stock structure**
 - *yes, reduction of growth overfishing*
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- **Reduce fishing mortality and fishing effort**
 - *yes, for females*
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 - *asymmetry in exploitation rates between males and females*
 - *Potential problem of sperm limitation*

Conservation - Phase II

Framework submitted to MI and GAS – fall 2005

- Objective

- Reduction of fishing effort

- Benefits

- Reduction of fishing mortality

- Improvement of size structure

- Reduction of dependency of fishery on annual recruitment

- Increase in multiparous females – *increase egg and larvae quality*

- Sex-ratios more balanced – *avoid sperm limitation problem*

Conservation - Phase II

- Limit

- Based on egg per recruit production (EPR)
- Overexploitation if $EPR < 10\%$ unexploited stock
- Limit (F) ideal = 0.45
- Present level = 0.60 (MI) and 0.65 (GAS) - *25%-30% too high*

- Target

- Half way between present and ideal level
- 12.5 % (MI) and 15 % (GAS) reductions

- Timeframe

- 7 years 2006-2012

- Tools

- Licenses, traps, season

Effort reduction - Tools

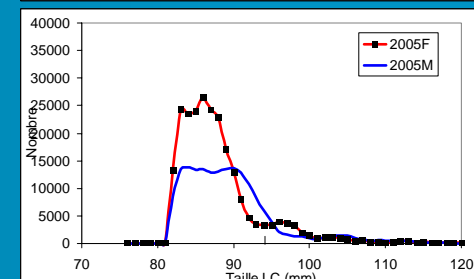
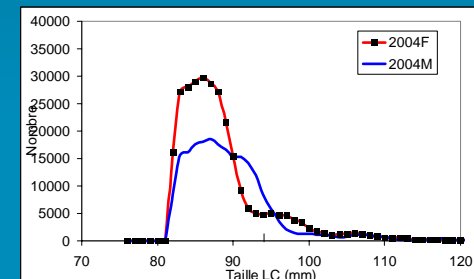
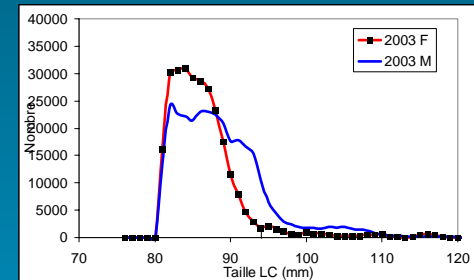
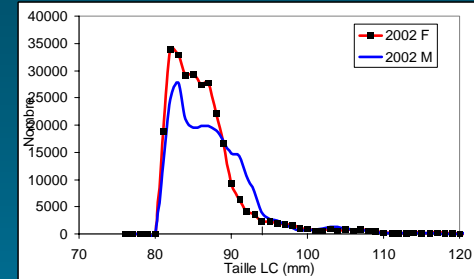
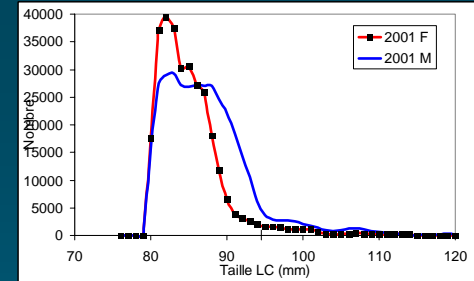
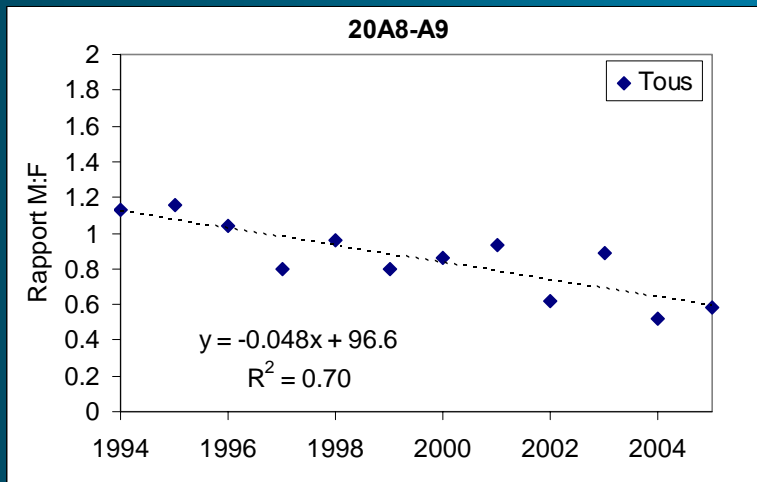
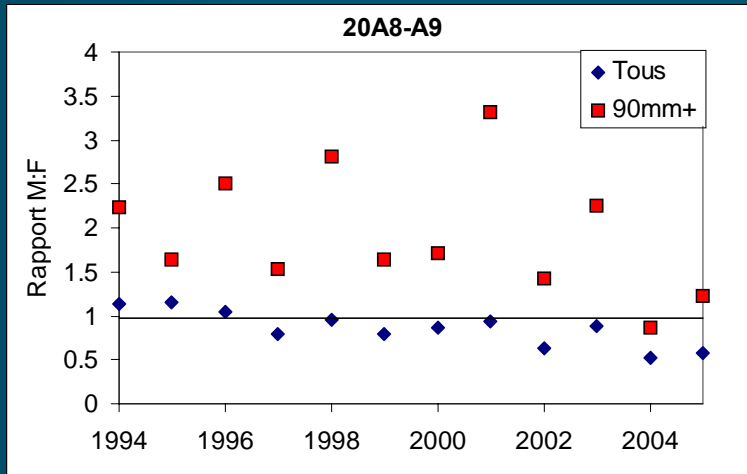
Reduction of the number of licenses	Reduction in the number of traps	Reduction of the number of days
5-6 licenses/year x 7 years	5-6 traps / fisher / year x 7 years	<ul style="list-style-type: none"> ▪ Eliminate one week (postpone the beginning of the fishing season) ▪ Eliminate one day in the week

Uncertainties of the measures in reducing fishing mortality

<i>Localized effect</i>	<i>Compensation by fishers</i> <i>Size of traps</i> <i>Number of hauls/day</i> <i>Number of traps/line</i> <i>Additional controls</i>	<i>Seasonal catchability</i>
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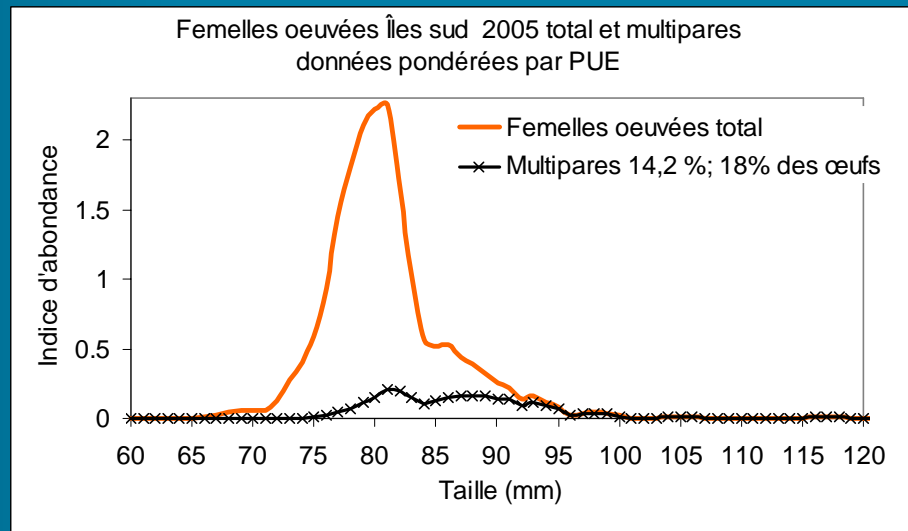
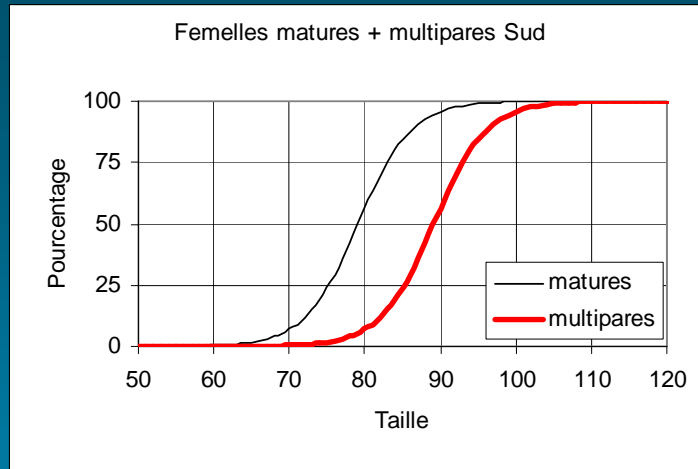
New indicators

- Sex-ratios



New indicators

- Multiparous females



New indicators

- Mating success

