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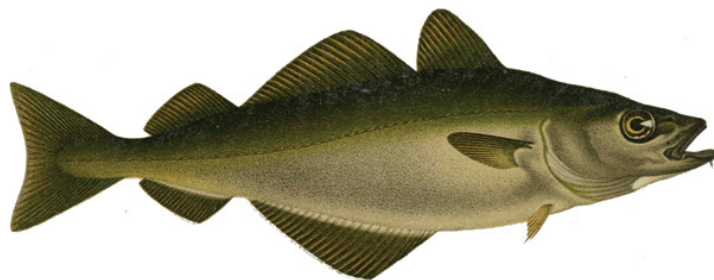
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Certification Report for

GERMAN NORTH SEA SAITHE TRAWL FISHERY

Client: Erzeugergemeinschaft der Hochsee - und Kutterfischer GmbH



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1 INTRODUCTION

This report sets out the results of the assessment of the German North Sea Saithe Trawl Fishery against the Marine Stewardship Council Principles and Criteria for Sustainable Fishing.

1.1 The fishery proposed for certification

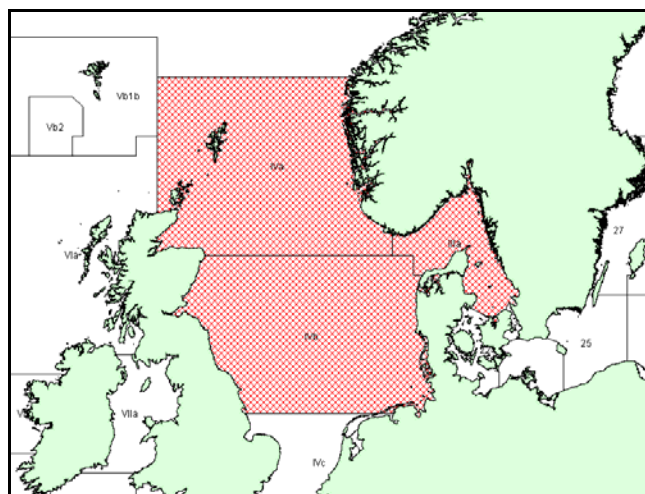
The MSC Guidelines to Certifiers specify that the unit of certification is "The fishery or fish stock (=biologically distinct unit) combined with the fishing method/gear and practice (=vessel(s) pursuing the fish of that stock) and management framework."

The fishery proposed for certification is therefore defined as:

Species:	Saithe (Seelachs / Köhler / Blaufisch) (<i>Pollachius virens</i> , Linneaus 1758)
Geographical Area:	North Sea ICES Area IV & IIIa
Method of Capture:	Trawl
Stock:	North Sea
Management:	Managed under EU-Norway Agreement and by Norwegian Authorities.
Client Group:	Erzeugergemeinschaft der Hochsee - und Kutterfischer GmbH specified vessels:

Antares	SAS211
Bianca	NC312
Christin-Bettina	SAS111
Helgoland	NC302
Iris	BX775
J. von Cölln	NC308
Kristin	NC330
Kristin	NC333
Seewolf	NC309
Susanne	NC120
Victoria	NC315
Westbank	SAS110

The geographic area of the unit of certification is illustrated below. Discussions are limited to that part of the North Sea where the German vessels listed above fish for saithe.



1.2 Report Structure and Assessment Process

The aims of the assessment are to determine the degree of compliance of the fishery with the Marine Stewardship Council (MSC) Principles and Criteria for Sustainable Fishing, as set out in Section 5.

This report firstly sets out:

- the background to the fishery under assessment
- the qualifications and experience of the team undertaking the assessment
- the standard used (MSC Principles and Criteria)
- stakeholder consultation carried out. Stakeholders include all those parties with an interest in the management of the fishery and include fishers, management bodies, scientists and Non-Governmental Organisations (NGO's)

Section 9 of the report sets out the methodology used to assess ('score') the fishery against the MSC Standard. The scoring table then sets out the Scoring Indicators adopted by the assessment team and Scoring Guidelines which aid the team in allocating scores to the fishery. The commentary in this table then sets out the position of the fishery in relation to these Scoring Indicators.

The intention of the earlier sections of the report is to provide the reader with background information to interpret the scoring commentary in context.

Finally, as a result of the scoring, the Certification Recommendation of the assessment team is presented, together with any conditions attached to certification.

In draft form, this report is subject to critical review by appropriate, independent, scientists ('peer review'). The comments of these scientists are appended to this report. Responses are given in the peer review texts and, where amendments are made to the report on the basis of Peer Review comments, these are also noted in the peer review text. The updated report is then circulated for public scrutiny on the MSC website.

The report, containing the recommendation of the assessment team, any further stakeholder comments and the peer review comments is then considered by the Moody Marine Governing Board (a body independent of the assessment team). The Governing Board then make the final certification determination on behalf of Moody Marine.

It should be noted that, in response to comments by peer reviewers, stakeholders and the Moody Marine Governing Board, some points of clarification may be added to the final report.

Finally, the complete report, containing the Moody Marine Ltd Determination and all amendments, will be released for further stakeholder scrutiny.

1.3 Information sources used

Information used in the main assessment has been obtained from interviews and correspondence with stakeholders in the fisheries, notably:

Meetings & Questionnaires

- I1. Client (Erzeugergemeinschaft der Hochsee- und Kutterfischer GmbH). Interview with Jörg Petersen and Kai-Arne Schmidt, 19th September 2007.
- I2. Federal Research Center for Fisheries (BFAFi). Interview with Dr Siegfried Ehrich and Dr Hans-Joachim Rätz, 19th September 2007.
- I3. Response from Federal Agency for Agriculture and Nutrition (BLE) to specific MSC Certification questions. November 2007.
- I4. Telephone conversation with Heike Vesper, WWF Germany. November 2007.

Other information sources

Published information and unpublished reports used during the assessment are:

- R1. Administrative order of 20 December of 2006 pertaining to the regulation of the saithe fishery in the North Sea and Skagerrak in 2007. Provided at meeting at the Norwegian Fisheries Directorate 24 January 2007.
- R2. Administrative order of 4 January of 2007 pertaining to the regulation of the fisheries for cod, haddock and saithe north to 62° N. Provided at meeting at the Norwegian Fisheries Directorate 24 January 2007.
- R3. Agreed record of conclusion of fisheries consultations between the European Community and Norway for 2007. Brussels, 1 December 2006. Copy viewed at <http://www.swfpa.org.uk/regulations/documents/EU-NorwayFisheriesAgreement200715.12.06.pdf>
- R4. Ahlers, W. 2004. Bericht über eine Fangbeprobung. 20/09 – 28/09/04. Schiff: Bianca. Bundesforschungsanstalt für Fischerei. 6p.
- R5. Ahlers, W. 2005. Bericht über eine Fangbeprobung. 6/11 – 14/11/05. Schiff: J. von Cölln. Bundesforschungsanstalt für Fischerei. 4p.
- R6. Ahlers, W. 2005. Bericht über eine Fangbeprobung. 10/04 – 14/04/05. Schiff: J. von Cölln. Bundesforschungsanstalt für Fischerei. 5p.
- R7. Ahlers, W. 2005. Bericht über eine Fangbeprobung. 05/09 – 19/09/05. Schiff: J. von Cölln. Bundesforschungsanstalt für Fischerei. 4p.
- R8. Ahlers, W. 2006. Bericht über eine Fangbeprobung. 25/01 – 31/1/06. Schiff: J. von Cölln. Bundesforschungsanstalt für Fischerei. 3p.
- R9. Ahlers, W. 2004. Bericht über eine Fangbeprobung. 04/06 – 14/06/04. Schiff: Bianca. Bundesforschungsanstalt für Fischerei. 6p.
- R10. Bjørge, A. and Kovacs, K.M., (sci. eds.). 'Report of the working group on seabirds and mammals'.
- R11. Blanchard, J.L., Pinnegar, J.K. and Mackinson, S. (2002). Exploring marine mammal-fishery interactions using 'Ecopath with Ecosim': modelling the Barents Sea ecosystem. Sci. Ser. Tech Rep., CEFAS Lowestoft, 117: 52pp.
- R12. Bundesanstalt für Landwirtschaft und Ernährung, 2006: Erste Bekanntmachung über den Fischfang durch deutsche Fischereibetriebe im Jahr 2007. Vom 4. Dezember 2006
- R13. Bundesanstalt für Landwirtschaft und Ernährung, 2006: Vierte Bekanntmachung über den Fischfang durch deutsche Fischereibetriebe im Jahr 2007. Vom 21. Mai 2007
- R14. Cardinale, M; Hjelm, J. 2003 Environmental stochasticity and recruitment anomalies of gadoids in the North Atlantic. ICES CM 2003/T:01.
- R15. Child, A. R. 1988. Population genetics of cod, haddock, whiting and saithe. CEFAS, Fisheries Research Technical Report No. 87.
- R16. Cook, R. M., and Heath, M. R. 2005. The implications of warming climate for the management

- of North Sea demersal fisheries. *ICES Journal of Marine Science*, 62: 1322-1326.
- R17. Cotter, J. Jeroen van Der Kooij, Clive Satchell, Kevin Sullivan, and Trevor Boon (2004). Report on catches of saithe, cod and haddock in the northern North Sea by FV Farnella in autumn 2003. <http://www.cefas.co.uk/FSP/publications/FSP-03-04-Project-2.pdf>
- R18. EC Directive (EEC) No 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. *OJ L* 206 22.07.1992 p. 7-50
- R19. EC Directive (EEC) No 79/409/EEC on the conservation of wild birds, *OJ L* 103 25.4.1979 p1-18.
- R20. EC Directive (EC) No 59/2000/EC of the European Parliament and of the Council of 27 November 2000 on port reception facilities for ship-generated waste and cargo residues – Commission declaration. *OJ L* 332, 28.12.2000 p.81-90
- R21. EC Regulation (EEC) No 2214/80. Conclusion of the Agreement on fisheries between the European Economic Community and the Kingdom of Norway.
- R22. EC Regulation (EC) No 2371/2002 of 20 December 2002 on the conservation and sustainable exploitation of fisheries resources under the Common Fisheries Policy *OJ L* 358, 31.12.2002, p. 59–80
- R23. EC Regulation (EC) No 423/2004 of 26 February 2004 establishing measures for the recovery of cod stocks. *OJ L* 70, 9.3.2004, p. 8–11
- R24. EC Regulation (EC) No 754/2007 of 28 June 2007 amending Regulations (EC) No 1941/2006, (EC) No 2015/2006 and (EC) No 41/2007, as regards fishing opportunities and associated conditions for certain fish stocks *OJ L* 172, 30.6.2007, p. 26–38
- R25. Cux-Trawl Fischereiausrüstung GmbH: testimonial dated 27.09.2007.
- R26. Daan, N, Heessen, H. and Hofstede, R. (2005). North Sea Elasmobranchs: distribution, abundance and biodiversity. *ICES CM* 2005/N:06
- R27. Daskalov, G. and Mackinson, S. (2004). Trophic modelling of the North Sea. *ICES CM* 2004/FF:40
- R28. Degel, H., Nedreaas, K. and Nielsen, J. R. (2006). Summary of results from the Danish-Norwegian fishing trials autumn 2005 exploring by-catch levels in the small-meshed fishery in the North Sea targeting Norway pout.
- R29. Ehrich, S., Adlerstein, S., Brockmann, U., Floeter, J., Garthe, S., Hinz, H., Kröncke, I., Neumann, H., Reiss, H., Sell, A.F., Stein, M., Stelzenmüller, V., Stransky, C., Temming, A., Wegner, G., Zauke, G-P. 2007. 20 years of the German small-scale bottom trawl survey (GSBTS): a review. *Senckenbergiana maritima* 37(1), 13-82.
- R30. Erzeugergemeinschaft der Hochsee- und Kutterfischer GmbH 2007: letter to Ministerium für Ernährung, Landwirtschaft und Forsten . 23.01.2007
- R31. Directorate of Fisheries. 2006. Developing resource management. Solutions for an improved resource management.
- R32. Directorate of Fisheries. Regulations amending the regulations relating to sea-water fisheries. 2006.
- R33. Folkow, L.P., Haug, T., Nilssen, K.T. and Nordøy, E.S. (1997). Estimated food consumption of Minke whales *Balaenoptera acutorostrata* in Northeast Atlantic waters in 1992-1995. *ICES CM* 1997/GG:01.
- R34. Frid, C.L.J., Harwood, K.G., Hall, S.J. and Hall, J.A. (2002). Long-term changes in the benthic communities on North Sea fishing grounds. *ICES J. Mar. Sci.* 57, 1303-1309.
- R35. Gross, T. 2007. Bericht über eine Fangbeprobung. 09/06 – 14/06/07. Schiff: J. von Cölln. Bundesforschungsanstalt für Fischerei. 4p.
- R36. Gröhsler, T., Zimmermann, C. 2003. Zustand und Entwicklung ausgewählter Fischbestände. Einschätzung des Internationalen Rates für Meeresforschung im Frühjahr 2003. *Inf. Fischwirtsch. Fischereiforsch.* 50(3): 98-121
- R37. Hammer, C. 2001a. Entwicklung und Lage ausgewählter Fischbestände. Einschätzung des Internationalen Rates für Meeresforschung Ende 2000. *Inf. Fischwirtsch. Fischereiforsch.* 48(2): 47-61
- R38. Hammer, C. 2001b. Lage und Entwicklung ausgewählter Fischbestände. Einschätzung des Internationalen Rates für Meeresforschung im Oktober 2001. *Inf. Fischwirtsch. Fischereiforsch.* 48(4): 151-162

- R39. Hammer, C., Gröhsler, T. 2002: Lage und Entwicklung ausgewählter Fischbestände. Einschätzung des Internationalen Rates für Meeresforschung im Juni 2002. Inf. Fischwirtsch. Fischereiforsch. 49(2/3): 35-55
- R40. Hammer, C., Gröhsler, T., Zimmermann, C. 2000: Die Lage der Fischbestände in Nordost-Atlantik, Nord- und Ostsee. Einschätzung des Internationalen Rates für Meeresforschung im Frühjahr 2000. Inf. Fischwirtsch. Fischereiforsch. 47(3): 111-126
- R41. Haug, T., Gjørseter, H., Lindstrøm, U. and Nilssen, K.T., (1995). 'Diet and food availability for northeast Atlantic minke whales (*Balaenoptera acutorostrata*), during the summer of 1992', ICES J. of Mar. Sci. 52, 77-86
- R42. Hiddink, J.G., Jennings, S., Kaiser, M.J., Queiros, A.M., Duplisea, D.E. and Piet, G.J. (2006). Cumulative impacts of seabed trawl disturbance on benthic biomass, production, and species richness in different habitats. Can. J. Fish. Aquat. Sci. 63, 721-736.
- R43. Hirst, D. et al. 2004. Estimating catch at age from market sampling data by using a Bayesian hierarchical model. Appl. Statist. 53 (1): 1-14.
- R44. Hirst, D. et al. 2005. Estimating catch at age by combining data from different sources. Can J Fish Aquat Sci. 62:1377-1385.
- R45. <http://www.ascobans.org/>
- R46. ICES 1965. Report of the Coalfish Working Group. Co-op. Res. Rep. Int. Coun. Explor. Sea ser. A. 6: 1-23.
- R47. ICES 1995. Report of the saithe study group. ICES CM 1995/G:2.
- R48. ICES 2004. Report of the Study Group on Cold-Water Corals (SGCOR)
- R49. ICES 2005. Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK). ICES CM 2005/ACFM:07
- R50. ICES 2006 Report of the Arctic Fisheries working Group (AFWG). ICES Advisory Committee on Fishery Management ICES CM 2006/ACFM:25
- R51. ICES 2006 Report of the ICES Advisory Committee on Fishery Management, Advisory Committee on the Marine Environment and Advisory Committee on Ecosystems, 2006. Books 1-10, 310pp.
- R52. ICES 2006. Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK). ICES CM 2006/ACFM:09
- R53. ICES 2006 Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK). ICES Advisory Committee on Fishery Management ICES CM 2006/ACFM:35
- R54. ICES 2006: Saithe in Subarea IV (North Sea), Division IIIa (Skagerrak), and Subarea VI (West of Scotland and Rockall). Volume 6 pp115-124
- R55. ICES (2007). Saithe in sub-area IV, VI, and division IIIa. P 375-414 in ICES WGNSSK report 2007. ICES, Copenhagen.
- R56. ICES 2007, Saithe in Subarea IV, Division IIIa (Skagerrak), and Subarea VI, in ICES Advice 2007 Book 6, 114 - 124
- R57. IMR book on "The Norwegian Sea ecosystem" (2004) – ed. Skjoldal, Tapir Academic Press (www.tapirforlag.no) ISBN 82-519-1841-3
- R58. Ingolfsson, O.A. (2006). Size selectivity and escape mortality of gadoid fish in the Barents Sea trawl fishery. University of Bergen PhD Thesis.
- R59. IUCN <http://www.iucnredlist.org/>
- R60. Jakobsen, T 1981a. Preliminary results of saithe tagging experiments on the Norwegian coast 1975-77. ICES-CM-1981/G:35
- R61. Jakobsen, T 1981b. Assessments of the north-east arctic and north sea stocks of saithe taking into account migration. ICES C.M. 1981/G:36.
- R62. Jakobsen, T. 1986. Recruitment and distribution of North-East Arctic saithe in relation to changes in the environment. pp 213-223 in Loeng, H. (ed.) The effect of oceanographic conditions on distribution and population dynamics of commercial fish stocks in the Barents Sea. Proceedings of the third Soviet-Norwegian Symposium, Murmansk 26-28 May 1986. Institute of Marine Research, Bergen, 1987.
- R63. Jakobsen, T. & S. Olsen 1987. Variation in rates of migration of saithe from Norwegian waters

- to Iceland and Faroe Islands. *Fisheries Research*, 5:217-222.
- R64. Jonsson, S 2001. The importance of tagging in earnest: Review of saithe tagging experiments in the NE-Atlantic and introducing an ongoing Icelandic saithe tagging study <http://www.ices.dk/products/CMdocs/2001/O/O-2001.pdf>
- R65. Kell, L. T., Pilling, G. M., Kirkwood, G. P., Pastoors, M., Mesnil, B., Korsbrekke, K., Abaunza, P., Aps, R., Biseau, A., Kunzlik, P., Needle, C., Roel, B. A., and Ulrich-Rescan, C. 2005. An evaluation of the implicit management procedure used for some ICES roundfish stocks. *e ICES Journal of Marine Science*, 62: 750e759.
- R66. Kroupis, S.. 2006. Bericht über eine Fangbeprobung. 15/01 – 22/1/06. Schiff: J. von Cölln. Bundesforschungsanstalt für Fischerei. 3p.
- R67. Letter dated 04 December 2006 from Ministry of Fisheries and Coastal Affairs to the International Council for the Exploration of the Sea regarding management objectives for saithe. Provided at meeting with the Ministry of Fisheries and Coastal Affairs 25 January 2007.
- R68. Leu, E. 2004. Bericht über eine Fangbeprobung. 21/02 – 02/03/04. Schiff: J. von Cölln. Bundesforschungsanstalt für Fischerei. 5p.
- R69. Leu, E. 2004. Bericht über eine Fangbeprobung. 02/12 – 13/12/04. Schiff: J. von Cölln. Bundesforschungsanstalt für Fischerei. 4p.
- R70. Leu, E. 2004. Bericht über eine Fangbeprobung. 05/03 – 11/03/04. Schiff: J. von Cölln. Bundesforschungsanstalt für Fischerei. 4p.
- R71. Leu, E.. 2006. Bericht über eine Fangbeprobung. 07/05 – 17/05/06. Schiff: J. von Cölln. Bundesforschungsanstalt für Fischerei. 5p.
- R72. Leu, E. and Kroupis, S. 2005. Bericht über eine Fangbeprobung. 01/03 – 11/03/05. Schiff: J. von Cölln. Bundesforschungsanstalt für Fischerei. 5p.
- R73. Lindstrøm, U., Harbitz, A., Haug, T. and Nilssen, K., (1998). 'Do harp seals *Phoca groenlandica* exhibit particular prey preferences?', *ICES J. Mar. Sci.*, 55, 941-953.
- R74. Lundbeck, J. 1962. Biologisch-statistische Untersuchungen über die deutsche Hochseefischerei, IV. Die Entwicklung der Hochseefischerei in fangtechnischer, räumlicher und biologischer Hinsicht, 5. Die Dampferfischerei in der Nordsee. *Ber. Dt. Wiss. komm. Meeresforsch.* XVI(3): 177-246
- R75. Management of Living Marine Resources. Paper provided at Ministry of Fisheries and Coastal Affairs, meeting 25 January 2007.
- R76. Management System of Marine Resources: Quota Allocation". Paper provided at Ministry of Fisheries and Coastal Affairs, meeting 25 January 2007.
- R77. Mehl, S. (2005). Stomach analyses of Northeast Arctic saithe sampled during the saithe survey Varanger-Møre, 1998-2003. Working Document 7 to the Arctic Fisheries Working Group.
- R78. Misund, O.A. and Skjoldal, H.R. (2005). Implementing the ecosystem approach: Experiences from the North Sea, ICES, and the Institute of Marine Research, Norway. *Marine Ecology Progress Series* 300, pp. 260-265
- R79. NEAFC (2004). 'Ghost fishing by lost fishing gear' Workshop Briefing Paper Discussion Workshop, 10-11 May 2005, The Centre, Brussels Reference: DG FISH/2004/20. http://www.neafc.org/reports/international/docs/ghost-fishing-workshop_briefing_paper.pdf
- R80. Nedreaas, K. 1987. Food and feeding habits of young saithe, *Pollachius virens* (L.), on the coast of western Norway. *Fiskeridirektoratets Skrifter, Serie Havundersøkelser* 18: 263-301
- R81. North Atlantic Marine Mammal Commission, 2005. *NAMMCO Annual Report 2005*. North Atlantic Marine Mammal Commission, Tromsø, Norway, 381 pp.
- R82. OSPAR 2010 presentation of quality state report
- R83. Pope, J., Hawkins, T., Tingley, D., Mardle, S., & Cattermoul, N. Long-term Management of North Sea Fisheries: Summary of a report to DEFRA and the North Sea Regional Advisory Council. <http://www.defra.gov.uk/fish/sea/pdf/others/20060921paper5.pdf>
- R84. Rätz, H.-J. 2001. Die Bedeutung biologischer Daten aus der deutschen Seelachsfischerei für Bestandsabschätzung und Management. *Inf. Fischwirtsch. Fischereiforsch.* 48(3): 122-128
- R85. Rätz, H.-J. 2005. German Otter Trawl Board Fleet as Tuning Series fort he Assessment of Saithe in VI, VI and IIIa. *ICES 2005 WGNSSK*, 8p.
- R86. Rätz, H.-J., Ehrich, S., Bethke, E. 2005. Wer fischt was? – Gemischte Bodenfischereien und

- ihre Auswirkungen auf die wichtigsten Nutzfischbestände in der Nordsee. Inf. Fischereiforsch. 52: 91-100
- R87. Reinsch, H.H. 1976. Köhler und Steinköhler. Die Neue Brehm Bücherei, A. Ziemsen Verlag, 158p.
- R88. Rätz, H-J, 2006. Saithe (*Pollachius virens*): stock status, fisheries and management. Presentation to Scientific Technical and Economic Committee for Fisheries of EU-COM.
- R89. Report Of The Second Meeting Of The Subgroup On Fishery And Environment (SGFEN) Of The Scientific, Technical And Economic Committee For Fisheries (STECF). Incidental Catches Of Small Cetaceans. Brussels, 22.10.2002 Sec(2002) 1134
- R90. Riksrevisjonen Dokument nr 3:13 (2003-2004): Riksrevisjonens undersøkelse av forvaltningen av ressursene
- R91. Robinson, L. 2003. The ecological disturbance of fishing in demersal fish and benthic invertebrate communities. MAFCONS report, 2003 – 003, 40pp.
- R92. Rumohr, H. and Kujawski, T. (2000). The impact of trawl fishery on the epifauna of the southern North Sea. ICES J. Mar. Sci. 57, 1389-1394.
- R93. Silvert, R. 2004. Report on Management Simulations for the North Sea based on Ecopath with Ecosim in Work Package 6 EFEP (European Fisheries Ecology Plan), 2004. <http://bill.silvert.org/pdf/ECOPATH%20Report.pdf>
- R94. Sparre, P. 1984. A computer program for estimation of food suitability coefficients from stomach content data and multispecies VPA. ICES CM 1984/G: 25, 59 pp.
- R95. Stratoudakis, Y., Fryer, R., Cook, R.M. & Pierce, G.J., 1999. Fish discarded from Scottish demersal vessels: estimators of total discards and annual estimates for targeted gadoids. ICES Journal of Marine Science 56, 592-605.
- R96. Tasker, M.L., C.J. Kees Camphuysen, J. Cooper, S. Garthe, W. A. Montevecchi, S.J.M. Blaber 2000. the impacts of fishing on marine birds. ICES J. Mar. Sci 57, 531-547.
- R97. Ugland, K. I., K. A. Jødestøl, P. E. Aspholm, A. B. Krøyer and T. Jakobsen , Fish consumption by invading harp seals off the Norwegian coast in 1987 and 1988. ICES Journal of Marine Science: Journal du Conseil 1993 50(1):27-38.
- R98. United Nations Convention on the Law of the Sea. Viewed at www.un.org/Depts/los/convention_agreements/texts/unclos/unclos_e.pdf
- R99. Vinther, M. and Larsen, F. 2004. Updated estimates of harbour porpoise (*Phocoena phocoena*) bycatch in the Danish North Sea bottom-set gillnet fishery. J. Cetacean Res. Manage. 6(1):19-24
- R100. Walker, P. A. and Heessen, H. J. L. (1996). Long-term changes in ray populations in the North Sea. Fish. Res. 53, 1085-1093.
- R101. Weber, W. 1999. Discards in der deutschen Seelachsfischerei. Inf. Fischwiss. Fischereiforsch. 46(4): 24-28
- R102. Wheeler, A. 1969. The fishes of the British Isles and North-west Europe. Michigan State University Press, 613pp.
- R103. WWF. 2003. Norwegian coldwater coral protection. Setting an international example in marine conservation.
- R104. Zimmermann, C., Hammer, C. 2002. Zustand und Entwicklung ausgewählter Fischbestände. Einschätzung des Internationalen Rates für Meeresforschung im Herbst 2002. Inf. Fischwirtsch. Fischereiforsch. 49 (4): 119-138
- R105. Zimmermann, C., Gröhsler, T. 2004. Zustand und Entwicklung ausgewählter Fischbestände. Einschätzung des Internationalen Rates für Meeresforschung im Jahr 2004. Inf. Fischwirtsch. Fischereiforsch. 51(2-4): 43-109

2 BACKGROUND TO THE FISHERY

2.1 Biology of the Target Species:

Juvenile saithe are mainly distributed in nursery grounds inshore, in sheltered bays and coastal waters along the west and south coast of Norway, the coast of Shetland and the coast of Scotland (ICES 2006b). Around age 3 they gradually migrate from the coastal areas to the northern part of the North Sea, mainly along the shelf edge (57°N - 62°N), where the feeding grounds of the adult part of the stock are situated. Age at maturity is between 4 and 6 years, and spawning takes place in January-March at about 200 m depth along the Northern Shelf edge and the western edge of the Norwegian deeps. Larvae and post-larvae are widely distributed in Atlantic water masses across the northern part of the North Sea, and around May the 0-group appear along the coasts of Norway, Shetland and Scotland. The west coast of Norway is probably the most important nursery ground for saithe in the North Sea.

When saithe exceed 60-70 cm in length the diet changes from plankton (krill, copepods) to fish (mainly Norway pout, herring, sandeel, haddock and blue whiting). Large saithe (>70 cm) show a highly migratory behaviour, and the feeding migrations extend from far into the Norwegian Sea to across the Norwegian deeps to the coast.

Before 1999 saithe in Sub-area IV and Division IIIa and saithe in Sub-area VI were treated as separate stock units. These stock boundaries were more for management purposes than a biological basis for stock separation. Present biological knowledge shows no evidence that saithe in Division IVa and VIa belong to separate stock units. There seems to be a similar recruitment pattern and the spawning areas in these divisions are not separated (ICES 1995). Stock assessments for 'North Sea' saithe therefore now cover areas IV, IIIa and VIa. ICES ACFM advice reflects the fact that in these ICES areas, the assessment indicates that saithe is at 'full reproductive capacity' and is considered to be 'harvested sustainably'. In turn, the Northeast Arctic saithe stock, with which exchange of individuals from the 'North Sea' stock may occur, is considered to be in a comparable sustainable state.

Tagging experiments by various countries have shown that exchange between all saithe stock components in the north-east Atlantic takes place to a variable extent (ICES 1995). For example, a substantial migration of immature saithe from the Norwegian coast between 62° N and 66° N to the North Sea has been shown to occur (Jakobsen 1981). 0-group saithe, on the other hand, drift from the northern North Sea to the coast of Norway north of 62° N.

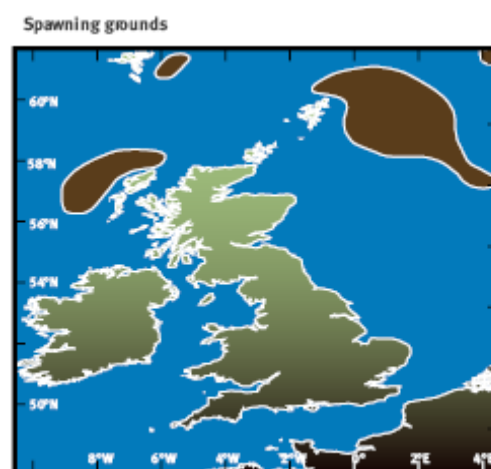


Figure showing spawning grounds of saithe around the British Isles. (FRS Aberdeen)

2.2 History of the Fishery:

As noted, before 1999, saithe in ICES statistical areas IV, IIIa and VI were viewed as distinct stocks. More recently, they have been assessed as one stock. The main fleets catching saithe are France, Norway, Scotland, Denmark, and Germany. Landings data within the assessment span the period 1967-present day. Catches peaked in 1976, but since 1990 have remained relatively constant at around half of that peak. Fishing mortality peaked in the mid-1980s, but has declined relatively consistently from then.

The last five years reported landings have been lower than the TAC, due to low prices and high costs of fishing (high fuel prices). Since 1987 (149,000 tons), landings have varied between 87,000 tons (2000) and 117,000 tons (2006). The fishery in area VI is dominated by EU vessels. Landings in this area were around 8,500 t. The German landings from areas IV and IIIa in 2006 were 14,390 tons, with 532 t taken in area VI. The combined TAC recommended for that year was between 108,000 and 136,000 t, dependent upon the use of the management rule (ICES ACFM Advice 2006, section 1.4.12), and set at 123,250 t (areas IV and IIIa) and 12,787 t (area VI) respectively (ICES WGNSSK, 2007).

2.3 Vessels and Gear:

Saithe in the North Sea are mainly taken in a direct trawl fishery in deep water near the Northern Shelf edge and the Norwegian deeps. Norwegian, French, and German trawlers take the majority of the catch. In the first quarter of the year the fisheries are directed towards mature fish in spawning aggregations, while concentrations of immature fish (age 3-4) often are targeted during the rest of the year. In recent years the French fishery deployed less effort along the Norwegian deeps, while the German and Norwegian fisheries have maintained their effort there.

The fishery in the related Area VI consists largely of a directed French, German, and Norwegian deep-water fishery operating on the shelf edge, and a Scottish fishery operating inshore. In both areas most of the saithe do not enter the main fishery before age 3, because the younger ages are staying in inshore waters. Minimum landing size for saithe is currently 35 cm in the EU zone and 32 cm in the Norwegian zone (south of 62°N).

The vessels in the unit of certification are listed below.

Name	Vessel Registration	Length (m)	Gross Tonnage	Fishing Method
Antares	SAS211	21	129	Otter trawl
Bianca	NC312	40	455	Otter trawl
Christin-Bettina	SAS111	25	152	Otter trawl
Helgoland	NC302	30	261	Otter trawl
Iris	BX775	35	425	Otter trawl
J. von Cölln	NC308	40	459	Otter trawl
Kristin	NC330	37.5	457	Otter trawl
Kristin	NC333	37	457	Otter trawl
Seewolf	NC309	30	261	Otter trawl
Susanne	NC120	40	492	Otter trawl
Victoria	NC315	28	308	Otter trawl
Westbank	SAS110	-	107	Otter trawl

2.4 Fishing Locations and Administrative Boundaries:

The North Sea saithe stocks are shared between Norway and the European Union, with 52 per cent to the EU and 48 per cent to Norway. German vessels have quotas for areas IV and IIIa, with lower quotas for VI and IIa (Norwegian Sea)¹.

2.5 Ecosystem Characteristics:

The North Sea is a semi-enclosed water body, situated on the continental shelf of Northwest Europe. Bounded by a number of countries, this relatively shallow sea (generally shallower than 200m) is strongly affected by both saline inflows from the north, and from freshwater inputs from the major rivers of the continent. It is a highly productive ecosystem, but primary productivity varies across the North Sea. Highest values of primary productivity occur in the coastal regions (influenced by terrestrial nutrient inputs), on the Dogger Bank, and at tidal fronts.

The North Sea is the focus of a range of human activities, including fishing, dredging, oil and gas exploration, shipping and as recipient for discharges from sources on land or offshore. In recognition of the potential impacts on the ecosystem, the Ministers at the 3rd Conference in The Hague in 1990 requested that OSPAR and ICES should establish a North Sea Task Force (NSTF), with one of the tasks being to produce a Quality Status Report (QSR) for the North Sea. This was completed in 1993 and identified fisheries as having major impacts on the North Sea ecosystem.

A range of information exists on elements of the North Sea ecosystem, including considerable knowledge on the oceanography, plankton, fish distribution and abundance, and the interactions between these fish components. Certain types of data, notably those related to fisheries, physical oceanography, plankton and nutrients, are measured typically throughout the North Sea, with many programmes covering several decades of observation. Other data, including biological effects (ecotoxicology), sediment chemistry (contaminants), species introductions, hazardous algal blooms in coastal waters and benthos surveys (to name a few) tend to be more localized (for example concentrated in coastal waters) or cover a more limited period of time, i.e., years rather than decades.

The process of linking these components of the North Sea ecosystem is beginning under the ICES Regional Ecosystem study group for the North Sea (REGNS)², which includes Norwegian scientific representatives. Under these auspices, a workshop to progress an Integrated Assessment of the North Sea (9–11 May, 2004) and the meeting of the REGNS Study Group (12–13 May 2004) was held at ICES Copenhagen, Denmark. This aimed to seek agreement on the methodological approach (or framework) for undertaking an Integrated Ecosystem Assessment of the North Sea (IEA). The process aims to bring together information from a range of other ICES Working Groups and organisations (including OSPAR and SAHFOS) to this aim.

Specifically concerning the interactions of fish species such as saithe within the North Sea ecosystem, the feeding habits of this species have been examined through data collected during annual research surveys and during the two ‘years of the stomach’ programmes (1981, 1991). These studies underlie the Multispecies VPA (MSVPA)³ programme developed for the North Sea by the ICES Multispecies Assessment Working Group, which estimates the predation mortalities for 9 commercially important fish stocks based upon key fish predators, and by seabirds and seals.

Detailed mass-balance trophic models of the North Sea have been developed using the Ecopath with

¹ Quotas for 2007 are listed in section 4.3.1

² ICES. 2005. Report of the Regional Ecosystem Study Group for the North Sea (REGNS), 9–13 May 2005, ICES Headquarters, Copenhagen. ICES CM 2005/. 49 pp.

³ Sparre, P. 1984. A computer program for estimation of food suitability coefficients from stomach content data and multispecies VPA. ICES CM 1984/G: 25, 59 pp.

Ecosim methodology⁴. This allows the temporal and spatial simulation of alternative fishing and environmental change scenarios to be examined on ecosystem components, which include saithe.

The impact of fishing gears on the seabed of the North Sea has been the focus of many studies, both from the impact on benthos, and the geochemistry of the seabed. The impact is most notable through the activities of the beam trawl fleet, which targets flatfish rather than gadoids such as saithe. However, the impact of demersal trawling cannot be disregarded. The impact on benthos has been found to vary. Comparisons of historical and modern data on benthic abundance and diversity have shown potential local effects⁵, and more regional changes in sessile, scavenger and predator species⁶. However, these shifts could be the result of a combination of the physical fishery impact of fishing and additional potential food for scavenging and predator species provided by the large amounts of discards and moribund benthos. Other direct studied effects of fishing include the physical disturbance to the seabed, and the generation of seabed litter from discarded gears etc. Despite these clear, and in many cases quantifiable, effects, it is still very difficult to separate the effects of commercial fisheries from natural fluctuations in reproductive success and predator-prey interactions. However, models suggest that trawling reduces biomass, production, and species richness. The impacts of trawling is greatest in areas with low levels of natural disturbance, while the impact of trawling was small in areas with high rates of natural disturbance. For the North Sea, models suggest that the bottom trawl fleet reduced benthic biomass and production by 56% and 21%, respectively, compared with an unfished situation⁷.

The ICES Working Group on Seabird Ecology (WGSE) has a wide remit which includes the review of current approaches for identifying offshore seabird aggregations and delineating Important Bird Areas (IBAs) and Special Protection Areas (SPAs); the development of recommendations for a comprehensive monitoring programme for seabirds; and details of how to sample diet and how to report results of dietary studies in seabirds.

The different areas of ecosystem interactions are yet to be drawn together. However, this work has begun under the auspices of ICES.

2.5.1 By-catch and Discards

Discarding of the target species (saithe) is relatively rare, largely because juvenile fish are distributed inshore until they are about 3 years old. This means that discarding of young fish is considered to be a small problem in this fishery⁸. Problems with by-catches in other fisheries when saithe quotas are exceeded may cause discarding

Independent observation of fishing activities is limited for this fishery (see below). However, German observers on board vessels targeting saithe have noted virtually no discarding of saithe within the saithe-targeted fishery. Evidence suggests that the German saithe fishery is relatively clean, with observers' estimates indicating that 98.7% of landings are of saithe. They have noted the bycatch of a number of commercially important species, notably haddock (1.8% of landings), cod (0.9%), pollock (0.5%), ling (0.3%) and hake (0.3%), with the vast majority of this catch being retained and hence counted against quota. Cod bycatch levels are below 5%, and hence vessels targeting saithe qualify for no restriction on fishing days at sea. While cod bycatch levels are indeed low, and discard levels

⁴ Daskalov, G. and Mackinson, S. (2004). Trophic modelling of the North Sea. ICES CM 2004/FF:40

⁵ Frid, C.L.J., Harwood, K.G., Hall, S.J. and Hall, J.A. (2002). Long-term changes in the benthic communities on North Sea fishing grounds. ICES J. Mar. Sci. 57, 1303-1309.

⁶ Rumohr, H. and Kujawski, T. (2000). The impact of trawl fishery on the epifauna of the southern North Sea. ICES J. Mar. Sci. 57, 1389-1394.

⁷ Hiddink, J.G., Jennings, S., Kaiser, M.J., Queiros, A.M., Duplisea, D.E. and Piet, G.J. (2006). Cumulative impacts of seabed trawl disturbance on benthic biomass, production, and species richness in different habitats. Can. J. Fish. Aquat. Sci. 63, 721-736.

⁸ ICES (2007). Saithe in Sub-area IV, VI and Division IIIa. ICES WGNSSK Report 2007, p 375-414.

of cod caught are approximately 3.1%, the cod stock is under a recovery plan and appropriate measures to minimise bycatches from the German saithe fishery should be explored and implemented.

A number of commercially unimportant or non-quota species (for the saithe vessels) are also caught (0.3% of landings in total across observed trips). These range from mackerel and herring to spiny dogfish and thorny skate. While caught at relatively low levels, the biology of the latter species raises some concerns.

Observer coverage is notably limited in terms of vessels covered (only one particular vessel being observed since 2005) and the periods of the year observed, which means that observations made above on bycatch and discard rates cannot be definitive. Additional information would be required to enable conclusive view to be reached on this issue, though all of the available evidence suggests that there should be no significant problems in this area.

2.5.2 Interactions with Protected, Endangered and Threatened Species:

PET species within the North Sea area notably include marine mammals, birds, elasmobranchs, and cold water corals.

NAMMCO (the North Atlantic Marine Mammal Commission), along with IWC and ICES, have recommended that member countries, including Germany, should monitor and report by-catches of marine mammals and seabirds.

With respect to marine mammals, the majority of studies on cetacean by-catch in the North Sea have been performed by the UK, Germany and Denmark⁹, and hence largely concentrate on different areas to those in which the German fleet operate. Furthermore, the likelihood of by-catch is strongly influenced by the location of fishing and gear used – nearshore gillnets being more likely to result in by-catch than offshore trawls. Studies have concentrated upon gillnet fisheries, and little information is available on by-catches in other fisheries, or of cetacean species other than harbour porpoise, in the North Sea.

Within the North Sea region, ASCOBANS¹⁰, The Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas, operates. Germany is a Party to this Agreement. The results of the two abundance surveys for harbour porpoise (SCANS-I and SCANS-II) led this body to call for a conservation plan for this species within the North Sea at the end of 2006.

Rays and skates are known to be one of the by-catches in demersal trawl fisheries in the North Sea, and impacts on ray populations have been identified¹¹. Observations of discard rates between different gear types (e.g. otter trawls, beam trawls etc.) are limited to the results of international observer programmes, the coverage of which is relatively limited.

German trawlers targeting saithe are expected to have relatively infrequent interactions with Protected, Endangered and Threatened species. However, information from the observer programme concentrates upon target and bycatch fish species (including some interactions with thorny skate, but none noted with the endangered *D. batis* and *R. clavata*) rather than PET species, and the limited coverage of the observer programme has already been noted. No bird PET species have been suggested as interacting with trawls on hauling. However, there are no numerical estimates of interactions between birds and mammals and the fishing operations from the observer programme. No gear impacts with sensitive benthos have been identified for the area fished by the German fleet in the North Sea.

⁹ http://ec.europa.eu/fisheries/publications/studies_reports/evaluation_bycatches_2000_en.htm

¹⁰ <http://www.ascobans.org/>

¹¹ Walker, P. A. and Heessen, H. J. L. (1996). Long-term changes in ray populations in the North Sea. Fish. Res. 53, 1085-1093.

2.6 Other Fisheries Relevant to this Assessment:

North Sea saithe fishery management is subject to the 2004 EU-Norway Agreement. While the Norwegian fishery does include some catches in Norwegian coastal waters by other gears (13 % from gillnet and long-line, 9 % from purse seine and 1% from other fishing gears) the majority of the catches are taken by Norwegian, French and German trawlers operating in a directed trawl fishery in deep water near the Northern Shelf edge and the Norwegian Deeps. In related Area VI, the directed French, German, and Norwegian deep-water fishery operating on the shelf edge, is supplemented by a Scottish fishery operating inshore.

In addition to quota regulations there are regulations aiming at protecting immature fish. In Norwegian waters, the minimum landing size is 32 cm, and the minimum mesh size in trawl and Danish seine is 120 mm. Discarding of commercial species is prohibited. In EU waters, the minimum landing size is 35 cm and minimum mesh size 110 mm.

There is no prohibition on discarding in EU waters and, as a result, fishers in EU waters discard undersized fish fetching lower prices, and over quota fish. Significant discards appear only in Scottish trawlers, mainly due to TAC regulations (Stratoudakis et al. 1999). However, as Scottish discarding rates are not representative of the majority of the saithe fishery, these have not been used by ICES in assessments (ICES 2006b). Saithe is also taken as unintentional by-catch in other North Sea fisheries.

Bycatch of other demersal fish species occurs in the trawl fishery for saithe. The stock of most concern is cod, for which there are specific management plans (the 1999/2005 EU-Norway agreements, and EU Council Regulation (EC) 423/2004). Bycatch in Norwegian waters is landed and counted against quota in the other fisheries. Bycatch in EU fisheries may be landed, in which case it counts against quota, or may be discarded.

In common with all demersal fisheries in the North Sea, ICES advice is based on mixed-fishery considerations (ICES 2006b).

Fisheries in Division IIIa (Skagerrak-Kattegat), in Subarea IV (North Sea) and in Division VIId (Eastern Channel) should in 2004 be managed according to the following rules, which should be applied simultaneously:

- *with minimal bycatch or discards of cod;*
- *implement TACs or other restrictions that will curtail fishing mortality for those stocks for which reduction in fishing pressure is advised;*
- *within the precautionary exploitation limits for all other stocks.*
- *where stocks extend beyond the North Sea, e.g. into Division VI (saithe and anglerfish) or is widely migratory (Northern hake) taking into account the exploitation of the stocks in these areas so that the overall exploitation remains within precautionary limits*

The Norwegian saithe fishery within the certification area has recently been assessed and certified to the MSC standard.

3 ADMINISTRATIVE CONTEXT

3.1 Legislation

The North Sea saithe fishery straddles the EU and Norwegian fishing zones, and is therefore managed under an international agreement between the EC and Norway. This agreement has been in force since 1999. The EC and the Norwegian Government meet annually in December to review this management measures enforced under this agreement, and to determine the Total Allowable Catch for saithe for the coming year, and to agree any additional management measures that are necessary to ensure that the fishery is sustainable¹². The outcome of these meetings is transposed into legislation via Norwegian and EC legislation.

The primary fisheries legislation within the EC is the Common Fisheries Policy, which was reviewed in 2002. EC Regulation 2731/2002¹³ sets out the framework and objectives for the CFP, and enables the Commission to make more detailed fisheries Regulations. The principal Regulations relevant to the saithe fishery are those that set the Total Allowable Catch and Quota for fishing fleets¹⁴; specify technical restrictions for fishing activity (such as limits on trawl mesh size); and restrict fishing in the North Sea to encourage the recovery of cod stocks¹⁵.

EC Regulations are directly applicable in each Member State and throughout EC waters, meaning that all vessels are legally required to abide by their provisions. National Governments around the North Sea may make their own domestic legislation to support the enforcement of EC Regulations – for instance the Bundesanstalt für Landwirtschaft und Ernährung (BLE) enforces EC fisheries quotas through domestic legislation enabling annual catch plans to be agreed with fishing vessel operators.

The Norwegian Government makes its own National Regulations to transpose the outcome of annual agreements into legislation that is enforceable throughout Norwegian waters.

3.2 Management Responsibilities and Interactions

Saithe stock management in the North Sea is achieved through the coordinated interaction of scientific organisations, regulators, and enforcement bodies. This coordination is part of a formal legislative process that transforms scientific advice into enforceable legislation.

Scientific advice is provided by ICES, using information gathered from many sources¹⁶. The ICES Advisory Committee on Fisheries Management (ACFM) provides formal advice on the status of target and non-target fish stocks which is considered at the annual fisheries management meeting between the EC and Norway. This advice forms the basis for the Total Allowable Catch agreed between Governments, and which subsequently becomes law (through EC and Norwegian legislation).

¹² See section 4.3

¹³ EC Regulation (EC) No 2371/2002 of 20 December 2002 on the conservation and sustainable exploitation of fisheries resources under the Common Fisheries Policy *OJ L 358, 31.12.2002, p. 59–80*

¹⁴ See, for instance, EC Regulation No. 754/2007 of 28 June 2007 amending Regulations (EC) No 1941/2006, (EC) No 2015/2006 and (EC) No 41/2007, as regards fishing opportunities and associated conditions for certain fish stocks *OJ L 172, 30.6.2007, p. 26–38*

¹⁵ EC Regulation (EC) No 423/2004 of 26 February 2004 establishing measures for the recovery of cod stocks. *OJ L 70, 9.3.2004, p. 8–11*

¹⁶ See section 4 below for detail

3.3 Regulation, Enforcement and Control

Implementation of the CFP at a national level is carried out by individual Member States. There are two aspects to this: the allocation of fishing quotas and the enforcement of regulations.

Resources are allocated in Germany by the BLE. After annual quotas have been agreed by the EC, the BLE issues a “Verteilungsplan” (“Distribution Scheme”) indicating the quota for each fishing vessel for each target species and ICES fishing area. The fishing vessel operator is then required to agree an “Operatives Programm” (“Operational Program”) with BLE, agreeing to these regulations and setting out the fishing plan for the coming year.

Enforcement of Regulations is carried out by EC Member State Governments and the Norwegian Government. Within Germany, the BLE is responsible for the enforcement of EC and national fisheries legislation. BLE fishery officers monitor fish landings, record vessel movements (from VMS satellite monitoring), and monitor compliance with technical measures governing fishing gear. These tasks are carried out by the Norwegian authorities within Norwegian waters.

The European Commission’s Fisheries Inspectorate monitors national enforcement processes, and records its results. The Commission can also request fishery related information from Member States. Member States collaborate with each other and the EC to ensure that EC Regulations are enforced at sea, beyond Member State Territorial Waters. Member State Fisheries Patrol Vessels and Aircraft, as well as the VMS system provide information on the activity of vessels at sea.

Vessels breaching fisheries regulations can be prosecuted. Offences taking place in Norwegian waters are heard in Norwegian Courts; offences detected in EC waters are heard by Member State courts. Stringent penalties, defined by legislation, can be imposed on offenders in each jurisdiction.

4 STOCK ASSESSMENT

Stock assessments for the species are undertaken by ICES. The following information is primarily derived from the relevant ICES reports:

- ICES 2006a Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK). ICES CM 2006/ACFM:09
- ICES 2006b Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK). ICES Advisory Committee on Fishery Management ICES CM 2006/ACFM:35
- ICES 2006c Report of the ICES Advisory Committee on Fishery Management, Advisory Committee on the Marine Environment and Advisory Committee on Ecosystems, 2006, Books 1-10, 310pp.
- ICES 2007a Saithe in sub-area IV, VI, and division IIIa. In ICES WGNSSK report 2007, p. 375-414. Ices, Copenhagen
- ICES 2007b Saithe in Subarea IV, Division IIIa (Skagerrak), and Subarea VI. In ICES Advice 2007 Book 6, 114 - 124

The North Sea saithe is assessed routinely by the ICES Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak, using the established analytical age-based tuned VPA method known as XSA, leading to a short term forecast, with various TAC options related to the management plan and the application of precautionary reference points. Under current ICES arrangements, the assessment is carried out annually

4.1 Management Unit

Before 1999, saithe in Subarea VI and saithe in Subarea IV and Division IIIa were assessed as two separate stocks. However, there is no separation of saithe between these areas, adults moving freely between them. The ICES advice now applies to the combined Areas IIIa, IV, and VI.

This stock is not isolated from the NEA stock, considerable movement being undertaken between the two, with eggs and larvae from the NS stock drifting north and adults undertaking spawning migrations from the NEA to southern spawning grounds.

4.2 Monitoring of Stock Status

Three commercial series of effort and catch at age and two series of survey indices area have been used in the ICES stock status assessment:

Commercial series of effort:

- French fresh fish trawl, age range: 3-9, year range: 1990-2006 (FRAtrb),
- German bottom trawl, age range: 3-9, year range: 1995-2006 (GERotb) and
- Norwegian bottom trawl, age range: 3-9, year range: 1980-2006 (NORtrl).

These fleets all target saithe along the Northern Shelf edge and along the western edge of the Norwegian deep, at depths of 150 - 250 m.

Surveys:

- Norwegian acoustic survey, age range 3-6, year range: 1995-2006, and
- International Bottom Trawl Survey quarter 3, age range: 3-5, year range: 1991-2006.

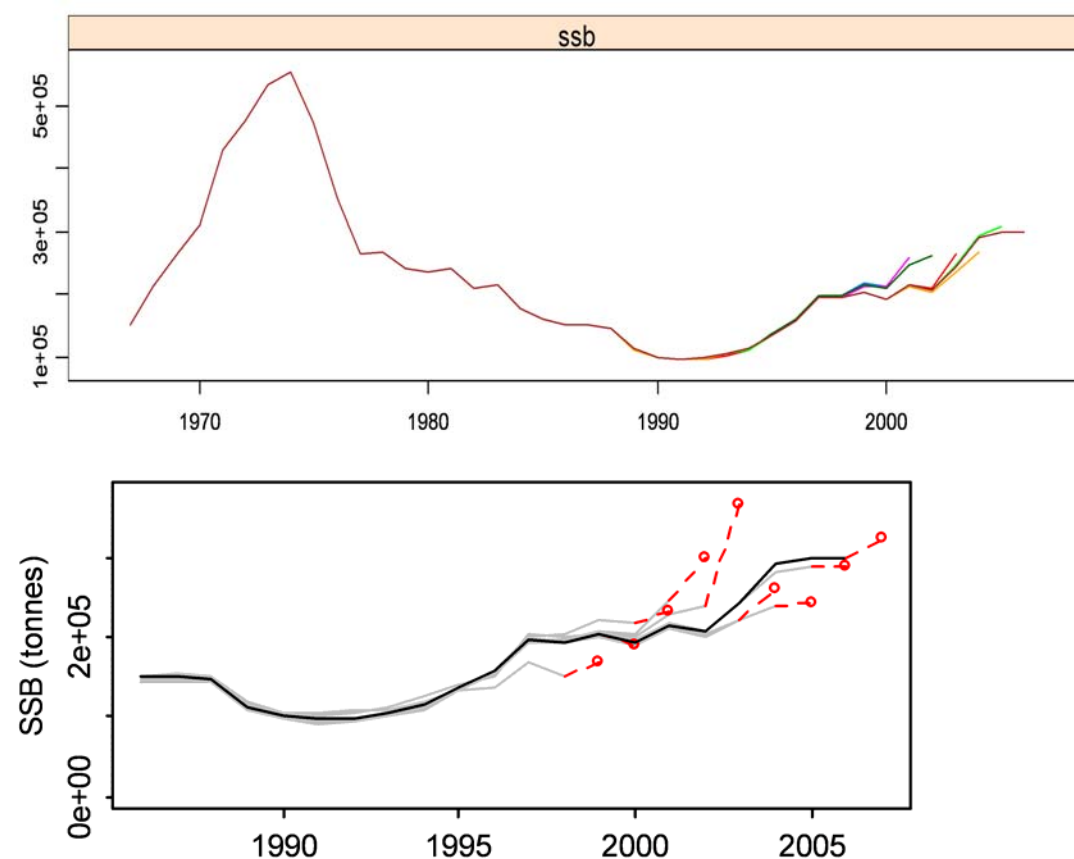
The Norwegian acoustic survey is conducted in conjunction with the Norwegian part of the IBTS quarter 3 survey, covering the area north of 56°30' N up to 62° N. Abundance indices of saithe in the

North Sea are also available from the IBTS quarter 1 and IBTS quarter 3 surveys. It should be noted that data from the Norwegian acoustic survey and the English and Scottish Groundfish surveys are used in the calculation of the IBTS quarter 3 indices, but saithe is considered to be too poorly represented in these surveys and they are not themselves useful as tuning indices in the assessment.

Qualitative surveys of fisher's opinions on Saithe abundance are also available (ICES 2007b).

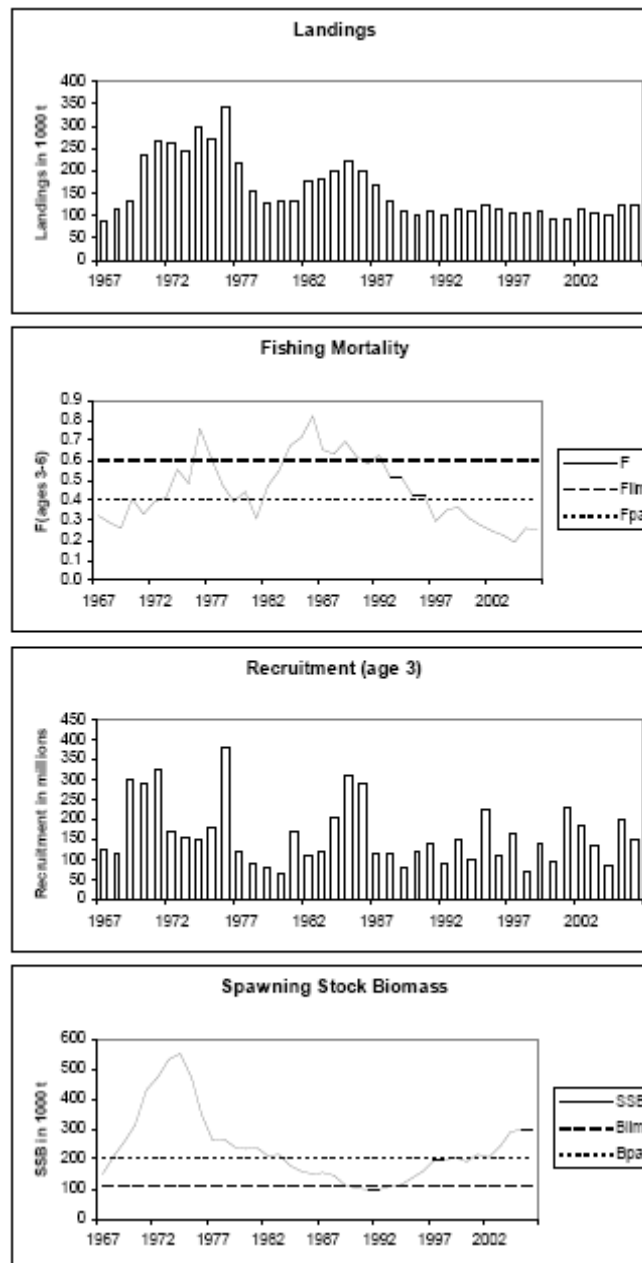
4.2.1 *Current Stock Status*

A retrospective analysis of the assessment reveals considerable, consistent bias in estimates of SSB and fishing mortality, such that at the moment stock size is underestimated and fishing mortality overestimated by the assessment. This is not of particular concern at the moment, as stock size is rising, but should the reverse bias be present during a declining phase this would give cause for concern. The problem probably arises from inconsistencies within the catch at age data or the CPUE tuning data (Mehl, pers comm.). Sensitivity tests run by the working group revealed that the assessment is very sensitive to different combinations of the tuning series. The working group also noted trends in survey Qs with time. However, forecasts made by the working group show greater consistency.



Retrospective analysis (top) and forecast performance (bottom) of North Sea saithe assessment (from ICES 2007a).

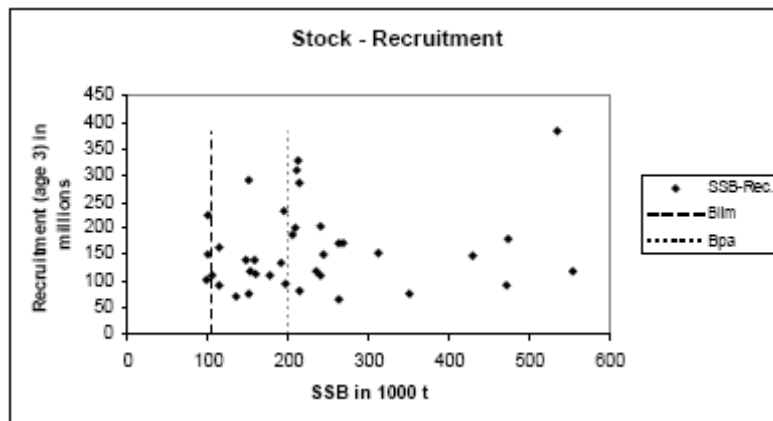
The general perception of the status of the saithe stock remains good. Fishing mortality is estimated to be well below F_{pa} and the spawning stock biomass is estimated to be well above B_{pa} .



North Sea Saithe stock status (ICES 2007b)

A serious problem with stock forecasts for saithe is the lack of reliable information about year class strength before age 4. The year classes that are age 2 and 3 in the assessment year (2007) contribute significantly to the projected landings in the forecast year (2008) and to the SSB the year thereafter (2009). An annual 0-group survey has been conducted by IMR (Norway) since 1999 in the northern North Sea, but this will not be continued due to lack of relationship between the 0-group index and later XSA population estimates for the year classes 1999-2001 (the 0-group index for the 2000 year class is extremely high, while this year class is estimated to be around average for age 4 in this year's assessment). IMR have started a new survey along the west coast of Norway to measure the relative abundance of saithe between 2 and 4 years old (when the saithe is distributed along the coast).

There appears to be no strong stock-recruit relationship



North Sea Saithe S-R relationship (ICES 2007b)

‘The assessment results show that fishing mortality, after increasing to well above F_{lim} by 1985, has now fallen progressively to well below F_{pa} in the recent assessment. After falling to a low level in 1992, SSB has therefore increased progressively, and is now well above B_{pa} . After several high values during the period of the gadoid outburst up to the mid 1980s, recruitment since 1987 has settled to a lower but stable level, with a relatively low coefficient of variation, and total landings have tended to follow this trend. As a result of the stable recruitment pattern, the stock-recruit plot shows that recruitment has been independent of SSB over a wide range of stock size. The precautionary reference points were therefore determined on the basis of the lowest SSB observed in 1992. An increase in biomass during a period of stable recruitment and reducing F provides evidence for the effectiveness of the management regime for this fishery. ICES classifies the stock as having full reproductive capacity, and as being harvested sustainably. Nevertheless, there are some uncertainties affecting this assessment.’

The assessment methodology does not lend itself to estimating the uncertainty in the assessment, apart from the sensitivity analysis reported above. Uncertainty is not estimated. Notable negative trends in the weight at older age groups are noted in the assessment reports, and are taken account of within the assessment, although the cause of these is not clear.

4.3 Management Advice

Biological reference points for North Sea Saithe are (ICES 2007b)

$F_{0.1}$	0.10	F_{lim}	0.60
F_{max}	0.22	F_{pa}	0.40
F_{med}	0.35	B_{lim}	106 000 t
F_{high}	>0.49	B_{pa}	200 000 t

B_{lim} was set at 106,000 t in 1998 as the lowest biomass (at that time) that had produced average recruitment, and B_{pa} at a level that affords a high probability of maintaining SSB above B_{lim} . F_{lim} is the fishing mortality estimated to lead to SSB falling below B_{lim} in the long term, and F_{pa} is the fishing mortality that in the long term should lead to only a 10% probability that SSB falls below B_{pa} .

In 2004 EU and Norway agreed to implement a long-term plan for the saithe stock in the Skagerrak, the North Sea and west of Scotland, which is designed to provide for sustainable fisheries and high yields (reproduced overleaf).

Although proposed to be consistent with a precautionary approach, the management plan has not been

evaluated by ICES to see if it is sufficiently precautionary. For instance, if clause 6 was not invoked it might not be possible to meet the requirements of paragraph 3 in the case of a rapidly declining stock.

ICES management advice is precautionary. Options for fishing mortality are presented along with their likely level of precaution and effect on SSB in relation to the precautionary level B_{pa} .

In 2007 ICES (2007b) concluded that although it had not evaluated the agreed management plan, the target fishing mortality in the management plan was expected to give high long-term gains in the present situation with a stock that is well above B_{pa} . ICES therefore recommended to limit landings in 2008 to 150 000 t corresponding to a fishing mortality below 0.3 in accordance with the management plan.

Long term management plan for Saithe¹⁷

The Parties agreed to implement a long-term management plan for the saithe stock in the Skagerrak, the North Sea and west of Scotland, which is consistent with a precautionary approach and designed to provide for sustainable fisheries and high yields.

The plan shall consist of the following elements:

- 1. Every effort shall be made to maintain a minimum level of Spawning biomass (SSB) greater than 106 000 tonnes (B_{lim}).*
- 2. Where the SSB is estimated to be above 200 000 tonnes the Parties agreed to restrict their fishing on the basis of a TAC consistent with a fishing mortality rate of no more than 0.30 for appropriate age groups.*
- 3. Where the SSB is estimated to be below 200 000 tonnes but above 106 000 tonnes the TAC shall not exceed a level which, on the basis of a scientific evaluation by ICES, will result in a fishing mortality rate equal to $0.30 - 0.20 \cdot (200\,000 - SSB) / 94\,000$.*
- 4. Where the SSB is estimated by the ICES to be below the minimum level of SSB of 106 000 tonnes the TAC shall be set at a level corresponding to a fishing mortality rate of no more than 0.1.*
- 5. Where the rules in paragraphs 2 and 3 would lead to a TAC which deviates by more than 15% from the TAC the preceding year the Parties shall fix a TAC that is no more than 15% greater or 15% less than the TAC of the preceding year.*
- 6. Notwithstanding paragraph 5 the Parties may where considered appropriate reduce the TAC by more than 15% compared to the TAC of the preceding year.*
- 7. A review of this arrangement shall take place no later than 31 December 2007.*
- 8. This arrangement enters into force on 1 January 2005.*

¹⁷ This text is reproduced from the *Agreed record of conclusions of fisheries consultations between the European Community and Norway for 2007*. Brussels, 1 December 2006. Copy viewed at www.swfpa.org.uk/regulations/documents/EU-NorwayFisheriesAgreement200715.12.106

4.3.1 *Total Allowable Catch (TAC)*

TACs agreed for 2007 were:

Zone														
	TAC	UE	BE	DK	DE	ES	FI	FR	IE	NL	PT	SE	UK	NR
I, II (Norwegian Waters)	NA	3950			3160			508					282	
IIa, IIIa, IIIbcd, IV	123250	59160	43	5111	12906			30374		129		702	9895	
Norwegian waters south of 62°N	NA	880										880		
Vb, VI, XII, XIV	12787	12787			798			7930	467				3592	0
Vb	NA	2700	54		334			1632		54			626	
VII, VIII, IX, X	3790	3790	10					2132	1066				582	0
TOTAL	139827	83267	107	5111	17198			42576	1533	183		1582	14977	

5 FISHERY MANAGEMENT

5.1 Management Objectives

The overall long-term objectives for the North Sea saithe fishery are set by the EC-Norway management strategy. This strategy specifies stock levels and reference points, providing a transparent framework for agreeing annual TAC's for saithe.

The EC-Norway agreement is supported by management objectives set out in the revised Common Fisheries Policy (2371/2002) which introduces the concepts of precautionary management, sustainability and the conservation of biodiversity. An additional set of management objectives arise from the North Sea Cod Recovery Plan and EC Regulation 423/2004¹⁸). These require that management of the saithe fishery should minimise impacts on cod stocks in the North Sea.

5.2 Consultative Process

The Fishery Management process provides a range of consultation opportunities. Some of these arise annually, others less frequently, and they operate at both the national and EC level.

Each year, there is an opportunity for the fishing industry and other interests to participate directly in the management process when ICES advice is being considered by the EC. Representative bodies are party to the discussions of TAC's and quotas. They can also make direct representations to the EC and Member State Governments during this process. ICES has also introduced stakeholder briefings into the recent advisory committee process.

During the 2001-02 review of the EC Common Fisheries Policy, the EC organised many events and provided numerous consultation opportunities for the fishing industry and other interests. The feedback from these events helped to shape the revised CFP in 2002.

The EC's legal processes provide mechanisms for individuals and organisations to raise formal concerns. Disputes or complaints are investigated by the Commission, and may ultimately require resolution in the European Court of Justice. The mechanism for doing this is clearly set out in the EC Treaty, is widely known, and has been used successfully on many occasions to address a wide range of issues. Importantly, it makes the management system accountable to the individuals and organisations that are affected by it.

5.3 Reviews of the management system

The saithe management system is subject to annual review at the December meeting between the EC and Norwegian Governments. The need for review is enshrined within the terms of the fishery agreement between the EC and Norway.

The entire EC fishery management system is subject to review every 10 years. The 2002 review changed the shape of the CFP, introducing a more precautionary management approach and acknowledging the need to embrace concepts such as ecosystem management. The next review of the CFP will take place in 2012.

¹⁸ OJ L 70, 9.3.2004 p8-11

6 STANDARD USED

The MSC Principles and Criteria for Sustainable Fisheries form the standard against which the fishery is assessed and are organised in terms of three principles. Principle 1 addresses the need to maintain the target stock at a sustainable level; Principle 2 addresses the need to maintain the ecosystem in which the target stock exists, and Principle 3 addresses the need for an effective fishery management system to fulfil Principles 1 and 2 and ensure compliance with national and international regulations. The Principles and their supporting Criteria are presented below.

Principle 1

A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.¹⁹:

Intent:

The intent of this principle is to ensure that the productive capacities of resources are maintained at high levels and are not sacrificed in favour of short term interests. Thus, exploited populations would be maintained at high levels of abundance designed to retain their productivity, provide margins of safety for error and uncertainty, and restore and retain their capacities for yields over the long term.

Criteria:

1. The fishery shall be conducted at catch levels that continually maintain the high productivity of the target population(s) and associated ecological community relative to its potential productivity.
2. Where the exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level consistent with the precautionary approach and the ability of the populations to produce long-term potential yields within a specified time frame.
3. Fishing is conducted in a manner that does not alter the age or genetic structure or sex composition to a degree that impairs reproductive capacity.

Principle 2

Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends.

Intent:

The intent of this principle is to encourage the management of fisheries from an ecosystem perspective under a system designed to assess and restrain the impacts of the fishery on the ecosystem.

Criteria:

1. The fishery is conducted in a way that maintains natural functional relationships among species and should not lead to trophic cascades or ecosystem state changes.
2. The fishery is conducted in a manner that does not threaten biological diversity at the genetic, species or population levels and avoids or minimises mortality of, or injuries to endangered, threatened or protected species.

¹⁹ The sequence in which the Principles and Criteria appear does not represent a ranking of their significance, but is rather intended to provide a logical guide to certifiers when assessing a fishery. The criteria by which the MSC Principles will be implemented will be reviewed and revised as appropriate in light of relevant new information, technologies and additional consultations

3. Where exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level within specified time frames, consistent with the precautionary approach and considering the ability of the population to produce long-term potential yields.

Principle 3

The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.

Intent:

The intent of this principle is to ensure that there is an institutional and operational framework for implementing Principles 1 and 2, appropriate to the size and scale of the fishery.

A. Management System Criteria:

1. The fishery shall not be conducted under a controversial unilateral exemption to an international agreement.

The management system shall:

2. Demonstrate clear long-term objectives consistent with MSC Principles and Criteria and contain a consultative process that is transparent and involves all interested and affected parties so as to consider all relevant information, including local knowledge. The impact of fishery management decisions on all those who depend on the fishery for their livelihoods, including, but not confined to subsistence, artisanal, and fishing-dependent communities shall be addressed as part of this process.
3. Be appropriate to the cultural context, scale and intensity of the fishery – reflecting specific objectives, incorporating operational criteria, containing procedures for implementation and a process for monitoring and evaluating performance and acting on findings.
4. Observe the legal and customary rights and long term interests of people dependent on fishing for food and livelihood, in a manner consistent with ecological sustainability.
5. Incorporates an appropriate mechanism for the resolution of disputes arising within the system²⁰.
6. Provide economic and social incentives that contribute to sustainable fishing and shall not operate with subsidies that contribute to unsustainable fishing.
7. Act in a timely and adaptive fashion on the basis of the best available information using a precautionary approach particularly when dealing with scientific uncertainty.
8. Incorporate a research plan – appropriate to the scale and intensity of the fishery – that addresses the information needs of management and provides for the dissemination of research results to all interested parties in a timely fashion.

²⁰ Outstanding disputes of substantial magnitude involving a significant number of interests will normally disqualify a fishery from certification.

9. Require that assessments of the biological status of the resource and impacts of the fishery have been and are periodically conducted.
10. Specify measures and strategies that demonstrably control the degree of exploitation of the resource, including, but not limited to:
 - a) setting catch levels that will maintain the target population and ecological community's high productivity relative to its potential productivity, and account for the non-target species (or size, age, sex) captured and landed in association with, or as a consequence of, fishing for target species;
 - b) identifying appropriate fishing methods that minimise adverse impacts on habitat, especially in critical or sensitive zones such as spawning and nursery areas;
 - c) providing for the recovery and rebuilding of depleted fish populations to specified levels within specified time frames;
 - d) mechanisms in place to limit or close fisheries when designated catch limits are reached;
 - e) establishing no-take zones where appropriate.
11. Contains appropriate procedures for effective compliance, monitoring, control, surveillance and enforcement which ensure that established limits to exploitation are not exceeded and specifies corrective actions to be taken in the event that they are.

B. Operational Criteria

Fishing operation shall:

12. Make use of fishing gear and practices designed to avoid the capture of non-target species (and non-target size, age, and/or sex of the target species); minimise mortality of this catch where it cannot be avoided, and reduce discards of what cannot be released alive.
13. Implement appropriate fishing methods designed to minimise adverse impacts on habitat, especially in critical or sensitive zones such as spawning and nursery areas.
14. Not use destructive fishing practices such as fishing with poisons or explosives;
15. Minimise operational waste such as lost fishing gear, oil spills, on-board spoilage of catch etc.
16. Be conducted in compliance with the fishery management system and all legal and administrative requirements.
17. Assist and co-operate with management authorities in the collection of catch, discard, and other information of importance to effective management of the resources and the fishery.

7 BACKGROUND TO THE EVALUATION

7.1 Evaluation Team

Evaluation leader: Dr Andrew Hough: Moody Marine Limited. Dr Hough has a PhD in marine ecology from the University of Wales, Bangor and fourteen years post-doctoral experience in commercial marine and coastal environmental management projects. He is manager of Moody Marine operations within Moody International Certification with particular responsibility for the implementation of MSC Certification procedures and development of MSC methodologies. Dr. Hough has acted as lead assessor on the majority of Moody Marine MSC pre assessments and main assessments.

Expert advisor: Ulf Löwenberg. Ulf has over 15 years post graduate experience in fisheries projects, including research experience in artisanal and industrial fisheries in inland, coastal and off-shore waters, namely catch surveys, young fish surveys, stock assessment and fisheries economy, environmental studies and hydrographic surveys, and planning of research programmes. He has also been involved with lecturing on fisheries and environmental topics, such as anatomy and physiology of fishes, fisheries statistics, population dynamics, oceanography and planctology. Specific experience includes work for the “Federal Research Centre for Fisheries” on the development of an application for the analysis of fisheries data for the North Sea and acting as a scientific observer onboard industrial fishing vessels operating in the German fishing zone in the North Sea, concentrating on by-catches.

Expert advisor: Graham Pilling. Graham is Fisheries Biologist & Advisor with the Centre for Environment, Fisheries and Aquaculture Science, UK. His experience includes a review of the NMFS Gulf of Mexico red snapper stock assessment, a review of the NMFS Pacific hake stock assessment, development of a fisheries management plan for Lake Paliastomi, Republic of Georgia, review of bycatch in the US Atlantic pelagic longline fleet for the US National Marine Fisheries Service, and implementing review recommendations, growth parameter estimation and effect of fishing on the assessment and management of snappers and emperors in the Indian Ocean, including capacity building of local institutions to improve stock assessment techniques, assessment of squid and finfish resources on the Patagonian shelf, South Atlantic.

Expert advisor: Jim Andrews. Jim is Director of AWJ Ltd, a specialist marine fisheries and environmental consultancy. His previous experience includes running the North Western and North Wales Sea Fisheries Committee as its Chief Executive from 2001 to 2005, and previously working for several years as Marine Environment Liaison Officer. He has an extensive practical knowledge of the UK's fisheries management regime. Jim has been involved in the review of several MSC certification assessments including the South-West Mackerel Handline Fishery, Loch Torridon Nephrops, Burry Inlet Cockles, North Sea Herring and South Georgia Patagonian Toothfish.

7.2 Previous certification evaluations

The fishery has not been previously assessed against the MSC standard.

The geographic area of the Unit of Certification for this fishery overlaps with the area that has been evaluated and certified for the Norwegian Saithe Fishery.

7.3 Inspections / site visits the Fishery

Site visits for this evaluation focussed on management and scientific issues rather than the practicalities of fishing operations. The main objectives of the evaluation team were to determine that there was adequate scientific understanding of the stock, and that appropriate fisheries management measures were both in force and enforced.

Information was gathered through interviews and e-mail correspondence, summarised below with key issues listed:

Name	Affiliation	Date	Key Issues
Jörg Petersen Kai-Arne Schmidt	Client	19 th September 2007, Hamburg; subsequent e-mails.	<ul style="list-style-type: none">• Area of North Sea for certification• Number of vessels in unit of certification• Agree timescales for assessment
Dr Siegfried Ehrich Dr Hans-Joachim Rätz	Bundesforschungsanstalt für Fischerei, Institut für Seefischerei	19 th September 2007, Hamburg; subsequent e-mails.	<ul style="list-style-type: none">• Discuss scientific information available for saithe stocks• Obtain additional scientific information• Identify gaps in knowledge
Lutz Wessendorf	Bundesanstalt für Landwirtschaft und Ernährung (BLE)	October – November 2007 (by e-mail)	<ul style="list-style-type: none">• Determine level of enforcement activity directed at fishery.• Establish level of compliance with regulations.• Identify opportunities to improve management.

8 STAKEHOLDER CONSULTATION

8.1 Stakeholder Consultation

An eventual total of 22 stakeholders were identified and consulted specifically by Moody Marine. Information was also made publicly available at the following stages of the assessment:

Table 1: Stakeholder Consultations Held

Date	Purpose	Media
5 April 2007	Notification of confirmation of assessment	Direct E-mail/letter Notification on MSC website
30 April 2007	Notification of Assessment Team nominees	Direct E-mail Notification on MSC website
2 May 2007	Confirmation of Assessment Team	Direct E-mail Notification on MSC website
13 June 2007	Consultation on draft Performance Indicators and Scoring Guideposts	Direct E-mail Notification on MSC website
13 September 2007	Release of final Performance Indicators and Scoring Guideposts	Direct E-mail Notification on MSC website
21 September 2007	Notification of assessment visit and call for meeting requests	Direct E-mail Notification on MSC website
22 November 2007	Notification of Proposed Peer Reviewers	Direct E-mail Notification on MSC website
	Notification of Draft Report	Direct E-mail Notification on MSC website
	Notification of Final Report	Direct E-mail Notification on MSC website

8.2 Stakeholder Issues

Feedback from stakeholders has not resulted in the identification of issues requiring specific investigation.

9 OBSERVATIONS AND SCORING

9.1 Introduction to scoring methodology

The MSC Principles and Criteria set out the requirements of certified fishery. The certification methodology adopted by the MSC involves the interpretation of these Principles and Criteria into specific Performance Indicators against which the performance of fishery can be measured according to pre-specified guideposts.

The Performance Indicators developed by the Moody Marine assessment team have been identified on the MSC website (Performance Indicators and Scoring Guideposts). In order to make the assessment process as clear and transparent as possible, these guideposts identify the level of performance necessary to achieve 100, 80 (a pass score), and 60 scores for each Performance Indicator.

These generic Performance Indicators and Scoring Guideposts have been the subject of stakeholder consultation and have been confirmed or modified following this process based on the judgement of the assessment team. Prior to scoring, the Indicators are also 'weighted' in relative importance according to the nature of the fishery undergoing certification.

At the top level, no weightings are assigned in terms of each MSC Principle; a fishery must 'pass' each of Principles 1, 2 and 3 in order to achieve certification and these are of equal importance.

Within each Principle, and related to each MSC Criterion, Sub-criteria and Performance Indicators are grouped in a hierarchy. Each level represents separate areas of important information (e.g. Indicator 1.1 requires a sufficient level of information on the target species and stock, 1.2 requires information on the effects of the fishery on the stock and so on).

At the level of the Performance Indicators, the performance of the fishery is assessed as a 'score'. In order for the fishery to achieve certification, an overall weighted average score of 80 is necessary for each of the three Principles and no Indicator should score less than 60. Accordingly, 100 represents a theoretically ideal level of performance and 60 a measurable shortfall. As it is not considered possible to allocate precise scores, a scoring interval of five is used in evaluations. As this represents a relatively crude level of scoring, weighted average scores are rounded to the nearest whole number.

Weights and scores for the Fishery are presented in the scoring table. Weights for criteria, sub-criteria and Performance Indicators add to a total of 100 at each level of the hierarchy. Scores are allocated relative to the Scoring Guideposts.

9.2 Evaluation results

Observations are presented in the scoring table, together with any weighting applied to the Fishery and the scores allocated.

10 LIMIT OF IDENTIFICATION OF LANDINGS

10.1 Ports

The extent of the fishery certification is the landing of saithe (and resulting products) at registered ports where recording and reporting of landings takes place. To be eligible to carry the MSC logo, these fish must then enter into separate Chain of Custody certifications.

11 CERTIFICATION RECOMMENDATION

11.1 Certification recommendation

The Performance of the Fishery in relation to MSC Principles 1, 2 and 3 is summarised below:

MSC Principle	Fishery Performance
Principle 1: Sustainability of Exploited Stock	Overall : 87 PASS
Principle 2: Maintenance of Ecosystem	Overall : 82 PASS
Principle 3: Effective Management System	Overall : 88 PASS

The fishery attained a score of 80 or more against each of the MSC Principles and did not score less than 60 against any Indicators. It is therefore recommended that the German North Sea Saithe Trawl Fishery (as defined in this report) be certified according to the Marine Stewardship Council Principles and Criteria for Sustainable Fisheries.

11.2 Scope of Certification

This assessment relates only to the fishery defined in Section 1.1 up to the point of landing as defined in Section 10.

11.3 Pre-conditions, Conditions or Recommendations Associated with Certification

11.3.1 *Pre-Conditions*

The fishery attained a score of 80 or more against each of the MSC Principles and did not score less than 60 against any Indicator. No pre-conditions are therefore required prior to certification being granted.

11.3.2 *Conditions*

The fishery attained a score of below 80 against a number of Performance Indicators. The assessment team has therefore set a number of conditions for continuing certification that the client for certification is required to address. The conditions are applied to improve performance to at least the 80 level within a period set by the certification body but no longer than the term of the certification.

As a standard condition of certification, the client shall develop an 'Action Plan' for Meeting the Conditions for Continued Certification', to be approved by Moody Marine.

Three Conditions, each associated with a key areas of performance of the fishery have been identified and agreed by the Evaluation Team. Each of these Conditions addresses a number of Scoring

Indicators. The Conditions, associated timescales and relevant Scoring Indicators are set out below.

Condition 1. Uncertainties in assessment

Action required: The assessment was considered to display retrospective bias, recruitment is poorly estimated and there is an unknown effect of variable migration of animals into, and out of, the stock. If not accounted for appropriately, these uncertainties could contribute to TACs being set above precautionary levels.

To address these areas, the impacts of these uncertainties on the assessment should be examined, alternative assumptions and model structures should be explored and the impacts of the uncertainty in inputs quantified in terms of uncertainty over the current status, projections of future stock status, and applicability of the precautionary reference point. It is acknowledged, however, that this may require extensive resource allocation (indeed, extensive work on recruitment variability has been undertaken by IMR in the past which has failed to resolve this particular issue).

Therefore, two options would be considered acceptable in addressing this uncertainty:

- a) Ideally, a plan to address any areas of data collection required to quantify, reduce and/or address the uncertainty should be developed, including international partners as appropriate, within 24 months of certification. The plan should include realistic timescales for completion.
- b) Alternatively, and acknowledging the potential technical and resource difficulties in resolving the above issues, annual TAC setting should explicitly incorporate an appropriate degree of precaution (including for an evaluation of assessment uncertainty and error in light of historical patterns, and its impact on estimates of stock status).

Timescale: Under option (a), the initial review of the assessment and its uncertainties should be carried out within 12 months of certification. Ensuing plan development should be completed and implementation initiated within 3 years of certification.

Under option b), TAC's set each year should be reviewed according to their adherence with ICES advice and a precautionary harvest strategy.

Relevant Scoring Indicators: 1.1.5.2, 1.1.5.5, 3A.3.4

Condition 2. By-catches

Action required: At present there is an observer programme providing good data on the bycatch associated with the fishery, but with limited coverage of the fleet.

Improved data gathering procedures should be implemented to provide adequate coverage of the certified fleet as well as fishing areas and seasons, so as to provide statistically robust estimates of the by-catch of all species, including estimates of discards. Information gathered should be sufficient to allow an assessment of the impacts of by-catches in relation to the distribution, ecology and abundance of the species and populations affected (commercial and non-commercial fish, mammals and birds).

Where assessments of impacts on by-catches are likely to be significant, and for all species identified as PET, appropriate measures to reduce by-catches to acceptable and precautionary levels shall be developed and implemented.

For example, the client is willing to participate in an improved observer programme to monitor bycatches of commercial and non-commercial species. This could be extended to provide the data required. The client could also liaise with relevant organisations to develop additional protocols and procedures for the ongoing monitoring of bycatches and discards of commercial and non-commercial fish, mammals and birds.

Timescale: Sampling programmes should be designed and initiated within 12 months of certification. Where mitigation measures are required to reduce or avoid impacts, these should be identified within 3 years of certification and fully implemented within 5 years of certification.

Relevant Scoring Indicators: 2.1.2.1, 2.2.1.2, 3A.3.4

Condition 3. North Sea Cod Bycatches

Action required: Interactions occur between the fishery and North Sea cod populations. North Sea cod is recognised as being in a depleted state and MSC certified fisheries are required to be prosecuted so as to promote rebuilding of depleted target and by-catch species.

It is recognised that rebuilding measures (the cod recovery plan) have been implemented for North Sea cod. There are indications in the North Sea that the decline in cod stock status has recently stabilized, and that the recent year class could promote stock recovery if recruited into the fishery. Nevertheless, the significance of the issue in German saithe fisheries should be identified, measures should be identified and implemented to minimise catches of North Sea cod, and future catches should be reported in relation to the proportion of cod in saithe catches, data from previous years and the relative status of the cod stock. Measures should remain in force until cod recovery has been achieved.

Timescale: The magnitude of the issue in German saithe fisheries should be identified, and appropriate measures to minimise cod bycatches in the saithe directed fishery identified within 6 months of certification. Testing of measures should take place within 2 years of certification. Effective measures to reduce cod bycatch should be fully implemented within 3 years of certification.

Relevant Scoring Indicators: 2.3.1.2, 2.3.1.3, 3A.3.4

APPENDICES

Appendix A: Peer Review Reports

1. Peer Reviewer Biographies
2. Peer Review Report A
3. Peer Review Report B

Appendix B: Client Action Plan

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
Principle 1		A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.		33.3	87
1.1 (MSC Criterion 1)		The fishery shall be conducted at catch levels that continually maintain the high productivity of the target population(s) and associated ecological community relative to its potential productivity.		85.7	86
1.1.1		There should be sufficient information on the target species and stock separation to allow the effects of the fishery on the stock to be evaluated.		17.6	-
1.1.1.1		Are the species readily identified as adults and juveniles?			
60	Misidentification is possible and increases recording errors of catches, but this does not compromise monitoring to unacceptable levels. Methods to improve identification are under development.	<p>The species (<i>Pollachius virens</i>, Linneaus 1758) has long been described. Recruited adults are readily and easily identified by fishers and regulators (Wheeler, 1969).</p> <p>The species is well recorded on landing by logbooks and in landing declarations – all landings are declared.</p> <p>Scientific surveys on spawning and nursery areas indicate that juvenile saithe can be distinguished by scientists.</p>	I1, I2, R53, R56, R87, R102	14.3	100
80	The target species is unlikely to be confused with any other species and is recorded appropriately.				
100	The species is readily identified by fishers and by regulators and is recorded appropriately.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
1.1.1.2		Is the life history of the species understood and the spawning and nursery areas described?			
60	There are gaps in information but the basis of the life history is understood. Information is adequate to support a general population model, but some assumptions are required. There is some information on spawning and nursery areas.	<p>Life history of the species is well understood, including spawning grounds and times, larval and adult distribution. Ecological interactions are known (prey and predators) (ICES 2006b Quality Handbook). The west coast of Norway is an important nursery area for North Sea saithe. However, there are known to be exchanges between the NEA and NS stocks (see main text). These are of the following categories:</p> <ol style="list-style-type: none"> 1. Larval drift from the North Sea spawning areas to north of 62°N. 2. Juvenile movement from between 62 and 64° N southwards to the North Sea was established to be significant by Jakobsen (1978, 1981a). The consequences of this were investigated by Jakobsen (1981b). 3. Adult movement from the Norwegian coast to the Faroe Islands and Iceland, which in some years may be considerable and augment the Icelandic stock (Jakobsen & Olsen 1987). Tagging experiments by various countries have shown that exchange between all saithe stock components in the north-east Atlantic takes place to a variable extent (ICES 1995). <p>Uncertainty about recruitment and subsequent migrations between the various stocks in the NE Atlantic (which may be variable from year to year) may be one of the factors underlying uncertainty in the assessment, as discussed below. These uncertainties contribute to the raising of Condition 1.</p>	I2, R61, R63, R87	14.3	85
80	The life history of the species is clearly documented and understood. Information is adequate to support an appropriate population model. Spawning and nursery areas are adequately well described.				
100	The life history of the species is clearly documented and understood including behaviour and ecological interactions. Spawning and nursery areas are sufficiently well documented to support closed area / seasons where this is deemed necessary.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
1.1.1.3		Is the geographical range of the target stock known and any seasonal migration described?			
60	A management unit approximating the stock is used with some biological justification. This is based upon a sufficiently robust estimation of the geographical range of the target stock.	Adult and larval distributions, spawning grounds and times are known. Information is available on migrations as discussed above. ICES now assesses the stock using data from Subareas IV (North Sea), Division IIIa (Skagerrak), and Subarea VI (West of Scotland and Rockall) combined. An abstract only paper (Jonsson 2001) suggests that in most years exchange between the various stocks (North Sea, Faroes, Iceland, Northeast Arctic) is small (<1%). This is unlikely to be large enough to affect the assessment, but there appear to be unpredictable large migrations occasionally.	I2, R62, R63, R64, R74, R86, R87	14.3	80
80	A reliable estimate of the geographic range of the target stock is available including seasonal patterns of movement and availability. Stock assessment and management units are consistent with the majority distribution of the stock.	Migration exchanges are not taken into account in the assessment (ICES 2006a) and few studies have examined the impact of migration on the assessments (Jakobsen 1981, Jakobsen & Olsen 1987). None of these are recent, although it is known that ICES have initiated studies on this in recent years. Results of the most pertinent study (Jakobsen 1981) were that assigning all catches of age 1-4 fish between 62 and 64°N to the North Sea stock increased estimates of recruitment in that stock and decreased them in the NEA stock. The study provided no information on goodness of fit of the model, and would not be relevant to today's assessment since the status of saithe is completely different to its status in 1981. Improvement in this area would lead to a higher score here.			
100	The complete geographic range of the stock, including seasonal patterns of movement/availability, is estimated and documented and is kept under review.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
1.1.1.4		Is there information on fecundity and growth?			
60	There is some appropriate information available on fecundity and growth.	Data on length and weight at age are routinely sampled, providing reliable time series estimates that are used in the assessment. Fecundity with size has been adequately established but does not appear to be under regular review to detect trends and shifts. The assessment uses a single maturity ogive and natural mortality of 0.2.	I2, R43, R44, R53, R56	14.3	80
80	Reliable estimates are available of fecundity at size and/or weight and growth rates, and this information forms an adequate time series.				
100	There is comprehensive and reliable information on fecundity at size, growth rates, and length and weight at age, and these are monitored over time to detect trends and shifts.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
1.1.1.5		Is there an understanding of the relationship of recruitment to parental stock?			
60	Indices of recruitment levels and recruiting ages, and corresponding spawning stock levels are available.	<p>Two surveys including estimating recruits at age 3 are available: the Norwegian acoustic survey, age range 3-6 (NORacu) and IBTS quarter 3, age range: 3-5 (IBTSq3). The WGNSSK appears to put more reliance on these than the AFWG does for the NEA stock, and indeed the residuals appear rather more consistent. However, there are still concerns in the working group and in ACFM, and the stock-recruit plot suggests no relationship between the two.</p> <p>ICES 2007 state that : “The most serious problem with stock forecasts for saithe is the lack of reliable information about year class strength before age 4...[as] year classes that are age 2 and 3 in the assessment year (2007) contribute significantly to projected landings in the forecast year (2008) and to the SSB the year after (2009). An annual 0-group survey has been conducted by IMR (Norway) since 1999 in the northern North Sea, but this will not be continued due to lack of relationship between the 0-group index and later XSA population estimates for the year classes 1999-2001 (the 0-group index for the 2000 year class is extremely high, while this year class is estimated to be around average for age 4 in this year s assessment). IMR have started a new survey along the west coast of Norway to measure the relative abundance of saithe between 2 and 4 years old (when the saithe is distributed along the coast).”</p> <p>Therefore, the stock-recruitment relationship is sufficient to allow determination of limit reference points. Given the long time series of data and contrast, there is a general relationship, but uncertainty in the assessment reduces confidence that the relationship is estimated with high statistical reliability, hence a score of only 80.</p>	I2, R53, R55, R56	14.3	80
80	Adequate estimates of recruitment and spawning stock are available. Sufficient years of data and contrast are available to establish a general relationship between stock and recruitment.				
100	The relationship between stock and recruitment is well understood with high statistical reliability.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
1.1.1.6		Is information collected on the abundance/density of the stock?			
60	Either fishery dependent or fishery independent indices are available on the abundance of the stock biomass. Qualitative information exists on the appropriateness of the indices as proportional indicators of stock size.	<p>The assessment uses the following fleets:</p> <p>Commercial fleets:</p> <ul style="list-style-type: none"> French fresh fish trawl, age range: 3-9 (FRAtrb) from 1990 German bottom trawl, age range: 3-9 (GERotb) from 1995 <p>The Norwegian bottom trawl, age range: 3-9 (NORtrl) from 1980 was removed for the 2007 final assessment. A concern noted in the assessment report is the need to use commercial CPUE data for tuning, as the survey series only contains information for ages 3-6. Commercial CPUE data may fail to track changes in relative abundance. This may contribute to residual patterns (e.g. under-estimation of F and overestimation of SSB in 2001-2002).</p>	I2, R53, R55, R56, R85	14.3	90
80	Fishery dependent and/or fishery independent indices are available on the abundance/density of the stock. Uncertainties have been analysed and any uncertainties reduced so as to allow trends to be determined from the indices. Indices are suitable to provide a high degree of confidence in the evaluation of stock abundance trends.	<p>Surveys:</p> <ul style="list-style-type: none"> Norwegian acoustic survey, age range 3-6 (NORacu) from 1995 IBTS quarter 3, age range: 3-5 (IBTSq3) from 1991 <p>Uncertainties in these surveys are extensively reported and analysed by the working group each year, both <i>a priori</i> and as part of the diagnostic analysis of the fits to the assessment model XSA.</p>			
100	Multiple fishery dependent and/or fishery independent indices are available on the abundance/density of the stock with sufficient time series to allow trends in abundance to be understood clearly. Where fishery independent surveys are used (for juveniles and/or adults) the design of the survey is statistically rigorous and robust, Indices are consistent and there is clear evidence that they are proportional to the stock size Uncertainties have been fully analysed.	The fishery independent survey is well designed and robust. A long time series of data is available, allowing trends to be analysed in each index. Trends within residuals for both fitted indices are visible, but are not consistent, and are routinely investigated. These suggest that, in general, indices are proportionate to stock size, but with only some deviations from proportionality in some years.			

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
1.1.1.7		Is information available on environmental influences on the stock dynamics?			
60	Some relevant studies have been undertaken on the effects of biological and physical factors which could affect the stock (including natural mortality). Research is encouraged and ongoing.	Natural mortality is estimated in the stock assessment and MSVPA estimates are available on natural mortality. The influence of temperature and the North Atlantic Oscillation on the stock-recruitment dynamics has been investigated in the North Sea. These results are not yet used in the assessment to modify recruitment expectations for the predictions, hence a score of only 80. There is also knowledge of the extent to which migrations affect distribution, as discussed above.	I2, R14, R16, R53, R56	14.3	80
80	There is knowledge of biological and physical factors affecting distribution, survival and year class strength (including natural mortality). Some information is sufficiently robust for use in the stock assessment process.				
100	There is comprehensive knowledge of biological and physical factors affecting distribution, survival and year class strength (including natural mortality). Key information is sufficiently robust for use in the stock assessment process.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score
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1.1.2		There should be sufficient information on the fishery to allow its effects on the target stock to be evaluated		17.6	-
1.1.2.1		Are all major sources of fishery related mortality recorded/ estimated, including landings, discards and incidental mortality?			
60	Sufficient information is available to allow accurate estimates to be made of landings, broken down as required for an evaluation of the fishery to be made. Estimates of discards and incidental mortality are available. Levels of IUU fishing are being estimated, but with some uncertainty.	Landings are comprehensively recorded for all gear types. ICES 2006b Quality Handbook: “Since the fish are distributed inshore until they are 2-3 years old, discarding of young fish is assumed to be a small problem in this fishery. Problems with by-catches in other fisheries when the quotas are exceeded may cause discarding. Data from SGDBI and Scotland indicate that the discard in the UK fleets in 2000 and 2001 was about 22 000 t and 15 000 t, respectively, mainly age 3 and age 4. Scottish discards are included in the assessment but their discard rates are not extrapolated across the fleet. French and German trawlers are targeting saithe and they have larger quotas, so the problem does not exist in these fleets. The German quota was never fully used in the last 5 years The Norwegian discard ban is effective on all vessels in Norwegian waters, while in the North Sea there is no such ban. The German vessels usually fish with bigger mesh sizes than stipulated (125+ instead of 120mm in Norwegian waters, 110+ instead of 100mm in the North Sea) the level of discards is negligible. Levels of IUU fishing in the fishery were considered to be negligible.	I2, R4, R5, R6, R7, R8, R9, R35, R53, R56, R66, R68, R69, R70, R71, R72, R96	28.6	90
80	Landings are accurately recorded. Discards and incidental mortality are well estimated for major gear types. Levels of IUU fishing are well estimated and low.				
100	Landings, discards and incidental mortality are accurately estimated and monitored for all gear types. Levels of IUU fishing are reliably estimated to be negligible.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
1.1.2.2		Are fleet descriptions, fishing methods and gear types known throughout the fishery?			
60	Significant fishing methods and gear types are known for the fishery with some information on geographical areas of use. Information is available on the size and composition of the fleets, but is not regularly updated.	<p>All fleets are known and controlled by the EU Member States or Norway, and described by ICES.</p> <p>Detailed composition of the German fleet sector and catches by area is known. Fishing practices are monitored through at-sea inspections and observations on reference fleets. Detailed data on the German saithe fleet are available through observer coverage, annual licensing arrangements and logbook information.</p>	I1, I2, R21	23.8	100
80	Significant fishing methods and gear types are known and information is available on the geographical areas of use. Recorded information is available on the size and composition of the fleets. This is reviewed and updated at appropriate intervals.	Information on fishing in the Norwegian waters is regularly updated by the Norwegian Fisheries Directorate. The majority of landings in this area are Norwegian, but full landings are reported. Catches by gear are presented and used in the assessments.			
100	All fishing methods and gear types employed in the fishery are known. <i>In-situ</i> observations are made of fishing practices. Comprehensive knowledge is recorded and regularly updated, on the size and composition of the fleets.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
1.1.2.3		Is gear selectivity known for the fishery?			
60	Appropriate information is available on selectivity and qualitative changes in selectivity.	Catches by size and age are known for different fleets and gear types, and are monitored every year. Catch at age data by fleet are supplied by Denmark, Germany, France, Norway, UK (England and Scotland) for Area IV. FRS (Aberdeen) is responsible for the database of catch at age data from the different countries. The assessment estimates individual catchabilities by age only for the tuning series, and estimates a combined selectivity (F at age profile) for all gears in any particular year. Some information is available on the mortality of non-retained fish.	I1, I2, R53, R56	23.8	85
80	Selectivities of gear types are well estimated by size. Information is sufficient to determine any changes in selectivity over time.				
100	Full selectivities have been accurately estimated for all gears, locations and times of fishing over time. Information is available on the mortality of individuals not retained by the gear.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score
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1.1.2.4		Is the target species taken in other fisheries in the area that are not subject to this certification, and are such catches recorded or estimated?			
60	There is an appropriate level of information relating to other fisheries in the area that are not subject to this certification, although these are not fully identified. The catches are estimated in the stock assessments.	All catches of saithe in other saithe-directed North Sea fisheries are reported, with the exception of discards, which are estimated. Catches of saithe in other fisheries are reported, and are used in the stock assessment.	I2, R53, R56, R95	23.8	90
80	The main fisheries not subject to certification are identified. Significant catches of the target species are either recorded or reliably estimated in the stock assessments.				
100	All fisheries (and other sources of human-induced mortality) in the area that are not subject to this certification are identified and monitored. All the catches are recorded and used in the stock assessment.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
1.1.3		Appropriate reference levels have been developed for the stock		14.7	-
1.1.3.1		Are there appropriate limit and precautionary reference points based on stock biomass and fishing mortality?			
60	Limit and precautionary reference points have been chosen and are justified based on standard international practice.	<p>Biological reference points are computed: B_{lim} was set at 106,000 t in 1998 as the lowest biomass (at that time) that had produced average recruitment, and B_{pa} at a level that affords a high probability of maintaining SSB above B_{lim}. F_{lim} is the fishing mortality estimated to lead to SSB falling below B_{lim} in the long term, and F_{pa} is the fishing mortality that in the long term should lead to only a 10% probability that SSB falls below B_{pa}. Fishing mortality reference points are computed to generate these precautionary biomass levels. The Norwegian-EU agreement management strategy uses F_{pa} as a target with a sliding scale of fishing mortality from F_{pa} when $SSB \geq B_{pa}$ to 0.1 when spawning stock is at or below B_{lim}.</p> <p>The level of uncertainty in the assessment appears, from the retrospective, to be moderate. The effect of this uncertainty on the reference points has not yet been rigorously examined, however. This score could be reviewed when the management plan evaluation is completed by ACFM.</p>	I2, R37, R38, R53, R56, R104, R105	100	85
80	Limit and precautionary reference points are justified based on stock biology (e.g. a stock-recruitment relationship) and are measurable given data and assessment limitations.				
100	Limit and precautionary reference points are justified based on stock biology, uncertainty, variability, data limitations and statistical simulations of these factors.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
1.1.4		There is a well-defined and effective harvest strategy to manage the target stock.		17.6	-
1.1.4.1		Is there a mechanism in place to contain harvest as required?			
60	Mechanisms are in place to monitor and (if necessary) reduce harvest, but do not fully contain harvest, or have not been tested. Measures provide a reasonable degree of confidence in stock management.	<p>The basis of the harvest strategy is discussed above. There is in addition an implicit harvest strategy in which B_{pa} is a target consistent with the precautionary approach (Kell et al, 2005). Uncertainty is accounted for in the reference points.</p> <p>Catches are constrained separately by each of the fishing nations, within a global TAC and nationally allocated quotas.</p> <p>There is no explicit requirement for a recovery plan in the harvest control rules. However, there is an implicit assumption within ICES that when biomass declines below B_{lim}, ACFM will advise the development of a recovery plan. If the stock biomass fell below B_{pa}, ICES is expected to recommend an appropriate reduction in the TAC to restore the stock to B_{pa}.</p>	I2, R37, R38, R49, R51, R52, R53, R56, R65, R104, R105	33.3	85
80	Appropriate mechanisms are in place to contain harvest as and when required to maintain, or allow the target stock to return to, productive levels. These have been tested if/as appropriate for robustness against uncertainties in the assessment and management process.	<p>Catches have been reduced in past which has led to reduced fishing mortality and stock recovery has been observed. There are, in addition, various technical controls including the protection of large concentrations of juveniles from all fishing. The advice on the state of this stock is based on reference points. The machinery is in place via the ICES ACFM advice, the EU and the EU / Norway agreement to implement measures to reduce the harvest as and when required.</p>			
100	Mechanisms are in place to contain harvest as and when required to maintain (or allow the target stock to return to) productive levels. Measures are robust to uncertainty in data inputs or stock biology. Specific measures to demonstrate effectiveness are in place and their robustness has been examined against a wide range of uncertainties.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
1.1.4.2		Are clear, tested decision rules set out?			
60	It can be demonstrated that decision making, though not documented, is logical and appropriate. Rules may not have not been tested, but appear appropriate for management.	The decision rules contained within the agreed EU-Norway Management Plan are as given above, and include the provision that fishing mortality may decline to 0.1 when spawning biomass declines to B_{lim} and below. These are reconciled with reference points. ICES is currently testing the decision rules through a variety of approaches, and evidence suggests that at current fishing mortality levels the management strategy performs well. These results await review by ACFM.	R51, R53, R56	33.3	85
80	Clear decision making rules exist, are fully documented, but may not have been fully tested. Decision rules are reconciled with reference points and with data and assessment limitations.				
100	Clear, documented and tested decision rules are fully implemented and have been fully reconciled with reference points and the data and assessment limitations, and have been periodically evaluated.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
1.1.4.3		Are appropriate management tools specified to implement decisions in terms of input and/or output controls?			
60	Management tools exist to implement decisions of input and/or output controls although these are not developed for the specific fishery, or management tools are not fully developed, but are specifically related to the fishery. Some evidence exists to show that tools can be effective in achieving management goals.	<p>For German vessels fishing in the North Sea, both input and output controls are used to manage the saithe fishery.</p> <p>Input controls limit the number of licence holders. In addition, various technical measures also apply, such as minimum landing sizes, mesh sizes etc.</p> <p>Output controls (via quotas) appear adequate to limit landings. Close communication between the Commission, national Fishing Authorities, Sales Organisations and fishers allow quota uptake to be monitored and managed.</p> <p>For the Norwegian and EU fleets as a whole, output controls appear adequate to limit catches. Since 1987 landings have been lower than the TAC. Total extractions (including estimates of discards) have been in some years slightly higher than the TAC, but not since 2001. This was the case even when TAC’s were being reduced in the early 1990s in the face of low stock sizes and high fishing mortality. However, a systematic scientific evaluation of the performance of the tools has not been undertaken.</p>	I2, R53, R56	33.3	90
80	Management tools have been specified to implement decisions of input and/or output controls. These are generic although some attempt has been made to relate them to the specific fishery OR tools are lacking in some details but are specifically related to the fishery. Evidence exists to show clearly that tools are effective in achieving long term sustainable management of the stock.	<p>In extreme circumstances, the Commission can close areas to protect stocks, but the procedure is time-consuming and rarely used.</p>			

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
100	Management tools, appropriate to the species and fishery, have been specified to implement decisions of input and/or output controls. Tools are responsive, relevant and timely. Performance of the tools has been evaluated and evidence exists to show clearly that the management system has a high probability of achieving its objectives.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
1.1.5		There is a robust assessment of stocks.		17.6	-
1.1.5.1		Are assessment models used and are they appropriate to the biology of the target species and the type of fishery?			
60	Robust assessment models are used. These are generic and do not account for specific characteristics of either the biology of the species or the nature of the fishery.	<p>The assessment is a tuned XSA, with reference points based on the S-R plot, a short term forecast based on long term GM recruitment. The assessment is performed on an annual basis. The assessment is appropriate to the species and fisheries, but does not capture all major features of the biology of the species (e.g. M (mortality) is not varied with age and maturity at age is constant over time).</p> <p>The score for this PI has been reduced to reflect the poor estimation of recruitment and the absence of recent investigations of the exchange between NE-Arctic and North sea stock.</p>	I2, R53, R56	21.2	85
80	Assessment models are used. Major criteria are related to the species and/or the fishery, but there are some areas of the assessment that are generic.				
100	Assessment models are used and capture all major features appropriate to the biology of the species and the nature of the fishery and the nature of the management questions being asked.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
1.1.5.2		Does the assessment take into account major uncertainties in data and have assumptions been evaluated?			
60	Major uncertainties are identified. Some attempt has been made to evaluate these in the assessment.	<p>Assessments are rigorously examined each year and uncertainties explored by ACFM and STECF as well as the working group. In 2007, the WG reviewed the assessment in the light of comments received from ACFM, particularly the suitability of using commercial LPUE for stock assessment and the need to investigate the decrease in weight at older ages. The retrospective bias is similar in direction to that in the NE Arctic, but lower in magnitude, and the historical forecasts suggest that past assessments have more or less been accurate. Uncertainties are presumed to be a problem within the catch at age matrix, or selectivity, but it may also be that recruitment is poorly estimated or that there is variable migration.</p> <p>The last investigation of the potential influence of migration was in the mid 1980's and estimates of annual migration between the North Sea and NE Arctic are not made and no account of them is incorporated in the assessment. (although this is probably relatively minor and restricted to the northern end of the North Sea saithe stock distribution).</p> <p>The fact that all uncertainties in the model are not explicitly considered in the provision of precautionary advice has led to the lower score here, and the assessment team feel that this should be addressed as a condition of certification.</p>	I2, R53, R55, R56	21.2	75
80	The assessment takes into account major uncertainties in the data and functional relationships. The most important assumptions have been evaluated and the consequences are known.				
100	The assessment addresses all significant uncertainties in the data and functional relationships and evaluates the assumptions in terms of scope, direction and bias relative to management-related quantities. The assessment model has been shown to meet sufficient levels of precision and accuracy to allow the management process to achieve its objectives.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
1.1.5.3		Are uncertainties and assumptions explored and reflected in management advice?			
60	Major uncertainties are recognised and are reported in management advice, as well as possible implications of those uncertainties on the management advice.	Major uncertainties, for instance recruitment, migration, catch/bycatch/discard, problems with the tuning fleet, are raised in the WG reports. B_{pa} and F_{pa} are established to take account of uncertainties by establishing precautionary limits. ICES are currently reviewing the principles underlying precautionary limit setting.	I2, R53, R55, R56	19.2	80
80	Major uncertainties and assumptions are addressed in the management advice and through the appropriate decision rules to address those limitations.	Uncertainty is only addressed within decision rules where it is assumed that the uncertainty in the assessment has an average CV of 30%. There is no testing of this hypothesis, hence a score of only 80. Management advice is always presented as a series of harvest strategy options relative to precautionary limits.			
100	All significant uncertainties and assumptions are addressed and reflected in the management advice, including appropriate decision rules.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
1.1.5.4		Does the assessment evaluate current stock status relative to reference points and make forecasts for the future?			
60	The stock status is estimated relative to reference points.	The assessment makes an evaluation of the stock status relative to the reference points. While short term forecasts were made in 2007 medium forecasts will be carried out during the forthcoming evaluation of the management plan. Testing of the management plan has been performed using alternative modelling approaches. Both CS4 (which assumes perfect knowledge) and FLR (more uncertainty) evaluations suggest the management plan is performing adequately at current low F levels.	I2, R51, R55	19.2	80
80	The assessment makes an evaluation of the stock status relative to the reference points. Both short and medium term forecasts are made.				
100	The assessment makes a reliable probabilistic evaluation of the stock status relative to the reference points and projects these into the future over appropriate timescales.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
1.1.5.5		Does the assessment include the consequences of current harvest strategies?			
60	The assessment makes an initial approximation of the consequences of current harvest strategies.	<p>Advice is provided in relation to harvest strategies, and various options are presented, but all uncertainties in the model are not explicitly considered in the provision of precautionary advice (although evaluations suggest that the current management plan approach is relatively robust to such uncertainties). The current status of the stock is assumed to be known without error.</p> <p>Management advice is always presented as a series of harvest strategy options relative to precautionary limits.</p> <p>The fact that all uncertainties in the model are not explicitly considered in the provision of precautionary advice has led to the lower score here, and the assessment team feel that this should be addressed as a condition of certification.</p>	I2, R51, R53, R56	19.2	75
80	The assessment includes a robust approximation of the consequences of current harvest strategies. Uncertainties in the model are considered in harvest strategy evaluations.				
100	The assessment includes the consequences of current harvest strategies, forecasts future consequences of these and evaluates stock trajectories under decision rules.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score
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1.1.6		The stock(s) is/are at appropriate reference level(s).			14.7	-
1.1.6.1		Is the stock(s) at or above reference levels? [YES - Criteria 1 is complete. NO - Answer Criteria 2]				
60	The stock is likely to be above the limit reference levels and trends in the stock abundance are positive.	Given the current apparent bias in the assessment, the stock is likely to be above precautionary reference levels for Biomass and below precautionary reference levels for Fishing mortality. Recent retrospective analysis indicates that the stock has been above B _{pa} since 1997.	R42, R51, R53, R55, R56	100	90	
80	The stock is likely to be above precautionary reference levels.					
100	The stock is highly likely to be consistently above precautionary reference levels.					

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
1.2 (MSC Criterion 2)		Where the exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level consistent with the precautionary approach and the ability of the populations to produce long-term potential yields within a specified time frame.		-	-
1.2.1		If the stock is below the precautionary reference points, are measures to rebuild the stock specified?		-	-
60	<p>Appropriate rebuilding measures through reduction in exploitation exist and are being implemented. Rebuilding measures other than reduction in exploitation are being considered.</p> <p>Measures are implemented but may not have not been tested.</p>	As detailed above, no evidence of depletion is evident and so this Criterion is not applied to this fishery.		-	-
80	<p>Appropriate rebuilding measures are being implemented to promote recovery within reasonable time frames.</p> <p>Measures have been tested and can be shown to be rebuilding the stock.</p>				
100	<p>Appropriate rebuilding measures are being implemented to promote recovery within specified and reasonable timescales. These measures are being monitored and can be adjusted as necessary.</p> <p>Additional measures are being implemented to prevent problems in the future.</p>				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
1.3 (MSC Criterion 3)		Fishing is conducted in a manner that does not alter the age or genetic structure or sex composition to a degree that impairs reproductive capacity.		14.3	90
1.3.1		Fishing activity maintains the age, genetic structure or sex composition of the stock to a degree that does not impair reproductive capacity.		100	-
1.3.1.1		Is the age/sex/genetic structure of the stock monitored so as to detect any impairment of reproductive capacity?			
60	<p>There is some information available on the sub-population/sex/age structure of the stock, and the relationship of these to reproductive capacity.</p> <p>Some monitoring of sub-populations is available as necessary.</p>	<p>Catches by size and age are known for different fleets and gear types, and monitored every year. Population structure, including sex ratio, is also monitored by the International Bottom-Trawl Surveys.</p> <p>There are no indications (e.g. from tagging studies) of any sub-populations in the saithe stock. Genetic studies of NS saithe do not show the presence of any sub-populations.</p> <p>Information on fecundity and SSB allows estimates of reproductive capacity to be made.</p>	I2, R15, R84	50	90
80	<p>Estimates are available of the sub-population/sex/age structure of the stock, and the relationship of these to reproductive capacity.</p> <p>Population structure is monitored based on adequate sampling and verification for this stock. Ageing errors are estimated and included in the stock assessment. Sub-population/genetic studies have been carried out as appropriate.</p>				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
100	<p>There is comprehensive and reliable information on the sub-population/sex/age structure of the stock, and the relationship of these to reproductive capacity as well as evaluations of the implications of shifts in these parameters on productivity and management quantities.</p> <p>Population structure is well estimated with only insignificant errors. Genetic studies have been conducted.</p>				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score
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1.3.1.2		Does information indicate any changes in structure that would alter reproductive capacity?			
60	Changes in stock structure have been detected but there is no evidence of negative effect on recruitment of the stock. Or potentially adverse changes in structure are identified and remedial measures are under consideration.	F has been well below F_{pa} since 1997. Age structure has become increasingly robust in recent years with an increasing proportion of older adults in the population. These data indicate a robust age structure with no obvious changes in stock structure that would impair reproductive capacity, and with no obvious declines in recruitment apparent from the stock assessment. Declines in the weight at older ages are noted, and the future effects of continued declines on future reproductive capacity would be monitored through stock-recruitment estimates.	I2, R36, R37, R38, R39, R40, R49, R51, R52, R55	50.0	90
80	Evidence exists that the fishery has not caused changes in stock structure that would affect recruitment. Or potentially adverse changes in structure are clearly identified and effective remedial measures are in place.				
100	Data strongly indicate a robust age, sex and genetic structure in the stock, such as would maintain reproductive capacity.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
Principle 2		Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends	33.3		83
2.1 (MSC Criterion 1)		The fishery is conducted in a way that maintains natural functional relationships among species and should not lead to trophic cascades or ecosystem state changes.	43.8		83
2.1.1		There is adequate understanding of ecosystem factors relevant to the distribution and life history strategy of the target species.	23.4		-
2.1.1.1		Are the nature, sensitivity and distribution of habitats relevant to the fishing operations known?			
60	Appropriate information exists but may not be comprehensive or up to date. The seasonal distribution of fishing operations is mapped.	The North Sea ecosystem is well studied, with the North Sea Task Force (NSTF), produced a Quality Status Report (QSR) for the North Sea ecosystem in 1993. Knowledge is continually updated using available information on oceanography, plankton, fish distribution and abundance, and the interactions between these fish components gathered during annual scientific research survey cruises. Certain types of data, notably those related to fisheries, physical oceanography, plankton and nutrients, are measured typically throughout the North Sea, with many programmes covering several decades of observation. Specifically related to German efforts, the Federal Research Centre for Fisheries (Institute for Sea Fisheries) performs an annual small-scale bottom trawl survey covering sites across the North Sea. This survey has been performed for 20 years, collecting a time series of environmental, ecosystem and biological information. Other data, including biological effects (ecotoxicology), sediment chemistry (contaminants), species introductions, hazardous algal blooms in coastal waters and benthos surveys, tend to be more localized (for example in coastal waters) or cover years rather than decades. These processes are being linked within the ICES regional ecosystems group, OSPAR and SAHFOS into an Integrated Ecosystem Approach.	I2, R29, R82, R84	33.3	85
80	Nature, sensitivity and distribution of all main habitats are known in adequate detail. Information is recent. The distribution of fishing operations is monitored.	Information on the geographic distribution of particularly vulnerable habitats is being gathered through side-scan sonar tracks, dredging and benthic sampling programmes performed by fisheries and oceanographic institutions around the North Sea, all helping to identify these areas in greater detail. The Ecosystem Management Plan exercise performed by Norway for the Barents Sea is expected to be expanded into the northern North Sea.			
100	The nature, sensitivity and the distribution of all habitats relevant to the fishing operations are known in detail. Information is recent. The distribution of fishing operations and their effort is monitored, and an appropriate time series of information is available.	Distribution of fishing vessel position (although not necessarily fishing effort, in particular in relation to specific habitat types) is recorded via vessel monitoring systems (VMS). For German vessels engaged in fishing in international waters and in the EEZs of other countries (for example in the North Sea), VMS is required and logbooks record fishing locations and effort. This information allows comparisons of fishing activities with critical habitats identified through the studies described above.			

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
2.1.1.2		Is information available on the trophic position, status and relationships of the target species within the food web?			
60	Key prey, predators and competitors are known.	The location of saithe within the food web is reasonably well described, due to data from the two 'years of the stomach' and annual research surveys, including the GSBTS. In the northern and northeastern North Sea, saithe is an important predator on sandeel, clupeids, Norway pout, and haddock. These food webs are generally on a gross-scale. Saithe has been modeled within the multi-species Virtual Population Analysis (MSVPA) for the North Sea (ICES Area IV), developed by the ICES multispecies assessment working group, which estimates the predation mortalities for 9 commercially important fish stocks based upon key fish predators, and by seabirds and seals. This includes quantitative information on saithe as a prey (predominantly by cod and seabirds) at different life stages (significant data are available, but this is now at least 5 years old). While the MSVPA is still under development, it is considered to be appropriately robust. Detailed mass-balance trophic models of the North Sea have also been developed using the Ecopath with Ecosim methodology. This allows the temporal and spatial simulation of alternative fishing and environmental change scenarios to be examined on ecosystem components, which include saithe. Juvenile saithe trophic relations have been established, with feeding on juvenile herring, cod and sandeel.	I2, R11, R27, R29, R33, R41, R73, R80, R87, R93, R97	33.3	90
80	Appropriate information is available on the position, relationships and importance of target species in the environment at key life stages.				
100	Quantitative information is available on the position and importance of the target species and their relationships within the food web at key life stages.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
2.1.1.3		Is there information on the potential for the ecosystem to recover from fishery related impacts?			
60	Key elements of the functioning of the ecosystem, relevant to the fishery, are identified.	<p>The impact of commercial fishing on the spawning stock is studied through the stock assessment, which has demonstrated that saithe stocks have recovered from a state defined as over-exploited (SSB was below B_{lim} and F above F_{lim}) in the early 1990s, due to reductions in fishing mortality and some above-average recruitment events. The impacts of this depletion on the ecosystem interactions have not been examined directly, but the potential trophic impacts of stock biomass removal are available from MSVPA analyses.</p> <p>Further potential ecosystem impacts of fishing, being physical disturbance (section 2.1.3.1), ghost fishing (section 2.1.3.2) and impacts on key vulnerable species (section 2.1.5) are considered elsewhere. Trophic impacts may be determined through ECOPATH/ECOSIM analysis, although these have not been performed specifically to examine the impact of saithe biomass fluctuations on the ecosystem. Given the range of fluctuations in the saithe biomass, these effects are expected to be minor.</p> <p>Benthic sensitivities are established and recovery patterns established for habitat types, albeit with studies concentrated on beam trawl impacts. Impacts from lighter trawls targeting saithe are expected to be less severe than beam trawls.</p>	I2, R11, R27, R49, R53, R93, R94	33.3	90
80	The main elements of the functioning of the ecosystem, relevant to the fishery, have been documented and are understood, allowing reasonable assessment of recovery potential.				
100	Detailed information is available on the potential for affected elements of the ecosystem to recover from fishery related impacts.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score
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2.1.2		General risk factors are adequately determined.		23.4	-
2.1.2.1		Is information available on the nature and extent of by-catch (capture of non-target species)?			
60	The main non-target species affected have been identified and qualitative information is available on significant by-catch.	Information on bycatch levels is available from observer trips on board German vessels within the saithe fleet. From available observer data, saithe represents between 78 and 99% of the catch (overall, 96%, with levels indicated to be lower in the summer). In the North Sea and Norwegian sea, haddock represents the majority of "by catch" in the saithe fishery (1.8% of total catch from available observer data). Whiting and cod have been found in very low proportions in catches (cod between 0% and 4.1%, overall 0.9%), and hence vessels targeting saithe qualify for no restriction on fishing days at sea, available to vessels with a cod bycatch of <5%). The vessels fishing for saithe have quotas for cod and haddock and so these species will be landed by the vessels and counted against the vessels' quotas for these species.	I2, R4, R5, R6, R7, R8, R9, R35, R53, R66, R68, R69, R70, R71, R72, R101	33.3	75
80	Information is available on non-target species directly affected by the fishery including their distribution and/or ecology. Quantitative information is available on significant by-catch. If obtained by sampling, this is considered sufficient to provide adequate information.	On a relatively small scale, the observer data indicate that vessels may also catch other types of fish as by catch in the saithe fisheries. This by catch consists of pelagic species, ling, pollock, and a variety of other commercial and non-commercial species. This information allows estimates of bycatch levels to be developed.			
100	Information is available on all non-target species directly affected by the fishery including the distribution and ecology. Accurate records are kept on the nature and extent of all by-catch species including species size and sex composition.	However, the limited observer coverage does not allow the question of whether bycatch levels show year effects and/or vessel effects, and hence whether the bycatch patterns seen are representative of the fleet as a whole. For this reason, the assessment team felt that action to address this information shortfall should be a condition of certification of the fishery. Bycatches of PET species are considered elsewhere (section 2.2.1).			

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
2.1.2.2		Is information available on the extent of discard and slippage (the proportion of the catch not landed)?			
60	Information is available of the extent of discarding and slippage, including an assessment of the main species represented.	By-catches of commercial species are principally haddock (North Sea), with smaller bycatches of cod and whiting as well as other commercial species. Generally, these species are landed and counted against the specific quotas. Such by-catches are recorded and monitored through information provided by observer programmes in European fleets, including Germany directly. Discarding does occur for all species, due to commercial and legislative controls, and estimates of the proportion discarded from observed hauls are available, and relatively small (e.g. where cod was discarded, the discarded weight represented generally <3.1% of the total weight of cod caught in a trip, amounting to 35.8kg across the thirteen trips observed). This allows estimates of the level of discarding by species to be calculated. Data on the size distribution of discards are available for specific species (including cod), but not for all species. In turn, observer coverage in terms of time and vessels is relatively limited, hence a score of only 80.	I1, I2, R5, R8, R101	33.3	80
80	Information is available to allow estimates of discard and slippage to be calculated and interpreted.				
100	Accurate and verifiable information is available on the extent of all discards and slippage (by age/size), and the consequences of these. Or the entire catch is landed.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
2.1.2.3		Is information available on other unobserved fishing mortality on target or other species?			
60	Sources of potential unobserved mortality have been identified.	<p>Experiments on the degree of unobserved mortality within Norwegian (rather than German) trawl fisheries have been performed and estimates of mortality can be derived. Evidence suggests that saithe escape mortality in the Barents Sea is negligible and unrelated to any selection device used (e.g. codend meshes and sorting grid) or fishing intensity. This subject has been a study of a PhD student at Bergen University. Given that similar (and often larger) mesh sizes are used by the German vessels targeting saithe, results are likely comparable for this fleet, allowing estimates of unobserved mortality to be made.</p> <p>All fish must be retained when fishing in Norwegian waters (part of Area IVa), however discarding is legal (and sometimes required) in EU waters. Estimates of discard levels are available from the German observer programme. These are available by size for specific species. There is some uncertainty within the data and any resulting estimates due to the limited observer coverage. It is likely that all discarded fish will suffer mortality on return to the sea, but the overall unobserved mortality will be low because of the seemingly low level of discarding.</p>	I1, I2, R58	33.3	80
80	Information is available to allow estimates to be made of unobserved mortality.				
100	Information is available to allow quantitative estimates to be made.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
2.1.3		There is adequate knowledge of the effects of gear-use on the receiving ecosystem and extent and type of gear losses.		19.4	-
2.1.3.1		Is there adequate knowledge of the physical impacts on the habitat due to use of gear?			
60	Main impacts of gear use on the habitat are identified including extent, timing and location of use.	Trawl operations have significant potential to impact on the bottom habitat. The impact of fishing gears on the seabed of the North Sea has been the focus of many studies, both from the impact on benthos, and the geochemistry of the seabed. However, studies have generally been limited to beam trawls, where the fishing method is more likely to have significant adverse affects on the sea bed and vulnerable habitats.	I2, R29, R34, R42, R48, R91, R92	60.0	90
80	All impacts of gear use on the habitat are adequately identified including extent, timing and location of use.	Trawling can have variable impacts on benthos, with physical fishery impacts and impacts on food availability interacting. Trawling reduces biomass, production, and species richness, with the 'bottom trawl' (beam trawl) fleet being estimated to have reduced benthic biomass and production by 56% and 21% respectively, compared with the unfished situation. While much information can be transferred from beam to otter trawls, this is more a 'worst-case' comparison and will be less for otter trawls on grounds which have been fished for many years. The impacts of trawling have also been the subject of EU Framework R&D programmes (e.g. MAFCONS), while the GSBTS also monitors benthic composition in the North Sea. This should be continued to monitor potential future impacts. All areas and times of activity are recorded accurately through VMS and logbook/landing declaration records.			
100	The physical impacts on the habitat due to use of gear have been studied and quantified, including details of any irreversible changes.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
2.1.3.2		Is any gear lost during fishing operations and can 'ghost fishing' occur?			
60	Some recording of gear losses takes place and an assessment can be made of ecosystem impacts, including possible 'ghost fishing'.	<p>Gear loss can potentially be caused through either (i) an excessive catch (although this usually results in the cod-end bursting rather than loss of the trawl) or (ii) through the gear snagging on the bottom, for example after an engine failure or some other power loss. When gear is lost, position is recorded and retrieval put in place, due to the relatively high monetary value of the gear.</p> <p>The ability of an abandoned trawl gear to continue to capture fish is limited, as the trawl gear only fully functions when under powered tow – estimates of impact can therefore be made. If a gear is lost with the doors it will remain in place. If lost without doors, it may drift with bottom currents, although the weight of the gear components will limit this. Under this scenario, some localised damage to benthic structures and communities may be possible through smothering.</p> <p>The assessment team found from the client and fishery regulators that the loss of trawl gear from the German saithe trawl fleet was minimal, due to the value of the gear and therefore the reluctance of the fishermen to lose it, and the fact that the fishing grounds are now well known.</p>	I1, I2, R78, R79	40.0	80
80	There is knowledge of the type, quantity and location of gear lost during fishing operations. Estimates can be made on the extent of adverse effects, including 'ghost fishing'.				
100	There is detailed knowledge of the type, quantity and location of gear types lost during fishing operations. The impact of gear loss on habitat, target and non-target species has been well estimated or recorded.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score
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2.1.4		Strategies have been developed within the fisheries management system to address and restrain any significant negative impacts of the fishery on the ecosystem		9.4	-
2.1.4.1		Are management strategies in place to address impact identification and avoidance/reduction?			
60	Management strategies include some appropriate consideration of ecosystem impact identification and avoidance/reduction, but may not be tested.	Objectives for the sustainable precautionary management of saithe are in place through the EU/Norway management system, with associated controls and reference point levels. The west coast of Norway is probably the most important nursery ground for saithe in the North Sea, with inshore nursery grounds and juvenile saithe mainly distributed along the west and south coast of Norway, the coast of Shetland and the coast of Scotland.	I2, R4, R5, R6, R7, R8, R9, R17, R35, R66, R68, R69, R70, R71, R72, R78	100	80
80	Management strategies are in place to detect and reduce ecosystem impacts, although these may not have been fully tested. These are designed to adequately protect key aspects of the ecosystem within main fishing areas.	Significant trophic impacts due to removal of biomass of the target and commercial by-catch stocks can be detected through Ecopath/Ecosim analyses. Discarding is prohibited in Norwegian waters, and levels of bycatch of commercial species are counted against quota. Bycatch in North Sea trawl fisheries has been examined through observer programmes, and annual surveys (although commercial gear is not commonly used), and specific programmes such as the UK Fisheries-Science partnership. Specific information on bycatches in the German saithe trawl fleet was available from observer programmes for thirteen trips between 2004-2007. Information on the levels of non-commercial bycatch was given (albeit from a limited sample of the fleet), indicating that it was low (approx <0.3% of total weight). Impacts on seabirds and PET species are examined separately (section 2.2.1). Studies have also been funded in the past on the impacts of changing net mesh sizes on bycatch composition and bycatch levels.			
100	Management strategies are in place to monitor, detect and reduce impacts. These are designed to adequately protect ecosystems, habitats and populations of target and non-target species and keep impacts within determined acceptable levels.	Management strategies and data collection mechanisms are therefore in place to detect and reduce the impacts on key ecosystem components, although the efficacy of the strategies has not been tested regularly.			

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
2.1.5		Assessments of impacts associated with the fishery including the significance and risk of each impact, show no unacceptable impacts on the ecosystem structure and/or function, on habitats or on the populations of associated species.		24.4	-
2.1.5.1		Does the removal of target stocks have unacceptable impacts on ecosystem structure and function?			
60	The removal of target stocks could lead to impacts upon ecological systems (applying the precautionary approach where necessary). A program is in development to identify these and, if appropriate, reduce these to acceptable, defined limits.	Ecosystem impacts stem from biomass removal and resultant changes in predator prey relationships, as well as potential physical impacts in geographic areas of key importance to the species. The inter-relationship between saithe and both predator and prey species has been modelled as part of the ICES multi-species VPA model for the North Sea (section 2.1.1.2). The level of coupling between predator-prey relationships, and opportunities for prey switching, is less well known and are likely to increase uncertainty over the response of predators to diminished prey availability. Further development of the MSVPA model should allow the inter-relationships between saithe and associated species to be better established.	I2, R93, R94	25.0	85
80	Sufficient information is available on consequences of current levels of removal of target species to suggest no unacceptable impacts of the fishery on ecological systems within major fishing areas.	Food web studies (Ecopath) of saithe suggest that the species is not a critical prey species of any one predator species identified (rather it is a small component in the diet of several predator species). This suggests that removal of this species at current sustainable levels is not likely to have a significantly large impact on the North Sea food web at current sustainable levels. However, this has not specifically been examined using multispecies models. The fluctuations in saithe abundance seen historically are not expected to impact the ecosystem significantly.			
100	The ecological consequences of current levels of removal of target stocks has been quantified and documented to be within acceptable, pre-determined, limits.	Impacts on critical areas (inshore areas as nursery grounds) are unlikely to be affected by the German fleet, given the concentration of its activities to the north of the North Sea, while any potential impacts on spawning areas offshore appear to be limited to direct impacts of gear on the habitat (see section 2.1.3.1), since population spawning stock biomass is currently at sustainable levels. In particular areas, vessels specifically target spawning aggregations. Given the perceived sustainable spawning stock levels, this does not appear to impact the population negatively at current fishing mortality levels. Impacts on the spawning stock should be closely monitored if effort is increased.			

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
2.1.5.2		Does the removal of non-target stocks have unacceptable impacts on ecosystem structure and function?			
60	The removal of non-target stocks could lead to impacts upon ecological systems (applying the precautionary approach where necessary). A program is in development to identify these and, if appropriate, reduce these to acceptable, defined limits.	Key species would include by-catch species such as haddock, while cod may also be caught. The inter-relationship between main gadoid bycatch species and their predator and prey species has been modelled as part of the ICES multi-species VPA model for the North Sea (section 2.1.1.2). The level of coupling between predator-prey relationships, and opportunities for prey switching, is less well known and are likely to increase uncertainty over the response of predators to diminished prey availability. Further development of the MSVPA model should allow the inter-relationships between key North Sea species to be better established. These species are all included in Ecopath assessments and are the subject of separate (much larger) directed fisheries. Non-commercial species such as skates and rays would not form significant parts of the demersal/pelagic ecosystem of the North Sea. Information on the bycatch of species is available from the German observer programme (noting certain limitations highlighted in 2.1.4.1).	I2, R11, R27, R94	25.0	80
80	Sufficient information is available on consequences of current levels of removal of non-target species to suggest no unacceptable impacts of the fishery on ecological systems within major fishing areas.				
100	The ecological consequences of current levels of removal of non-target stocks has been quantified and documented to be within acceptable, pre-determined, limits.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score
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2.1.5.3		Does the fishery have unacceptable impacts on habitat structure?			
60	There is no evidence that the fishery is having unacceptable impacts, although the issue has not been directly studied.	<p>The effects of trawling on sea bed habitats have been studied, and the distribution of sensitive benthic habitats is well known (see 2.1.3.1)</p> <p>Benthic habitats within established fishing grounds are not considered likely to suffer significant adverse effects from ongoing trawling activity. Unacceptable impacts would only arise if fishing moved to new areas supporting sensitive benthic habitats. There is no evidence of such a change in fishing patterns occurring, or being likely to occur in the foreseeable future. However, sufficient data is collected (both through logbooks and vessel monitoring systems) to detect and evaluate any significant extensions of trawl areas and trawl grounds are extremely well established.</p>	I2, R34	25.0	85
80	No unacceptable impacts of the fishery on habitat within major fishing areas have been demonstrated.				
100	Effects on habitat structure are well documented and are within acceptable tested/justified limits.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
2.1.5.4		Are associated biological diversity, community structure and productivity affected to unacceptable levels?			
60	There is no evidence that the fishery is having unacceptable impacts, although the issue has not been directly studied.	Biodiversity, in terms of impacts on rare, protected or threatened species is considered separately in Section 2.2.1.	I2, R11, R27	25.0	85
80	Information is available on the effects of the fishery on biological diversity, community structure and productivity. This does not indicate any unacceptable impacts.	The development of Ecopath/Ecosim ecosystem models for the North Sea allow the overall community level impacts of the fishery to be determined. Analyses do not indicate a major influence of saithe on associated ecosystem components, even for Norway pout, for which saithe is a major predator in the North Sea. For key fish species, including saithe, this is also examined through MSVPA. Following stock rebuilding and biomass increases, there is no evidence to suggest that productivity of the system has been impaired directly through fishing for saithe.			
100	The effects of the fishery on biological diversity, community structure and productivity have been quantified and are within acceptable tested/justified limits.	There is the potential for trawl gear to affect the productivity of benthic communities. Although scientific research has been performed to examine this, conflicting results suggest that while certain communities will be adversely affected, others might benefit from increased availability of particular organisms, and that productivity may overall be increased. Impacts on commercial bycatch species are understood through the relevant stock assessments, and information on non-commercial species is also gathered, and their population status is generally understood. Information available indicates no unacceptable impacts, although condition 2 has been raised to collect further information in order to confirm this.			

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
2.2 (MSC Criterion 2)		The fishery is conducted in a manner that does not threaten biological diversity (at the genetic, species or population levels and avoids or minimises mortality of, or injuries to endangered, threatened or protected species.	43.8		85
2.2.1		Fishing is conducted in a manner, which does not have unacceptable impacts on recognised protected, endangered or threatened species.	50.0		-
2.2.1.1		Is there information on the presence and populations of protected, endangered or threatened (PET) species?			
60	There is a program in place to identify protected, threatened and endangered species directly related to the fishery. There is periodic monitoring of the main population trends and status of protected, endangered and threatened species.	<p>Sea mammals.</p> <p>The populations of seals in the North Sea are monitored by a number of organisations including NERC's Special Committee on Seals (SCOS) and the Sea Mammal Research Unit, which since 2000 has carried out investigations of the level of bycatch of sea mammals in UK fisheries. In addition to these studies, harbour seals are surveyed annually in the Kattegat/Skagerrak by Swedish scientists and in the Wadden Sea by Dutch scientists. Elsewhere surveys are less frequent but data are relatively complete for most harbour seal populations in the region of the North Sea. Grey seals are also surveyed intermittently along the Norwegian coast and in the Baltic but there are no systematic surveys of abundance. A major international survey was conducted in 1994 (known as SCANS) to estimate the abundance of harbour porpoises and other small cetaceans in the North Sea and adjacent waters. The current plan is to repeat the survey in the North Sea and to extend the survey area to include shelf waters to the west of the British Isles where there are not yet any robust estimates of cetacean abundance.</p>	I2, R10, R29, R59, R81	33.3	95
80	Key protected, threatened and endangered species directly related to the fishery have been identified. The populations of key protected, threatened and endangered species directly related to the fishery are monitored on a regular basis.	<p>Fish</p> <p>The angel shark (<i>Squatina squatina</i>) is now extinct in the North Sea and has been declared critically endangered elsewhere, while the common skate (<i>Raja batis</i>) is now extremely rare in Area IVc (an area not fished by vessels targeting saithe). Skates and rays are of critical concern due to their long-lived life histories and limited reproductive potential and information on the status of stocks is available.</p> <p>Seabirds.</p> <p>Seabirds at sea are monitored by the seabirds at sea unit of JNCC. The German small-scale bottom trawl survey also monitors seabirds and their feeding habits. The ICES Working Group on Seabird Ecology (WGSE) reviews current approaches for identifying offshore seabird aggregations and delineating Important Bird Areas (IBAs) and Special Protection Areas (SPAs), develops recommendations for a comprehensive monitoring programme for seabirds and details of dietary studies in seabirds. Interactions of seabirds with gears are also anecdotally reported.</p> <p>Other Species.</p> <p>Surveys of the sea bed through specific side-scan sonar surveys and benthic surveys have provided information to identify vulnerable areas and species such as cold water corals within the North Sea.</p>			

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
100	There is knowledge of all populations of protected species directly or indirectly related to the fishery including their dynamics. Regular monitoring of protected, endangered and threatened species is undertaken, supported by research programmes to assess threats and promote their conservation. The type and distribution of critical habitats have been identified.	The majority of PET species (but not necessarily all), which may directly or indirectly interact with the fishery, are identified. Populations are monitored and threats to populations, and measures necessary to promote conservation are identified. Critical habitats are understood.			

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
2.2.1.2		Are interactions of the fishery with such species adequately determined?			
60	The main interactions directly related to the fishery are known.	<p>There are several programmes of data collection and review in the North Sea, particularly for Marine Mammals the NAMMCO annual reviews and for birds the ICES Working Group on Seabird Ecology. The majority of studies on cetacean by-catch in the North Sea have been performed by the UK, Germany and Denmark, and hence largely concentrate on different areas to those in which the German fleet operates, but there are also several additional Norwegian studies. Several EU fleets have observer programmes which monitor seabirds and cetacean interactions in addition to fish bycatch. Furthermore, the likelihood of by-catch is strongly influenced by the location of fishing – for example nearshore fishing being more likely to result in by-catch than that offshore.</p> <p>EU regulations currently require the reporting of mammal catches (Council Regulation (EC) 812/2004) and are likely to require reporting of seabird deaths from 2009.</p> <p>Sufficient information on sensitive/rare sea bed communities (cold water corals) is available to identify no areas of significant interaction with fishing gear in areas where the German saithe fleet operates in the North Sea.</p> <p>Interactions of trawl gear with sea mammals is reported to be very limited. Observer programmes on EU vessels have operated on different gear types, including trawls. Pelagic trawl observations (more of a worst-case than demersal trawls) were considered to have negligible effects on sea mammal populations. Evidence therefore supports estimation that the occasional interaction could occur, but very rarely.</p>	I2, R4, R5, R6, R7, R8, R9, R17, R35, R57, R66, R68, R69, R70, R71, R72	33.3	75
80	Quantitative estimates are made of the effects of interactions directly related to the fishery.	<p>Direct interactions of seabirds and trawls has not been directly estimated for the German saithe fleet. However, several other observer programmes do operate in the North Sea with other, comparable fleets and issues associated with various gear types (including trawls) have been considered. Interactions of seabirds are reported as being very rare in trawls, with occasional birds being caught in nets. However, numerical estimates and observer protocols are not available to support this observation.</p> <p>German observer programme data indicate rays and skates (identified as <i>Raja radiata</i>) to be a small by-catch in the saithe directed demersal trawl fishery in the North Sea. For example, a total of 73.4kg of thorny skate were recorded as discarded across the 13 trips, representing ~0.01% of the total catch weight, but biological information on these limited number of animals was not collected. The ICES WG on Elasmobranch Fisheries has collected landings information for the North Sea. ICES advised that target fisheries for common skate <i>R. batis</i> and thornback ray <i>R. clavata</i> should not be permitted, and by-catch in mixed fisheries should be reduced to the lowest possible level. Length frequency distributions of discarded and retained elasmobranchs, covering the period from 1998 to 2006, are available from the UK, but</p>			

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
100	Reliable quantitative estimates are made of the interactions of all populations directly related to the fishery, and qualitative information is available on indirect impacts. Incidental mortalities are recorded and reported.	<p>observations of discard rates between different gear types (e.g. otter trawls, beam trawls etc.) are limited to the results of observer programmes and ad-hoc specific studies.</p> <p>In summary, existing information from trawl fisheries in the North Sea and the existing observer programme on German vessels indicates that most interactions are negligible. However, the extent of by-catch level of species such as skates and rays (and possibly other non-commercial PET fish, bird, and sea mammal species) has not been quantified. Condition 2 has been raised to address this.</p>			

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
2.2.1.3		Do interactions pose an unacceptable risk to such species?			
60	Known effects are within acceptable limits of national and international legislative requirements and are believed to create no biological threats to the species concerned.	Reviewing all the data noted above, of the various categories of PET that might be impacted by fisheries: no significant interactions between mammal species (in particular harbour porpoise) and German demersal trawl vessels targeting saithe have been found; no bird PET species has been identified as interacting significantly with trawls on hauling, although numerical estimates are not available; and no gear impacts with sensitive benthos have been identified for the area fished by the German fleet.	I2, R10, R26, R45, R89, R96, R100	33.3	85
80	Critical interactions are well estimated. Available information suggests interactions are below a level at which PET species populations would be at risk.	Information on the potential impact of trawls on bycatch fish is available, but the observer coverage is relatively limited, leaving some concern with respect to elasmobranchs. Rays and skates are known to be one of the by-catches in demersal trawl fisheries in the North Sea, and impacts on ray populations have been identified. Available information suggests that impacts of the German saithe trawl fishery on ray stocks may be relatively minor, but further information is needed to confirm this. Information on discards in the different demersal fisheries is being collected by several countries. Length frequency distributions of discarded and retained elasmobranchs, covering the period from 1998 to 2006, are available from the UK, but observations of discard rates between different gear types (e.g. otter trawls, beam trawls etc.) are limited to the results of observer programmes and other specific studies (e.g. Cotter et al., 2004). Status of elasmobranchs in the North Sea have been examined (e.g. Dann et al., 2005; ICES Working Group on Elasmobranchs) and ICES has advised that target fisheries for common skate <i>R. batis</i> and thornback ray <i>R. clavata</i> should not be permitted, and by-catch in mixed fisheries should be reduced to the lowest possible level. German observers have not noted the presence of <i>R. batis</i> as a bycatch in catches of German trawlers targeting saithe.			
100	It is established that the direct and indirect effects of fishing on threatened and endangered species are within acceptable pre-defined limits.	In summary, the available evidence suggests that this fishery does not present an unacceptable risk to PET species, although the score here is likely to be higher following further work associated with 2.2.1.2 above.			

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score
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2.2.2		Strategies have been developed within the fisheries management system to address and restrain any significant impacts of the fishery on protected, endangered or threatened species.		50.0	-
2.2.2.1		Are management objectives and accompanying strategies in place in relation to impact identification and avoidance/reduction?			
60	Management systems are in place to address key areas of impact identification and avoidance/reduction.	The fishery managers for the proposed certification area (Germany, Norway & the EC) have ratified a number of conventions on species protection and management, including the Convention on Biological Diversity, Bern, Bonn and CITES Conventions, these establish overarching objectives for PET species conservation. The German Red List is updated regularly. If issues relating to protected, endangered or threatened species were to be identified, various mechanisms have been developed internationally (via OSPAR strategy) and within EU jurisdiction to initiate action. These include i) the ASCOBANS Agreement that sets the 1.7% maximum allowed removal rate for harbour porpoises; (ii) the EC Habitats Directive that provides protection for key habitats and species; (iii) Biodiversity Action Plans that provides action plans for the protection of key and threatened species and habitats; (iv) the OSPAR Strategy on the Protection and Conservation of the Ecosystems and Biological Diversity of the Maritime Area.	I2, R45, R82	100	80
80	Management objectives are set to detect and reduce impacts. Accompanying strategies are designed to adequately protect recognised protected, endangered or threatened species.				
100	Tested management objectives are set to detect and reduce impacts. Accompanying strategies are designed to adequately protect recognised protected, endangered or threatened species.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
2.3 (MSC Criterion 3)		Where exploited populations (of non-target species) are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level within specified time frames, consistent with the precautionary approach and considering the ability of the population to produce long-term potential yields.		12.5	77
2.3.1		There are management measures in place that allow for the rebuilding of affected populations.		100	-
2.3.1.1.		Is there sufficient information to allow determination of necessary changes in fishery management to allow recovery of depleted populations?			
60	There is some information on functional relationships, sufficient to allow alterations to be made to fishing to recover and rebuild depleted species.	Identified depleted populations which could be by-catches in German saithe directed fisheries would notably include North Sea cod. Stock assessments are carried out annually which identify appropriate fishing levels to rebuild populations. A rebuilding plan is in place for North Sea cod. Commercial catches of cod are reported by German trawlers fishing for saithe, estimates of discard levels are available from the observer programme by size, but do not cover all of the fleet.	I2, R23	33.3	85
80	There is adequate information, combined with a precautionary approach wherever necessary, to allow alterations to be made to fishing that would be expected to recover and rebuild depleted species to specified levels within appropriate timeframes.	There is the potential for saithe directed fisheries to impact vulnerable species such as skates and rays, (which are considered under Criterion 2.2 above, although information indicates that interactions are limited and not with specific PET species. No other by-catch species (with the possible exception of redfish) is known to be depleted, although this will be subject to further evaluation as detailed under Criterion 2.1 above. Functional relationships are clear, but the score here would be higher if the effects of by-catches versus directed catches had been more clearly established. This may result from actions required by Condition 2.			
100	There is a clear understanding of functional relationships between the impacted population and the fishery. Intervention measures based on this understanding have been tested and /or are known to be effective in promoting recovery of depleted species to specified levels within appropriate timeframes.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
2.3.1.2		Are management measures in place to modify fishery practices in light of the identification of unacceptable impacts?			
60	A mechanism exists for the modification of fishing practices in light of the identification of unacceptable impacts.	<p>For North Sea cod, a recovery plan is in force including annual stock assessments and limits on exploitation, setting objectives and limits guiding operational practices. Cod by-catch landings from the saithe directed fisheries are set against the TAC for North Sea cod. Cod landings made up 0.9% of the total landed weight of all fish landed in 13 observed saithe fishing trips (5.7t of cod). All German vessels operating in the saithe directed fishery have a specific cod quota in the North Sea reserved for by-catches. Additional management measures can be implemented under the terms of the EU-Norway agreement within Norwegian waters.</p> <p>Discard levels of cod are generally low, cod discarding was observed on just six of the thirteen trips. A maximum of 3.1% of the caught cod was discarded (by weight) across the observed trips. In total, this observed discarding amounted to 35.8kg.</p> <p>Cod is a recognised depleted species and while evidence suggests that bycatch in the saithe fishery is low, any available means of minimising cod bycatches should be explored and implemented.</p> <p>Condition 3 has been raised to address this.</p>	I2, R5, R6, R23, R32, R71	33.3	75
80	Effective and timely management measures are in place to modify fishery practices in light of the identification of unacceptable impacts.				
100	Monitoring programs are in place within the management system to allow modification of fishery practices in light of the identification of unacceptable impacts. Objectives and limits for environmental change are used to guide operational practices. It is demonstrated that these are effective.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
2.3.1.3		Do management measures allow for recovery of affected populations?			
60	Rebuilding measures exist and are fully implemented. Measures may not have been tested.	Rebuilding measures (the cod recovery plan) have been implemented for North Sea cod. There are indications in the North Sea that the decline in stock status has recently stabilized, and that the recent year class could promote stock recovery if recruited into the fishery. It is recognised that the saithe directed fisheries represent only a minor component of total fishing pressure, and the German by-catch quota has proportionally reduced with reductions in the TAC. Nevertheless, North Sea cod remains depleted and appropriate measures to minimise by-catches from the German saithe fishery are therefore required as a condition of certification for the fishery to ensure that it does not jeopardize recovery of this stock.	I2, R23	33.3	70
80	Appropriate rebuilding measures are being implemented. Measures have been tested and can be shown to be promoting the rebuilding of affected populations.				
100	Appropriate rebuilding measures are being implemented to promote recovery as quickly as is possible. Additional measures are being implemented to prevent problems in the future.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
Principle 3		The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable		33.3	88
3.A		Management System Criteria		50.0	90
3A.1 (<i>MSC Principle 3 Intent and Criterion 3</i>)		A management system containing an institutional and operational framework exists with clear lines of responsibility.		16.7	-
3A.1.1		Are organisations with management responsibility clearly defined including areas of responsibility and interactions?			
60	Organisations with management responsibility are known. Responsibilities and interactions require clarification and occasional issues may arise.	Management Overview The North Sea saithe fisheries occur on a stock that is shared between Norway and the EU. The division of the saithe stock between these has been agreed since 1981, since when the TAC has been set with no ensuing issues regarding allocation of National quotas. TAC's are set on the basis of ICES advice. The bilateral cooperation has been functioning for almost 3 decades (EU-Norway cooperation beginning in 1978). Responsibility Organizations, management responsibilities and interactions are clearly defined within the three core areas of resource management: developing the knowledge base, preparing and implementing regulations, and enforcing them. Scientific advice	I2, R3, R12, R13, R22, R53, R54, R55	25	95
80	Organisations with management responsibility have been defined including key areas of responsibility and interaction. In general, interactions are effective and operate without serious difficulties.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score
100	<p>Organisations with management responsibility are clearly defined including all areas of responsibility and interaction. Interactions are demonstrably effective.</p> <p>Scientific advice on the stock management is provided by ICES through a process that engages scientists from all of the countries with an interest in the stock.</p> <p>Scientific information describing fish stocks is assessed by ICES Working Groups, and these assessments are considered by the Advisory Committee on Fishery Management (ACFM). ACFM determines ICES advice on Total Allowable Catches, based on a precautionary approach to stock management. The EC proposes TACs based upon this advice and input from its Scientific, Technical and Economic Committee on Fisheries (STECF). The EC and Norway negotiate TACs for shared stocks, and management measures are agreed annually for the entire EC-Norway area.</p> <p>Additional scientific inputs on nature conservation issues is provided through other research institutions (for example NINA, the Norwegian Polar Research Institute).</p> <p>Implementation: Norwegian Sector The overall responsibility for resource management resides with the Ministry of Fisheries and Coastal Affairs, while the Fisheries Directorate acts as a technical body preparing secondary legislation containing regulations and implementing it. Interactions between the Ministry, Directorate and IMR appear to function well. This is significant as these are key management organisations.</p> <p>Enforcement of regulations is the responsibility of the Coast Guard (at sea), the Fisheries Directorate (nearshore waters and upon landings) and the sales organizations (upon landing). These organisations have set procedures governing joint activities and regularly meet to coordinate actions.</p> <p>Implementation: EU Sector Overall responsibility for resource management resides with the EC, through the Common Fisheries Policy. Implementation of the CFP is carried out by individual Member States’ fisheries managers. Institutional arrangements vary from State to State. In essence, Member State patrol vessels and aircraft work together to monitor and inspect vessels at sea. National fisheries management organisations monitor landings and ensure that administrative measures (such as logbook records) are observed.</p> <p>In Germany, the CFP is implemented through a combination of local and Federal agencies.</p> <p>Interactions between organisations There are clear divisions between organisations, yet they appear to interact well. There are clear links between scientific advisors and management organisations. The effectiveness of these links have been demonstrated by the agreement of the North Sea Cod Recovery Plan through this management framework.</p>			

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
3A.1.2		Is the management system consistent with the cultural context, scale and intensity of the fishery?			
60	Inconsistencies arise in some key areas but a programme is in place to address these.	The EU-Norway fisheries agreement recognises historical participation of Norwegian and EU member states in shared waters.	I1, I2, R3, R22, R24, R31	25.0	95
80	The system is consistent with key elements of the cultural context, scale and intensity of the fishery.	This management system is comprehensive and encompasses the entire fishery and those participating in it at an appropriate scale and intensity. It provides fishing opportunities (annual TAC and quotas) that are based on an analytical assessment, precautionary scientific information, and a short term forecast, and that are socially and economically equitable.			
100	The system is entirely consistent with the cultural context, scale and intensity of the fishery.	An ecosystem scale management plan is due to be developed for the North Sea, but no date has been set for this yet. Management is considered to be consistent with the cultural context, scale and intensity of the fishery.			

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
3A.1.3		Is the management system subject to internal review?			
60	There are mechanisms in place to allow for internal review.	The management is subject to annual internal reviews at various levels.	I2, R3, R50, R53, R54	25.0	90
80	The management system is subject to internal review at appropriate intervals.	Management Advice Scientific data and assessment methodology are subject to continuous internal scientific review within ICES, in particular through its working groups.			
100	The management system is subject to regular and frequent internal review. This includes evidence that the assessment methodology has been evaluated extensively and that any recommended changes have been made. Monitoring and evaluation are ongoing and improvements quickly tested and implemented.	The assessment and management options prepared by ICES working groups is assessed by ICES working group review panels, and interpreted for management internally by the ACFM. Further internal assessment of management advice is carried out by the EC's STECF prior to the agreement of management measures. Management Measures The management framework for the saithe fishery is set out in the long term management plan agreed by the EU and Norway in 2004. This plan sets long-term objectives for the target species and also imposes constraints on management measures (such as a limit on the amount that the TAC may be increased between years). Management advice from scientists is reviewed in this context, prior to negotiation of annual management measures between the EC and Norway. In turn, the management plan for saithe in EU waters is undergoing simulation evaluation currently. Enforcement Each Member State must also report annually on control matters. EC fishery inspectors monitor national enforcement activity. EC data collection requirements, carried out by Member States, are reviewed each year.			

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
3A.1.4		Is the management system subject to external review?			
60	There are mechanisms in place to allow for external review.	<p>The management system in Norway and within the EC is open to public scrutiny, direct participation by stakeholders and external review. The EU-Norway Fisheries Management Plan provides a formal basis for this process, and ensures that all management decisions are taken in the context of clearly understood management criteria.</p> <p>Scientific Advice: External Review ICES involves external scientists in reviews of its methodologies on a regular basis. In particular, the decision rules proposed for the saithe stock by Norway are currently being reviewed externally by ICES to confirm conformance with the precautionary approach. STECF carries out reviews of ICES advice to the EC, which includes both North Sea and NE Arctic stocks.</p> <p>Management: External Review The recent review of the CFP included consultation with all relevant stakeholders, including industry, NGO's etc. Further consultation processes exist between fishing industry and National authorities and often between National fishing associations, NGO's etc and the Commission. The latter takes the views of industry through DG Fish's Advisory Committee on Fisheries and discusses issues with the Member States and the Council, particularly through the Internal and External Fisheries Groups of the Council Machinery.</p> <p>Prior to the EC's annual December Council of Fisheries Ministers, management proposals and preparatory documents are scrutinised by industry and other stakeholders both in Norway and within the EC. Conferences take place between EC and Norwegian delegations to review and agree management measures for the coming year. These Conferences consider management issues raised by stakeholders and other parties, and their outcome is open to review.</p> <p>Conclusion: The management system is subject to thorough external review, although the depth of the review varies with different aspects of the management system. Reviews apply to the scientific basis, regulatory approach as well as enforcement aspects.</p>	I2, R22, R50, R53, R67, R88	25.0	80
80	The management system is subject to external review at appropriate intervals.				
100	The management system is subject to regular and frequent external review. Monitoring and evaluation are ongoing and improvements quickly tested and implemented				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score
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3 A.2 (MSC Criteria 1, 2, 4)		The management system has a clear legal basis.		16.7	-	
3A.2.1		Is the fishery consistent with International Conventions and Agreements?				
60	The management system operates under relevant international conventions and agreements, but some management actions may be questionable in relation to the terms of these.	<p>Saithe fisheries are consistent with relevant international conventions and agreements, in particular the fishery falls under the international cooperative agreement between Norway and the EU, and it is in compliance with that.</p> <p>The fisheries-related provisions of the 1982 Law of the Sea Convention, that fisheries are managed sustainably, that they are optimally used and that states cooperate on the management of shared stocks is considered to be complied with. There are no controversial exemptions to international agreements.</p> <p>The fisheries are carried out according to the principles set out in the Code of Conduct for Responsible Fisheries, which includes the application of a precautionary approach. Also, the requirements in the 1995 UN Fish Stocks Agreement regarding reference points and application of the precautionary approach are complied with. Fishing is considered to be consistent with relevant provisions of international nature conservation agreements (e.g. Bonn, Bern Conventions).</p>		R3, R21, R22, R23, R24, R98	40.0	100
80	The management system is generally consistent with relevant international conventions and agreements. The management system does not operate under any controversial exemption to an international fisheries or environment-related agreement.					
100	The management system is demonstrably compliant with all relevant international conventions and agreements.					

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
3A.2.2		Is the fishery consistent with national legislation?			
60	The management system operates under relevant national legislation, but some management actions may be questionable in relation to the terms of these.	Two bodies of national legislation are relevant to this fishery: Norwegian legislation, which must be observed when vessels are operating in the Norwegian sector; and German legislation, which is particularly relevant to quota management and administration. German Legislation The fishery is conducted outside German waters. The relevant national legislation is that which implements the CFP quota for saithe. This legislation is implemented by the Federal Agency for Agriculture and Food (the BLE, Bundesamt für Landwirtschaft und Ernährung). BLE requires the client to prepare an annual 'Catch Plan' for each of its fishing vessels, broken down by target species and ICES area. Inspections are carried out by the BLE to ensure compliance with this plan, and also with other legislation, such as the CFP.	I2, R1, R2, R32, R76, R90.	40.0	100
80	The management system makes consistent, good faith efforts to be consistent with relevant national legislation. Management organisations have not been found to be repeatedly in violation of national law.	The German management system is compliant with national legislation that implements CFP management measures.			
100	The management system is demonstrably compliant with all relevant national legislation.	Norwegian Legislation When fishing in Norwegian waters, all vessels must comply with Norway's comprehensive legislative/regulatory framework. Norwegian legislation imposes technical regulations on the fishery that are more onerous than those applying within the EC. In particular, it requires that vessels should use trawls with a cod end mesh of 120mm or more, and that no commercial fish species should be discarded. The client's vessels all use nets that are manufactured with a cod end mesh of 125-128mm to comply with these requirements.			

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
3A.2.3		Does the system observe the legal and customary rights of people dependent upon fishing?			
60	The customary and legal rights of the people dependent upon fishing are known and no major conflicts have occurred.	Rights are clearly codified in legislation concerning participation in fisheries. Rights have been developed through legal, democratic processes.	I1, I2, R3, R24, R31, R75, R76	20.0	100
80	The system observes the legal and customary rights of people dependent upon fishing but does not necessarily have a formal codified system.	Fishing rights are allocated through vessel licences, and catch opportunities are allocated through the TAC, national, and individual fleet / vessel system established by the EC's CFP. This ensures that fishing opportunities are allocated in an equitable and proportionate manner which respects legal and customary rights.			
100	The system observes all legal and customary rights of people dependent upon fishing under a formal codified system.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score
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3A.3 (MSC Criteria 2, 5, 7)		The management system includes strategies to meet objectives including consultative procedures and dispute resolutions.	11.1	-	
3A.3.1		Does the management system contain clear short and long-term objectives?			
60	Short and long-term resource and environment objectives are implicit within the management system	Long-term, overall goals for fisheries management are set out by the EC’s Common Fisheries Policy and the bilateral agreements between Norway and the EU. Short-term objectives are represented by annual TACs, the performance against which can be measured on an annual basis. The TACs are based on ICES advice, which build on the precautionary approach.	I2, R1, R2, R22, R32, R75	16.7	85
80	The management system contains clear short and long-term resource and environment objectives.	The management system contains overarching environmental management objectives arising from international agreements (such as the UN Convention on the Law of the Sea, and Convention on Biological Diversity), and EC legislation (the CFP and EC environmental Directives (e.g. the Habitats Directive)).			
100	The management system contains clear and explicit short and long-term resource and environment objectives that can be measured by performance indicators.	Objectives for environmental protection are an integral part of the EC treaty and its fisheries legislation; there are, however, no formalised and integrated performance indicators for delivery of these environmental objectives.			

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
3A.3.2		Do operational procedures exist for meeting objectives?			
60	Operational procedures exist which are applied to the meeting of objectives.	National TAC's are allocated to fleet groups for the entire resource. Within each group, the quota is allocated according to set procedures. Vessels record catches in logbooks, and catches and landings are recorded and checked against the quota of each vessel (where vessel quotas exist) and/or sector quotas.	I2, R1, R2, R12, R13, R18, R19, R22, R32	16.7	80
80	Transparent operational procedures are applied to the meeting of objectives. These procedures can be shown to support the objectives.	<p>EC Waters</p> <p>In EC waters, fisheries authorities carry out inspections of logbooks, catches and landings.</p> <p>Restrictions on fishing techniques and fishing areas have been introduced to meet fisheries management objectives. The EC's Cod Recovery Plan, introduced in 2004, demonstrates that operational procedures can be implemented for this.</p>			
100	Operational procedures are transparent and clearly applied. There is a feedback mechanism testing effective application.	<p>Other measures are being introduced to protect environmental features in EC waters, notably the creation of Natura 2000 sites in areas beyond Member States' territorial waters.</p> <p>Norwegian waters</p> <p>In Norwegian waters, the fisheries authorities can close a fishery where by-catch levels are too high (this is subject to continuous monitoring), or when the total quota for a particular group of vessels is reached. The procedures for doing so are well understood in the industry, and closure of areas in practice constitutes almost real-time management. In addition, vessels carry out specific trial fisheries providing for effective application of this by-catch control mechanism – e.g. in cases of too high incidence of undersize fish, a fishery is closed. When bycatch/undersize fish etc levels falls below a given level, the fishery is re-opened.</p> <p>Relevant environmental objectives are applied through regulation and enforcement activities as for fishery controls, for example closures of areas of cold water coral, measures for the protection of coastal cod and lost net retrieval.</p>			

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
3A.3.3		Are there procedures for measuring performance relative to the objectives?			
60	Operational procedures exist which can be used to measure performance relative to the objectives.	Performance relative to resource and fishery-related environmental objectives is closely monitored through landing records and regulatory enforcement.	I2, I3, R53, R31, R50, R53, R90	16.7	85
80	There are procedures used for measuring performance relative to the objectives.	Fishery departments within the “Länder” monitor landings and collect relevant documentation (logbooks). These data are immediately forwarded to BLE. The logbooks provide information on the date and time of any catch; ICES fishing area and grid square; and the species of fish caught.			
100	Tested procedures are used for regular measurement of performance relative to the objectives.	The BLE collects and analyses the submitted data. Warnings are given for any misdemeanours detected, and infringements are prosecuted by BLE. The overall performance of the management regime for the resource is measured annually by assessing the status of stocks. This is a tested procedure that is repeated annually under the purview of ICES, resulting in new stock assessments and scientific advice for the following year. This management approach integrates scientific information with coordinated management action by the EC and Norwegian Governments. Compliance with ecosystem objectives is closely monitored (see relevant criteria under Principle 2).			

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score
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3A.3.4		Do procedures include for a precautionary approach in the absence of sufficient information?			
60	Measures exist to implement a precautionary approach in the absence of sufficient information. There is some evidence that this is occurring.	The precautionary approach is formalised and implemented in the management of all major EU fish stocks and ICES advice is based on established precautionary and limit reference points. This applies to both saithe and main commercial by-catch species such as cod and haddock. As discussed under Principle 1, some uncertainties in the assessment have been identified but not yet fully investigated.	I2, R22, R23, R50, R53	16.7	75
80	Formalised measures exist to implement a precautionary approach in the development and application of operational procedures in the absence of sufficient information.	Good information exists on ecosystem impacts (see Principle 2), suggesting that these do not raise significant concerns, but where impacts are identified for this fishery, operational procedures should be adapted so that they are addressed in a precautionary manner.			
100	All procedures include for evaluation of uncertainty and application of precaution at an appropriate level.	The assessment team felt that uncertainties in the assessment of stocks should be addressed as a condition of certification of the fishery, reflecting the concerns raised elsewhere in PIs 1.1.5.2 and 1.1.5.5.			

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
3A.3.5		Does the system include a consultative process including relevant and affected parties?			
60	The system includes a consultative process including key stakeholders within the fishery.	<p>The recent review of the CFP included consultation with all relevant stakeholders, including industry, NGO's etc. Further consultation processes exist between fishing industry and National authorities and often between National fishing associations, NGO's etc and the Commission. The latter takes the views of industry through DG Fish's Advisory Committee on Fisheries and discusses issues with the Member States and the Council, particularly through the Internal and External Fisheries Groups of the Council Machinery.</p> <p>Information gathering, and dissemination of results, takes place between ICES Working Group members and industry stakeholders.</p> <p>The EC management regime provides two formal and regular avenues for stakeholder involvement. The first is through participation in the December Council of Fisheries Ministers; and the second is via the North Sea Regional Advisory Council.</p> <p>Input to the annual Council of Fisheries Ministers can be achieved during the preparations for this meeting; via the Scientific, Technical and Economic Committee on Fisheries (STECF); and through Member State delegations attending the annual meeting.</p> <p>The North Sea Regional Advisory Council (RAC) provides an avenue for fishing and environmental stakeholders to directly participate in the EC's fishery management regime. RACs have a recognised formal role in fishery management under the Common Fisheries Policy.</p> <p>The North Sea RAC is made up of representatives from the fishing industry from all of the EC Member States bordering the North Sea, as well as several environmental NGOs. Norway participates in the North Sea RAC as an observer. The RAC may submit recommendations on fisheries management to the EC and also to Member States.</p>	I1, I2, R22, R31, R75, R76	16.7	85
80	The system includes an appropriate consultative process including all main public and private stakeholders and can demonstrate consideration of representations made.				
100	The system includes an appropriate consultative process including all affected stakeholders. Decisions specifically discuss and/or address stakeholder concerns.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
3A.3.6		Is there an appropriate mechanism for the resolution of disputes within the system?			
60	Mechanisms are theoretically adequate but have not been consistently applied or tested.	<p>The principal management mechanism for this fishery is the allocation of quotas and the use of technical measures (such as days at sea and mesh sizes) to conserve stocks. There are mechanisms for resolving disputes over these matters at the national and EC level.</p> <p>National disputes: Germany National technical measures are not relevant to this fishery, which is prosecuted beyond German Territorial Waters. The only management measures within national control which could give rise to disputes are the allocation of national quotas between and within Producer Organisations.</p> <p>Disputes over quota allocation can be resolved by negotiations within the system. Representations about quota allocation are typically resolved within the industry by the Producer Organisation (Erzeugergemeinschaft für Frischfisch der Deutschen Hochseefischerei) and representative bodies. If disputes cannot be resolved at this level, representations could then be made to the Government for formal resolution.</p> <p>EC Disputes Disputes over EC management measures can be raised directly with the EC, and also via the North Sea Regional Advisory Council. Representations have been made to the EC over issues such as the mesh size of cod ends used in trawls within the EC, both by EC fishermen, and by Norwegian fishermen and the Norwegian Government.</p> <p>Ultimately, disputes concerning the enforcement of EC legislation can be resolved by the European Court of Justice, whether these are raised by Member States, organisations or individuals.</p>	I1, I2, R22	16.7	95
80	There is an appropriate and established mechanism for the resolution of disputes within the system.				
100	There is an appropriate and tested mechanism within the system for the documentation and resolution of disputes of varying magnitude.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score
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3A.4 (MSC Criterion 6)		The management system operates in a manner appropriate to the objectives of the fishery.		11.1	-
3A.4.1		Does the system include subsidies that contribute to unsustainable fishing?			
60	Subsidies exist that may contribute indirectly to unsustainable fishing. These are short-term and are in the process of being removed within acceptable timescales.	The system has no subsidies that contribute to unsustainable fishing or ecosystem degradation.	I1, I2, R22	50.0	100
80	The system is essentially free from subsidies that contribute to unsustainable fishing or ecosystem degradation.				
100	The system has no subsidies that contribute to unsustainable fishing or ecosystem degradation.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
3A.4.2		Does the system include economic/social incentives that contribute to sustainable fishing?			
60	Measures to allocate fishing opportunities and/or entry to the fishery, or other incentives, are generally supportive of achieving fishery objectives.	<p>Economic and social incentives are provided by the management regime through the allocation of resources (quota) at a level compatible with precautionary stock management. This regime is supported by a legal regime that provides an additional incentive to comply with management measures.</p> <p>The European management regime also provides strong incentives to fish sustainably, through the penalties that can be imposed for non-compliance with the CFP. Administrative, technical and quota-related offences can all result in legal action, prosecution and fines.</p> <p>These measures will indirectly contribute to sustainable fishing and ecosystem management.</p>	I1, I2, R1, R2, R22, R75	50.0	90
80	Allocations of fishing opportunities and/or entry to the fishery, and/or other incentives, promote fishery and ecosystem management goals.				
100	The system has established economic and social incentives that contribute to sustainable fishing and ecosystem management.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
3A.5 (MSC Criterion 8)		A research plan exists in line with the management system to address information needs.		11.1	-
3A.5.1		Have key research areas requiring further information been identified?			
60	Some major areas requiring further research have been identified.	Reviews of key areas of research requirements have been conducted for the North Sea Saithe stocks by the Federal Research Centre for Fisheries (BFAFI). These reviews have identified 3 key research areas:	I2, R49, R52, R54, R88	33.3	85
80	The key areas requiring further research have been identified.	<ul style="list-style-type: none"> • Status of juvenile < 3yrs saithe around Norway & Scotland • Actual stocks (rather than inferred from CPUE data) • Recruitment index for the stock 			
100	A comprehensive review of necessary information requirements has been undertaken.	The ICES working group has identified similar research needs. BFAFI have drawn the attention of STECF to these research areas.			

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
3A.5.2		Is research planned/undertaken by the scientific advisers to meet the specific requirements of the management plan?			
60	Research is planned for highest priority information needs.	Fundamental research and monitoring relevant to the stock assessment is carried out through ICES, via a fully funded and ongoing programme international programme.	I2, R29, R49, R52, R53, R54	33.3	80
80	Research is planned and undertaken to provide necessary scientific support to the plan. There are demonstrable resources to allow implementation of the programme.	<p>Within EC waters, most of the information supporting the management plan is derived from landings and logbook data provided by fishing vessels, which enable scientists to infer stock status and ensure compliance with the management plan. This information is supported by observers on fishing vessels and catch sampling programmes.</p> <p>The research outlined in the paragraphs above yields that data that are used to inform the management plan for this species.</p>			
100	There is an ongoing, funded, comprehensive and balanced research programme, linking research to the management plan.	<p>Some independent scientific work is carried out by the German Fisheries Institute (BFAFI) to validate compliance with the management plan and survey environmental features of the North Sea through the German Small Scale Bottom Trawl Survey.</p> <p>The research carried out specific to saithe stocks is adequate to underpin the management of the fish stock, but does not provide a comprehensive and balanced research programme, hence a score of only 80.</p>			

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
3A.5.3		Is relevant research carried out by other organizations (e.g. Universities) and is this taken into consideration?			
60	The management system is aware of research carried out by other organisations and elements of this are taken into consideration.	<p>ICES provides a forum for the integration of fisheries research from a variety of sources. EC, German and Norwegian scientists are fully engaged with ICES.</p> <p>In Germany, workers from the University of Hamburg are collaborating with other institutions to develop a new multi-species management model for the North Sea.</p>	I2, R29, R34, R75, R88	33.3	80
80	Appropriate research carried out by other organisations is taken into consideration, although there is not necessarily any proactive co-ordination between organisations.				
100	Relevant research carried out by other organisations is taken into account for management considerations. This research is often co-ordinated with existing research plans of the management system.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
3A.6 (MSC Criteria 7, 9, 10)		The management system includes measures to achieve objectives for the stock		11.1	-
3A.6.1		Are the resource and effects of the fishery monitored?			
60	A monitoring programme is in place that addresses some aspects of resource and effects and which can be extended.	The resource is monitored annually through fishery dependent and independent indices (as described under Principle 1).	I2, R50, R53, R54	33.3	90
80	A monitoring programme is in place that addresses all key aspects of resource and effects at appropriate intervals and results are recorded.	Logbook and landing records are kept at close geographical and temporal scales and are transmitted to management and research organisations. VMS data is held by Government agencies and can be used to monitor the distribution of fishing effort within the fishery.			
100	The resource and effects of the fishery are closely monitored over appropriate geographical areas and time periods. Full records are kept of monitoring results and these are made available to relevant research and management bodies.	These comments apply specifically to the management regime for the unit of certification. Monitoring is also carried out by other Governments within the EC, as well as the Norwegian Government.			

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
3A.6.2		Are results evaluated against precautionary target and limit reference points?			
60	Target and limit reference points exist and some level of evaluation against these is possible. These take account of the precautionary approach, but this may not be explicit.	Monitoring results are evaluated quantitatively within the stock assessment process, on an annual basis, against the precautionary target and limit reference points within ICES (see Principle 1). Biological reference points are computed: B_{lim} was set at 106,000 t in 1998 as the lowest biomass (at that time) that had produced average recruitment, and B_{pa} at a level that affords a high probability of maintaining SSB above B_{lim} . F_{lim} is the fishing mortality estimated to lead to SSB falling below B_{lim} in the long term, and F_{pa} is the fishing mortality that in the long term should lead to only a 10% probability that SSB falls below B_{pa} . Fishing mortality reference points are computed to generate these precautionary biomass levels. The Norwegian-EU agreement management strategy uses F_{pa} as a target with a sliding scale of fishing mortality from F_{pa} when $SSB \geq B_{pa}$ to 0.1 when spawning stock is at or below B_{lim} . The level of uncertainty in the assessment appears, from the retrospective, to be moderate.	R50, R53, R54	33.3	100
80	Results of monitoring are regularly interpreted in relation to precautionary, target and limit reference points.				
100	Results of monitoring are quantitatively evaluated against precautionary target and limit reference points on a regular and timely basis.	The assessment of the fishery is based on an evaluation of the stock status relative to these reference points. While short term forecasts were made in 2007 medium forecasts will be carried out during the forthcoming evaluation of the management plan. Testing of the management plan has been performed using alternative modelling approaches. Both CS4 (which assumes perfect knowledge) and FLR (more uncertainty) evaluations suggest the management plan is performing adequately at current low F levels.			

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
3A.6.3		Do procedures exist for reductions in harvest in light of monitoring results and how quickly and effectively can these be implemented?			
60	Practical procedures exist to reduce harvest. Programmes to link these with monitoring results are underway.	Procedures exist for monitoring catches in both EC and Norwegian waters, and provide a mechanism for triggering management action.	R3, R22, R23, R24, R51, R54, R75, R83, R90	33.3	90
80	Practical procedures exist to reduce harvest in the light of monitoring results and provide for stock recovery to specified levels. Measures can be implemented speedily.	The EC-Norway fisheries management plan for the North Sea allows the TAC to be increased or reduced between years in response to changes in stock abundance. TAC adjustments between years are generally limited to a 15% change, but greater reductions can be made in exceptional circumstances in order to ensure compliance with the management plan.			
100	Practical procedures exist to reduce harvest in light of monitoring results and provide for stock recovery to specified levels within specified time frames. There are well documented procedures to implement changes and these can be introduced with immediate effect.	<p>The catch control rules have, in recent years, maintained total extractions at or below the TAC level, but the harvest strategy is still being tested.</p> <p>In addition, short-term management action may be taken, and this differs in its scope between Norwegian and EC waters.</p> <p>EC waters Monitoring of catches and landings is carried out to ensure compliance with quota allocations and fishing plans for individual vessels. These quotas are monitored by the BLE, providing a mechanism for fishing to be stopped if quota limits are approached or exceeded.</p> <p>Short term closures of areas can be introduced by the EC if necessary, as demonstrated by the 2004 response to the poor cod stocks. The procedure for this is, however, time consuming and rarely used.</p> <p>Norwegian waters The fisheries are continuously monitored. At sea surveillance of the fisheries can close an area on very short notice (hours) should the amount of undersized fish or bycatch be too high. Such areas closures are frequently used. Areas are re-opened when bycatches and other incidences reach acceptable levels.</p>			

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score
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3A.7(MSC Criterion 10)		The management system includes measures to pursue objectives for the affected ecosystem.		11.1	-
3A.7.1		Are measures in place to address (avoid or minimise) significant environmental impacts?			
60	Significant environmental impacts are known and measures are being applied to reduce key impacts.	A review of the environmental impacts of fishing has been carried out through various mechanisms such as ICES and OSPAR. Measures to address, minimise and monitor these impacts are outlined under Criterion 2.1.4.1.	R34, R103	66.7	80
80	Environmental impacts are known. Measures are being applied to minimise all significant ones and there is evidence that the measures are working.				
100	Measures are in place to avoid all significant environmental impacts and are subject to monitoring and periodic review.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
3A.7.2		Are no take zones, Marine Protected Areas or closed areas for specific periods appropriate and, if so, are these established and enforced?			
60	Suitability of no-take zones and/or closed areas / seasons has been reviewed against objective biological criteria. Plans are in place to implement some or all of these as appropriate.	Several reviews of the need for closed areas in the North Sea have been conducted. No requirement for closed areas specific to the saithe resource has been identified, although areas have been implemented in the past for other, gadoid-directed fisheries (notably cod). EC waters The CFP provides mechanisms to enable fishing areas to be closed for stock conservation purposes, and it also requires that biodiversity is conserved.	R2, R18, R19, R31, R32, R103	33.3	85
80	Suitability of no-take zones and closed areas / seasons has been reviewed and these have been or are currently being implemented and enforced if and where appropriate.	There are presently no MPAs within the EC section of this fishery. EC Member States are, however, currently progressing proposals for the creation of Special Areas of Conservation in areas of sea outside Territorial Waters. These “Offshore SACs” will protect any fragile ecosystems within the fishery area. There are presently no closed areas within the saithe fishery area.			
100	No-take zones and closed areas / seasons are established and enforced if and where appropriate and, if implemented, the consequences are being monitored.	Voluntary area closures to protect juvenile cod are being introduced by some EC Member States. Such measures could be applicable to parts of the German North Sea saithe fishery area. Norwegian waters A network of proposed MPA’s have been identified within Norwegian waters for general conservation purposes to protect biodiversity (resulting from OSPAR). Closed areas to mobile gear are in force to protect areas with coral reefs and numerous permanent and temporary closures are put in place for specific gear in specific areas. Flexible area closures are also frequently used.			

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score
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3 A.8 (MSC Criterion 11)		There are control measures in place to ensure the management system is effectively implemented.		11.1	-
3A.8.1		Are information, instruction and/or training provided to fishery operatives in the aims and methods of the management system?			
60	Mechanisms exist for the dissemination of information, instruction and/or training of fishery operatives. Implementation of these mechanisms may not be universally implemented.	The key fishery operatives who need to understand the management system are the skippers and crews of fishing vessels, and the vessel owner. These operatives need to understand several aspects of the management system: <ul style="list-style-type: none">• Areas where (and when) fishing is permissible;• The quota available for the vessel;• The system for recording fishing activity;• The size and species of fish that the vessel is allows to catch and retain; and• The technical restrictions applying to fishing gear deployed from the vessel. <p>Awareness of these management measures is understood to be good.</p> <p>In Germany, the Ministry and BLE keep all stakeholders informed and instructed either on a regular basis (through public announcements, newsletters, and meetings) or an a more ad-hoc basis in the event of urgent matters. Similar arrangements are used in Norway.</p> <p>Operators have stressed the importance of maintaining a full understanding of fisheries regulations to avoid infringements, which carry significant administrative and economic penalties. No evidence has been found to indicate significant breaches of regulations, demonstrating good awareness and compliance.</p>	I1, I2, I3	33.3	90
80	Information, instruction and/or training are provided to fishery operatives in the aims and methods of the management system allowing effective management of the system.				
100	Information, instruction and/or training are provided to fishery operatives in the aims and methods of the management system allowing effective management of the fishery and operatives demonstrate comprehensive knowledge of this information.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
3A.8.2		Is surveillance and monitoring in place to ensure that requirements of the management system are complied with?			
60	An enforcement system has been implemented; however, its effectiveness and/or compliance has not been fully demonstrated relative to conservation objectives.	<p>A comprehensive enforcement scheme is in place, with inspections to ensure compliance with input and output controls at sea as well as monitoring of landings ashore.</p> <p>The BLE keeps records of catches, and monitors progress with fishing of the German TAC. BLE immediately stops fishing in the event of over-fishing of the allocated quota, and notifies the EC of any action taken to stop fishing. BLE also provides advance warnings to the industry before quota limits are reached.</p> <p>All of the certified vessels are part of a satellite based vessel monitoring system, providing real-time monitoring of vessel movements and fishing activity. Overflight data and observations from patrol vessels gathered by EC Member States augments these data.</p> <p>Fishing activity is recorded in vessel logbooks, which may be inspected at sea or on return to port. All landings from vessels are recorded and cross-checked with logbook records and also against quotas.</p> <p>Misreporting is subject to strict penalties, and there is generally a high degree of compliance with regulations.</p>	I1, I2, I3, R31, R54, R75, R76	33.3	90
80	An effective enforcement system has been implemented and there is an appropriate degree of control and compliance. Enforcement systems include measures to control misreporting.				
100	An effective enforcement system has been implemented and there is a high degree of control and compliance. Robust enforcement systems are in place to control misreporting.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
3A.8.3		Can corrective actions be applied in the event of non-compliance and is there evidence of their effectiveness?			
60	Mechanisms exist or are being developed which can be implemented or applied to deal with non-compliance.	In cases of non-compliance, a range of penalties can be applied by the authorities. These vary slightly between Norwegian and EC waters.	I1, I2, I3, R1, R2, R3, R22	33.3	90
80	There are set measures that can be applied in the event of non-compliance although these may not be included in a formal or codified system. These have been tested if/as appropriate as to their effectiveness.	In EC waters, the CFP provides a consistent statutory basis for the application of corrective actions. Penalties for non-compliance with CFP management measures can be imposed by Member State Courts. Corrective actions are well established, codified, understood and tested.			
100	Agreed and tested corrective actions can be applied in the event of non-compliance.	In Germany there are a number of corrective actions that can be used either separately or together. Ultimately this could lead to the closure of the saithe fishery, firstly by the BLE and then by the EC. The most likely response to a problem would be administrative action. In the case of overfishing, the excess catch would be deducted from the following year's quota. In more severe cases, the amount deducted could be made greater than the excess catch. Ultimately, fishing licences could be confiscated and the vessel prevented from leaving port. In Norwegian waters, non-compliance can also result in the use of administrative or economic sanctions. For minor infringements a series of warnings can be issued. Corrective actions are consistently applied and severe infractions are tried in the Courts.			

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score
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3 B		Operational Criteria		50.0	86
3B.1(MSC Criterion 12)		There are measures that include practices to reduce impacts on non-target species and inadvertent impacts upon target species.		18.1	-
3B.1.1		Do measures, principally through the use of gear and other fishing practices, include avoidance of impacts on non-target species and inadvertent impacts upon target species? These would include by-catch, discard, slippage and high grading.			
60	Measures have been implemented as appropriate that are intended to reduce the major impacts on non-target species and inadvertent impacts on target species, but their effectiveness is uncertain.	The approach to avoiding impacts on non-target species and inadvertent impacts on target species differs between EC and Norwegian waters. EC waters Specific measures are in force in the North Sea to reduce bycatch of non-target fish species, principally cod. Operating practices used by the German Saithe vessels create a negligible cod bycatch in this fishery (see Principle 2.3.1.2) The fishery is conducted in deeper waters (>200m), away from the main aggregations of juvenile saithe, reducing inadvertent impacts on the target species. Norwegian waters In all fisheries there is a ban on discarding, minimum mesh sizes are specified, and areas can be closed to fishing in order to protect juvenile fish and non-target species. These measures, along with quota management, appear to have been very effective for the conservation of saithe stocks in the North Sea, which are considered by ICES to be sustainably fished. There is a small cod bycatch from this fishery which is not considered to represent a major impact on the North Sea cod stock (see Principle 2.3.1.3)	R1, R2, R28, R32, R42, R75, R92, R95, R96, R100, R103	100	85
80	Measures have been implemented as and when appropriate to avoid or reduce the major impacts on non-target species and inadvertent impacts on target species and there is evidence that they are having the desired effect.				
100	Measures have been implemented to avoid or reduce the major impacts on non-target species and inadvertent impacts on target species, and their effectiveness is clearly demonstrated.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score
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3B.2 (MSC Criterion 13)		There are systems in place that encourage fishing methods that minimise adverse impacts on habitat.		18.1	-
3B.2.1		Do fishing operations implement appropriate fishing methods designed to minimise adverse impacts on habitat, especially in critical or sensitive zones such as spawning or nursery areas?			
60	Fishing operations use measures to reduce major impacts on habitat, especially in critical or sensitive zones such as spawning or nursery areas.	The fishing methods routinely used in the fishery minimise habitat impacts; no additional measures are employed specifically for this purpose. No sensitive habitats have been identified in the parts of the North Sea where the fishery is prosecuted. Overall technical restrictions control the type of gear employed, which addresses key fishing-related impacts.	R22, R32, R42, R92.	100	80
80	There is evidence that fishing operations are effective in avoiding significant adverse effects on the environment, especially in critical or sensitive zones such as spawning or nursery areas.				
100	There is direct evidence that fishing operations implement appropriate methods to avoid significant adverse impacts on all habitats.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score
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3B.3 (MSC Criterion 14)		The management system incorporates measures that discourage destructive practices.		2.2	-
3B.3.1		Does the fishery employ destructive fishing practices (such as poisons or explosives)?			
60	The fishery does not allow any such destructive fishing practices.	Destructive fishing practices, such as the use of explosives, are not used in this fishery.	I1, I2, R22.	100	95
80	The fishery does not employ any such destructive fishing practices and enforcement is considered sufficient to prevent their use.				
100	The fishery does not employ any destructive fishing practices. There is a code of conduct for responsible fishing, prohibiting these, that is fully supported by fishers.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score
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3B.4 (MSC Criterion 15)		The management system incorporate measures that reduce operational waste.		18.1	-
3B.4.1		Do measures exist to reduce operational waste?			
60	Measures/facilities are in place to reduce sources of operational waste that are known to have detrimental environmental consequences, but further reductions may be possible.	Garbage must be returned to shore and waste reception facilities are in place in ports. Waste management measures are fully implemented by the vessels within the unit of certification.	I1, R20, R32	100	90
80	Measures/facilities are in place to reduce all sources of operational waste that are known to have detrimental environmental consequences, and there is evidence they are effective.				
100	Measures/facilities are in place to reduce all sources of operational waste that are known to have detrimental environmental consequences, and there is evidence they are effective and these measures are supported by the fishers.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score
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3B.5 (MSC Criterion 16)		Fishing operations are conducted in compliance with the management system and legal and administrative requirements.	25.5	-	
3B.5.1		Are fishers aware of management system, legal and administrative requirements?			
60	Fishers are aware of key management and legal requirements.	Awareness of the management system is generally considered to be good, with several lines of communication ensuring that awareness is maintained, including direct communication from the authorities (see 3A.8.1)	I1, I3	33.3	90
80	Fishers are aware of management and legal requirements upon them and are kept up to date with new developments.	Relevant documentation is distributed to the Association of German Fishermen (“Deutscher Fischereiverband”), to producer organisations and to nonunionised fishermen. In extraordinary circumstances the ministry convenes meetings to inform stakeholders about new legislation or new rules of procedure.			
100	All fishers are aware of management legal requirements through a clearly documented and communicated mechanism such as a code of conduct.	The BLE itself often convenes such meetings to discuss special topics or questions relating to quota allocation and quota surveillance.			

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
3B.5.2		Do fishers comply with management system, legal and administrative requirements?			
60	Fishers appear generally to comply with requirements, but there is incomplete information on the actual extent of compliance.	Fishermen are fully aware and compliant with the management system in place. Saithe fishery is quite a big fishery in Germany and thus fishermen are vigilant to stick to the rules both on national and on international level.	I1, I2, I3, R25, R30	33.3	85
80	Fishers appear compliant with relevant management and legal requirements and there are no indications of consistent violations.	The level of compliance is relatively high. Data from inspections at sea and of landings indicate that the number of serious infractions is low. Overfishing is considered unlikely due to the comparatively large German saithe quota and its economic importance. The management system in general has a high level of legitimacy among fishers, and the need to manage resources through restrictions on access and execution of the fishery is well understood.			
100	Fishers are fully compliant with, and fully supportive of, legal, and administrative requirements, such as through a code of conduct.	There are no indications of consistent violation of legal and administrative requirements for this fishery.			

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
3B.5.3		What is the record of enforcement of regulations in the fishery: quota control, by-catch limits, MLS, mesh regulations and closed areas?			
60	There is information on breaches of regulations and on corrective action to prevent or curtail.	The saithe fisheries are relatively strictly controlled.	I3, R22, R31, R32, R75	33.3	90
80	Evidence of rigorous monitoring of all the enforcement measures and evidence of effective actions taken in the event of breaches is available.	The BLE databases contain all catch data of the last years and eventual cases of overfishing can be tracked easily. Control reports and cases of administrative offences are kept within the archives of the BLE. BLE inspectors carry out spot checks of Producer Organisations or and non-sector fishermen. These audits consist of checking of accounts and are used for the legal follow up of infringement procedures.			
100	Strong evidence of rigorous monitoring and control of the enforcement measures through for example satellite monitoring, shipboard observers and nominated landing ports. Strong evidence of firm and effective action taken in the event of breaches.	At sea, all saithe vessels operating in the North Sea fishery are obliged to carry satellite transponders. Operations at sea are subject to inspections by fishery patrol vessels from Norway or from EC Member States, and landings ashore are inspected by German authorities (BLE). In the event of infractions, there is a standard set of penal actions that apply, corresponding to the severity of the breaches. BLE report that compliance with all regulations is good.			

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score
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3B.6 (MSC Criterion 17)		The management system involves fishers in data collection.		18.1	-
3B.6.1		Do fishery operatives assist in the collection of catch, discard and other relevant data?			
60	Fishery operatives are involved in the collection of some catch, discard and other information.	Fishery operatives assist in the collection of data from the fisheries. All landings are reported to BLE, and are used by ICES to assess the status of the fishery and determine future management. This information is limited to landings data, and does not provide a measure of discard rates in the fishery. BLE provides observers which join vessels, principally to supervise the 5% cod by-catch ceiling in the saithe fishery (set out in Annex II of the TAC and Quota Regulation). These observer reports form part of BLE's general surveillance of the fishery. Client vessels have been active participants in observer schemes to enable validation of catch and landing data, and to monitor discard rates. They are keen to expand this involvement. This score would be higher if more comprehensive data were available to describe all catches, landings and discards, either from observer records or fishery operatives observations.	I1, I2, I3	100	85
80	Fishery operatives are regularly involved in the collection and recording of relevant catch, discard and other information.				
100	Fishery operatives assist significantly in the collection and recording of all appropriate catch, discard and other information.				

**Erzeugergemeinschaft der Hochsee - und Kutterfischer GmbH
German North Sea Saithe Trawl Fishery**

Marine Stewardship Council Certification

Certification Body: Moody Marine Ltd

Notification of Proposed Peer Reviewers

A Peer Review panel has been proposed for this fishery. Potential peer reviewers have been approached on the basis of their experience of one or more of the following; the fishery under assessment, fishery management, stock assessment issues and relevant ecosystem interactions.

Brief details of each reviewer are provided below. All stakeholders (including the applicant fishery) are now given the opportunity to state any objections to the selection of a proposed member of the peer review panel, on the basis of any conflicts of interest, accompanied by a statement on the basis of any objection.

Comments on the suitability of any of the persons listed below should be forwarded, **before 5:00 p.m. GMT on 5 December 2007**, to Dr Andrew Hough at Moody Marine Ltd as follows:

E-mail: athough@moodymarine.com

Fax: +44 (0) 1633 401092

Address: Moody Marine Ltd

Merlin House

Stanier Way

Wyvern Business Park

Derby DE21 6BF

UK

Proposed Peer Reviewers:

Dr Colin Bannister. Colin Bannister is the former Senior Fisheries Science Advisor at CEFAS, providing high level advice to DEFRA and industry on all aspects of the assessment and management of finfish stocks. He has extensive knowledge and experience of the management of stocks; crustacean, finfish and molluscan, and of scientific research and advice on the same. Since 2004, he has acted as a scientific member of the Canadian Government Review Panel for fisheries in the Gulf Region of Canada; a member of the Committees and Council of the Shellfish Association of Great Britain; and recently completed a report "Towards a Development Strategy for the Shellfish Industry in England" for the DEFRA Inshore Group.

Dr Stephen Lockwood. Stephen is an independent marine environment consultant and chairman of the Welsh Minister's fishing industry consultation group. Until 1999 he was Head of the UK Ministry of Agriculture, Fisheries and Food laboratory at Conwy, which undertook research and development work in the fields of fish and shellfish cultivation, and the environmental effects of fishing. At a personal level, he was responsible for providing advice to MAFF policy divisions, and through them to ministers, across the broad field of coastal zone management. Previously, he led research and providing scientific advice on the conservation of fish stocks and the management of fisheries, including the Western mackerel stock, Celtic Sea and Bay of Biscay Demersal fisheries, Pilchard (*Sardina pilchardus*) stocks and Western English Channel herring and sprats. He has published on stock assessment, fishery management and coastal development issues.

Peer Review A

Ref 82032: Certification of the German North Sea Saithe Trawl Fishery

Peer Review Report

Introductory Comments

My review has had in mind whether the assessment reports have sufficient content, accuracy, and focus to

- a) Stand reasonably alone without requiring undue checking of sources,
- b) Allow readers unfamiliar with North Sea fisheries or ICES-EU assessments and management systems to scrutinise effectively for comparability with the certification of fisheries elsewhere,
- c) Convince that the scores and conclusions are vindicated by the facts and text
- d) Accept the fact that it is generally easier to meet fishery than ecosystem criteria

Regarding a) and b), I have identified some limitations in the Certification Report, to which I have drawn attention in my review of **Report 1**.

Regarding c) and d), my review of **Report 1** makes some comments and suggestions on priorities and timing for the Conditions, and for Conditions 2 and 3 I have suggested an additional element, on which the assessment team will wish to have the final word.

My review of **Report 2** has a substantial list of comments/questions for clarification or justification on individual indicators. These occur where:

- 1) I feel that known points or questions have been missed, or I differ over the interpretation/conclusion.
- 2) The scoring text describes general studies but without in my view identifying clearly enough what the position is for the saithe fishery
- 3) The scoring text gives information, but does not in my view address clearly the relevant point or phrase in the scoring guidelines
- 4) I have felt the need to be more assertive about ecosystem questions

In many cases, the assessment team can consider my questions without impact on the scores, either by answering or dismissing the question, or possibly by adding a simple highlighting sentence to the text box. In some instances, however, I have disagreed or queried whether the text or the data justify the scores, and these **I have highlighted in bold**.

Overarching Comments

Certification Unit

In my comments on Report 1, I noted that there does not appear to be any evaluation or conclusion by the assessment team on the suitability of the certification unit. **MML Comment: text modified accordingly.**

Under Principle 1 the fishery appears to suffer from fewer compliance issues than some fisheries in the North Sea; the ICES assessment is of reasonable quality; and ICES is unreserved about its advice that the current fishery has a low impact on the target species (and hence, presumably, the food chain, although it is not easy to judge from the Certification Report how reliably the food chain aspects are assessed by ECOPATH/ECOSIM and MSVPA). I had no difficulty in reviewing this section and my main questions under Principle 1 relate to assessment uncertainty in scoring sections 1.1.5.2-1.1.5.5, although I accept that uncertainty warrants Condition 1.

Under Principle 2 the main difficulty is to determine whether individual scores have been justified by clear cut information for the saithe fishery and fishing area, or whether they are based largely on inference from more general studies for the North Sea as a whole, or for gears other than those used in this fishery, and

whether that inference is justifiable. Since fishery studies are inevitably more advanced and detailed than environmental/ecosystem studies, this is a common problem under Principle 2, and it raises the higher level question for Moody and MSC whether comparability is adequately served by accepting a more inferential standard under this Principle. At least in this case, two conditions have been set, which I support.

Under Principle 3 the strengths and weaknesses of the management system for fish resources in the EU and Norwegian zones, and the role of the German national system, are well known and adequately addressed by the assessment team. As under Principle 2, the framework and measures in place for the management of the environment and ecosystem are less clear cut because they are still being developed, posing again the higher level question whether it is reasonable to justify scores based on inferences about impacts, independently of whether formal environmental/ecosystem objectives are identified and included in management plans and a formal managed system. This is at the root of most of the questions that I have raised about scores under Principle 3.

References and Citations. It is helpful to have the list of numbered references in the audit track on the right hand side of the scoring table, but in the future it would also help if the Certification Report, and the key sentences in the scoring texts, also identified the citations routinely, since they are generally less familiar to reviewers than the assessment team.

Comments on Report 1: Certification Report

Section 1. Suggest a list of acronyms

1.3 References.

The list is comprehensive, but does not cite Kell et al 2005 (mentioned in 1.1.4.1) see below for insertion or ICES 1995 (cited in Section 2.1, end of para 3, and in several other places, but should this be ICES 1965?) In Report 2, under 1.1.1.7, I pointed out Beaugrand, Brander, Lindley, Souissi and Reid, in Nature, vol 426, 2003, pp 661-4, on the relation between plankton changes and cod recruitment in the North Sea. **MML Comment: Kell et al and ICES report added to the lists; Beaugrand et al not considered directly relevant to this assessment.**

Section 2

The following comments relate to my first reading of the Report. **Section 2.5** contains some of the material that I mention below, so possibly some rearrangement or redistribution could be considered.

2.2 History of the Fishery

At this point I needed a short identification of the different component fleets, their relative contribution to the total landings of saithe, and a very brief statement of the overall long term decline and increase in stock biomass as a prelude to the greater detail on this in the assessment section. **MML Comment: text modified to address this.**

2.2 Vessels and Gear: should this be **2.3**, with the other numbers re-jigged ? **MML Comment: yes, numbering corrected accordingly.**

Note that there does not seem to be any evaluation of the suitability of the unit of certification, with respect to the rest of the fishery.

Because scoring on habitat effects can be difficult, I think this section should include pithy descriptions of the physical character of the different gears used by the different fleets, including mesh sizes and fittings relevant to selectivity and habitat effects. Is German otter trawler gear 'light' or 'heavy' (e.g. simple footropes, or rockhopper wheels or bobbins? does the net hug the seabed, or does it use kites?). What are the relevant rules on mesh size, panels, and chafers that might affect selectivity and exploitation patterns for the target species, and by catches of cod? What is the predominant seabed and its community in saithe waters, and for the 11 vessels being certified, what is the average engine power and towing speed, and the most likely quantity and composition of benthos retained and brought aboard? This need not be too detailed, but would be a helpful prelude to para 7 in section 2.4, since it influences how a reader perceives or judges the habitat effects by this fleet in comparison with beam trawls in the southern N Sea, or other otter trawl gears

in other areas or fisheries. **MML Comment: appropriate text added to the scoring indicators.**

2.4 Ecosystem characteristics

The overview is helpful, but to answer specific questions about the saithe fishery I think it needs more focus. There is undoubtedly a generalised ‘understanding’ but the assessment should stress what this actually means for the saithe fishery/fishing areas. For example:

In para 4 does this work allow specific answers relevant to this assessment?

What do the stomach and MSVPA studies cited in para 5, actually say about the role of saithe, and hence the impact of reducing saithe abundance?

Do the Ecopath/Ecosim papers have specific output on saithe that can be used in the scoring section?

Does the overview in para 6 on habitat effects permit clear conclusions about saithe fishing in the saithe fishery area?

MML Comment: these issues are most appropriately addressed in the relevant parts of the scoring table – appropriate amendments have been made.

2.4.1 By-catch and discards

Is discarding low just because the TAC is too high? It is surely mainly due to the inshore/offshore recruitment noted. In line 3, it would be stronger, and factually correct, to say that the ICES working group ‘considers’ rather than ‘assumes’. Discarding and by-catches are also conditioned by the specific rules in the Norwegian sector, but I am not up to date with the most recent rules in the EU sector. **MML Comment: appropriate changes have been made to the text to clarify this point.**

The observations in para 2 are helpful, but the qualification in para 4 about what seems to be a very limited observer coverage should be brought forward, and amplified. Given the words in the relevant scoring indicators, is the observer coverage an ad-hoc programme or is it part of a managed programme, and does it map to any requirements under the EU Data Regulation? **MML Comment: appropriate changes have been made to the text to clarify this point.**

2.4.2 PET species

In Canada last year I was struck by the formal framework for PET species, where candidate endangered species are identified and listed by the Committee on Status of Endangered Wildlife in Canada (COSIWE), from which list individual species can then be identified as threatened and action taken under the Species at Risk Act (SARA). I am not clear if there is an analogous European framework, or whether it is feasible to organise the various North Sea elements into something like that framework. **MML Comment: we have used the IUCN lists to identify PET species; this is the most relevant list for the area.**

It would help to summarise this section in a simple two way box that identifies what species or groups the various different surveys and sources **rule out or rule in** as potentially or actually threatened species in the saithe fishing area i.e. species/groups that are ‘in the clear’, potentially at risk, actually at risk, or about which we cannot make a judgement from existing information. That would help the subsequent scoring sections.

Section 3.1

Suggest: ‘The North Sea saithe stock straddles the EU and Norwegian fishing zones, and is therefore managed under an international agreement between the EC and Norway, which includes setting a joint management plan for the North Sea saithe fishery.’ **MML Comment: this text has been added.**

Is the Agreement reviewed each year, or only the TAC and other measures? **MML Comment: this has been clarified in the text.**

Section 3.3

Suggest a comment on any arrangements within EU and Norway for reviewing the performance and results of the enforcement / control activities. **MML Comment: this has been put in the text.**

Section 4. Stock Assessment

For comparability with fisheries outside the ICES area it would help to say up front something like:

‘The North Sea saithe is assessed routinely by the ICES Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak, using the established analytical age-based tuned VPA method known as XSA, leading to a short term forecast, with various TAC options related to the management plan and the application of precautionary reference points. Under current ICES arrangements, the assessment is carried out every (year or other year?)’ **MML Comment: the assessment is annual; this amendment has been included in the text.**

Section 4.2.1

Before discussing uncertainty, I feel that the Certification Report would be a much more authoritative basis for a good score for management of the fishery if this section started with a brief appraisal of the trends illustrated by the four plots on page 21. For example, I could suggest this text:

‘The assessment results show that fishing mortality, after increasing to well above Flim by 1985, has now fallen progressively to well below Fpa in the recent assessment. After falling to a low level in 1992, SSB has therefore increased progressively, and is now well above Bpa. After several high values during the period of the gadoid outburst up to the mid 1980s, recruitment since 1987 has settled to a lower but stable level, with a relatively low coefficient of variation, and total landings have tended to follow this trend. As a result of the stable recruitment pattern, the stock-recruit plot shows that recruitment has been independent of SSB over a wide range of stock size. The precautionary reference points were therefore determined on the basis of the lowest SSB observed in 1992. An increase in biomass during a period of stable recruitment and reducing F provides evidence for the effectiveness of the management regime for this fishery. ICES classifies the stock as having full reproductive capacity, and as being harvested sustainably. Nevertheless, there are some uncertainties affecting this assessment.’ **MML Comment: this text has been added to the report.**

Then onto the existing text on uncertainties.

Additional comments on this section.

Is it possible to compare the magnitude of the retrospective bias in saithe with that for, say, North Sea cod, in order to establish how ‘good or bad’ it is? Reading the comments about good compliance in the Norwegian and German saithe fisheries there should at least be little or no under-reporting or discarding of saithe to contribute to the retrospective pattern. **MML Comment: it is not appropriate to draw such comparisons between species; the retrospective bias will be relative to stock levels and assessment methods. These points do not affect the assessment, nor to they have practical significance for the overall result.**

Under scoring indicator **1.1.5.2 in my review of Report 2** I have questioned aspects of the score on the uncertainties in this assessment. I could have made these comments here, but prefer to leave them in Report 2, where they are more relevant to the certification.

I commented earlier about the transition in recruitment levels after 1987 at the end of the gadoid outburst. For indicator 1.1.1.7, I mention that this is exactly the transitional point that was observed for cod, where it has potentially been linked to the North Sea plankton changes (Beaugrand et al 2003). The assessors might like to consider whether it is worth a comment here. **MML Comment: this is an interesting observation, but we don’t feel it is directly relevant to the assessment.**

Finally this section should note that Figure 11.2.2 in the 2007 working group report illustrates major trends in the weight at age of older saithe that have not been explained. It is conceivable that they are linked to the increase in SSB, or to the plankton changes. **MML Comment: this point is noted and appropriate changes have been made to the report.**

Section 5.2

As the assessors noted in the scoring tables, the North Sea RAC is a particularly important focus for consulting and informing fisheries stakeholders. Also ICES has introduced stakeholder briefings into the recent advisory committee process.

Section 11.3.2 Conditions

Condition 1

I accept that it is desirable to develop, a priori, the position on uncertainties, but is the last sentence of para 1

a sequitur, since it is not clear to me that the over-estimation of TAC is entirely due to the uncertainties being considered? Maybe recruitment is underestimated by the surveys, and the extensive migration of fish between spatial components of the stock is a two-way balance, so does absence of the knowledge raise or lower the TAC? In any case other factors could also be in play. **MML Comment: appropriate changes have been made to the text to address this point.**

Given the likely resource implications of collecting new data identified by the certification team, I feel that the emphasis must be on examining the existing assessment and its assumptions using modelling, before embarking on any further data collection. Also, the resources for data collection may not be at the disposal of the client, and may not become a priority for the international community until additional information is known. So I feel that the steps should be:

- 1) Test the existing assessment and assumptions by modelling.
- 2) Evaluate if this demonstrates that additional precaution in the TAC calculation is needed or feasible (existing point b), and seek an implementation package
- 3) Then if justified by the first point, develop existing point (a).

I suggest that the time scales may need to be reconsidered. In the nature of Working Group priorities, I suggest that point (1) would probably require 12 months to plan and a minimum of a further 12 months to achieve, leading to implementation of point (2) in year 3, if approved by the advisory process. The data required under point (3) depends on the results of point (1), so planning could not start until year 3, for a start by say year 5 **MML Comment: the timescale here is designed to reflect the importance of the issue, not the administrative convenience of resolving it. The same condition has been imposed on other saithe fisheries in the area.**

Condition 2

I accept the importance of the condition. In addition to improving the on-board collection of data, the assessment team might consider whether the condition should also initiate a review of existing fish and habitat survey data in order to produce a baseline report that refines our understanding of what is under threat in the saithe fishing areas, and where, (unless this has already been done ?). This could require 2 years to achieve **MML Comment: the condition proposes practical action as the assessment team have concluded that this is important. Nevertheless, the condition offers the client sufficient flexibility to meet the condition by collating such data, if they exist, and if this seems appropriate. No changes are needed to the text, but this may be addressed in the client's Action Plan.**

Condition 3

I accept that this is an important condition. As with condition 2 the team might like to consider whether groundfish survey data provide enough information on the abundance and distribution of cod to identify which parts of the saithe fishing area, and hence which particular fleets, are most likely to pose a problem. **MML Comment: appropriate minor changes have been made to the text.**

Comments on Report 2: Scoring Indicators

Principle 1

1.1.1.2 Suggest the text makes reference to Condition 1 re the migration aspect. **MML Comment: Text added.**

1.1.1.3 Are the migration questions included in any research plans **MML Comment: text amended to report that ICES have been investigating this issue.**

1.1.1.4

What is the cause of the long decline in weight at age of older fish (Figure 11.2.2 in ICES 2007), and how does this affect reproductive capacity? **MML Comment: This comment is not directly relevant to this scoring guidepost, but is relevant to 2.3, so has been added there.**

1.1.1.5

The problems in estimating 3 year old recruits from surveys affect short term predictions, but the long term stability and absence of trend in the estimate of R from XSA since 1988 does not suggest any problem with the conclusion that R is independent of SSB. **MML Comment: we agree, and feel that the text adequately reflects this point.**

1.1.1.7

The step change in saithe R after about 1987 is marked by a much reduced frequency of large year classes, which is also the case for N Sea cod and whiting, and which also coincides with the step change in the N Sea plankton regime described by Beaugrand, Brander, Lindley, Souissi and Reid, in Nature, vol 426, 2003, pp 661-4 **MML Comment: see our previous comments on this matter.**

1.1.2.2

What is the intensity of at-sea coverage? Are there similar data for France and Scotland? **MML Comment: at-sea coverage is not relevant to the scoring of this indicator. .**

1.1.2.3

Is there specific information on the selection ogives of each gear, since changes in catch at age could also be affected by changes in abundance and targeting **MML Comment: only the combined selectivity of the fleets is readily available. Gear selectivity is likely to be affected by abundance and year class strength. No changes seem to be needed.**

1.1.4.1 Kell et al 2005 is not in the reference list. **MML Comment: this has been inserted.**

1.1.4.2

Specifically, decisions rules arise from the ICES evaluation of stock status in relation to precautionary reference points, and from specific formulations agreed in the EU-Norway Management Plan. **MML Comment: this has been added to the text.**

1.1.4.3

Specifically, the management tools are the Annual TAC, and the ongoing technical measures, the saithe fishery being exempt from the Days at Sea rules owing to the low by-catch of cod. Landings that are less than the TAC do not necessarily indicate that output control is effective, since the TAC may be too high for assessment reasons. Also, in recent years, effort has been kept down by low fish prices and high fuel costs. **If ‘performance of the tools has not been tested scientifically’, is the 90 score justified?**

MML Comment: the first part of this comment is covered in the present text. The TAC management tool appears to be effective (although we have flagged up concerns about retrospective bias in stock assessment elsewhere).

1.1.5.1

For readers outside the ICES area, it would help to state explicitly that the assessment is a tuned XSA, with reference points based on the S-R plot, a short term forecast based on long term GM recruitment, and that it is updated every second year or so. **MML Comment: the text has been modified to clarify this point.**

1.1.5.2, 1.1.5.3, 1.1.5.4, and 1.1.5.5

Given that this assessment is rather typical of ICES assessments generally, it is important to be clear about the basis for the scores given for these indicators on uncertainties.

I need clarification why **1.1.5.2** is a narrow fail. The assessment does not appear to be subject to some of the more common uncertainties, since saithe landings data are allegedly unaffected by misreporting; there are acceptable data on catch at age; and there is apparently little discarding except in one fleet where it is well quantified. The problem with the survey estimates of recruitment affects the short term forecast, and there is a retrospective bias, but these are less significant than for other stocks because of the low F and high SSB. In practice the recruitment issue is dealt with using a long term Geometric Mean from a set of VPA recruitments that have no trend and quite a low CV. The trend in weight at age has not been explained, and the role of migration is not considered, but in the latter the flux is alleged to be stable with only occasional large influxes. Does this assessment display more uncertainty than most other ICES gadoid assessments?

MML Comment: we feel that the uncertainty in the assessment justifies a narrow fail on this PI. In contrast I question the pass score in **1.1.5.3**, since I am not sure if a catch options table relative to precautionary limits quite addresses the problems of uncertainty that have been identified. This is what the modelling part of Condition 1 should address. **MML Comment: we consider that the management approach demonstrates an appropriate response to uncertainty in the assessment (covered under 1.1.5.5 below).** Under **1.1.5.4** some readers might like a few simple words explaining very briefly what CS4 and FLR do. **MML Comment: some**

clarification has been added to the text. For 1.1.5.5, I am not clear about the score, since unless I misunderstand something the assessment seems to follow normal ICES practice by assuming that the current harvest is accounted for by adopting **F_{sq}** in the interim year of the short term forecast, and there are no issues with under-reporting, high-grading, or discarding. That said, I entirely accept that the problems of uncertainty should be addressed, assuming that Condition 1 is attainable by the client. **MML Comment: the fail here stems from the same concerns as for 1.1.5.1 above.**

1.3.1.2

I accept that recruitment is stable and that the numerical proportion of fish aged 6+ in the stock has probably doubled since the 1980s, but there has also been a decrease in the weight at age. How do the effects on population fecundity balance out? **MML Comment: some clarifying text has been added to the assessment.**

Principle 2

2.1.1.1

The text describes a range of studies at the North Sea scale, but I miss text that says if they provide habitat knowledge specific enough to compare with the detailed knowledge of where the saithe fleets fish, and hence allows real evaluation of impacts by this fishery. **MML Comment: Sentence added**

2.1.1.3

Is the relatively high score justified by the inferential nature of the text? e.g:

para 1, line 4 ‘The impacts of this depletion ... have not been examined directly’.

para 2, Is there a specific conclusion for saithe from the Ecopath/Ecosim analysis?

para 3, Is the recovery of habitat from beam trawling in the shallow southern N Sea, indicative for recovery from different gears in the deeper northern N Sea ? **MML Comment: We viewed the fact that given that Ecopath models existed, this qualified as ‘detailed information being available’, justifying the high score. Some text has been added to clarify the scoring.**

2.1.2.1

We need to know how very limited the observer coverage is. The low by-catch of cod may simply be because the cod stock is now so depleted. **MML Comment: observer coverage is addressed in the body of the report.**

2.1.2.3

To justify the pass score, the last sentence should probably read ‘It is likely that all discarded fish will suffer mortality on return to the sea, but the overall unobserved mortality will be low because of the seeming low level of discarding’. **MML Comment: this text has been inserted.**

2.1.3.1

There is adequate knowledge on the location of saithe fishing, and on the effects of trawling generally, especially beam trawling in the southern N Sea. But is there specific knowledge on the effects of saithe fishing gears in saithe fishing areas, including specific conclusions from the GSBTS, **sufficient to justify the score given to this fishery?** **MML Comment: the assessment team felt that there is sufficient information available to justify the score. Note that beam trawls are not used in this fishery.**

2.1.3.2

I accept the view that there is no issue, but is the last sentence of para 1 a mandated practice in the fleets being scored, or merely a presumed practice? **MML Comment: see our comments under 2.1.3.1 above; text has been modified to clarify the basis of the team’s assessment.**

2.1.4.1

The question is what *management strategies* are in place? EU management of the saithe resource/fishery is a management strategy for the target species and, by implication, for the food chain, and Norwegian rules are a strategy for discards and by-catches in that sector. BUT, is there a management strategy on habitat effects; is the German observer programme sufficiently intensive and managed; and is the EU position on discards and by-catches sufficiently adequate, **to justify the score?** **MML Comment: the score is justified, and the text has been clarified.**

2.1.5.2

Suggest including cod in the first sentence, and that the penultimate sentence should end with the words ‘in saithe fishing areas’if true! **MML Comment: text has been modified accordingly.**

2.1.5.3

It was not clear in 2.1.3.1 if there is specific information for saithe fishing gears in saithe fishing areas, so are we clear that there **are no unacceptable impacts in the saithe fishery?** **MML Comment: the available information justifies this score.**

2.1.5.4

Para 3 is ambiguous (‘impacts and information are “understood”’). **To justify the score** we need to know, and say, that there are no unacceptable impacts. **MML Comment: the text has been clarified, and cross-referred to condition 2.**

2.2.1.2 Helpful to refer to Condition 2. **MML Comment: this has been done.**

2.2.1.3

Is it D batis or R Batis, near the end of para 2. If data for the critical by-catch species are inadequate (2.2.1.2) **are we confident about a conclusion of no unacceptable risk?** **MML Comment: Text corrected; conclusion of no unacceptable risk is justified by assessment team’s findings.**

2.2.2.1

The text cites the generic overarching provisions. Are there identifiable ‘*management objectives and accompanying strategies in place*’ for the saithe fishery that would identify and trigger the required action if it were needed? **MML Comment: the assessment team have reviewed the available information and concluded that the score here should be reduced from 85% to 80%, which does not affect the overall score for the fishery.**

2.3.1.1

Following from 2.1.3.1 and 2.1.5.3 **does the position on skates and rays warrant the pass**, unless it is sufficient to refer to Condition 2? **MML Comment: This is covered by the earlier sections and condition 2, so a cross reference to condition 2 has been added.**

2.3.1.2 Add a Reference to Condition 3. **MML Comment: this has been done**

2.3.1.3

The main cause of a delay in recovering the cod stock must surely be compliance problems in the directed cod fisheries? I accept, however, that cod by-catches should be dealt with as per Condition 3, which should consider not only the German fishery, but also saithe fishing in coastal inshore waters, in case juvenile cod co-occur there with juvenile saithe. **MML Comment: this assessment deals with the German trawl fishery, so it can’t raise conditions on others fisheries.**

Principle 3

3A.1.2

Suggest that for non-ICES area readers, the last sentence of Para 2 should read: ‘..fishing opportunities (annual TAC and quotas) based on an analytical assessment, precautionary reference points, and a short term forecast, and that are socially.....’ **MML Comment: these suggestions have been inserted in the text.**

3A.1.3

Suggest that in the para on management measures, the second sentence should have the important qualification; ‘This plan sets long term objectives *for the target species* and..’ **MML Comment: these suggestions have been inserted in the text.**

3A.1.4 Helpful to note how frequently the various external reviews take place. **MML Comment: the text has been modified to indicate this.**

3A.2.1 Add the Common Fisheries Policy and associated Regulations and Directives for data collection,

TACs and quotas, technical measures, enforcement and reporting. **MML Comment: these references are not appropriate here; they are covered by 3.A.1.**

3A.2.2 Typo in last line: cod end **MML Comment: Typo corrected.**

3A.2.3 Suggest the text should mention allocation of fishing rights by vessel licence, and allocation of catch opportunity by TAC, national quota, and individual fleet/vessel quota. **MML Comment: these suggestions have been inserted in the text.**

3A.3.1

The performance indicator requires both resource and environmental objectives for the fishery, **so does the last sentence of para 2 justify a pass?**

MML Comment: The last sentence highlights the shortcomings of the regime in respect of SG=100; in all other respects the management arrangements meet the standard set out in SG=80. A pass is therefore justified.

3A.3.2

In light of 3A.3.1 are operational procedures **for environmental management currently sufficient or specific enough to justify a pass?**

MML Comment: yes – see comments above concerning 3.A.3.1

3A.3.3

Do the provisions in para 2 apply to the Norwegian zone as well as the EU zone?

Is the last sentence a fair reflection, given the comments made under Prin 2? **MML Comment: some changes have been made to clarify which provisions apply where; the assessment team feel that the final sentence is justified.**

3A.3.4

At end of first line suggest ‘all major EU fish stocks....’. Suggest last sentence of para 1 should read ‘As discussed under Principle 1, some uncertainties in the assessment have been identified but not yet fully investigated’. **MML Comment: some changes have been made to the text to clarify this.**

3A.3.5

Helpful to stress that the various consultations are not ad-hoc but are part of a managed process. **Is there comparable consultation on ecosystem/environmental issues ?**

MML Comment: text altered to illustrate the status of the consultations; any management measures applied to fishing activities to address environmental issues would be implemented through the same mechanisms, justifying the score.

3A.4.2

Re para 2, results for the N Sea cod fishery scarcely convince me that the European regime provides effective incentives to fish sustainably, and I suspect that in the saithe fishery compliance is more to do with low saithe fishing pressure and a high TAC.

MML Comment: see earlier comments under Principle 1 and Principle 2.

3A.5.1

Topics not identified in the text include the trend in weight at age; the problem of by-catches of cod, skates and rays; the impact of climate change including the possibility of a plankton-related step change in recruitment round about 1987.

MML Comment: the assessment team were satisfied that the key issues facing the fishery had been identified. The topics proposed for listing are all of interest, but their absence from the key issues does not detrimentally affect the assessment.

3A.5.2

It is not clear how much of the generic programme implicit in paras 1 and 2 is on saithe.

MML Comment: the text has been altered to make this clearer.

3A.6.1

The text is rather sparse. What about sampling of age structure, weight at age ? Does monitoring cover all nations and gear types?

MML Comment: the assessment is limited to the unit of certification, so monitoring of all nations (other than Germany) and all gear types (other than trawling) lies outwith its scope.

3A.7.1

The question is about *measures in place*. See my comments under **2.1.4.1**.

MML Comment: the assessment has been correctly made against the Scoring Guideposts, and is justified.

3A.8.2 Is the information on compliance based on published audits?

MML Comment: this information is based upon information provided by statutory bodies in Germany during the fishery assessment.

3B.2.1

The fishery is operating in locations where habitat, and spawning or juvenile fish are allegedly not at risk from fishing methods, but the question is, do fishing operations *implement methods designed to minimise impacts on habitat*, other than by complying with EU technical gear specifications ?

MML Comment: the assessment, relative to the scoring guideposts, seems appropriate – some modifications have been made to the text to clarify its basis however.

3B.5.3 The text implies that compliance is very high. Is this based on verified records?

MML Comment: see our comments under 3.A.8.2.

End of comments on individual scoring indicators

20 April 2008

Peer Review B

Marine Stewardship Council Certification Report

prepared by
Moody Marine Ltd

German North Sea Saithe Fishery

(Erzeugergemeinschaft der Hochsee – und Kutterfischer GmbH)

Introduction

The certification report prepared by Moody Marine Ltd of the German North Sea saithe (*Pollachius virens*) fishery is presented in two main parts: an outline of the administrative framework within which the assessment has been prepared, including a narrative description of the assessment and conclusions, and the details of the assessment made in relation to the Marine Stewardship Council's (MSC) three Principles for a sustainable fishery. Overall, it is a thorough report giving an accurate picture of stock status (Principle 1), fishery–environment interactions (Principle 2) and fishery management (Principle 3). There are no obvious omissions from the assessment and the conclusion in favour of certification is fair. Nevertheless, whilst there are no fundamental reasons for challenging this conclusion, there are aspects of the report where the assessors may have been less critical than perhaps they should and other areas where they might reasonably have taken a more sanguine view. The two key areas are the interpretation of 'stock' upon which this fishery depends and the extent to which by-catch of non-target species is or is not cause for concern – and further investigation.

Stock Identity and the Basis for Saithe Fishery Management

A fish stock is a unit of management. For the fishery biologist it has been defined as 'a relatively homogeneous and self-contained population whose losses by emigration and accessions by immigration, if any, are negligible in relation to the rates of growth and mortality'²¹ i.e. It is 'a population of a species of fish which is isolated from other stocks of the same species and does not interbreed with them and can, therefore, be managed independently of them'²².

By either of these definitions it would seem that the current ICES practice of treating the North Sea and Northeast Atlantic populations of saithe as two separate 'stocks' is flawed. Throughout the detailed comments reviewing Principle 1 and the narrative report there are frequent references to interchange and mixing at the larval, juvenile and adult stages of the life history (e.g. § 2.1, P 1.1.1.2 & 1.1.1.3). Indeed, in § 4.1 the report states: "This stock is not isolated from the NEA stock, considerable movement being undertaken between the two, with eggs and larvae from the NS stock drifting north and adults undertaking spawning migrations from the NEA to southern spawning grounds".

²¹ Proceedings of the joint scientific meeting of ICNAF, ICES and FAO on fishing effort, the effect of fishing on resources and the selectivity of fishing gear. 1960 Vol. I *Special Publication of the International Commission for North West Atlantic Fisheries*.

²² Holden, M.J., 1994. *The Common Fisheries Policy: origin evaluation and future*. Fishing News Books, Oxford.

This being the case, it is difficult to accept that the North Sea saithe fishery management unit (i.e. ICES sub-areas VI, IV and Division IIIa) constitutes a unit fish stock. It would seem that all the evidence points toward the saithe comprising this management unit are integral with the Northeast Arctic management unit (Norwegian Sea and Barents Sea) that together must comprise a single Northeast Atlantic saithe stock.

If one accepts this hypothesis, one might argue that the German saithe fishery fails to meet the necessary criteria for certification as it has not been judged against the appropriate fish stock and management. Such a view would be unnecessarily severe, however, as the ICES assessment for the Northeast Arctic saithe indicates its current status to be no less, and probably more robust than the North Sea saithe.²³ It is reasonable to infer, therefore, that the final conclusions on the fishery's suitability for certification would be unaffected if it were judged against a unified stock, but it could affect some of the conditions placed on the fishery.

Although the Moody Marine assessment does not challenge explicitly the current view of there being two separate saithe stocks, it appears to do so by implication. In Condition 1 'Uncertainties of Assessment' it requires, *inter alia*, that the various problems associated with recruitment and migration should be examined. In particular it requires that 'alternative assumptions and model structures should be explored'. One assumes this is a *socce voce* suggestion that a single, Northeast Atlantic stock assessment might be worth examining. Such a move must be fundamental to any future improvement in assessments, fishery management and long-term sustainability of the stock and its fisheries. That said, it is not something to which the client fishery can make a direct input. **MML Comment: appropriate text has been added to the report, addressing the issues raised in connection with the stock definition.**

By-catch, Protected, Endangered, and Threatened (PET) Species

There is a popular old saw that advises 'if it ain't broke, don't mend it'. For many years this was an unstated approach to fishery management – if there are no indicators for concern, don't spend scarce resources looking for them. In no small measure this approach is a response to the reality that all aspects of marine data collection, not the least of which is fishery data, are expensive. Increasingly, however, it seems that this pragmatic approach to fishery management and data collection is no longer acceptable. If fishery scientists conclude 'there is no evidence that ----' it is frequently greeted by sceptical NGO as an indication that fishery managers are not making enough effort to find the evidence.

In making such accusations or demands the NGO overlook the keystone of scientific investigation – you cannot prove a negative. If an investigation looks for information but draws a blank, the only conclusion must be 'there is no evidence that ---' (which is not the same as saying that nothing is happening). This leaves the door open for a different conclusion if circumstances change or methods improve. All too often, however, it seems that sustained pressure from NGO overrides scientific rigour and forces organisations to initiate programmes where they are not justified or, at best, are of dubious priority. In no small measure one fears this failing has affected the Moody Marine assessors and their conclusions with respect to by-catch and PET species.

Wherever the topic of by-catch or PET species is discussed the numbers, i.e. the evidence, seem trivial if not non-existent: haddock 1.8%; cod 0 – 4.1%, overall 0.9%; ling, pollock, pelagic species, occasional (P 2.1.2.1); 35.8 kg of cod over 13 trips (P 2.1.2.2); marine mammals, no evidence of by-catch; elasmobranchs, occasional; sea birds, no evidence of by-catch (P 2.2.1.1; P 2.2.1.3). The by-catch of commercial or PET species has not been quantified because it is either trivial or there are no catches to quantify. Despite this, the assessors have felt constrained by the assessment criteria to give the fishery a low score under P 2.2.1.2 and make Condition 2 dependent on sampling programmes designed and initiated within 12 months of certification and mitigation measures to reduce or avoid impacts, 'impacts' that have not been identified. This seems unduly onerous on the client. Either the assessors have

²³ ICES, 2007. *Report of the ICES Advisory Committee on Fishery Management, Advisory Committee on the Marine Environment and Advisory Committee on Ecosystems, 2007*
Book 3. Copenhagen: ICES.

identified specific problems, in which case they should specify appropriate action, or they have not, in which case the Condition is unjustified. **MML Comment: agreed; however the MSC standard demands a precautionary approach where such impacts are identified.**

Similar conclusions apply to Condition 3 and cod by-catch. No evidence has been presented by the assessors that there is specific cause for concern with this fishery. On the contrary, it appears that the fishery is fully compliant with all that is expected of it with respect to cod and cod recovery plans. Nevertheless, it is made a condition that (unspecified) ‘action’ be taken. One wonders if this condition is a consequence of their conclusion that ‘there is no evidence that----’ – but we’d better safeguard ourselves against the (almost) inevitable NGO demand that something must be done. If the assessors cannot identify specific cause for concern and propose specific appropriate action, it is unduly onerous (unrealistic even) to expect the client fishery to do it for them. **MML Comment: this is a valid point; however the need to act in a precautionary manner justifies the requirement.**

Conclusion

Undoubtedly, there is still a considerable amount that can be done to improve our understanding of Northeast Atlantic saithe populations. In particular, gathering more detailed information on migration patterns and inter-annual variation in population movements, and developing the means whereby a reliable pre-recruit abundance index might be gathered. These are scientific matters beyond the immediate control or direct influence of commercial fishing fleets and it would be unreasonable to expect them to contribute directly to their solution or implementation.

On the other hand, the industry can – and do – contribute directly to programmes such as data collection, particularly discard and by-catch data. But again, is it reasonable to expect the industry, whether at large or a specific fleet, to initiate a particular discard–observer programme if the fishery scientists or administrators do not rank their fishery of sufficient priority? Even if they were to initiate a discard self-sampling programme they could not force the fishery authorities to either analyse samples or data. All we can reasonably expect is that they will continue to cooperate when asked, develop gears with lower seabed footprint and reduced by-catch of non-target species. The latter two are both areas of ongoing industry development, not least to reduce seabed drag and associated fuel costs and to reduce on-deck handling time to improve catch quality.

Finally, with these aspects of the report in mind, should the fishery be certified? There is still considerable scope for improvement to saithe stock assessment but all available evidence indicates a stock that is in robust condition, is being managed openly, fairly and within a precautionary framework. Whilst no fishery exerts no environmental effect, there is no evidence that this fishery is having any significant or unacceptable adverse effects. The recommendation for certification, therefore, is justified – even if aspects of the conditions seem unduly onerous.

Client Action Plan

Action Plan for Meeting the Conditions for Continued Certification of the German North Sea Saithe Fisheries

The Erzeugergemeinschaft der Hochsee - und Kutterfischer GmbH (HUK) submits this Action Plan for meeting the Conditions for Continued Certification of the German North Sea Saithe Fishery. HUK agrees to make a good faith effort to meet the intent of the Conditions set forth in the certifier's March 2008 Final Report determining that the HUK saithe fisheries are sustainably managed under the MSC Principles and Criteria.

Condition 1: Uncertainties in assessment

Summary:

The assessment was considered to display retrospective bias, recruitment is poorly estimated and there is an unknown effect of variable migration of animals into, and out of, the stock. If not accounted for appropriately, these uncertainties could contribute to TACs being set above precautionary levels.

HUK Comments:

As a general observation HUK would point to the fact that, as a private sector applicant, there are clear limits to what influence industry can (and should) exert on national and international ocean research procedures and methodology. Our powers only stretch as far as private sector bodies can reach by influencing national and international institutions to modify methodology and seek further clarification to issues as those raised under Condition 1. At the same time we would underline that management of the saithe stocks are well within precautionary limits, and the relevant national and international institutions have for several years been working seriously with methodology improvements, and as such do not need any push from industry to work towards that goal. In addition, HUK would underline that stock assessments at ICES and the Bundesforschungsanstalt in Hamburg

- do take into account major uncertainties in the data and functional relationships*
- does include an evaluation of the most important assumptions and known consequences*
- does include analysis of consequences of current harvest strategies*

As noted above and in the revised formulation of the condition, significant scientific effort has been allocated to reduce uncertainty and improve recruitment data both for the North East Arctic and the North Sea Saithe stocks. However, it has not been possible to develop methodology that predicts stock development on the basis of recruitment data. For several years large year classes has come into the stock/fishery which scientists have not been able to see at recruitment stage. On the basis of this uncertainty it has been concluded that management policy should be to keep a relatively low F in the fishery.

The North Sea/West of Scotland saithe assessment is not the most precise assessment in the ICES area, but certainly one of the better ones. Assessors clearly state that the analysis of past forecasts indicate that the assessment is accurate and that there is only a slight bias in historical SSB. ACFM's perception was that the major deficit of the assessment is the lack of reliable recruitment information, while possible migration between stocks, and problems with the selectivity or the catch-at-age-matrix seems to be negligible. The lack of information on the strength of incoming yearclasses until they have already recruited to the fishery might be considered a problem for the precision of the forecast, however, this uncertainty has been included in the management advice. Juvenile saithe is thought to occur in Norwegian coastal waters and even inside the fjords, where they are almost unavailable to the fishery and to research vessels. This separation between

juveniles and adults is clearly a benefit of the life history of the stock and supports a sustainable exploitation of the adults. While catch at age and bycatch data can always be improved in fisheries science, the development of a survey to deliver a recruitment index is not only unreasonably expensive, but also superfluous given the present exploitation pattern. Plus, such a survey can only be developed under Norwegian coordination as the early life stages of this resource are almost exclusively distributed in the Norwegian coastal waters.

This stock is one of the few in the ICES area where the fishery is not largely depending on incoming yearclasses, and where Fishing mortality is (and has been) in the range of F_{msy} . At such a low F , uncertainties in the parameter Recruitment and a slight retrospective bias in the determination of SSB will not bear any significant risk to the stock.

HUK do however declare our interest to seek further improvements to methodology and reduce uncertainty under Condition 1 by all means available. The certifier therefore should remain flexible and adaptive with respect to Condition 1, mindful of the limitations mentioned.

For **North Sea Saithe** HUK would argue that saithe this is certainly one of the better fish stock assessments in the world, with reasonable fishery dependent and independent data available and only limited assessment bias, which is also thought to be irrelevant in the present management framework. Major uncertainties are taken into account and assumptions have been explored (as the retrospective analysis indicates).

The management plan has been evaluated by ICES in the last months, and uncertainties in the assessment have been included in this evaluation. The results of this procedure were published by ICES on April 25th, 2008. Management advice is regularly not only given in relation to the management plan or the precautionary approach, but also in relation to the maximum sustainable yield concept. ICES has discouraged to manage the stock in the frame of the precautionary approach for a number of years and preferred to use the management plan instead. Realised fishing mortality has been below the target F fixed in the management plan (0.3) in the last 6 years, indicating a lightly exploited stock.

Conclusion:

There is substantial additional information available in the North Sea Saithe assessment and management in 2007. The assessment team did not use the 2007 material. Based on the 2007 data it can be demonstrated that the assessment does take into account major uncertainties in data and functional relationships, and that data and relationships are reviewed annually. It can also be shown that the assessment model was evaluated since it was run for various datasets. Finally there has been an evaluation of the management plan in October 2007, to determine consequences of the current harvest strategy, though this is not available yet publicly, its outcomes will no doubt be used in assessment and advice by ICES. Recent precaution in setting the advised F and TAC can be demonstrated as a result of known and evaluated uncertainties.

Nonetheless, and as noted previously, HUK does acknowledge that an uncertainty in assessments, particularly under stock situations exists regarding the situation of stocks. Bearing this in mind we and of course German authorities acknowledge that we jointly shall strive to improve management of fisheries and the scientific methodology.

Noting that this very relevant new information on both stocks was unavailable to the assessment team at the time of the information gathering stages of the main assessment, and the procedural constraints of conducting a rescoring of the relevant indicators, combined with the client's interest in bringing the main assessment to a completion, HUK would therefore be prepared to examine whether further work aimed at addressing the issue of retrospective bias and uncertainty is feasible, or in the absence of such further studies, manage the fisheries and set TACs within the framework of the precautionary approach and based on best available scientific advice. New information could then be evaluated during the first annual surveillance audit.

Action Plan

Our action plan on Condition 1 would therefore consist of a combination of reviewing existing and new information:

Action 1 :

Within 12 months after certification, during the 1st audit we will present the certifier with evidence of work undertaken by ourselves with relevant stakeholders / authorities to address the issues raised under Condition 1 incorporating ICES (working group) reports 2007 or later. On the basis of this, and the CB's consideration of Condition 1 in the light of new information, plans for vitalising or re-vitalising past and present work will be developed as appropriate.

Action 2 :

In light of the contents of Condition 1 and by bearing in mind the technical and resource difficulties in the issues concerned, HUK commits to an annual TAC that incorporates an appropriate degree of precaution. This shall take into account uncertainties in the assessment, errors regarding historical patterns and their impact on stock estimates through reviewing TAC's according to their adherence with ICES advice and a precautionary harvest strategy.

Condition 2: By-catches

Summary:

At present there is an observer programme providing good data on the bycatch associated with the fishery, but with limited coverage of the fleet

HUK comments and action plan

From the MML response to HUK's comments to the draft report, we draw the conclusion that this general issue of by-catches relates to non-commercial species by-catches, in particular PET species (protected, endangered and threatened).

In 2008 HUK has launched a "Stop-Discard" project. With explicit support from the EU-commission and in cooperation with the Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz, the Johann Heinrich von Thünen-Institut (former Bundesforschungsanstalt) will accompany our saithe trawlers in 2008 on several voyages. During these voyages discarding is not allowed at all. By avoiding any discarding, the scientists will be able to identify the volume and spread of possible discards in the saithe fishery

Action Plan

Action 4

the HUK shall negotiate in 2008 with EU-commission and German authorities a prolongation of the "Stop-Discard" project for at least two more years (to extend the period of data collection to a total of three years).

Action 5

HUK shall propose further actions and developments on an observation programme with better coverage of the fleet within 12 months after certification. This programme shall include the registration of non-target species (= non-commercial species incl. PET species that may occur and not catches of other commercial species that occur in the saithe fishery) removals in the saithe fishery.

Action 6

Within 3 years of certification, potential impacts of the above named non-target species removals in the saithe fishery shall be assessed based on the programmes mentioned in the 1st paragraph of action5. Where areas with the need of action are identified, potential measures for improvement shall be identified.

Action 7

Within 5 years of certification, any identified necessary mitigating measures shall be identified and implemented.

Condition 3: North Sea Cod Bycatches

Summary : Interactions occur between the fishery and North Sea cod populations. North Sea cod is recognised as being in a depleted state and MSC certified fisheries are required to be prosecuted so as to promote rebuilding of depleted target and by-catch species.

HUK comments and action plan

With respect to cod by-catches it should be recognized that significant regulatory measures have been introduced in recent years, and work is continuously going on in a joint industry-government working group to assess further measures.

With respect to North Sea Cod by-catches we draw the attention to the extremely low German North Sea Cod catches in general, catches that over the last years due to the very stringent management measures have fallen well short of the German TAC. Catches of cod during saithe fisheries represent a negligible part of the (low) overall North Sea Cod catches. Although the EU-regulations allow utmost cod-bycatches up to 5 %, the German saithe fishery fishes some 1,5 % cod as by-catch in this fishery. In 2008 this means in total some 180 tons of cod.

Action Plan

Action 8 :

Within 6 months after the final certification HUK shall further assess the magnitude of cod bycatches in German saithe directed fishery and identify any measures necessary for reducing them.

Action 9

If necessary, measures for further reductions of cod bycatches in the German saithe fishery shall be tested within 2 years of certification.

Action 10

Identified necessary mitigation measures should be introduced within 3 years of certification.

Submitted August 2008, by the Erzeugergemeinschaft der Hochsee - und Kutterfischer GmbH