



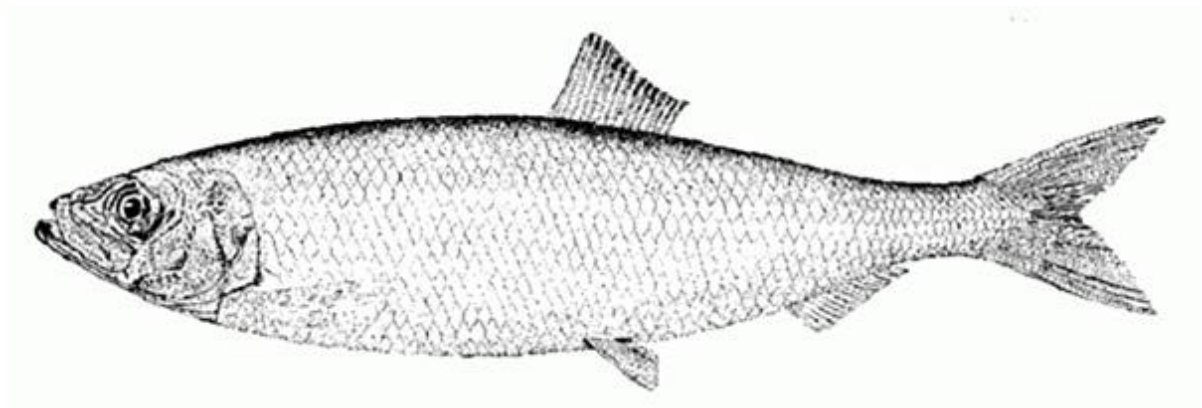
Norfish Dataset 10

**Danish Kattegat Herring Fishery**

**1520-1899**

*Supporting Documentation*

Poul Holm, John Nicholls



*Clupea harengus: Herring (Whitehead 1985)*



# Danish Kattegat Herring Fishery

## 1520 – 1899

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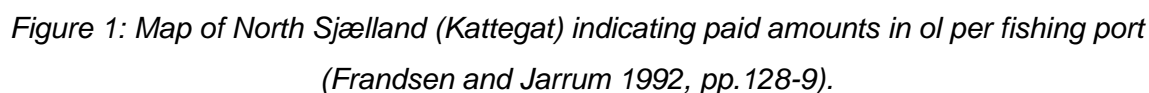
### Summary

<b>Dataset Title:</b>	Danish Kattegat Herring Fishery 1520 - 1899
<b>Norfish Case Study:</b>	Danish Kattegat Herring Fishery 1520 - 1899
<b>Large Marine Ecosystem:</b>	22: North Sea; 23: Baltic Sea
<b>Subject:</b>	Catches, Herring, North Sea, Baltic Sea, Danish Kattegat, 1520 - 1899
<b>Author:</b>	Poul Holm, John Nicholls Norfish Project Centre for Environmental Humanities Trinity College Dublin
<b>Data Provider:</b>	Poul Holm Norfish Project Centre for Environmental History Trinity College Dublin
<b>Data Editor:</b>	John Nicholls Norfish Project Centre for Environmental History Trinity College Dublin
<b>Extent:</b>	380 records
<b>Keywords:</b>	North Sea and Baltic Sea Herring catches; Norfish; Danish Kattegat Fishery

#### Citations:

- a. **The dataset:** please cite as follows Holm, P and Nicholls, J. 2020. Norfish: Danish Kattegat Herring Fishery 1520 - 1899. Dublin: TCD
- b. **Supporting documentation:** please cite as follows Holm, P and Nicholls, J. 2020. Norfish: Danish Kattegat Herring Fishery 1520 - 1899. Dublin: TCD

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## Sources and Chronology

The Kattegat is historically important as the entry to the Baltic from the North Sea and the wider Atlantic. For centuries, whoever held control of this region determined the rights and abilities of shipping to pass safely. Taxes were levied on passing vessels and local fisheries were recognised separately as a result. The local herring fishery was typically subject to the “oar tax” which extracted a value in herrings per vessel as payment for safe landing and harbouring in the Kattegat.

There were several locally active herring fishing ports in the Kattegat, primary of which was Gilleleje. While the fishery was relatively minor in comparison with the industrial scales of the Flemish and later Dutch fisheries, it nevertheless provides an important series of indicators that reflect the fortunes of the herring fishery over time.

The Kattegat region is distinct from the Oresund (Danish Sound) insofar as the fish caught was deemed of a different quality. This was made clear in a statement by the reverend Morten Smith of the Søborg parish on 7 February 1763 in correspondence to the estate governor:

”Den er større end den sild, der fanges oppe for (syd for) Helsingør og Dragør, hvilken sidste slags næppe nogensinde kommer længere end lidt neden for (nord for) Sundet, og vender straks om til Østersøen, da den sild der fanges nedenfor (nord for) sundet kommer fra Nordsøen og går did tilbage igen. Når denne sidste slags i nogen mængde ankommer, som imange år er sket skønt ikke alle år 1 ige meget - så forøges fiskernes tal på. lejerne årlig.”<sup>1</sup>

(Frandsen and Jarrum 1992, pp.121-123)

The fishery usually began early in August of each year and lasted into October, but occasionally ran on close to Christmas. However, late season herring was “spent” (having spawned); it was deemed as being lean and of less value.

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<sup>1</sup> Translation by Poul Holm: “It is larger than the herring that is caught south of Elsinore and Dragør (which hardly ever ventures north of the Sound and returns to the Baltic) as the herring that is caught north of the Sound comes from the North Sea and returns. When it arrives in some amount as it has for many years though not every year in equal amount - then the number of fishers in the coastal sites is increased by the year.”

For this dataset, there are four distinct periods for which data has been collated, recorded and calculated.

### 1520 to 1584

No specific records were found for this period and as a result, a simple estimate has been provided for the year 1520 of 1,500 metric tonnes of caught herring that was landed at ports along the Kattegat. This assumed value, while slightly under the 1585 value of 1752 metric tonnes, reasonably reflects the scale of the fishery. From this figure, an extrapolated series was determined between 1520 and 1584.

### 1585 to 1855

This period is far better represented than the earlier period based on the Kronberg Estate figures which include estate records and county records. Kindly provided by the Head Curator, Søren Frandsen of the Gilleleje Museum, they provide details for the annual **Åresild** (oar tax) that was imposed on local vessels, and therefore enable reasonable calculations to be made to derive annual catch figures. The several gaps in these data have been filled by extrapolation between available given annual values.

The Åresild (oar tax) was paid in 'ol', with 1 ol equating to 80 herrings. The number of ol levied varied over time; until the 17th century it amounted to 4 ol per boat, but it was then decreased significantly. In 1666 the tax was between 1 and 1.5 ol per boat, but by 1693 this was increased to between 2 and 3 ol per boat dependant upon the size of the vessel. From the mid-18th century, the tax was set at a uniform 2 ol per boat despite the vessel size.

From these tax figures it is possible to derive an estimation for the number of boats actively involved in the fishery. An extended research effort into the estate accounts would be required to determine the number of vessels deployed to a greater level of accuracy.

### 1856 to 1866

In a similar vein to the 1520 to 1584 period, no specific records have been found for this period and, therefore, an extrapolated simple trend (straight line) has been applied between the last given 1855 value and the 1867 value.

### 1867 to 1899

Catches for this final section of the series were derived from the existing History of Marine Animals Dataset 07 (Bager 2006). The resulting values for the extensive 1585 to 1855 part

fo the dataset (derived from the oar tax) may be corroborated when compared against typical catches reported for the ports of Gilleleje and Hornbæk between 1867 and 1899; they exhibit total landings in the same range as derived by the oar herring tax and similar decadal variability.

## Statistical Observations and Calculations

An important observation derived from these data is that an index of the declining fortunes of the herring fishery in the Kattegat is provided.

A running 5-year average of the annual data reveals a 20-year periodicity in the return of the herring throughout the period. Krøyer (1837) further observes that the years 1810-1816 were so good that one man in 4 weeks could fish enough to live off the rest of the year. Conversely, between 1817 and 1830 catches failed but then recovered thereafter.

Frandsen & Jarrum (1992) calculate that the oar tax was 1/1000 of catches; this is formulated on the basis of direct observations by Krøyer in 1837 (Krøyer 1948; 1949) of average annual landings per boat of 2000 ol. This has been used to estimate total landings in metric tonnes in the dataset, resulting in the formula:

$$\text{Metric live weight} = \text{ol (oar tax value)} * 80 * 1,000 / 10,000$$

The Map (Figure 1) indicates the major Kattegat herring fishing ports in 1624. Each port is represented by its relative value of paid amounts in ol (oar tax). Gilleleje is clearly the largest port, with Hornbæk, Villingebæk, Saunte and Kikhavn featuring as important centres as well. The modern port of Kronborg may be found on the promontory between Alag årde and Snekkersten to the northeast of the map.

## Conversion rates

For the purposes of this dataset, the conversion factors that were applied are as follows:

### Weights

1 ol = 80 herrings

1 herring = 120 grammes



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1 herring = 0.00012 metric tonnes

### Other Processes

The marine species information that informs the dataset is obtained from the World Register of Marine Species which validates common species names, scientific names and sources (WoRMS 2020).

The Metadata system underpinning the dataset is based on Darwin Core which provides static formulations of all data fields as outlined in the Data Fields section of this document (OBIS 2017; 2020).

### Data Fields

Darwin Core Field Name	Description
<b>occurrenceID</b>	A globally unique “per record” identifier based upon the concatenated institutionCode, collectionCode, catlogNumber and ID fields. (TCD _Norfish_DenKatHolNicHer_1)
<b>type</b>	Description of data series type. (Dataset)
<b>modified</b>	Most recent date the data was modified; ISO 8601 metric date/time standards apply. (2021-01-08)
<b>license</b>	Data licensing conditions that apply. ( <a href="http://creativecommons.org/licenses/by/4.0/legalcode">http://creativecommons.org/licenses/by/4.0/legalcode</a> )
<b>bibliographicCitation</b>	Author citation for the dataset. (Holm, P and Nicholls, J. 2021. Norfish: Danish Kattegat Herring Fishery 1468-1599. Dublin: TCD.)
<b>references</b>	Denotes the link where more detailed information about the dataset is held. ( <a href="http://www.vliz.be/imis?module=project&amp;proid=5064">http://www.vliz.be/imis?module=project&amp;proid=5064</a> )
<b>institutionCode</b>	Identifies the institution which owns the data - Trinity College Dublin. (TCD)
<b>collectionCode</b>	Code of the project or research group. (Norfish)
<b>datasetName</b>	Name of the dataset. (Danish Kattegat Herring Fishery 1520-1899)
<b>basisOfRecord</b>	Specifies the nature of the observed or researched specimens or data (HumanObservation)
<b>dataGeneralizations</b>	Source data that informs the provenance of the data. (Sources: Kronberg Estate records and County records kindly provided by the Head Curator, Søren Frandsen of the Gilleleje Museum, Denmark.)





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<b>catalogNumber</b>	Identifier of the data within the institution and project – “Den” refers to Danish, “Kat” refers to Kattegat, “Hol” refers to Holm, “Nic” refers to Nicholls, “Her” refers to Herring. (DenKatHolNicHer)
<b>occurrenceRemarks</b>	Comments about the occurrence record. (Simple extrapolated value trended between 1520 and 1585 values as no Capacity Trend comparison is available for adjusted trending.)
<b>recordedBy</b>	Researchers who recorded the data. (Poul Holm   John Nicholls)
<b>organismQuantity</b>	Quantity of fish represented in the record shown in Kg live weight. (1503876)
<b>organismQuantityType</b>	organismQuantity unit of measurement. (biomass in kilograms (kg))
<b>occurrenceStatus</b>	Stipulates the physical presence or absence of animals relating to the record. (present)
<b>eventDate</b>	Actual date and time at which an occurrence was recorded. ISO 8601 metric date/time standards apply. (1520)
<b>year</b>	Year taken from the eventDate field. (1520)
<b>locationID</b>	Marine Region unique identifier. ( <a href="http://marineregions.org/mrgid/2374">http://marineregions.org/mrgid/2374</a> )
<b>locality</b>	Local name for the overall location or region. (Denmark, Kattegat)
<b>locationAccordingTo</b>	MRGID location identifier based on the <a href="http://marineregions.org/mrgid">marineregions.org/mrgid</a> system. (MRGID)
<b>locationRemarks</b>	Description of location identifier. (Kattegat herring fishing ports)



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<b>decimalLatitude</b>	Latitude shown in decimal notation based on the WGS 84 (EPSG:4326) geodetic datum standard. (56.34319764)
<b>decimalLongitude</b>	Latitude shown in decimal notation based on the WGS 84 (EPSG:4326) geodetic datum standard. (11.30411887)
<b>coordinateUncertaintyInMeters</b>	The smallest circle (radius) in metres from the ground zero point depicted by the decimalLatitude and decimalLongitude fields. In this instance, “219607” depicts a radius of 219.607 Km.
<b>georeferenceRemarks</b>	Remarks indicating the geographic area identified – Large Marine Ecosystems are used. (22: North Sea; 23: Baltic Sea)
<b>scientificNameID</b>	The WoRMS LSID associated with the scientificName, based on the Marine Species database. (urn:lsid:marinespecies.org: taxname:126417)
<b>scientificName</b>	Scientific name of the animal based upon the vernacularName. (Clupea harengus)
<b>kingdom</b>	Together with taxonRank assists in determining broader animal characteristics for darwinCore search engines. (Animalia)
<b>taxonRank</b>	Together with kingdom assists in determining broader animal characteristics for darwinCore search engines. (species)
<b>scientificNameAuthorship</b>	Based on the scientificNameID field and discoverable through the WoRMS database. (Linnaeus, 1758)
<b>vernacularName</b>	Literal common name applied to the animal involved. In this case, all values are sild – the Danish common name for herring
<b>conversion</b>	Conversion factor applied to derive catchMT.

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(1 ol = 80 herrings; 1 herring = 120 grammes; 1 herring = 0.00012 metric tonnes; Metric live weight = ol (oar tax value) \* 80 \* 1,000 / 10,000)

**oarTaxInOl** The 'Oar Tax' (Åresild) levied for a particular year given in 'ol' used to determine catchMT.  
(365)

**oarTaxTatePerVessel** Specific rate of Oar Tax levied for a year used to determine catchMT.  
(4)

**catchMT** Derived metric tonnes value based on the calculated fields as shown in the conversion field, or as shown in the codes field.

**trafficLight** Traffic Light coding system denotes level of certainty, and/or level of accuracy that can be described for each record; see Appendix 1 for details.

**codes** Explanation codes that highlight the process for each record; see Appendix 2 for details.

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## Appendix 1

### Traffic Light System

Traffic Light	
green	Reliable Quantitative Data
amber	Reliable Data with some calculated or estimated values included
red	Only calculated values based on extrapolation and capacity trending

## Appendix 2

### Codes

Codes	Explanation
a	Extrapolated value trended between 1520 and 1585 values. 1520 value estimated at 1500 metric tonnes.
b	Values calculated based on given oar tax; Metric live weight = ol (oar tax value) * 80 * 1,000 / 10,000
c	Calculated trend value based on last given and next given points.
d	Given values.