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Organisations

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Publications:

Changes in reproductive life history and resource allocation impacting population dynamics of Baltic cod

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Marine Living Resources, Section for Monitoring and Data, Section for Ecosystem based Marine Management, Institute Management
Authors: Tomkiewicz, J. (Intern), Huwer, B. (Intern), Cordón, C. T. F. (Intern), Storr-Paulsen, M. (Intern), Eero, M. (Intern), Köster, F. (Intern)
Publication date: 2017
Main Research Area: Technical/natural sciences
Publication: Research › Conference abstract for conference – Annual report year: 2017

Do spatio-temporal spawning closures promote the recovery of cod in the Baltic Sea?

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Section for Marine Living Resources, Institute Management, Section for Monitoring and Data
Authors: Eero, M. (Intern), Hinrichsen, H. H. (Ekstern), Huwer, B. (Intern), Köster, F. (Intern), Mosegaard, H. (Intern), Storr-Paulsen, M. (Intern)
Publication date: 2017
Main Research Area: Technical/natural sciences
Publication: Research › Conference abstract for conference – Annual report year: 2017

Forskningsskibet Dana er netop vendt hjem fra Østersøen

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data, Section for Marine Living Resources
Authors: Storr-Paulsen, M. (Intern), Huwer, B. (Intern)
Pages: 14-16
Publication date: 2017

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Newspaper: Fiskeri Tidende
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ISI indexed (2013): ISI indexed no
ISI indexed (2012): ISI indexed no
Hvorfor samarbejde med biologerne?

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data, Danish Fishermen's Producers' Organization
Authors: Storr-Paulsen, M. (Intern), Andersen, M. (Ekstern)
Pages: 17
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REKREA - Evaluating Survey Methods for Danish Marine Recreational Fisheries

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data, Section for Freshwater Fisheries Ecology, Section for Ecosystem based Marine Management, Institute Management
Publication date: 2017
Event: Poster session presented at World Recreational Fishing Conference 2017, Victoria, Canada.
Main Research Area: Technical/natural sciences
Publication: Research › Poster – Annual report year: 2017

REKREA - Evaluating Survey Methods for Danish Marine Recreational Fisheries

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data, Section for Freshwater Fisheries Ecology, Section for Ecosystem based Marine Management, Institute Management
Publication date: 2017
Event: Poster session presented at Danfish International Fisheries Exhibition 2017, Aalborg, Denmark.
Main Research Area: Technical/natural sciences
Publication: Research › Poster – Annual report year: 2017

Deliverable CS1 Pelagic fisheries sampling designs: WP2 – Regional sampling design for commercial fisheries. WP2.3 – Case Study fisheries

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data, IMARES
Authors: Håkansson, K. B. (Intern), Storr-Paulsen, M. (Intern), Chen, C. (Ekstern), Verver, S. (Ekstern), van Helmond, E. (Ekstern), Pout, A. (Ekstern), Clarke, L. (Ekstern)
Trends in records and contribution of non-indigenous species (NIS) to biotic communities in Danish marine waters

The report investigates trends in the temporal and spatial changes of non-indigenous marine species in the Danish part of the OSPAR and HELCOM regions. The assessment is based on a quantitative analysis of data available in national monitoring databases and covers the period 1989 to 2014 and other documented records of non-indigenous marine species in the Danish waters.

Discarding of cod in the Danish Fully Documented Fisheries trials

Denmark was the first nation in Europe to promote the use of Fully Documented Fisheries (FDF) through Remote Electronic Monitoring (REM) and CCTV camera systems, with pilot schemes in place since 2008. In theory, such a scheme could supplement and even potentially replace expensive control and monitoring programmes; and when associated with a catch quota management (CQM) system, incentivize positive changes in fishing patterns in a results-based management approach. New data flows are, however, required to ensure the practical implementation of such a scheme. This paper reviews the quality of the FDF data collected during 2008–2014 and their potential in strengthening information on cod discards. The analyses demonstrate the improved reporting of discards in logbooks and overall discard reductions, but they also show that some uncertainties around the absolute estimates of discard quantities have remained. Regular validation of weight estimation methods and close collaboration between scientific monitoring and control are important to support the use of reported discards as a reliable source of information. We discuss the potential of electronic monitoring in the context of the EU landing obligation.
Eastern Baltic cod in distress: biological changes and challenges for stock assessment

The eastern Baltic (EB) cod (Gadus morhua) stock was depleted and overexploited for decades until the mid-2000s, when fishing mortality rapidly declined and biomass started to increase, as shown by stock assessments. These positive developments were partly assigned to effective management measures, and the EB cod was considered one of the most successful stock recoveries in recent times. In contrast to this optimistic view, the analytical stock assessment failed in 2014, leaving the present stock status unclear. Deteriorated quality of some basic input data for stock assessment in combination with changes in environmental and ecological conditions has led to an unusual situation for cod in the Baltic Sea, which poses new challenges for stock assessment and management advice. A number of adverse developments such as low nutritional condition and disappearance of larger individuals indicate that the stock is in distress. In this study, we (i) summarize the knowledge of recent changes in cod biology and ecosystem conditions, (ii) describe the subsequent challenges for stock assessment, and (iii) highlight the key
questions where answers are urgently needed to understand the present stock status and provide scientifically solid
support for cod management in the Baltic Sea

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Section for
Marine Ecology and Oceanography, Institute Management, Section for Monitoring and Data, Swedish University of
Agricultural Sciences, University of Skövde, International Council for the Exploration of the Sea, University of Kiel, Lund
University, Johann Heinrich von Thünen-Institute
Authors: Eero, M. (Intern), Hjelm, J. (Ekstern), Behrens, J. (Intern), Buckmann, K. (Ekstern), Cardinale, M. (Ekstern),
Casini, M. (Ekstern), Gasyukov, P. (Ekstern), Holmgren, N. (Ekstern), Horbowy, J. (Ekstern), Hüssy, K. (Intern),
Kirkegaard, E. (Intern), Kornilovs, G. (Ekstern), Krumme, U. (Ekstern), Köster, F. (Intern), Oeberst, R. (Ekstern), Plikss, M.
(Ekstern), Radtke, K. (Ekstern), Raid, T. (Ekstern), Schmidt, J. O. (Ekstern), Tomczak, M. (Ekstern), Vinther, M. (Intern),
Zimmermann, C. (Ekstern), Storr-Paulsen, M. (Intern)
Pages: 2180-2186
Publication date: 2015
Main Research Area: Technical/natural sciences

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Journal: ICES Journal of Marine Science
Volume: 72
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BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.63
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 2.18
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 2.62
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 2.46
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 2.35
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): CiteScore 2.32
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Web of Science (2008): Indexed yes
Web of Science (2007): Indexed yes
Web of Science (2006): Indexed yes
Web of Science (2005): Indexed yes
Eel, cod and seatrout harvest in Danish recreational fishing during 2012

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data
Authors: Olesen, H. J. (Intern), Storr-Paulsen, M. (Intern)
Number of pages: 21
Publication date: 2015

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Publisher: Institut for Akvatiske Ressourcer, Danmarks Tekniske Universitet
ISBN (Electronic): 978-87-7481-204-3
Original language: English
Series: DTU Aqua Report
Number: 293-2015
ISSN: 1395-8216
Main Research Area: Technical/natural sciences
Electronic versions:
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Publication: Research › Report – Annual report year: 2015

Havforskningsskibet Dana er netop vendt hjem fra Østersøen

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data, Section for Marine Ecology and Oceanography
Authors: Storr-Paulsen, M. (Intern), Huwer, B. (Intern)
Pages: 9
Publication date: 2014

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Pages (from-to): 9
Newspaper: Fiskeritidende
Volume: 21
No.: 47
Ratings:
ISI indexed (2013): ISI indexed no
ISI indexed (2012): ISI indexed no
ISI indexed (2011): ISI indexed no
Main Research Area: Technical/natural sciences
Publication: Communication › Newspaper article – Annual report year: 2014
Behind the shine: An appraisal of five years of Danish CCTV trials

Denmark has been the first nation in Europe to promote the use of Fully Documented Fisheries (FDF) through Remote Electronic Monitoring (REM) and CCTV camera systems, and some pilot schemes for monitoring cod catches have been in place since 2008. In theory, such a scheme could supplement and even potentially replace expensive control and monitoring programs; and, when associated to a Catch Quota management system, incentivize positive changes in fishing patterns in a results-based management approach. However, in practice, the technical and institutional challenges remain important hurdles to overcome for the system to be beneficial and reliable. In this paper we investigate the added value on catch information gained over the last five years, and discuss the future of REM as a monitoring program in the context of the future discards ban.
Danish sampling of commercial fishery: Overview with special attention to discards 2010 data

Utilization of our common marine reassurances has in later years had an increasing focus among the EU member states, with societal demands to reduce discarding. Discards have for many years been an unavoidable component of most commercial fisheries due to management regulation and profit optimizing. However, the first step into reducing the discard problem is to investigate where discard is occurring in larger amounts, to highlight the pattern in different fleet components and to document the monitoring of the sampling program. In 2010 the total discard observed in Danish waters were 21500 t corresponding to 26% of the total catch from these fleets. In Denmark sampling onboard commercial vessels has been ongoing since 1995. In this report the aim has been to describe the Danish commercial at sea sampling strategy and results from 2010

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Monitoring, Section for Public Sector Consultancy
Authors: Storr-Paulsen, M. (Intern), Håkansson, K. B. (Intern), Egekvist, J. (Intern), Degel, H. (Intern), Dalskov, J. (Intern)
Number of pages: 84
Publication date: 2012

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Publisher: National Institute of Aquatic Resources, Technical University of Denmark
ISBN (Electronic): 978-87-7481-150-3
Original language: English
Applicant: Ministeriet for Fødevarer, Landbrug og Fiskeri
Series: DTU Aqua Report
Number: 250-2012
ISSN: 1395-8216
Main Research Area: Technical/natural sciences
Electronic versions:
250_2012_danish_sampling_of_commercial_fishery.pdf
Links:
Publication: Commissioned › Report – Annual report year: 2012

Eel, cod and seatrout harvest in Danish recreational fishing during 2011

Marine recreational fishing is a popular outdoor leisure activity, yet the impact on the targeted stocks is often unidentified. In order to estimate 2011 cod, eel and seatrout harvest (fish caught and kept) in the Danish angling and passive gear fishing, two interview surveys were conducted in July 2011 and January 2012. Recreational fishing was separated into anglers (with rod and reel) and passive gear fishing (fyke and gillnets). In 2011 a total of 157,762 anglers and 33,911 passive gear fishers had issued the annual license, which is compulsory if saltwater fishing is practiced. In total, it was estimated that 80 t [Relative standard error (RSE)=6%] eel, close to 1,300 t (RSE=5 %) cod and 400 t (RSE=5 %) seatrout (including freshwater catches) was harvested in the recreational fishery. Eel is almost exclusively taken in the passive gear fykenet fishery and seatrout was mainly caught by anglers which accounted for 88 % of the total harvest. Present interview survey indicates that approximately 4.5 % of the total Danish cod yield (commercial landings plus recreational harvest) was taken in the recreational fishery. There were, however, large differences between areas and especially in Kattegat and the Sound the recreational had a large share of the total yield accounting for 51 % and 34 %, respectively. Approximately 18 % of the total eel yield was taken by the recreational fishing. In the estimation, harvest taken by fishers without a legal license was also included. This inclusion increased the estimated harvest with 17 % and 24 %, respectively for passive gear and angling

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Coastal Ecology, Section for Monitoring
Authors: Sparrevohn, C. R. (Intern), Storr-Paulsen, M. (Intern)
Publication date: 2012

Publication information
Publisher: DTU aqua. National Institute of Aquatic Resources
ISBN (Print): 978-87-7481-157-21
Original language: English
Series: DTU Aqua Report
Spatial management of marine resources can enhance the recovery of predators and avoid local depletion of forage fish
The eastern Baltic cod stock has recently started to recover, after two decades of severe depletion, however with unexpected side effects. The stock has not re-occupied its former wide distribution range, but remains concentrated in a limited area in the southern Baltic Sea. The biomass of forage fish, i.e., sprat and herring, is historic low in this area, which in combination with increasing cod stock results in locally high predation mortality of forage fish and cannibalism of cod. In line with low prey availability, body weight and nutritional condition of cod drastically declined. In the southern Baltic Sea, cod competes with pelagic fisheries for the limited resources of sprat and herring, while the largest biomass of these species is currently found outside the distribution range of cod. Accounting for spatial overlap between species is crucial in developing ecosystem based fisheries management to enhance the recovery of predator stocks

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Management Systems, Section for Public Sector Consultancy, Section for Population Ecology and Genetics, Section for Monitoring, Institute Management
Authors: Eero, M. (Intern), Vinther, M. (Intern), Haslob, H. (Ekstern), Huwer, B. (Intern), Casini, M. (Ekstern), Storr-Paulsen, M. (Intern), Köster, F. (Intern)
Pages: 486-492
Publication date: 2012
Main Research Area: Technical/natural sciences
Publication information
Journal: Conservation Letters
Volume: 5
Issue number: 6
ISSN (Print): 1755-263X
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Using interview-based recall surveys to estimate cod Gadus morhua and eel Anguilla anguilla harvest in Danish recreational fishing

Using interview-based recall surveys to estimate cod Gadus morhua and eel Anguilla anguilla harvest in Danish recreational fishing. – ICES Journal of Marine Science, 69: 323–330. Marine recreational fishing is a popular outdoor activity in Denmark, practised by both anglers and passive gear fishers. However, the impact on the targeted stocks is unknown, so to estimate the 2009 harvest of cod Gadus morhua and eel Anguilla anguilla, two separate interview-based surveys were initiated and carried out in 2009/2010. The first recall survey exclusively targeted fishers who had been issued with the mandatory Danish fishing licence. The second survey was designed to identify those who fish without a licence. It was estimated that 1231 t of cod were harvested in 2009, corresponding to 4.8% of the entire Danish cod yield (recreational harvest + commercial landings). Area differences were found, and, in certain areas, the recreational harvest of cod accounted for more than 30% of the total yield. The majority (81%) of the recreational cod harvest was taken by anglers. Eels, however, are almost exclusively caught with passive gear (fykenets) and a total of 104 t year−1 was harvested, which corresponds to 19% of the entire Danish eel yield. The inclusion of the harvest taken by fishers without a valid licence was important and added almost 20% to the estimated harvest.
10,000 kr. i duser for mærkede torsk i Østersøen

General information
State: Published
Organisations: Section for Monitoring, National Institute of Aquatic Resources, Section for Coastal Ecology, Section for Population Ecology and Genetics
Authors: Storr-Paulsen, M. (Intern), Sparrevohn, C. R. (Intern), Hüsey, K. (Intern)
Pages: 9
Publication date: 2011

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Newspaper: Fiskeritidende
Volume: 18
No.: 2
Ratings:
ISI indexed (2013): ISI indexed no
ISI indexed (2012): ISI indexed no
ISI indexed (2011): ISI indexed no
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 273996
Publication: Communication › Newspaper article – Annual report year: 2011

Den østlige Østersøtorsks fremgang - held eller forstand?

General information
State: Published
Organisations: Section for Management Systems, National Institute of Aquatic Resources, Section for Monitoring
Authors: Eero, M. (Intern), Storr-Paulsen, M. (Intern)
Pages: 8
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Newspaper: Fiskeritidende
Volume: 18
No.: 27-31
Ratings:
ISI indexed (2013): ISI indexed no
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ISI indexed (2011): ISI indexed no
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 278320
Publication: Communication › Newspaper article – Annual report year: 2011

Eel, seatrout and cod catches in Danish recreational fishing: Survey design and 2010 catches in the Danish waters

General information
State: Published
Organisations: Section for Coastal Ecology, National Institute of Aquatic Resources, Section for Monitoring, Section for Freshwater Fisheries Ecology
Authors: Sparrevohn, C. R. (Intern), Storr-Paulsen, M. (Intern), Nielsen, J. (Intern)
Number of pages: 22
Publication date: 2011
Neutral and nonneutral genetic markers revealed the presence of inshore and offshore stock components of Atlantic cod in Greenland waters

General information
State: Published
Organisations: Section for Monitoring, National Institute of Aquatic Resources
Authors: Pampoulie, C. (Ekstern), Danielsdottir, A. K. (Ekstern), Storr-Paulsen, M. (Intern), Hovgård, H. (Ekstern), Hjorleifsson, E. (Ekstern), Steinarsson, B. (Ekstern)
Pages: 307-319
Publication date: 2011
Main Research Area: Technical/natural sciences

Publication information
Journal: American Fisheries Society. Transactions
Volume: 140
Issue number: 2
ISSN (Print): 0002-8487
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.51 SJR 0.819 SNIP 0.914
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.799 SNIP 0.879 CiteScore 1.43
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.932 SNIP 1.073 CiteScore 1.78
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.949 SNIP 1.087 CiteScore 1.57
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.1 SNIP 1.181 CiteScore 1.66
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.973 SNIP 0.966 CiteScore 1.33
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.203 SNIP 1.057
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.952 SNIP 0.891
Spatio-temporal overlap of the alien invasive ctenophore Mnemiopsis leidyi and ichthyoplankton in the Bornholm Basin (Baltic Sea)

General information
State: Published
Organisations: Section for Population Ecology and Genetics, National Institute of Aquatic Resources, Section for Monitoring, Institute Management
Authors: Schaber, M. (Ekstern), Haslob, H. (Ekstern), Huwer, B. (Intern), Harjes, A. (Ekstern), Hinrichsen, H. (Ekstern), Storr-Paulsen, M. (Intern), Schmidt, J. (Ekstern), Voss, R. (Ekstern), Neumann, V. (Intern), Köster, F. (Intern)
Pages: 2647-2660
Publication date: 2011
Main Research Area: Technical/natural sciences

Publication information
Journal: Biological Invasions
Volume: 13
Issue number: 12
ISSN (Print): 1387-3547

Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 1.294 SNIP 1.193 CiteScore 2.71
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.444 SNIP 1.19 CiteScore 2.58
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.416 SNIP 1.402 CiteScore 2.78
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.553 SNIP 1.29 CiteScore 2.9
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.523 SNIP 1.335 CiteScore 2.79
ISI indexed (2012): ISI indexed yes
The invasive ctenophore Mnemiopsis leidyi in the central Baltic Sea: seasonal phenology and hydrographic influence on spatio-temporal distribution patterns

In the Western Baltic, the invasive ctenophore Mnemiopsis leidyi was recorded for the first time in autumn 2006. An eastward propagation of the ctenophore into the central Baltic, and thus into important spawning grounds of major Baltic fish stocks, was observed in 2007. The focus of the present study was to investigate the seasonal phenology of this introduced species and whether it is able to form a self-sustaining population in this area. Therefore, the variability of temporal and spatial distribution of M. leidyi in the Bornholm Basin was analyzed over the first 4 years following the invasion and related to ambient hydrographic parameters. Results show a clear seasonal pattern. In contrast to the majority of other native and exotic habitats, the seasonal phenology showed highest abundances in spring and autumn months and only sporadic or even no appearance during summer. Vertical distribution was mostly confined to water layers below the permanent halocline and significantly influenced by ambient temperature. Our results indicate that there is no
self-sustaining population of M. leidyi in the central Baltic Sea. Instead, the species is most likely re-introduced into the Bornholm Basin every year via lateral advection from source populations in the Western Baltic. These findings are important not only to further assess the potential impact of M. leidyi on the pelagic ecosystem of the central Baltic Sea, but also for a better understanding of the mechanisms of its invasion into other marine areas.
Using recall surveys to estimate harvest of cod, eel and sea migrating brown trout in Danish angling and recreational passive gear fishing

Recreational fishing is a popular outdoor leisure activity in Europe but the actual impact on the targeted stocks is often unknown. Besides angling, marine recreational fishing in Denmark is practiced using passive gear, such as gill- and fykenets. A list of participants is updated continuously, as all recreational fishermen have to purchase a personal non-transferable and time limited national license before fishing. However, this list will not include those fishing illegally without a license. Therefore, two types of recall surveys with their own questionnaires and group of respondents were carried out. The first survey - the license list survey – was carried out once in 2009 and twice in 2010. This survey had a sampling frame corresponding to the list of persons that had purchased a license within the last 12 months. Respondents were asked to provide detailed information on catch and effort per ICES area and quarter. In order to also estimate the fraction of fishermen that fished without a valid license, a second survey, called – the Omnibus survey-, was carried out four times. This survey targeted the entire Danish population between 16 and 74 of age.

Variability of microsatellite loci of Greenland cod Gadus ogac Richardson 1836: Comparison with other species of Gadus genus (Gadidae)

Variability of microsatellite loci of Greenland cod Gadus ogac Richardson 1836: Comparison with other species of Gadus genus (Gadidae)

State: Published
Organisations: Section for Monitoring, National Institute of Aquatic Resources
Pages: 738-744
Publication date: 2011
Main Research Area: Technical/natural sciences
Åle- og torskefangst ved rekreativt fiskeri i Danmark: Undersøgelsesdesign og fangster i 2009

Eel and cod catches in Danish recreational fishing: Survey design and 2009 catches
Estimating abundances of 0-group western Baltic cod by using pound net fisheries

Nearshore 0-group western Baltic cod are frequently caught as bycatch in the commercial pound net fishery. Pound net fishermen from the Danish Isle of Funen and Lolland and the German Isle of Fehmarn have recorded their catches of small cod between September and December 2008. Abundance patterns were analysed, particularly concerning the influence of abiotic factors (hydrography, meteorology) and the differences between sampling sites. Catch per unit effort (CPUE) differed by site and location, whereas CPUE were highest at Lolland. Correlation between catch and wind/currents were generally weak. However, wind directions and current speeds seem to affect the catch rates. Finally an algorithm was developed to calculate a recruitment index for western Baltic cod recruitment success based on previous analyses.

General information
State: Published
Organisations: Section for Monitoring, National Institute of Aquatic Resources
Authors: Bauer, R. (Ekstern), Stepputtis, D. (Ekstern), Storr-Paulsen, M. (Intern), Weigelt, R. (Ekstern), Hammer, C. (Ekstern)
Pages: 1-11
Publication date: 2010
Main Research Area: Technical/natural sciences

Occurrence of anisakid nematodes in Atlantic cod (Gadus morhua) and Greenland cod (Gadus ogac), West Greenland

Anisakid nematodes commonly infect gadids, and are of economic and aesthetic importance to the commercial fishing industry in Greenland as some species are pathogenic to humans. However, very little is known about the occurrence of these parasites and their impact on the hosts in Greenland waters. During a survey in 2005, stomach sample of 227 Atlantic cod (Gadus morhua) and 64 Greenland cod (Gadus ogac) was collected in Godthaab and Sisimiut fiord systems in West Greenland waters. All cod were dissected for stomach contents and anisakid nematodes were removed from the visceral cavity. Third stage larvae (L3) of three anisakid species were found, including Contracaecum osculatum (Rudolph, 1802), Anisakis simplex (Rudolph, 1809) and Hysterothylacium aduncum (Rudolph, 1802). Molecular
Identification by PCR-RFLP indicated the presence of A. simplex s.s. and the sibling species C. osculatum B and C. The prevalence of infection by C. osculatum was higher in Greenland cod (84.3%) than in Atlantic cod (73.9%) whereas the prevalence of A. simplex showed an opposite pattern (Greenland cod 8.3%; Atlantic cod 24.2%). Only one G. morhua (1.0%) was infected by H. aduncum. No gender specific difference in both nematode species regarding prevalence of infection and mean infection intensity was evident, and there was no relationship between fish condition and the intensity of nematode infections. Standardised for size, capelin-eating cod were in better condition and more heavily infected than fish subsisting on alternative prey at the point of collection. Hence, nematode infections in the two gadids seem governed in part by feeding behaviour, and capelin appears a significant source of larval anisakids.

**General information**

**State:** Published
**Organisations:** Section for Monitoring, National Institute of Aquatic Resources, Aarhus University, University of Copenhagen, University of Gdansk
**Authors:** Mouritsen, K. N. (Ekstern), Hedeholm, R. (Ekstern), Schack, H. B. (Ekstern), Møller, L. N. (Ekstern), Storr-Paulsen, M. (Intern), Dzido, J. (Ekstern), Rokicki, J. (Ekstern)
**Pages:** 81-89
**Publication date:** 2010
**Main Research Area:** Technical/natural sciences

**Publication information**

**Journal:** Acta Parasitologica
**Volume:** 55
**Issue number:** 1
**ISSN (Print):** 1230-2821
**Ratings:**
- BFI (2018): BFI-level 1
- Web of Science (2018): Indexed yes
- BFI (2017): BFI-level 1
- Web of Science (2017): Indexed yes
- BFI (2016): BFI-level 1
- Scopus rating (2016): SJR 0.532 SNIP 0.721 CiteScore 1.24
- BFI (2015): BFI-level 1
- Scopus rating (2015): SJR 0.6 SNIP 0.831 CiteScore 1.18
- BFI (2014): BFI-level 1
- Scopus rating (2014): SJR 0.452 SNIP 0.778 CiteScore 0.9
- Web of Science (2014): Indexed yes
- BFI (2013): BFI-level 1
- Scopus rating (2013): SJR 0.497 SNIP 0.816 CiteScore 1.05
- ISI indexed (2013): ISI indexed yes
- Web of Science (2013): Indexed yes
- BFI (2012): BFI-level 1
- Scopus rating (2012): SJR 0.506 SNIP 0.923 CiteScore 1.12
- ISI indexed (2012): ISI indexed yes
- BFI (2011): BFI-level 1
- Scopus rating (2011): SJR 0.591 SNIP 0.696 CiteScore 0.89
- ISI indexed (2011): ISI indexed yes
- BFI (2010): BFI-level 1
- Scopus rating (2010): SJR 0.596 SNIP 0.656
- Web of Science (2010): Indexed yes
- BFI (2009): BFI-level 1
- Scopus rating (2009): SJR 0.594 SNIP 0.734
- BFI (2008): BFI-level 1
- Scopus rating (2008): SJR 0.515 SNIP 0.873
- Scopus rating (2007): SJR 0.487 SNIP 0.706
- Scopus rating (2006): SJR 0.406 SNIP 0.653
- Scopus rating (2005): SJR 0.312 SNIP 0.546
- Scopus rating (2004): SJR 0.326 SNIP 0.604
- Scopus rating (2003): SJR 0.276 SNIP 0.594
Stock-based vs. fleet-based evaluation of the multi-annual management plan for the cod stocks in the Baltic Sea

This study evaluated the EU 2008 multi-annual plan for Baltic cod stock recovery. The plan combines harvest control rules that set TACs with reductions in direct effort (E) and fishing mortality (F). Performance and robustness of the plan are tested with a management strategy evaluation model (MSE). Stochastic simulations are carried out under different scenarios of recruitment and sources of uncertainties. Under the different magnitudes of errors investigated, the plan in its current design is likely to reach precautionary targets for the Eastern and the Western Baltic cod stocks by 2015. It is, however, more sensitive to implementation errors (e.g. catch misreporting) than to observation errors (e.g. data collection) when the (i) current settings of the ICES single-stock assessment model are maintained. (ii) intended fishing effort reduction is fully complied with, and (iii) biological parameters are assumed constant. For the Eastern Baltic stock, additional sources of uncertainties from fishery adaptation to the plan are tested using a fleet-based and spatially explicit version of the model which leads to higher reductions in F and no significant change in management robustness. The relative difference between both approaches is mainly due to differences in exploitation patterns in catching the same amount of fish. The effort control is demonstrated to be more efficient when supplemented with a TAC and avoids unintended effects from fishery responses, e.g. spatial effort reallocation. Medium term economic evaluation of fishery performance shows an initial reduction in profit with effort and TAC reductions, but profit is always positive. (C) 2009 Elsevier B.V. All rights reserved.

General information
State: Published
Organisations: Section for Management Systems, National Institute of Aquatic Resources, Section for Public Sector Consultancy, Section for Monitoring
Authors: Bastardie, F. (Intern), Vinther, M. (Intern), Nielsen, J. R. (Intern), Ulrich, C. (Intern), Storr-Paulsen, M. (Intern)
Pages: 188-202
Publication date: 2010
Main Research Area: Technical/natural sciences

Publication information
Journal: Fisheries Research
Volume: 101
Issue number: 3
ISSN (Print): 0165-7836
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.21 SJR 1.12 SNIP 1.136
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.067 SNIP 1.133 CiteScore 2.01
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.105 SNIP 1.312 CiteScore 2.17
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.037 SNIP 1.173 CiteScore 1.85
ISI indexed (2013): ISI indexed yes
Dataindsamling til søs

General information
State: Published
Organisations: Section for Monitoring, National Institute of Aquatic Resources
Authors: Storr-Paulsen, M. (Intern)
Pages: 9
Publication date: 2009

Publication information
Pages (from-to): 9
Newspaper: Fiskeritidende
Volume: 16
No.: 36
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Den invasive Mnemiopsis-ribbegople i østersøtorskens gydeområde

General information
State: Published
Organisations: Section for Monitoring, National Institute of Aquatic Resources, Section for Population- and Ecosystem Dynamics
Authors: Storr-Paulsen, M. (Intern), Huwer, B. (Intern), Warnar, T. (Intern), Bøttiger, L. (Ekstern), Madsen, C. V. (Ekstern)
Pages: 14-24
Publication date: 2009
Main Research Area: Technical/natural sciences

Publication information
Journal: Fisk og Hav
Issue number: 62
ISSN (Print): 0105-9211
Ratings:
ISI indexed (2013): ISI indexed no
ISI indexed (2012): ISI indexed no
ISI indexed (2011): ISI indexed no
Original language: Danish
Links:
Source: orbit
Source-ID: 242886
Publication: Research › Journal article – Annual report year: 2009

Evaluation of the multiannual plan for the cod stocks in the Baltic Sea

General information
State: Published
Organisations: Section for Management Systems, National Institute of Aquatic Resources, Section for Public Sector Consultancy, Section for Monitoring
Authors: Bastardie, F. (Intern), Vinther, M. (Intern), Nielsen, J. R. (Intern), Ulrich, C. (Intern), Storr-Paulsen, M. (Intern)
Number of pages: 29
Publication date: 2009
Main Research Area: Technical/natural sciences

Host publication information
Title of host publication: Book of Abstracts
Links:
Source: orbit
Source-ID: 314574
Publication: Research › Conference abstract in proceedings – Annual report year: 2010

Garnfiskere skal registrere udsmid

General information
State: Published
Organisations: Section for Monitoring, National Institute of Aquatic Resources
Authors: Storr-Paulsen, M. (Intern)
Pages: 9
Udbredelse af den invasive ribbegople Mnemiopsis leidyi i Bornholmerdybet og mulige konsekvenser for kommercielt
vigtige fiskebestande

General information
State: Published
Organisations: Section for Population Ecology and Genetics, National Institute of Aquatic Resources, Section for
Monitoring
Authors: Huwer, B. (Intern), Storr-Paulsen, M. (Intern), Schaber, M. (Ekstern), Haslob, H. (Ekstern), Harjes, A. (Ekstern),
Hinrichsen, H. (Ekstern), Voss, R. (Ekstern), Köster, F. (Intern)
Publication date: 2009
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 279280
Publication: Research › Conference abstract for conference – Annual report year: 2009

Abundance, horizontal and vertical distribution of the invasive ctenophore Mnemiopsis leidyi in the central Baltic Sea,
November 2007

The distribution and abundance of the invasive ctenophore Mnemiopsis leidyi in the Bornholm Basin, an important
spawning ground of several fish stocks, and in adjacent areas in the central Baltic Sea was studied in November 2007.
The study showed that M. leidyi were relatively small (body length 18.6 ± 7.6 mm) and they were patchily distributed over
a large part of the investigated area. Specimens were found on 68 and 59% of stations sampled with a Bongo net (n=39)
and an Isaac-Kidd midwater trawl (n=51), respectively. Vertically, the highest densities of M. leidyi occurred at 40 to 60 m
around the halocline. Horizontally, the highest abundances were found north and west of Bornholm, but relatively high
densities were also observed in the Slupsk Furrow. The mean abundance was 1.58 ± 2.12 ind. m-2, the peak abundance
was 8.92 ind. m-2, and the average and peak population density were 0.03 ± 0.05 and 0.28 ind. m-3, respectively. The
abundances are low compared to densities recently observed in other areas of the Baltic region (e. g. Limfjorden, Åland
Sea) and the estimated predation impact on zooplankton by M. leidyi was negligible in November 2007. However,
because of the ctenophore’s wide distribution in the central Baltic Sea, its ability for rapid population growth, and its
potential influence on fish stocks by competing for food and by preying on fish eggs and newly hatched larvae, close
monitoring of the future development of M. leidyi in the Baltic Sea is strongly recommended.

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources, Section for
Fisheries Advice, University of Southern Denmark, Leibniz Institute of Marine Sciences
Authors: Huwer, B. (Intern), Storr-Paulsen, M. (Intern), Riisgaard, H. U. (Ekstern), Haslob, H. (Ekstern)
Pages: 113-124
Publication date: 2008
Main Research Area: Technical/natural sciences
Changes in distribution and lengths of Mnemiopsis leidyi in the central Baltic Sea between fall and spring

In March 2008, we conducted a survey to investigate the distribution and abundance of the invasive ctenophore Mnemiopsis leidyi in the Bornholm Basin after the winter period. Compared to the situation in November 2007 the centre of the distribution had shifted towards the deeper parts of the Basin where temperatures were higher than at the surface. Furthermore, we found a decrease in average size from 18.6 mm ± 7.6 SD in November to an average of 10.5 mm ± 4.9 SD in March, which may indicate the emergence of a new generation of M. leidyi between the two sampling dates.

General information
State: Published
Organisations: Section for Fisheries Advice, National Institute of Aquatic Resources, Section for Population- and Ecosystem Dynamics
Authors: Storr-Paulsen, M. (Intern), Huwer, B. (Intern)
Pages: 429-434
Publication date: 2008
Main Research Area: Technical/natural sciences

Publication information
Journal: Aquatic Invasions
Volume: 3
Response in stock size and recruitment of northern shrimp (Pandalus borealis) to changes in predator biomass and distribution in west Greenland waters

General information
State: Published
Organisations: Section for Monitoring, National Institute of Aquatic Resources
Authors: Wieland, K. (Intern), Storr-Paulsen, M. (Intern), Sünksen, K. (Ekstern)
Pages: 21-33
Publication date: 2008
Main Research Area: Technical/natural sciences
Publication information
Journal: Journal of Northwest Atlantic Fishery Science
Volume: 39
Biomass and abundance of demersal fish stocks off West Greenland estimated from the Greenland shrimp survey, 1988-2005

General information
State: Published
**Hvor er alle småtorskene?**

**General information**
State: Published
Organisations: Unknown
Authors: Storr-Paulsen, M. (Intern)
Pages: 4
Publication date: 2007
Main Research Area: Technical/natural sciences

**Publication information**
Journal: Fiskeritidende
Issue number: 38
ISSN (Print): 0909-7325
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ISI indexed (2012): ISI indexed no
ISI indexed (2011): ISI indexed no
Original language: Danish
Source: orbit
Source-ID: 227531
Publication: Research › Journal article – Annual report year: 2007

**Referenceflåde i Kattegat søges**

**General information**
State: Published
Organisations: Unknown
Authors: Jørgensen, O. A. (Intern), Storr-Paulsen, M. (Intern)
Pages: 16
Publication date: 2007
Main Research Area: Technical/natural sciences

**Publication information**
Journal: Fiskeritidende
Issue number: 49
ISSN (Print): 0909-7325
Ratings:
ISI indexed (2013): ISI indexed no
ISI indexed (2012): ISI indexed no
ISI indexed (2011): ISI indexed no
Original language: Danish
Source: orbit
Effect of tow duration on catch rate and size composition of Northern shrimp (Pandalus borealis) and Greenland halibut (Reinhardtius hippoglossoides) in the West Greenland Bottom Trawl Survey

The standard towing time in the annual West Greenland Bottom Trawl Survey for shrimp and fish has initially been 60 min. Shorter tow durations have been gradually introduced over time and a mixture of 30 and 15 min tows have been used in the recent years. From the surveys conducted since 1999, 15 and 30 min tows have been analysed to examine whether a reduction of tow duration to 15 min influences the catch per swept area (CPUE), its precision and the size composition of Northern shrimp and Greenland halibut. For both species, neither total biomass density nor numerical densities of different size groups differed significantly (p...
The importance of Atlantic cod (Gadus morhua) predation on northern shrimp (Pandalus borealis) in Greenland waters 2005

General information
State: Published
Organisations: Unknown
Authors: Storr-Paulsen, M. (Intern), Carl, J. (Ekstern), Wieland, K. (Ekstern)
Pages: 16
Publication date: 2006
Conference: Scientific Council Research Meeting NAFO, 01/01/2006
Main Research Area: Technical/natural sciences
Biomass and abundance of demersal fish stocks off West Greenland estimated from the Greenland shrimp survey, 1988-2004

General information
State: Published
Organisations: Section for Fisheries Advice, National Institute of Aquatic Resources, Section for Management Systems
Authors: Storr-Paulsen, M. (Intern), Jørgensen, O. A. (Intern)
Pages: 1-27
Publication date: 2005
Main Research Area: Technical/natural sciences

East and West Greenland cod: From: ICES 2005 Spawning and life history information for North Atlantic cod stocks

General information
State: Published
Organisations: Unknown
Authors: Wieland, K. (Intern), Storr-Paulsen, M. (Intern), Brander, K. (ed.) (Intern)
Publication date: 2005

Is cod recovering at West Greenland?

General information
State: Published
Biomass and abundance of demersal fish stocks off West Greenland estimated from the Greenland trawl survey, 1988-2003

General information
State: Published
Organisations: Section for Fisheries Advice, National Institute of Aquatic Resources, Section for Management Systems
Authors: Storr-Paulsen, M. (Intern), Jørgensen, O. A. (Intern)
Pages: 1-29
Publication date: 2004
Main Research Area: Technical/natural sciences

Stock structure of Atlantic cod (Gadus morhua) in West Greenland waters: implications of transport and migration

General information
State: Published
Organisations: Section for Fisheries Advice, National Institute of Aquatic Resources, Section for Fisheries- and Monitoring Technology
Authors: Storr-Paulsen, M. (Intern), Wieland, K. (Intern), Hovgård, H. (Intern), Rätz, H. (Ekstern)
Pages: 972-982
Publication date: 2004
Main Research Area: Technical/natural sciences
The stock structure of Atlantic cod (Gadus morhua) in West Greenland waters: Implications of transport and migration

General information
State: Published
Organisations: Section for Fisheries Advice, National Institute of Aquatic Resources, Section for Fisheries- and Monitoring Technology
Authors: Storr-Paulsen, M. (Intern), Wieland, K. (Intern), Hovgård, H. (Intern), Rätz, H. (Ekstern)
Pages: 1-20
Publication date: 2003
Main Research Area: Technical/natural sciences

Publication information
Journal: ICES C.M. 2003/
Volume: O:06
Original language: English
Source: orbit
Projects:

**Eastern Baltic cod - New knowledge of growth and mortality is the way to improved management advice (39366)**
The aim of the project is to improve the knowledge and data basis for stock assessment and management for cod in the eastern Baltic Sea.

In later years, changes in growth and natural mortality of cod have presumably taken place and new knowledge on these parameters is essential for restoring analytical stock assessment for Eastern Baltic cod that is currently lacking. Improved knowledge on cod growth and mortality is therefore a prerequisite for being able to evaluate the stock status in relation to management targets and implement management plans that are built on quantitative stock assessment.

Ecological situation in the Baltic Sea has changed in later years, which requires updated biological information. This is done in the project using different approaches, bringing together expertise of different research areas. The approaches applied include molecular-genetic analyses of cod growth, bioenergetic modelling, and analyses of monitoring data on predation and condition/growth of cod. An important component of the project is cooperation with fishing industry to support tagging experiments of Baltic cod, to obtain updated estimates of cod growth.

Finally, the project combines the new knowledge on cod that becomes available from this and other relevant projects to ensure that the assessment of stocks status and management advice is based on best available scientific information.

This project is coordinated by DTU Aqua.

The project is funded by the Ministry of Environment and Food of Denmark and the European Maritime and Fisheries Fund (EMFF).

National Institute of Aquatic Resources
Section for Ecosystem based Marine Management

Danish Fishermen's Association

University of Copenhagen
Period: 15/08/2016 → 15/08/2018
Number of participants: 8
Research areas: Ecosystem based Marine Management & Fish Biology & Marine Populations and Ecosystem Dynamics & Population Genetics & Marine Living Resources & Fisheries Management
Project participant:
Storr-Paulsen, Marie (Intern)
Tomkiewicz, Jonna (Intern)
Hansen, Jakob Hemmer (Intern)
Neuenfeldt, Stefan (Intern)
Christensen, Asbjørn (Intern)
Kindt-Larsen, Lotte (Intern)
Berg, Casper Willestofte (Intern)
Project Coordinator:
Eero, Margit (Intern)

**Forbedring af forvaltningsgrundlaget for bestande i det rekreative fiskeri (39370)**

National Institute of Aquatic Resources
Section for Monitoring and Data
Section for Ecosystem based Marine Management
Section for Freshwater Fisheries Ecology

Institute Management
Period: 14/07/2016 → 14/07/2018
Number of participants: 16
Acronym: REKREA
Sustainable management of Kattegat cod; Improved knowledge about stock components and migration (39346)
The Kattegat cod has been categorized as a data limited stock, mainly due to a large unallocated mortality, which may be caused by migration between Kattegat and neighbouring areas. In this project, we aim to improve our understanding of migration patterns and mixing of different stock components within the Kattegat through a novel combination of genetic and micro-chemical signatures for individual fish. Results from the project will feed directly into the ICES advisory process, including a scheduled benchmark meeting in early 2017 where new procedures for stock assessment will be discussed. As cod are also caught as bycatch in other fisheries, a more robust stock assessment for cod will also be important to fisheries for other species under the landing obligation, which is scheduled for implementation in the Kattegat in 2017.

This project is coordinated by DTU Aqua.

The project is funded by the Ministry of Environment and Food of Denmark and the European Maritime and Fisheries Fund (EMFF).

National Institute of Aquatic Resources
Section for Marine Living Resources
Danish Fishermen's Association
Period: 01/03/2016 → 28/02/2018
Number of participants: 7
Research areas: Population Genetics & Marine Living Resources & Fisheries Management
Project participant:
Hüssy, Karin (Intern)
Eero, Margit (Intern)
Thygesen, Uffe Høgsbro (Intern)
Storr-Paulsen, Marie (Intern)
Meldrup, Dorte (Intern)
Levinsky, Svend-Erik (Intern)
Project Coordinator:
Hansen, Jakob Hemmer (Intern)

Tagging Baltic cod (TABACOD) (39333)
The aim of this project is to improve the management of eastern Baltic cod by 1) providing new information on growth and mortality patterns, and 2) develop a validated method for deriving this information from historic and future samples.

In recent years, the traditional age-based stock assessment had to be abandoned owing to extensive uncertainties in stock trends. These uncertainties were to a large extent attributable to inconsistencies in age estimation. As a consequence thereof, the current stock status is unknown.

Estimates of growth and mortality rely on unbiased age information. TABACOD will provide this information through a
A large scale tagging experiment, where 20,000 cod are tagged with an externally visible tag as well as with an internal tag on their otoliths. This experiment will also provide the samples for the development and validation of a new age estimation method based on the chemical composition of the cod’s otoliths.

The knowledge gained will be incorporated in length-based assessment models and their performance compared to the traditional methods evaluated in order to provide the ICES stock assessment group with the relevant tools to provide a reliable advice and to improve stock exploitation.

This project is coordinated by DTU Aqua.

The project is funded by BalticSea2020.

National Institute of Aquatic Resources
Section for Oceans and Arctic
Swedish University of Agricultural Sciences
Johann Heinrich von Thünen-Institute
National Marine Fisheries Research Institute
Period: 01/01/2016 → 31/12/2019
Number of participants: 7
Research areas: Marine Populations and Ecosystem Dynamics & Fish Biology & Marine Living Resources
Project participant:
Olesen, Hans Jakob (Intern)
Andersen, Niels Gerner (Intern)
Storr-Paulsen, Marie (Intern)
Thygesen, Uffe Høgsbro (Intern)
Berg, Casper Willetofte (Intern)
PhD Student:
Nielsen, Kristian Ege (Intern)
Project Coordinator:
Hüssy, Karin (Intern)

Minimising discards in Danish fisheries (MINIDISC) (39020)

The landings obligation, currently being implemented in the new CFP, puts major constraints on fishers, by making the landing of unwanted catch mandatory. Less restrictive technical rules (TR) in a results-based management frame under Catch Quota Management (CQM) have been suggested as a mechanism to release some of these constraints. To investigate the effects of the existing TR, some fishers were relaxed from TR during the trial and could freely choose and develop alternative gears, aiming to optimize annual catch value, while reducing discards. The study included 14 demersal fishing vessels, operating in the North Sea, Skagerrak and the Baltic Sea.

Fishers used test and control gears interchangeably or in pairs during up to 6 months and were required to sort and weigh all discard of seven common target species on a haul by haul basis. All vessels were equipped for Fully Documented Fisheries (FDF), including cameras. Collected data were analyzed to investigate differences in landings, discards, discard ratio, CPUE, VPUE and DPUE, between conventional (control) and new gears (test). The results showed a varying degree of success, depending both on area and on choices made by the individual fisher. The best results were observed in the Baltic Sea, where relaxing technical rules led to major improvements in fishing patterns. But gear changes did not contribute much in fisheries where initial discards rates were already low. Interviews realized with the skippers around the end of the trial were performed and analyzed to investigate (i) their experiences with “free” choice of gear, (ii) the processes that they followed for developing their gears and (iii) their tools for evaluating the efficiency and selectivity of their trial.

In addition to the trial, a number of other activities were performed under the MINIDISC project, including (i) the publishing of a catalogue (in Danish) of the selectivity devices experimented in Danish fisheries, (ii) a scientific selectivity trial on Danish seines fisheries in Skagerrak and (iii) a review of international experiences in the uptake of selective devices.

The project has been disseminated through several meetings and conferences. A number of scientific publications are in review or close to submission.

This project was coordinated by DTU Aqua.

The project was funded by the Danish Ministry of Food, Agriculture and the Fisheries and the European Fisheries Fund (EFF).
Study on stomach content of fish to support the assessment of good environmental status of marine food webs and the prediction of MSY after stock restoration (Open call for tenders No MARE/2012/02) (39036)

In support of policies for sustainable management strategies of living marine resources, demands for integrated ecosystem advice are growing and more extensive use of long-term management plans, which are consistent with the ecosystem approach to fisheries management, is anticipated. However, long-term management plan evaluations of fish are particularly sensitive to changes in the proportion of fish removed by natural predators (natural mortality). A prerequisite for estimating this correctly is accurate knowledge of species interactions: Who is eating whom when, where and in which quantity?

Existing stomach content data are currently used in multispecies models using historic stomach content data from before 1995. Since this period, there have been considerable changes in the predator and prey stocks of both the Baltic and the North Sea. Thus, updated information on stomach contents of the essential predators in these two areas is urgently needed.

In order to update and improve the quality and quantity of the available background data for the above mentioned multispecies models and management plans, the aim of this project is to
- conduct new stomach content analyses of Baltic cod to support our knowledge of the spatial and temporal stability of cod preferences
- conduct new stomach content analyses of Baltic whiting as well as grey gurnard, mackerel and hake collected in the North Sea to support our knowledge of potentially important predators for which the diet is presently poorly known or is expected to have changed significantly since the last sampling efforts
- compile historical data, which are existing in several institutes around the Baltic and North Sea, and convert them from paper or outdated electronic format into the necessary standard format
- incorporate the new as well as all appropriate historical stomach content information into the Baltic and North Sea stomach content databases

The end product will be updated stomach content databases for the Baltic and North Sea, which include all available information up to 2013. In the Baltic, the project will increase the number of stomachs available for modeling by more than 170%. In the North Sea, the project will increase the number of years where data are available for grey gurnard from 2 to 8, for mackerel from 2 to 6 and for hake from 0 to 1, hence substantially increasing the confidence in the temporal stability of the modeling results.

The databases will be made freely available to the scientific community and will form the basis for new estimates of natural mortality and improved long-term management plans in the Baltic and North Sea.

The project is coordinated by DTU Aqua.

National Institute of Aquatic Resources
Section for Marine Ecology and Oceanography
Johann Heinrich von Thünen-Institute
National Marine Fisheries Research Institute
The aim of this project was to improve the management of western Baltic cod by incorporating stock identification routines in order to discriminate between eastern and western Baltic cod stocks. In recent years, evidence from fishery patterns and otolith structures have indicated an increasing degree of mixing between the two cod stocks which, up until 2013, were managed as two separate stocks. Changes in fishing pressure and patterns would therefore result in a risk for local depletion of the smaller western stock.

Stock identification methods were based on established approaches using genetic discrimination and otolith shape analysis, and improved by linking these methods. This method provides a tool to estimate the degree of stock mixing using the existing otolith archives. This approach documented an increase of eastern Baltic cod from 30% to > 80% in the eastern part of the western Baltic Sea management area. As a consequence of this stock mixing, a new procedure incorporating stock mixing on an annual basis was set in place, with the aim to improve stock exploitation and reduce the risk of local depletion. The knowledge gained also influenced recent management regulations, particularly a prolongation of spawning closer of the fishery in 2016.

The project was coordinated by Centre for Environment, Fisheries & Aquaculture Science, UK. The project was funded by the Danish Ministry of Food, Agriculture and Fisheries and the European Fisheries Fund (EFF).
The purpose of the project was to investigate main exploited fish stock and fisheries dynamics in relation to the marine environment with focus on the Fehmarn Belt area in the Western Baltic Sea. The work was associated to the scientific baseline investigations (2009-13) and impact assessment of the projection of the Fehmarn Belt Fixed Link between Denmark and Germany involving a science cooperation between DTU Aqua, Thünen-Institute and Femern Bælt A/S in order to generate knowledge on potential impacts of establishment of the fixed link.

Focus was on the most important commercial fisheries and fish stocks in the area (cod, herring, and sprat, but also flatfish and eels).

Tasks and Deliverables

The work covered WP0: Prospecting, planning and development of the investigations, producing outline and main contents of the science provision contract and coordination of tasks hereunder with DTU Aqua as international project coordinator; WP1: Review of knowledge: Review, provision of data, and analyses of selected historical data on fish stock and fisheries dynamics; WP2: Extension of existing, standard research surveys and linking to standard survey time series to detect potential effects on important fish stocks; WP3: Evaluation of potential integrated effects on important fish stocks and fisheries; WP4: Evaluation of potential effects of change and variability in hydrographic features and conditions on recruitment for important fish stocks (cod, herring, sprat); WP5: Evaluation of herring occurrences and migrations as well as separation of spring and autumn spawning herring stock components in the area.

WP1 included provision of state of the art knowledge from historical surveys and review of quality of survey indices, commercial fisheries data, and information on recruitment dynamics with emphasis on fluctuations in distribution and productivity with respect to environmental and anthropogenic drivers of change including species interactions and fisheries.

WP 2 included extension of existing standard surveys in the near field area and analyses of both the standard and extended time series with respect to variability in distribution, density and abundance patterns of relevant stocks, as well as developing advanced scientific survey evaluation models and methods for doing this.

WP 3 analyzed stock and fisheries dynamics by use and development of complex multi-fleet-multi-stock bio-economic management evaluation models performing analyses on a very high spatial and temporal resolution scale using integrated fisheries, stock and survey data. The models evaluated different management options and scenarios relevant for the establishment of the fixed link.

WP 4 evaluated variability in recruitment and important spawning areas according to hydrographic features and in relation to impact of the fixed link among others by use and further development of complex hydro-dynamic models.

WP 5 evaluated herring stock occurrence and migration patterns in the Baltic area by use of genetic identity markers, otolith micro-structures and information from fisheries and research surveys in order to evaluate impact of the fixed link. The project has besides a long row of project papers produced around 30 scientific peer reviewed journal papers where DTU Aqua are first author on more than half and co-author on more than 20 of the papers.

The project was coordinated by DTU Aqua. The project was funded by the 3 partners with external funding from Femern Bælt A/S.
Management plans and Danish fishery (2245)
The objectives of the project were with reference to the EU Commissions proposals on multi-annual management plans, to deliver high quality advice on management of the fishing effort in Danish fisheries in the Baltic Sea, the North Sea, the Skagerrak and the Kattegat.

To be able to deliver the advice the project addressed the need for detailed and accurate data on catches, effort and economical performance in the main demersal Danish fisheries in the concerned areas and the need for accurate stock assessment of the economically most important fish and shellfish stocks. The project also developed a systematic method to give a qualified prediction of the selectivity of a trawl based on information on the trawl design.

The project included seven work packages: (i) Description of development in catches, fishing effort and economical performance of the main demersal Danish fisheries including creation of a single database; (ii) Develop a reference fleet system to collect detailed information on catches and fishing effort; (iii) Development of a software to be used to simulate trawl selectivity; (iv) Establish a fisheries independent monitoring survey on Norway lobster in the Skagerrak and the Kattegat; (v) Provide advice on a fishing effort management system for the demersal fisheries in Kattegat including proposal for enhancement of the cod selectivity in trawl fisheries; (vi) Provide advice on fishing effort in form of days at sea by métier; and (vii) Evaluate the impact of the effort management system in the Baltic Sea on the Danish fishery and the stocks.

The project was coordinated by DTU Aqua.

National Institute of Aquatic Resources
Section for Ecosystem based Marine Management
University of Copenhagen
Period: 01/01/2006 → 31/12/2008
Number of participants: 13
Research areas: Fisheries Management & Fisheries Technology
Project participant:
Munch-Petersen, Sten (Intern)
Madsen, Niels (Intern)
Bastardie, Francois (Intern)
Pedersen, Eva Maria (Intern)
Christensen, Steen (Ekstern)
Project Manager, academic:
Kirkegaard, Eskild (Intern)
Andersen, Bo Selgaard (Intern)
Jørgensen, Ole A. (Intern)
Herrmann, Bent (Intern)
Storr-Paulsen, Marie (Intern)
Dalskov, Jørgen (Intern)
Nielsen, J. Rasmus (Intern)
Krag, Ludvig Ahm (Intern)

Project

**Spatially-explicit management methods for North Sea cod – a Danish fishermen-science collaboration (REX, REX II, REX III) (38430, 38431, 38541)**

The REX project started in 2006 as a protest from the Danish Fishermen Association because fishers had a less pessimistic perception of the status of the cod stock in the North Sea than ICES, and they considered the agreed TAC levels far too low. In particular the fishermen considered the scientific surveys as inappropriate due to extremely low catches of large cod because of wrong gear and fishing on smooth bottom only. This seemed to call for more spatially-explicit oriented approaches and REX was born with an aim of getting closer to a common understanding of the true number of adult cod in the North Sea by focusing on communication and collaboration in developing and implementing a scientifically sound and robust survey strategy with commercial ships in a north-eastern area selected by the Danish Fishermen Association using three vessels presenting different fishing methods (flyshooter, trawler and gillnetter).

The development of the fishermen-scientists collaboration with mutual respect has increased the understanding on both sides. In particular the emphasis on defining common goals, facing and solving conflicts immediately and extending thorough collaboration from survey planning, conducting of field work to interpretation of results during workshops have contributed to bridging the communication gap.

A better understanding of cod biology has also been a focal point in these projects through the new field studies incorporating fishermen’s knowledge. This includes distribution and migration, feeding behavior and importance of Hot-Spots (e.g. ship wrecks). Electronic tags were applied to learn about migration also in the Baltic. Together with the aim of continuing to obtain better assessments of the stocks such more mechanistically oriented studies are needed to answer two apparently simple questions “Where are the cod and why?”

The REX projects have strengthened the scientific collaboration with fishermen and produced several results and types of knowledge that will influence future work on developing spatial explicit management tools. REX also represents capacity building for DTU Aqua’s interdisciplinary field research and monitoring towards the spatial dynamics of cod.

The project is coordinated by DTU Aqua.

National Institute of Aquatic Resources
Section for Marine Living Resources
Danish Fishermen's Association
Period: 01/01/2006 → 31/01/2010
Number of participants: 17
Research area: Marine Living Resources
Project participant:
Pedersen, Eva Maria (Intern)
Olesen, Hans Jakob (Intern)
Andersen, Ken Haste (Intern)
Thygesen, Uffe Høgsbro (Intern)
Kristensen, Kasper (Intern)
Berg, Casper Willestofte (Intern)
Storr-Paulsen, Marie (Intern)
Vinther, Morten (Intern)
Christensen, Per (Intern)
Jensen, Rasmus Frydenlund (Intern)
Pedersen, Jan (Intern)
Grønby, Søren Larsen (Intern)
Thaarup, Flemming (Intern)
Project Manager, organisational:
Neuenfeldt, Stefan (Intern)
Project Manager, academic:
Beyer, Jan (Intern)
Andersen, Niels Gerner (Intern)
Wieland, Kai (Intern)
Understanding the mechanisms of stock recovery (UNCOVER) (38104)
The UNCOVER project has produced a rational scientific basis for developing Long-Term Management Plans (LTMP) and recovery strategies for 11 of the ecologically and socioeconomically most important fish stocks/fisheries in the Norwegian and Barents Seas, the North Sea, the Baltic Sea and the Bay of Biscay and Iberian Peninsula.

UNCOVER’s objectives were to:
(i) identify changes experienced during stock depletion/collapses,
(ii) to understand prospects for recovery,
(iii) to enhance the scientific understanding of the mechanisms of fish stock/fishery recovery, and
(iv) to formulate recommendations how best to implement LTMPs/recovery plans.

The project recommends that such plans ideally should include:
(i) Consideration of stock-regulating environmental processes,
(ii) Incorporation of fisheries effects on stock structure and reproductive potential,
(iii) Consideration of changes in habitat dynamics due to global change,
(iv) Incorporation of biological and technological multispecies interactions,
(v) Integration of economically optimized harvesting,
(vi) Exploration of the socio-economic implications and political constraints from existing and alternative recovery plans,
(vii) Investigations on the acceptance of plans by stakeholders and specifically incentives for compliance by the fishery,
(viii) Agreements with and among stakeholders.

UNCOVER has provided imperative policy support underpinning the following fundamental areas:
(i) Evolution of the Common Fisheries Policy with respect to several aims of the ‘Green Paper’;
(ii) Contributing to the Marine Strategy Framework Directive with respect to fish stocks/communities;
(iii) achieving Maximum Sustainable Yield (MSY) for depleted fish stocks. This has been done by contributing to LTMPs/recovery plans for fish stocks/fisheries, demonstrating how to shift from scientific advice based on limit reference points towards setting and attaining targets such as MSY, and furthering ecosystem-based management through incorporating multispecies, environmental and habitat, climate variability/change, and human dimensions into these plans.

The project was coordinated by Institut für Ostseefischerei, Bundesforschungsanstalt für Fischerei, Germany.

National Institute of Aquatic Resources
Section for Marine Living Resources
Bundesforschungsanstalt für Fischerei
Marine Research Unit, Marine and Food Technological Centre
Cefas
University of Portsmouth
Marine Laboratory
Instituto Español de Oceanografía
Aalborg University
Leibniz Institut für Meereswissenschaften, Universität Kiel
IFREMER
Institute of Marine Research
Sea Fisheries Institute
Knipovich Polar Research Institute of Marine Fisheries and Oceanography
Nederlands Instituut voor Visserij Onderzoek b.v.
University of Aberdeen
University of Bergen
University of Hamburg

Period: 01/01/2006 → 31/12/2010
Number of participants: 14
Research areas: Marine Living Resources & Fish Biology
Contact person:
Köster, Fritz (Intern)
Project participant:
Tomkiewicz, Jonna (Intern)
Vintherr, Morten (Intern)
Payne, Mark (Intern)
Munk, Peter (Intern)
Støttrup, Jósianné Gatt (Intern)
Storr-Paulsen, Marie (Intern)
Eg Nielsen, Einar (Intern)
Brander, Keith (Intern)
Andersen, Ken Haste (Intern)
Huwer, Bastian (Intern)
Bastardie, François (Intern)
Project Manager, academic:
Neuenfeldt, Stefan (Intern)
MacKenzie, Brian (Intern)

Activities:

ICES - Annual Meeting of Advisory Working Group Chairs - WGCHAIRS (External organisation)
Period: 2015
Marie Storr-Paulsen (Participant)
National Institute of Aquatic Resources
Section for Monitoring and Data

Related external organisation

ICES - Annual Meeting of Advisory Working Group Chairs - WGCHAIRS
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

ICES - Baltic Fisheries Assessment Working Group - WGBFAS (External organisation)
Period: 2015
Marie Storr-Paulsen (Chairman)
National Institute of Aquatic Resources
Section for Monitoring and Data
Degree of recognition: International

Related external organisation

ICES - Baltic Fisheries Assessment Working Group - WGBFAS
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

ICES - Benchmark Workshop on Baltic Cod Stocks - WKBALTCOD (External organisation)
Period: 2015
Marie Storr-Paulsen (Chairman)
National Institute of Aquatic Resources
Section for Monitoring and Data
Degree of recognition: International

Related external organisation

ICES - Benchmark Workshop on Baltic Cod Stocks - WKBALTCOD
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar
ICES - Planning Group on Data Needs for Assessments and Advice - PGDATA (External organisation)
Period: 2015
Marie Storr-Paulsen (Chairman)
National Institute of Aquatic Resources
Section for Monitoring and Data
Degree of recognition: International
Related external organisation
ICES - Planning Group on Data Needs for Assessments and Advice - PGDATA
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

ICES - Working Group on Commercial Catches Sampling - WGCATCH (External organisation)
Period: 2015
Marie Storr-Paulsen (Participant)
National Institute of Aquatic Resources
Section for Monitoring and Data
Degree of recognition: International
Related external organisation
ICES - Working Group on Commercial Catches Sampling - WGCATCH
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

ICES - A Benchmark Workshop on Baltic Flatfish Stocks - WKBALFLAT (External organisation)
Period: 2014
Marie Storr-Paulsen (Participant)
National Institute of Aquatic Resources
Section for Monitoring and Data
Degree of recognition: International
Related external organisation
ICES - A Benchmark Workshop on Baltic Flatfish Stocks - WKBALFLAT
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

ICES - Annual Meeting of Advisory Working Group Chairs - WGCHAIRS (External organisation)
Period: 2014
Marie Storr-Paulsen (Participant)
National Institute of Aquatic Resources
Section for Monitoring and Data
Degree of recognition: International
Related external organisation
ICES - Annual Meeting of Advisory Working Group Chairs - WGCHAIRS
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

ICES - Baltic Fisheries Assessment Working Group - WGBFAS (External organisation)
Period: 2014
Marie Storr-Paulsen (Chairman)
National Institute of Aquatic Resources
Section for Monitoring and Data
Degree of recognition: International

Related external organisation

ICES - Baltic Fisheries Assessment Working Group - WGBFAS
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

ICES - Planning Group on Commercial Catches, Discards and Biological Sampling - PGCCDBS (External organisation)
Period: 2014
Marie Storr-Paulsen (Participant)
National Institute of Aquatic Resources
Section for Monitoring and Data
Degree of recognition: International

Related external organisation

ICES - Planning Group on Commercial Catches, Discards and Biological Sampling - PGCCDBS
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

ICES - The Working Group on Commercial Catches - WGCATCH (External organisation)
Period: 2014
Marie Storr-Paulsen (Participant)
National Institute of Aquatic Resources
Section for Monitoring and Data
Degree of recognition: International

Related external organisation

ICES - The Working Group on Commercial Catches - WGCATCH
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

ICES - The Workshop on Scoping for Integrated Baltic Cod Assessment - WKSIBCA (External organisation)
Period: 2014
Marie Storr-Paulsen (Participant)
National Institute of Aquatic Resources
Section for Monitoring and Data
Degree of recognition: International

Related external organisation

ICES - The Workshop on Scoping for Integrated Baltic Cod Assessment - WKSIBCA
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

ICES - Baltic Fisheries Assessment Working Group - WGBFAS (External organisation)
Period: 2013 → …
Marie Storr-Paulsen (Chairman)
National Institute of Aquatic Resources
Section for Monitoring and Data
Degree of recognition: International

Related external organisation

ICES - Baltic Fisheries Assessment Working Group - WGBFAS
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar
ICES - Baltic Fisheries Assessment Working Group - WGBFAS (External organisation)
Period: 2012 → …
Marie Storr-Paulsen (Participant)
National Institute of Aquatic Resources
Section for Monitoring
Degree of recognition: International

Related external organisation
ICES - Baltic International Fish Survey Working Group - WGBIFS (External organisation)
Period: 2012 → …
Marie Storr-Paulsen (Participant)
National Institute of Aquatic Resources
Section for Monitoring
Degree of recognition: International

Related external organisation
ICES - Planning Group on Commercial Catches, Discards and Biological Sampling - PGCCDBS (External organisation)
Period: 2012 → …
Marie Storr-Paulsen (Participant)
National Institute of Aquatic Resources
Section for Monitoring
Degree of recognition: International

Related external organisation
ICES - Study Group on Practical Implementation of Discard Sampling Plans - SGPIDS (External organisation)
Period: 2012 → …
Marie Storr-Paulsen (Participant)
National Institute of Aquatic Resources
Section for Monitoring
Related external organisation

ICES - Study Group on Practical Implementation of Discard Sampling Plans - SGPIDS
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

ICES - Working Group on Recreational Fisheries Surveys - WGRFS (External organisation)
Period: 2012 → …
Marie Storr-Paulsen (Participant)
National Institute of Aquatic Resources
Section for Monitoring
Degree of recognition: International

Related external organisation

ICES - Working Group on Recreational Fisheries Surveys - WGRFS
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

ICES - Workshop on Regional Database (External organisation)
Period: 2012 → …
Marie Storr-Paulsen (Participant)
National Institute of Aquatic Resources
Section for Monitoring
Degree of recognition: International

Related external organisation

ICES - Workshop on Regional Database
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar