Economic and social impacts of the proposed scenarios for a multi-annual plan for Baltic pelagic fisheries

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Overview

- Introduction
- Baseline situation
- Methodology
  - Management scenarios
  - Bio-economic model
- Impact assessment
  - Environmental
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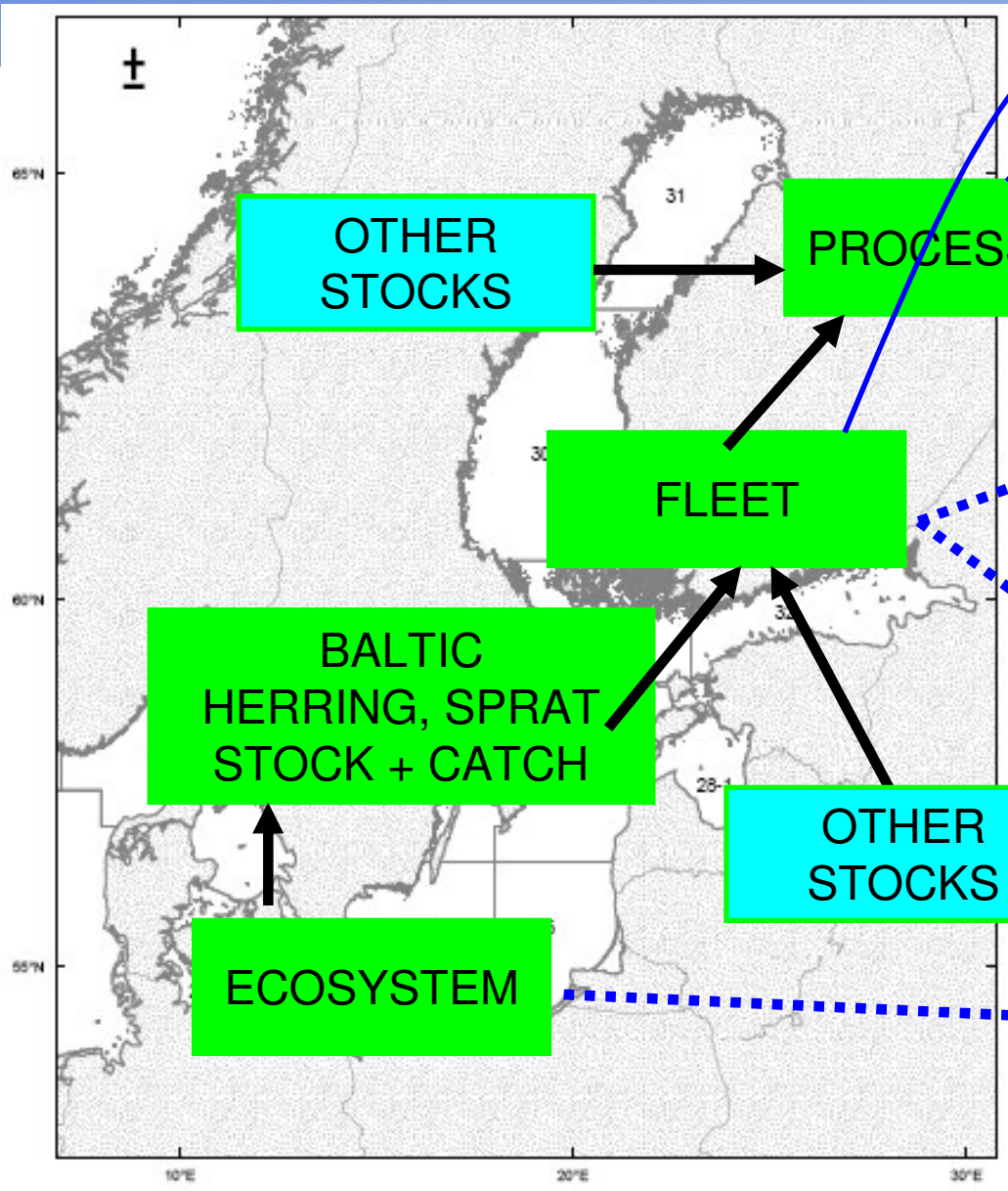
- Conclusions

Introduction

- Report assesses impacts on Baltic pelagic fisheries from multi-annual management scenarios
  - environmental, economic and social
  - assessment period – 2010, 2015 and 2020
  - Bio-economic model comprised of ICES stock assessment model (WKMAMPEL) and the EIAA model

- Data Sources
  - Stocks/environment - ICES
  - Fleet economics and employment – AER (Annual Economic Report) data
  - Processing economics, dependency and employment – Member State questionnaires
  - Industry interviews, other specific reports

Assessment components



OTHER STOCKS

PROCESSING

ANCILLARY

ECONOMIC

REVENUE
VALUE ADDED
PROFITABILITY

FLEET

BALTIC
HERRING, SPRAT
STOCK + CATCH

SOCIAL

EMPLOYMENT
WAGES
SOCIAL DEPENDENCY

OTHER STOCKS

ECOSYSTEM

ENVIRONMENTAL

Economic concepts

- Gross Value Added
  - Contribution to GNP
  - income – (fuelcost + repcost +varcost +fixedcost)

- Profit
  - Income minus all costs
  - income – (fuelcost + repcost +varcost +fixedcost + capital cost + crew cost)

Baseline situation

- 25 fleet segments catch Baltic pelagics
- Quotas often not fully utilised
- 10 fleets identified with high dependency on pelagics (> 66%)

	Herring			Sprat		
	Landings ('000 t)	Quotas ('000 t)	Uptake	Landings ('000t)	Quotas ('000 t)	Uptake
Denmark	24	44	**56%**	42	45	**93%**
Estonia	25	31	**79%**	49	52	**94%**
Finland	78	95	**83%**	21	24	**87%**
Germany	26	28	**93%**	30	29	**106%**
Latvia	22	24	**92%**	60	63	**95%**
Lithuania	2	4	**51%**	12	23	**53%**
Poland	23	36	**64%**	62	133	**46%**
Sweden	97	100	**96%**	79	87	**91%**
Total	297	361	**82%**	355	455	**78%**

MS	Model segments	High dependency	Medium dependency	No. segment unprofitable	No. segment profitable
SWE	4	2	1	0	4
DNK	3	1	2	0	2
FIN	3	2	0	0	1
LVA	3	2	1	2	1
POL	4	1	0	1	1
EST	3	2	0	2	1
DEU	4	0	1	2	2
LTU	1	0	0	0	0
Total	**25**	**10**	**5**	**7**	**12**

Baseline situation

- Variability across fleets
- Unprofitable segments primarily in new-EU state fleets
  - Unprofitable high dependency
    - EST PTS 12-24m
    - EST PTS 24-40m
    - LVA PTS 12-24m
  - Unprofitable medium dependency
    - DEU PG 0-12m
    - LVA PG 0-12m

MS	Vessels	FTE	Average crew wage ('000 €)	GVA (€ mln)	Net profit (€ mln)	Net profit / Gross rev
SWE	45	199	18.6	12.7	5.4	19%
DNK	43	101	80.3	12.5	1.6	7%
FIN	819	1063	4.7	12.1	2.5	11%
LVA	854	1667	1.9	7.6	4.7	26%
POL	826	2361	3.2	15.2	3.7	10%
EST	951	2914	1.7	2.7	-9.6	-67%
DEU	1118	821	31.5	54.6	24.5	28%
LTU	29	166	7.0	1.2	-0.1	-3%
Total	**4685**	**9291**	**6.4**	**118.5**	**32.6**	**14%**

Baseline situation - employment

- EST, FIN, LVA and POL fishing sectors have highest dependencies on Baltic pelagics
  - The other member states are dependent on other species
  - Or operate outside the Baltic (e.g. large DNK vessels)

Fishing sector

MS	FTE	Depend on Baltic pelagics	Employment depend on Baltic pelagics	Dependency on Baltic pelagic fishing employment	
				% of national employment	% of fishing employment
DNK	101	43%	44	0.00%	0.5%
EST	2,914	77%	2,259	0.37%	35.9%
FIN	1,063	80%	1,025	0.04%	56.9%
DEU	821	7%	84	0.00%	0.6%
LVA	1,667	81%	1,351	0.13%	12.3%
LTU	166	25%	42	0.00%	0.5%
POL	2,361	37%	865	0.01%	3.5%
SWE	199	67%	134	0.00%	3.3%

Baseline situation - processing

- Nearly 25% of the Baltic region's processing sector is dependent on Baltic pelagics
  - Poland, Latvia, Estonia and Finland account for over 90 % of Baltic pelagic dependent processing workers
  - Dependency on Baltic pelagics (against imported pelagic catches) is high for Estonia, Finland and Latvia
- 54% of herring and sprat goes to human consumption, 38% fish meal, 11% fodder

Pelagic processing sector

MS	Number companies	Number workers	Dependency on Baltic pelagic catches	Baltic pelagic processing employment
DNK	3	250	30%	75
EST	35	1,100	80%	880
FIN	78	626	95%	595
DEU	1	53	100%	53
LVA	106	6,149	58 %	3566
LTU	49	3,163	6%	183
POL	126	12,625	18%	2309
SWE	-	129	40%	51
Total		**24,095**	**25%**	

Management scenarios

- Option 1 - status quo scenario
  - Future TACs corresponding to status quo fishing mortality
- Option 2 - ICES harvest control rules for multi-annual management plans
  - All other variables (e.g. vessel numbers) remain constant
- Option 3 - ICES HCR with additional changes, including:
  - Changes in vessel numbers and uptake

Bio-economic model i

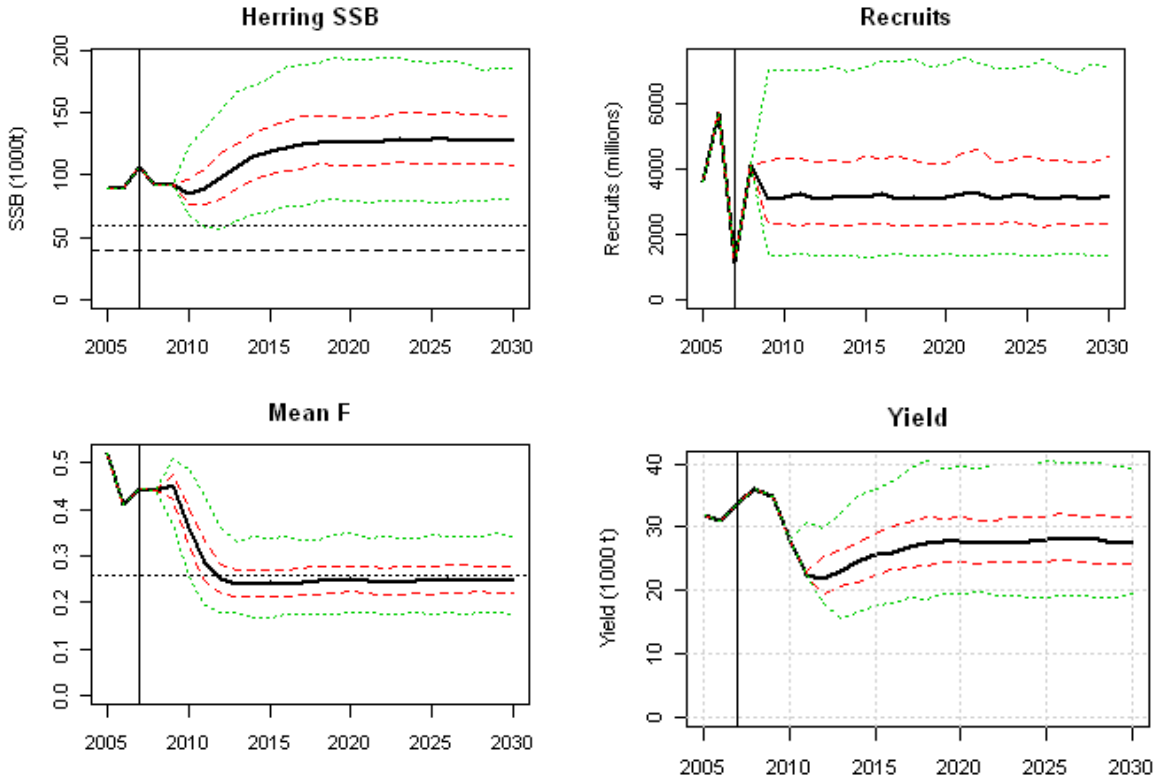
- Option 1: SMS model used by ICES projected at F=status quo

- Option 2: WKMAMPEL results
  - CENTRAL BALTIC HERRING
  - GULF OF RIGA HERRING
  - SPRAT

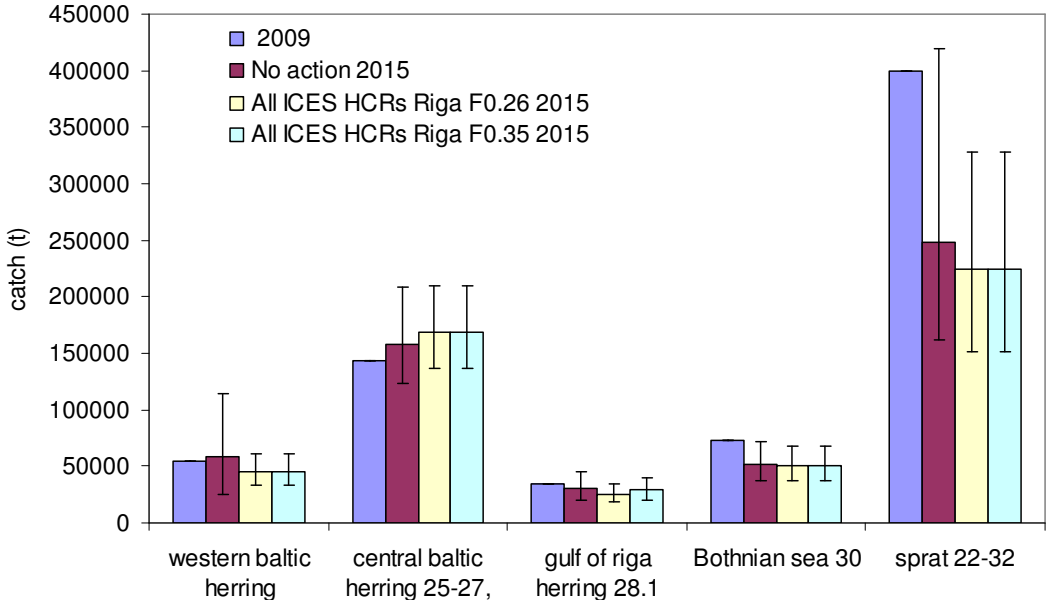
- Option 2 for stocks not approved by ICES
  - BOTHNIAN SEA from WKMAMPEL
  - WESTERN BALTIC HERRING = F=.48

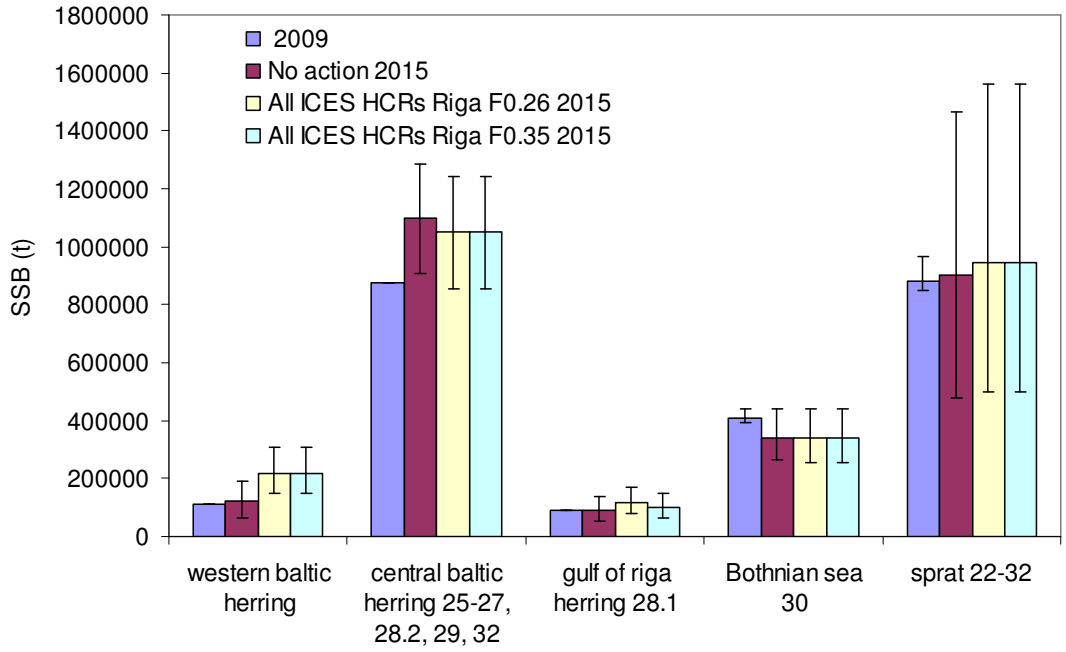
- Sensitivity of model results to future cod recovery – WKMAMPEL projections

Western Baltic herring



Biological modelling ii





	Herring	Sprat
2009 TAC (tonnes)	320,541	399,953
Option 1 no action 2015	330,085	276,436
Option 2a: ICES HCR, Gulf of Riga F=0.26	323,612	248,849
Option 2b: ICES HCR, Gulf of Riga F=0.35	326,890	248,849
Output 2a_1: ICES HCR, 2020, Gulf of Riga F=0.26	343,729	277,753
Output 2a_2: Multispecies HCR, 2015, Gulf of Riga F=0.26	300,706	200,000

Bio-economic model - ii

- Latest version of EIAA model used for Economic component
  - Baseline period set as 2005 to 2007: 2008 AER report
  - Modifications made to allow analysis of specified capacity changes

- Gaps in Input data provided in AER report filled by:
  - Consultation with contacts in relevant member state authorities

Economic Modelling i

Option 3 investigates potential of changes in fleet size and uptake to increase profitability under implementation of ICES HCR

- Option 3a - Expected changes in fleet capacity using trend analysis and consultation with experts
- Option 3b - Option 3a, with additional capacity reductions for unprofitable segments to achieve profitability
- Option 3c - Option 3a, with variable uptake
  - Uptake allowed to increase, responding to decreasing TACS, to maintain current catch levels
- Option 3a_1 - Option 3a with a 50 % fuel price increase from 2005-07

Economic Modelling ii

- Expected capacity changes (Option 3a) determined from trend analysis and consultation
- ITQ system implemented in DNK pelagic fleet in 2003
  - Assumed that DNK fleet sizes remain at 2007 levels
- Latvia and Germany require very significant capacity reductions to force profitability (Option 3b) for PG0012 segments
  - Capacity reduction at national level very high as PG0012 has high number of vessels

	Capacity change	
MS	**Option 3a**	**Option 3b**
SWE	-36%	-36%
DNK	-14%	-14%
FIN	-3%	-3%
LVA	-7%	-85%
POL	-41%	-43%
EST	-36%	-40%
DEU	-30%	-70%
LTU	-38%	-38%
Total	**-24%**	**-49%**

Social Impacts Methodology

Data collection for social impact assessment

- Questionnaires sent to MS government reps from BSRAC
  - Followed up with focused interviews of industry (BSRAC members and organisations from AIPCE)
  - Countries experiencing insignificant impacts not approached
    - Danish fishing industry, Swedish and Finish processing industry
  - Danish and Swedish questionnaires completed by the team

- Processing employment data taken from EUROSTAT (and other literature as necessary)

- Multipliers used to calculate upstream employment

Impact Assessment

- Environmental Impacts
  - Objective: a predefined HCR with target F associated with MSY.
  - EU and MS committed to restoring/maintaining stocks at levels capable of producing MSY by 2015 - World Summit on Sustainable Development (WSSD)
- Economic Impacts
  - Objective: profitable fleets with high GVA
  - Performance of fleet segments and calculation of pelagic sector value added
  - Crew wage calculations
- Social Impacts
  - Objective: maximum fleet and onshore (processing and upstream) employment
  - Qualitative examination of impacts at community level

Environmental impacts

- 'No change' (option 1) scenario not consistent with EU or WSSD objectives for sustainable environmental management

- Option 2 is consistent with EU and WSSD objectives, through adopting target F close to Fmsy
  - All stocks likely to achieve Bmsy by 2020, most stocks by 2015
  - All stocks managed at F associated with Fmsy by 2015

- Likely improvement in general ecosystem health through increased availability of sprat and herring for other predators
  - Increase in SSB may not lead to increase in catches due to other ecosystem interactions (e.g. cod recovery leading to increased predation - Option 2a_2)

Economic Impacts i

- All options have decreased revenue compared to baseline, but Options 2 & 3 give increased performance compared with Option 1 (status quo)
- Performance under option 2a (multi-annual management plan) generally slightly worse than under option 1 (no change)
- Reductions in fleet size under Option 3a result in significant improvement in profitability
  - However some fleet segments remain unprofitable

Options	Gross rev. €m	Wages €m	Avg crew wage € '000	Value added €m
Baseline 2005-2007	226	58	6.2	114
Option 1 no change	213	55	5.9	108
Option 2a ICES HCR	211	55	5.9	107
Option 3a vessel trend	211	55	8.4	117

Options	No profitable fleets	No of stable fleets	No. unprofitable fleets
Baseline	12	6	7
Option 1	12	5	8
Option 2a	12	5	8
Option 3a	16	2	7

Economic Impacts ii

- Allowing higher F in Gulf of Riga (Option 2b) does benefit Estonian and Latvian fleets
  - However does not shift unprofitable segments in to the stable category
- Allowing stocks to stabilise fully (Option 2a_1) results in improved performance compared to Option 1
- Profitability is reduced if likely impact of interactions between cod, herring and sprat considered (Option 2a_2)

Options	Gross rev. €m	Wages €m	Avg crew wage € '000	Value added €m
Option 1 no change	213	55	5.9	108.1
Option 2a Gulf of Riga F=0.26	211	55	5.9	107.1
Option 2b Gulf of Riga F=0.35	211	55	5.9	107.2
Output 2a_1 2020	215	56	6	109.2
Output 2a_2 ICES multispecies	209	54	5.8	105.5

Options	No profitable fleets	No of stable fleets	No. unprofitable fleets
Option 1	12	5	8
Option 2a	12	5	8
Option 2b	12	5	8
Output 2a_1	12	5	8
Output 2a_2	12	5	8

Economic Impacts iii

- Further capacity reductions (Option 3b) beyond those expected (Option 3a) significantly improves profitability
- Increasing uptake (Option 3c) results in overall increase in performance

Options	No profitable fleets	No of stable fleets	No. unprofitable fleets
Option 1	12	5	8
Option 3a	16	2	7
Option 3b	20	3	2
Option 3c	17	1	7
Option 3a_1	12	7	6

Options	Gross rev. €m	Wages €m	Avg crew wage € '000	Value added €m
Option 1	213	54.9	5.9	108.1
Option 3a expected vessel trend	211	54.6	8.4	116.6
Option 3b additional	211	54.6	10.8	120.1
Option 3c Increased uptake	216	55.8	8.6	118.8
Output 3a_1 increased fuel cost	211	43.3	6.7	98.4

Economic impacts iv

- Calculation of total value added
  - Value added of the fleet attributed solely to Baltic pelagic catches (dependency)
  - Processing income Value Added multipliers (from Saltz et al 2007) used to calculate total value added
- Value added of pelagic component (fleet and processing) reduces slightly under option 2a compared to option 1
- Capacity reductions (options 3a and 3b) and increased uptake (option 3c) lead to significant increases in value added over Option 1 (status quo)

	Total	Change on base year	Change on Option 1
Fleet value added (€m)			
2005-2007	119		
Option 1	108	-9%	
Option 2a	107	-9%	-1%
Option 3a	118	-1%	9%
Option 3b	121	2%	12%
Option 3c	120	1%	11%
Catching value added (pelagic component)			
2005-2007	43		
Option 1	37	-15%	
Option 2a	36	-16%	-2%
Option 3a	39	-8%	7%
Option 3b	41	-6%	10%
Option 3c	41	-5%	11%
Total value added (pelagic component)			
2005-2007	96		
Option 1	82	-14%	
Option 2a	81	-16%	-2%
Option 3a	88	-8%	7%
Option 3b	91	-6%	10%
Option 3c	91	-5%	11%

Social Impacts i

- Option 3a – capacity reduction
- Overall expected capacity changes lead to 30 % decrease in employment compared to 2005-2007
- Some of this decrease will happen anyway by 2010 (Option 1 Status Quo)
- Increases to 46 % with capacity reductions to enforce profitability

Fleet employment change compared to 2005-07

MS	3a	3b
SWE	-40%	-40%
DNK	-19%	-19%
FIN	-5%	-5%
LVA	-14%	-76%
POL	-42%	-46%
EST	-37%	-43%
DEU	-34%	-51%
LTU	-40%	-40%
Total	**-30%**	**-46%**

Social Impacts ii

- Modest reductions in overall pelagic processing and upstream employment for Option 2
  - However reductions much higher as percentage of Baltic pelagic dependent processing
- Highest losses in processing employment for countries dependent on sprat
  - Latvia and Estonia
- Allowing increases in uptake along with capacity reductions (Option 3c) gives increase in employment against Option 1

	Total	Change on base year	change on Option 1
Total pelagic processing employment			
2005-2007	24095		
Option 1	22531	-6%	
Option 2a	22346	-7%	-1%
Option 2b	22383	-7%	-1%
Output 2a_2	22133	-8%	-2%
Option 3c	23105	-4%	3%
Upstream employment			
2005-2007	1420		
Option 1	1173	-17%	
Option 2a	1136	-20%	-3%
Option 2b	1149	-19%	-2%
Output 2a_2	1104	-22%	-6%
Option 3c	1168	-18%	0%

Social Impacts ii

- Modest reductions in overall pelagic processing and upstream employment for Option 2
  - However reductions much higher as percentage of Baltic pelagic dependent processing
- Highest losses in processing employment for countries dependent on sprat but even these are limited under Option 3c
  - Latvia: loss of 2% of total processing + upstream compared to Option 1
  - Estonia: loss of 1%
  - Lithuania: gain of 2%
  - Poland: gain of 4%

	Total	Change on base year	Change on Option 1
Baltic pelagic processing employment			
2005-2007	5303		
Option 1	3739	-29%	
Option 2a	3554	-33%	-5%
Option 2b	3591	-32%	-4%
Output 2a_2	3341	-37%	-11%
Option 3c	4313	-19%	15%

Social Impacts iii

- Allowing increases in uptake along with capacity reductions (Option 3c) gives increase in employment against Option 1
- Most vulnerable communities and fishing sectors in Estonia and Latvia which have a high dependency on sprat catching and processing (Leipaja, Ventspils, Dirhami, Veere, Lehtma)
- Vulnerability will depend on the extent to which fleets and processing can switch from sprat to herring

Conclusions i

- Environment:
  - Even Option 1 leads to declines in sprat catches.
  - Options 2 and 3 (application of ICES HCR) consistent with WSSD objectives and greater biomass

Conclusions ii

- Economic
  - Option 1 leads to reduction in profitability
  - Option 2 leads to greater losses in GVA and profitability
  - Option 2 with multispecies leads to greater losses in GVA and profitability
  - Option 3 gives better performance (GVA, profitability) than Status Quo (Option 1). Some fleets remain unprofitable
  - The best performance is generated with anticipated fleet reductions and increased uptake and utilisation of herring and sprat
  - All options 3 give better performance for processing sector than Status Quo

Conclusions ii

- Social
  - Option 3 decline in fleet employment as fleet declines
  - Option 3 average wage increases
  - If uptake increases processing employment increased compared to Option 1

Conclusions iii

- Impacts will be greatest for those fleets, communities and MS with high dependency on Baltic sprat and processing (Latvia, Estonia, Poland) but should not be much greater than under Option 1 and in some cases (Option 3c – increased uptake) processing employment will increase