1

14 References

- Alexander, Karen A.; Heymans, Johanna J.; Magill, Shona; Tomczak, Maciej T.; Holmes, Steven J.; Wilding, Thomas A. 2015. Investigating the recent decline in gadoid stocks in the west of Scotland shelf ecosystem using a foodweb model. ICES JOURNAL OF MARINE SCIENCE, Vol. 72, No. 2, 2015, p. 436-449.
- Beggs, S. 2007. Stock Identification of 0-group Herring in the Irish Sea (VIIaN): Otolith microstructure and shape. Working Document to ICES HAWG.
- Beggs, S., -Jan Schon, P.-J., McCurdy, W., Peel, J., McCorriston, P. and McCausland, I. 2008. Seasonal Origin of Irish Sea Herring. Working Document to ICES HAWG 2008. Bowers, A. 1964. 0-group herring in the North Irish Sea. Seasonal Report of the Marine Biological Station Port Erin, 77: 34–42.
- Berg, Casper W., Nielsen, Anders and Kristensen, Kasper. 2014. Evaluation of alternative age-based methods for estimating relative abundance from survey data in relation to assessment models. Fisheries Research, 151: 91-99.
- Berg, F., Almeland, O. W., Skadal, J., Slotte, A., Andersson, L., Folkvord, A. 2018. Genetic factors have a major effect on growth, number of vertebrae and otolith shape in Atlantic herring (*Clupea harengus*). PLoS ONE, 13: e0190995.
- Berg, F., Lusseau, S. M., Bartolino, V., Gröhsler, T., Kvamme, C., Nash, R. D. M., Slotte, A. 2019. Using otolith shape analysis and machine learning techniques to discriminate between stocks of Atlantic herring. ICES CM 2019/C:427.
- Berg, F., Østgaard, H.D., Slotte, A., Andersson, L., and Folkvord, A. 2020. A combination of genetic and phenotypic characterization of spring- and autumn-spawning herring suggests gene flow between populations. ICES Journal of Marine Science. doi: 10.1093/icesjms/fsaa046.
- Bergström, U., Olsson, J., Casini, M., Eriksson B.K., Fredriksson R., Wennhage H., Appelberg M. (2015). Stickleback increase in the Baltic Sea - A thorny issue for coastal predatory fish. Estuarine, Coastal and Shelf Science. 163:134 – 142.
- Burke, N., Brophy, D., and King, P. A. 2008. Otolith shape analysis: its application for discriminating between stocks of Irish Sea and Celtic Sea herring (Clupea harengus) in the Irish Sea. – ICES Journal of Marine Science, 65: 1670–1675.
- Burke, N., Brophy, D., Schön, P-J., and King, P. A. 2009. Temporal trends in stock origin and abundance of juvenile herring (Clupea harengus) in the Irish Sea. ICES Journal of Marine Science, 66: 1749–1753.
- Cardinale, M., Möllmann, C., Bartolino, V., Casini, M., Kornilovs, G., Raid, T., Margonski, P., Grzyb, A., Raitaniemi, J., Gröhsler, T., Flinkman, J. (2009). Effect of environmental variability and spawner characteristics on the recruitment of Baltic herring *Clupea harengus* populations. Marine Ecology Progress Series, 388, 221-234.
- Chen, K.-Y., Marschall, E.A., Sovic, M.G., Fries, A.C., Gibbs, H.L., Ludsin, S.A. 2018. assignPOP: An r package for population assignment using genetic, non-genetic, or integrated data in a machine-learning framework. Methods in Ecology and Evolution 9: 439-446.
- Clarke, M., and Egan, A. 2012. Evaluation of proposed long-term management plan for Celtic Sea Herring. ICES CM 2012/ACOM:75. 48 pp.
- Clarke, M., and Egan, A. 2017. "Good luck or good governance? The recovery of Celtic Sea herring." *Marine Policy* 78 (2017): 163-170.
- Darby, C. D., & Flatman, S. 1994. Lowestoft VPA Suite Version 3.1 User Guide. MAFF: Lowestoft.

- Dodson, J.J., Daigle, G., Hammer, C., Polte, P., Kotterba, P., Winkler, G., Zimmermann, C. (2019). Environmental determinants of larval herring (Clupea harengus) abundance and distribution in the western Baltic Sea. Limnology and Oceanography, Limnology and Oceanography 64, 2019, 317–329
- EU 2016/0203 (NLE). Proposal for a COUNCIL REGULATION amending Regulations (EU) 2016/72 and (EU) 2015/2072 as regards certain fishing opportunities.
- EU 2017/127. COUNCIL REGULATION (EU) 2017/127 of 20 January 2017 fixing for 2017 the fishing opportunities for certain fish stocks and groups of fish stocks, applicable in Union waters and, for Union fishing vessels, in certain non-Union waters <u>http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32017R0127</u>
- Gröger, J.P., Hinrichsen, H.-H., Polte, P. (2014). Broad-scale climate influences on spring-spawning herring (Clupea harengus L.) recruitment in the western Baltic Sea. PLoS One 9, e87525, Doi:10.1371/journal.pone.0087525.
- EU 2018/120. COUNCIL REGULATION of 23 January 2018 fixing for 2018 the fishing opportunities for certain fish stocks and groups of fish stocks, applicable in Union waters and, for Union fishing vessels, in certain non-Union waters, and amending Regulation (EU) 2017/127. http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R0120&from=EN
- EU 2019/124. COUNCIL REGULATION of 30 January 2019 fixing for 2019 the fishing opportunities for certain fish stocks and groups of fish stocks, applicable in Union waters and, for Union fishing vessels, in certain non-Union waters, and amending Regulation (EU) 2017/127 https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R0124&from=EN
- Fernández, A.C. and Prista, N. 2012. Portuguese discard data on anglershouthernLophiuspiscatorius and blackbellied angler Lophiusbudegassa (2004-2010). Working document-07 presented at WKFLAT2012. ICES CM: ACOM: 46.
- Harma, C., Brophy, D., Minto, C., and Clarke, M. 2012. The rise and fall of autumn-spawning herring (Clupea harengus L.) in the Celtic Sea between 1959 and 2009: Temporal trends in spawning component diversity. Fisheries Research 121–122: 31–42.
- Hintzen, N. T., Roel, B., Benden, D., Clarke, M., Egan, A., Nash, R. D. M., Rohlf, N., and Hatfield, E. M. C. 2015.Managing a complex population structure: exploring the importance of information from fisheries-independent sources. – ICES Journal of Marine Science, 72: 528–542.
- ICES, 1994. Report of the Study Group on Herring Assessment and Biology in the Irish Sea and Adjacent Waters. ICES C.M.1994/H:5. 67 pp.
- ICES. 2006. Report of the Herring Assessment Working Group South of 620 N (HAWG), 14–23 March, ICES Headquarters. ICES CM 2006/ACFM:20. 647 pp.
- ICES 2007. Report of the Herring Assessment Working Group for the Area South of 62°N (HAWG). ICES CM 2007/ACFM:11, 340 pp.
- ICES. 2008. Report of the Herring Assessment Working Group South of 62 N (HAWG), 11-19 March 2008, ICES Headquarters, Copenhagen. ICES CM 2008/ACOM:02. 601 pp.
- ICES. 2010. Report of the Herring Assessment Working Group for the Area South of 62n (HAWG), 15 23 March 2010, ICES Headquarters, Copenhagen, Denmark. 688 pp.
- ICES, 2012a. Report of the Anglerfish (Lophiuspiscatorius) illicia and otoliths exchange 2011. 61 pp.
- ICES. 2012b. Report of the Benchmark Workshop on the Flatfish Species and Anglerfish (WKFLAT), 1–8 March 2012, Bilbao, Spain. ICES CM 2012/ACOM:46.
- ICES. 2013. Report of the Benchmark Workshop on Sprat Stocks (WKSPRAT), 11–15 February 2013, Copenhagen, Denmark. ICES CM 2013/ACOM:48. 220 pp
- ICES. 2013. Report of the Benchmark Workshop on Sprat Stocks (WKSPRAT), 11–15 February 2013, Copenhagen, Denmark. ICES CM 2013/ACOM:48. 220 pp

- ICES. 2014a. Interim Report of the Working Group on Multispecies Assessment Methods (WGSAM), 20–24 October 2014, London, UK. ICES CM 2014/SSGSUE:11. 104 pp.
- ICES. 2014b. Report of the Workshop to consider reference points for all stocks (WKMSYREF2), 8-10 January 2014, ICES Headquarters, Copenhagen, Denmark. ICES CM 2014/ACOM:47. 91 pp.
- ICES. 2015b. Report of the Herring Assessment Working Group for the Area South of 62°N (HAWG), 10– 19 March 2015, ICES HQ, Copenhagen, Denmark. ICES CM 2015/ACOM:06. 864 pp.
- ICES. 2016. Report of the Working Group on Multispecies Assessment Methods (WGSAM), 9–13 November 2016, Woods Hole, USA. ICES CM 2016/SSGEPI:20. 206 pp.
- ICES 2016a. General context of ICES advice. In Report of the ICES Advisory Committee, 2016. ICES Advice 2016, Book 1, Section 1.2.
- ICES. 2016b. Report of the Workshop to consider FMSY ranges for stocks in ICES categories 1 and 2 in Western Waters (WKMSYREF4), 13–16 October 2015, Brest, France. ICES CM 2015/ACOM:58.
- ICES 2016b. Greater North Sea Ecoregion Ecosystem overview. In Report of the ICES Advisory Committee 2016. ICES Advice, 2016. Book 6. Section 6.1.
- ICES 2016. Report of the Working Group on Integrated Assessments of the North Sea (WGINOSE). ICES CM 2016/SSGIEA:06.
- ICES. 2016. Report of the Workshop on Blue Whiting (Micromesistius poutassou) Long Term Management Strategy Evaluation (WKBWMS), 30 August 2016, ICES HQ, Copenhagen, Denmark. ICES CM 2016/ACOM:53. 104 pp.
- ICES 2016a. EU request for advice on a scientific monitoring fishery for herring in ICES divisions 6.a, 7.b, and 7.c. Section 5.4.3 in ICES Special Request Advice Celtic Seas Ecoregion. 29 April 2016.
- ICES. 2017. Interim Report of the Working Group of International Pelagic Surveys (WGIPS). 16-20 January 2017. Reykjavik, Iceland. ICES CM 2017/SSGIEOM:15. 577 pp.
- ICES. 2017. EU request to assess the effects of lifting the "sprat box". In Report of the ICES Advisory Committee, 2017. ICES Advice 2017, sr.2017.06.
- ICES 2017a. Herring (*Clupea harengus*) in divisions 6.a and 7.b-c (west of Scotland, west of Ireland). *In* Report of the ICES Advisory Committee, 2017. Advice book 5. Section 5.3.33: June 30th 2017. Version 2: 11 July 2017 Version 3: 06 October 2017 DOI: 10.17895/ices.pub.3061. <u>http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2017/2017/her.27.6a7bc.pdf</u>
- ICES. 2017. EU request for ICES to evaluate the recovery plan for herring in divisions 6.a and 7.b–c. *In* Report of the ICES Advisory Committee, 2017. ICES Advice 2017, sr.2017.20.9 pp.
- ICES 2017b. EU request for ICES to evaluate the recovery plan for herring in divisions 6.a and 7.b–c. ICES Special Request Advice Celtic Seas and Bay of Biscay and the Iberian Coast Ecoregions Published 24 November 2017 sr.2017.20 DOI: 10.17895/ices.pub.3599
- ICES. 2018a. Report of the Benchmark Workshop on Pelagic Stocks (WKPELA 2018), 12–16 February 2018, ICES HQ, Copenhagen, Denmark. ICES CM 2018/ACOM:32. 313 pp.
- ICES, 2018b EU request for ICES to evaluate the long-term management plan for Celtic Sea herring
- ICES. 2018. Report of the Working Group on International Pelagic Surveys (WGIPS). ICES WGIPS Report 2018 15–19 January 2018. Den Helder, the Netherlands. 340 pp.
- ICES. 2018. Interim Report of the Working Group of International Pelagic Surveys (WGIPS). 13-18 January 2018. Santa Cruz, Tenerife. ICES CM 2018/SSGIEOM:15. 577 pp.
- ICES. 2018a. Report of the Herring Assessment Working Group for the Area South of 62°N (HAWG). 29-31 January 2018 and 12-20 March 2018. ICES HQ, Copenhagen, Denmark. ICES CM 2018/ACOM:07. 960 pp.

http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2018/HAW G/01%20HAWG%20Report%202018.pdf

- ICES. 2018. Benchmark Workshop on Sprat (WKSPRAT 2018). ICES WKSPRAT Report 2018, 5–9 November 2018. ICES HQ, Copenhagen, Denmark. ICES CM 2018/ACOM:35. 60 pp.
- ICES. 2018 Report of the workshop on mixing of western and central Baltic herring stocks (WKMixHER). 11–13 September 2018, Gdynia, Poland. ICES CM 2018/ACOM:63. 39 pp.
- ICES.2018. Workshop on the management strategy evaluation of the reference point, Fcap, for Sprat in Division 3.a and Subarea 4 (WKspratMSE). 11-12 December 2018. ICES HQ, Copenhagen, Denmark. ICES CM 2018/ACOM:69.
- ICES. 2019. Interbenchmark Protocol for Herring in 6.a, 7.b-c 2019 (IBPher6a7bc). ICES Scientific Reports. 1:19. 74 pp. <u>http://doi.org/10.17895/ices.pub.5261</u>
- ICES. 2019. ICES Working Group of International Pelagic Surveys (WGIPS). ICES Scientific Reports. 1:11. 499 pp. <u>http://doi.org/10.17895/ices.pub.5122</u>
- ICES. 2019. ICES User Handbook: Best practice for Data Management. 12pp. http://doi.org/10.17895/ices.pub.4889
- ICES. 2019. Herring Assessment Working Group for the Area South of 62° N (HAWG). ICES Scientific Reports, 1(2): 1-936.
- ICES. 2019. EU request for advice on a monitoring TAC for herring in ICES divisions 7.a South of 52°30'N, 7.g–h, and 7.j–k. In Report of the ICES Advisory Committee, 2019. ICES Advice 2019, sr.2019.20, https://doi.org/10.17895/ices.advice.5614
- ICES. 2019a. Greater North Sea Ecoregion Ecosystem overview. In Report of the ICES Advisory Committee, 2019. ICES Advice 2019, Section 9.1, <u>https://doi.org/10.17895/ices.advice.5750</u>.
- ICES. 2019b. Celtic Seas Ecoregion Ecosystem overview. In Report of the ICES Advisory Committee, 2019. ICES Advice 2019, Section 7.1, <u>https://doi.org/10.17895/ices.advice.5749</u>.
- ICES 2020a. Report of the Working Group on International Pelagic Surveys (WGIPS). ICES WGIPS Report 2020 13–17 January 2020. Bergen, Norway pp.
- ICES 2020c. Report of the workshop on Herring Acoustic Spawning Surveys (WKHASS) ICES CM 2020/in press
- ICES 2020d. Report of the workshop on the criteria for evaluation of rebuilding plans (WKREBUILD), 24-28 February 2020, ICES HQ, Copenhagen, Denmark
- ICES. 2020. Steering Committee of the Regional Fisheries Database (SCRDB). ICES Scientific Reports. 2:24. 57 pp. http://doi.org/10.17895/ices.pub.5992
- Kanstinger, P., Beher, J., Grenzdörffer, G., Hammer, C., Huebert, K.B., Stepputis, D., Peck, M.A. (2018). What is left? Macrophyte meadows and Atlantic herring (Clupea harengus) spawning sites in the Greifswalder Bodden, Baltic Sea. Estuarine, Coastal and Shelf Science, 201, 72-81.
- Kornis, M., S., Mercado-Silva, N., Vander Zanden, M., J. (2012). Twenty years of invasion: a review of round goby Neogobius melanostomus biology, spread and ecological implications. Journal of Fish Biology, 80:2, 235-285
- Kotterba, P., Kühn, C., Hammer, C., Polte, P. (2014). Predation of threespine stickleback (Gasterosteus aculeatus) on the eggs of Atlantic herring (Clupea harengus) in a Baltic Sea lagoon. Limnology and Oceanography 59 (2): 578–587.
- Kotterba, P., Moll, D., Hammer, C., Peck, M.A., Oesterwind, D., Polte, P. (2017). Predation on Atlantic herring (Clupea harengus) eggs by the resident predator community in coastal transitional waters. Limnology and Oceanography, 62(6), 2616-2628.
- Kotterba, P., Moll, D., von Nordheim, L., Peck, M.A., Oesterwind, D., Polte, P. (2017b) Predation on larval Atlantic herring (Clupea harengus) in inshore waters of the Baltic Sea. Estuarine, Coastal and Shelf Science 198, 1-11.

- Landa, L., Duarte, R. and I. Quincoces. 2008. Growth of white anglerfish (*Lophiuspiscatorius*) tagged in the Northeast Atlantic, and a review of age studies on anglerfish. ICES Journal of Marine Science 65: 72– 80.
- Lewy, P. and Vinther, M., 2004. A Stochastic age-length-structured multispecies model applied to North Sea stocks. ICES CM 2004/FF:20
- Libungan, L. A., Óskarsson, G. J., Slotte, A., Jacobsen, J. A., Pálsson, S. 2015. Otolith shape: a population marker for Atlantic herring *Clupea harengus*. Journal of Fish Biology, 86: 1377-1395.
- Libungan, L. A., and Pálsson, S. 2015. ShapeR: An R package to study otolith shape variation among fish populations. PLoS ONE, 10: e0121102.
- Mackinson, S. and Daskalov, G., 2007. An ecosystem model of the North Sea to support an ecosystem approach to fisheries management: description and parameterisation. Sci. Ser. Tech Rep., Cefas Lowes-toft, 142: 196pp.
- Mackinson, S. 2017. Working Document on the location and timing of spawning for herring in 6.aN for discussion in survey planning 2017. 21 April 2017.
- Mackinson, S., Pastoors, M., Lusseau, S., Armstrong, E., O'Connell, S, Haan, D., Burgraaf, D., Berges, B., McClean, A, Langlands, B., Scott, A., Wiseman, A., O'Malley, M., Clarke, M. 2018. The 2017 industryscience survey of herring in the Western British Isles (ICES div 6a, 7bc).
- Mackinson, S., Pastoors, M., Lusseau, S., O'Connell, S, Forbes-Birnie, J., Sakinan, S., Berges, B., Brigden, K., O'Malley, M., Farrel, Ed., Brigden, K. 2019. The 2019 industry-science survey of herring in the Western British Isles (ICES div 6a, 7bc). 98pp
- Moll, D., Kotterba, P., von Nordheim, L., Polte, P. (2018). Storm-Induced Atlantic Herring (Clupea harengus) Egg Mortality in Baltic Sea Inshore Spawning Areas. Estuaries and Coasts 4: 1-12.
- Moll, D. (2018). Contribution of coastal nursery areas to the spring-spawning population of Atlantic herring (Clupea harengus) in the Western Baltic Sea. Dissertation, University of Hamburg, p.233.
- Möller, H. (1984). Reduction of a Larval Herring Population by Jellyfish Predator. Science, 224:4649, 621-622
- Molloy, J. 1980. The assessment and management of the Celtic Sea herring stock. Rapp. P.-V. Reun. Cons. Int. Explor. Mer, 177:159–165.
- Molloy, J., and Corten, A. 1975. Young herring surveys in the Irish Sea. ICES CM H:11.
- Molloy, J., Barnwall, E., & Morrison, J. 1993. Herring tagging experiments around Ireland, 1991. Department of the Marine Fisheries Leaflet 154. 8 pp.
- N Bailey, DM Bailey, LC Bellini, PG Fernandes, C Fox, S Heymans, S Holmes, J Howe, S Hughes, S Magill, F McIntyre, D McKee, MR Ryan, IP Smith, G Tyldsely, R Watret and WR Turrell. 2011.: The west of Scotland marine ecosystem: a review of scientific knowledge. MSSR 09/11. 292pp.
- Nielsen, J.R., Lundgren, B., Jensen, T.F., Stæhr, K.-J. (2001). Distribution, density and abundance of the western Baltic herring (Clupea harengus) in the Sound (ICES Subdivision 23) in relation to hydrographical features. Fisheries Research 50, 235–258.
- von Nordheim, L., Kotterba, P., Moll, D., Polte, P. (2018). Impact of spawning substrate complexity on egg survival of Atlantic herring (*Clupea harengus*, L.) in the Baltic Sea. Estuaries and Coasts 41(2), 549-559
- O'Donnell, C., Mullins, E., Lynch D., Lyons, K., Keogh, N and O'Callaghan, S. (2018). Celtic Sea Herring Acoustic Survey Cruise Report 2018. FSS Survey Series: 2018/04
- O'Dwyer, P., McKeogh, E. and Berrow, S. 2016. Results of an Independent Observer Study of the Celtic Sea Herring Fishery, 2016. IWDG Consulting, Merchants Quay, Kilrush, Co Clare. 15 pp.
- O'Malley, M., Clarke, M., O'Donnell, C., Murphy, I. 2016. Atlantic Herring in 6aS/7b,c Industry Acoustic Survey Cruise Report. FEAS Survey Series: Industry Survey/01/2016

- O'Donnell, C., O'Malley, M., Lynch, D., Lyons, K., Keogh, N. and O'Driscoll, D. (2017). Celtic Sea Herring Acoustic Survey Cruise Report 2017, 15-04 November 2017. FSS Survey Series: 2017/04. Marine Institute. http://hdl.handle.net/10793/1338
- O'Dwyer, P and Berrow, S (2017). Results of an Independent Observer Study of the Celtic Sea Herring Fishery, 2017
- O'Malley, M., Clarke, M., Smith, T. & Mullins, E. (2018). Atlantic Herring and Horse Mackerel in 6aS/7b; Industry Acoustic Survey Cruise Report. FEAS Survey Series: Industry Acoustic Survey/01/2017. Marine Institute. <u>http://hdl.handle.net/10793/1341</u>
- O'Malley M. Blaszkowski M. White E. O'Brien S. & Mullins E. (2019). Atlantic Herring and Horse Mackerel in 6aS/7b; Industry Acoustic Survey Cruise Report. FEAS Survey Series: Industry Acoustic Survey/01/2018. Marine Institute
- O'Sullivan, D, O'Keeffe, E., Berry, A., Tully, O. and Clarke, M (2013) An inventory of Irish Herring Spawning Grounds. Irish Fisheries Bulletin No 42 2013.
- Pelagic Advisory Council. 2016. Minutes of the Focus Group meeting on herring in area VIa and VII b,c. 27 January 2016, The Hague, The Netherlands. <u>http://www.pelagic-ac.org/me-dia/pdf/Minutes%20VIa%20herring%2027%2001%202016.pdf</u>
- Peck, M.A., Kanstinger, P., Holste, L., Martin, M. Thermal windows supporting survival of the earliest life stages of Baltic herring (Clupea harengus). ICES Journal of Marine Science, 69(4), 529–536 (2012).
- Podolska, M., Horbowy, J., Wyszyński, M. (2006). Discrimination of Baltic herring populations with respect to *Anisakis simplex* larvae infection. Journal of Fish Biology, 68:4, 1241-1256.
- Prista, N., Fernandes, A., Pereira, J, Silva, C., Alpoim, R. and F. Borges. 2014. Discards of WGBIE species by the Portuguese bottom otter trawl operating in the ICES division 9.a (2004-2013). Working Document presented at WGBIE2014.
- Smoliński, S., Schade, F.M., and Berg, F. 2020. Assessing the performance of statistical classifiers to discriminate fish stocks using Fourier analysis of otolith shape. Canadian Journal of Fisheries and Aquatic Sciences, 77(4): 674-683.
- Wiegleb, J., Kotterba, P., Hammer, C., Oesterwind, D. (2018) Predation of the round goby (*Neogobius melanostomus* Pallas, 1814) on Atlantic herring eggs in the Western Baltic Sea. Marine Biology Research, 14:9-10, 989-1003.