

BULLETIN

ZOÖLOGISCH MUSEUM

UNIVERSITEIT VAN AMSTERDAM

Vol. 16 No. 4 1997

THE NORTH SEA HOUTING, *COREGONUS OXYRINCHUS*, BACK IN THE NETHERLANDS (PISCES, SALMONIFORMES, SALMONIDAE)

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ABSTRACT

Four specimens of the North Sea houting, *Coregonus oxyrinchus* (Linnaeus, 1758) are reported from the IJssellake in The Netherlands.

INTRODUCTION

Due to the kindness of the staff of the Netherlands Institute for Fisheries Research (RIVO-DLO) at IJmuiden, three specimens of the North Sea houting, *Coregonus oxyrinchus* (Linnaeus, 1758) were donated to the Zoological Museum of the University of Amsterdam (ZMA 121.720/722). They were caught in fykes in the IJssellake in July 1997. Their total lengths are 24.8 (Fig. 1), 29.1, and 29.2 cm. Another specimen of 17 cm total length is not preserved; it was reported by Dekker & van Willigen (1997: 28) half a year earlier, in September 1996, also from the IJssellake.

Thirty years earlier Reuter (1966) recorded a 'houting' from the IJssellake with a total length of 10 cm. The author does not tell which characters were used to identify this juvenile specimen 'without snout', which in our opinion is a *C. lavaretus*.

Since the North Sea houting is since long (1940) been reported to be extinct in the Netherlands, both in fresh water as along the North Sea coast (Nijssen & de Groot, 1987) it seems useful to report upon these recently caught specimens and to compile the history of the North Sea houting in the Netherlands.

HISTORY

At the beginning of this century three species of the genus *Coregonus* were reported to be present in the ichthyofauna of the Netherlands: *C. albula* (Linnaeus, 1758) = vendace, *C. lavaretus* (Linnaeus, 1758) = shelly or powan, and *C. oxyrinchus* (Linnaeus, 1758) = houting.

Svetovidov (1984) regards *C. oxyrinchus* as a subspecies of *C. lavaretus*. Other authors are of the opinion that the houting is the migrating population of *C. lavaretus*. Until better arguments are brought forward, we regard the houting as a valid species.

Coregonus albula (Linnaeus, 1758)

We have been unable to trace a specimen of *C. albula* caught before 1925 with a proper locality in a museum collection in The Netherlands; its former occurrence in Dutch rivers is based on citations only, e.g. by Redeke (1934: 352), recording four fresh water localities where this rare species was said to be caught. The presence of *C. albula* is not surprising, because it was reared and released in great numbers in the rivers Maas and IJssel since 1925 (500.000 specimens); this was repeated in 1926 and 1927 (Anonymous, 1940).

Coregonus lavaretus (Linnaeus, 1758)

C. lavaretus disappeared since 1940 from the rivers in the Netherlands. This seems strange because one might expect a natural fish population to expand during the war years (1940-1945) when fishery activities were nearly nihil. There is no proof about the existence of such a population in our rivers. In previous years specimens have been rarely encountered in the estuary of the river Rhine (Redeke, loc. cit: 352), which he presumed to have been reared in 'foreign countries'. From the "Mededelingen en Verslagen van de Visserij-inspectie van 1912-1939" (Anonymous, 1940) we note that in 1937 - for the last time recorded -



Fig. 1. The North Sea houting, *Coregonus oxyrinchus* (Linnaeus, 1758) from the IJssellake in The Netherlands; total length 24.8 cm 141 g, collected 21 July, 1997.

one million specimens have been released in many large lakes in the Netherlands, evidently without success.

Since 1967 specimens were irregularly encountered, which always appeared to be immigrants from both Germany and Switzerland where they were reared and from where they descended the river Rhine to the Netherlands. Material of *C. lavaretus* is preserved in the Zoological Museum of Amsterdam (1967: one specimen; 1978/79: four specimens; 1981: three specimens; 1987/89: seven specimens up to 32.0 cm SL). About 20 specimens were reported from 1978 through 1984 by Cazemier (1984). Two specimens caught in the spring of 1992, up to 36.5 cm SL, were preserved and deposited in ZMA (121.092/93). Two others up to 24.0 cm (ZMA 121.723) were caught in the winter of 1996.

C. oxyrinchus (Linnaeus, 1758)

Untill 1914 *Coregonus oxyrinchus* was a common species in some Dutch rivers. From reports (1912-1939) of the 'Fishery Inspection' [cited by Reuter in 1966 and by Klein Breteler, 1982 and 1983] we learn that since 1916 (in which year 3298 kilogram houting was caught) this species declined in numbers (1918: 1175 kg; 1921: 972 kg; 1928: 115 kg) and completely disappeared from fresh water (1938: 0 kg) as well from along the coast of The Netherlands. This despite experiments during the period 1922-1938 in which millions (1926: 2.121.000; 1927: 2.442.000; 1929: 1.000.000; 1931: 1.000.000) of reared specimens (often together with *C. lavaretus*) were released, mainly in

the rivers IJssel and Maas without much success. Of this material Redeke (loc. cit: 253) recorded about 200 specimens from 'Hollands Diep' (Rhine system), river Maas and river IJssel (Rhine system) with a total length of 25 up to 51 cm, up to 1500 gram, of which 80% was aged about 3 years (about 23 cm total length).

Klein Breteler (1983) reviewed the houting-literature with remarks on the natural production and rearing-experiments, especially in north-european countries. The North Sea houting - inhabiting the North Sea and the Wadden Sea area - used to migrate up-river in autumn and winter to spawn in fresh waters in The Netherlands, Germany and Denmark.

C. oxyrinchus also disappeared from the German rivers Weser, Elbe and Ems and from most Danish rivers. However, one small migrating population of a few hundred specimens survived more or less unnoticed, spawning in the Vidå river system (Fig. 2) up-stream of the village Tønder.

Local Danish authorities and private foundations started a rescue program to try to save the North Sea houting, involving production, release of fry, and protection and improvement of its spawning grounds, because the main reason for the decline of the houting is the elimination and deterioration of suitable spawning-grounds (Grøn, 1987).

The Danish Aquaculture Institute cultured a brood-stock of of about 600 specimens in a fish farm in Aabenraa at the end of 1986 from which yearly several hundred thousands specimens of fry could be expected. Since one

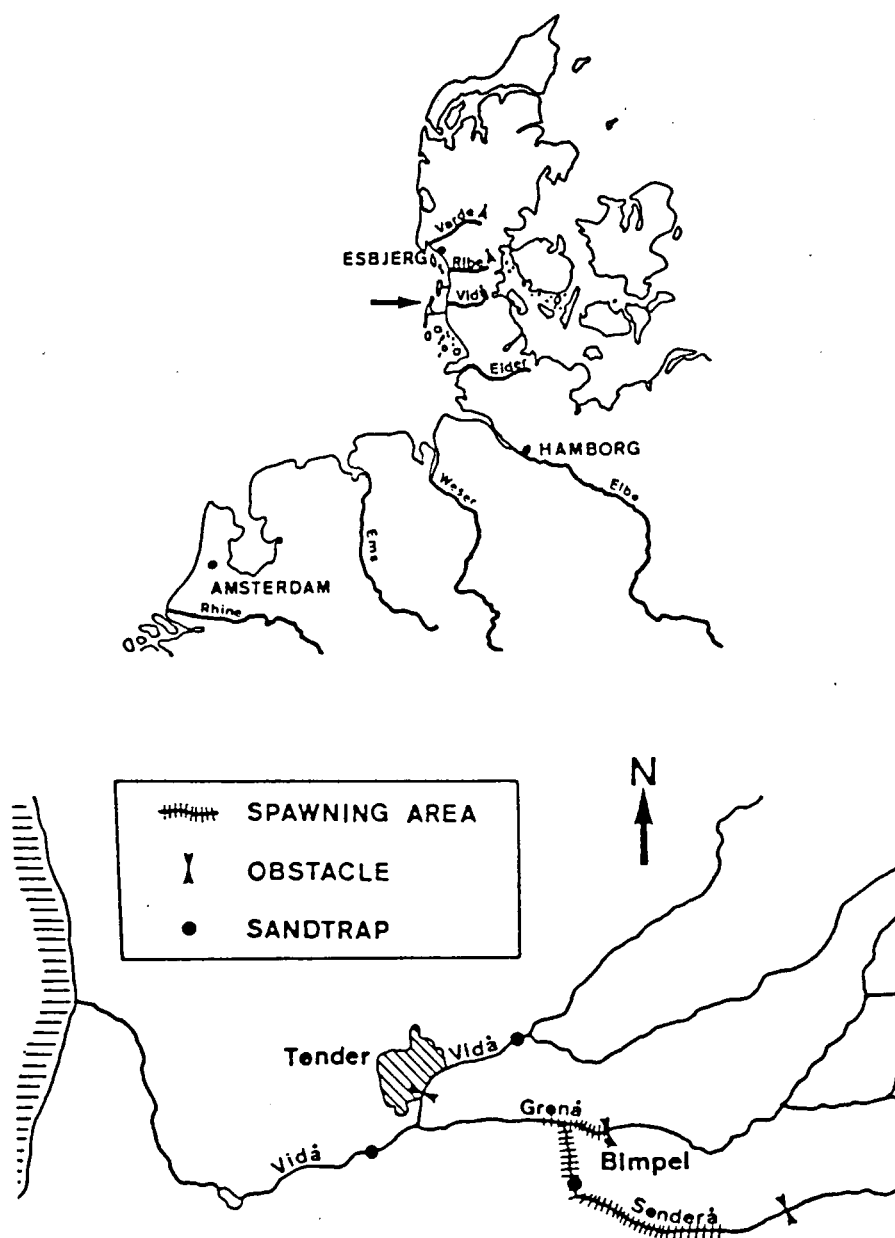


Fig. 2. The Vidå river system (in detail below) in Denmark, the last natural spawning area of the migrating *Coregonus oxyrinchus*.

flowing in the Wadden Sea.

In Germany (Schleswig-Holstein) 100.000 specimens of fry were released e.g. in the river Eider, where after an absence since 1926, 44 adults were recaptured in 1990.

In May, 1991 a meeting was initiated by the International Waddensea Secretariat (CSWS) in Tønder, Denmark to discuss a possible involvement (Lauwersmeer) of the Netherlands, and to extend (Niedersachsen) the experiments in Germany to bring the North Sea houting back in the Wadden Sea. Although no decision was reached, a second meeting was organised in Hamburg in September 1991, where the Danish results were presented together with the costs of this Danish North Sea restoration project. So far, it remains unknown whether The Netherlands will participate in

expected the fishes to return after 3 to 4 years to their site of release, extension of the spawning area became necessary together with reduction of pollution, reduction of sediment and establishment of fish passages. Two other streams, the Ribe Å and Varde Å were considered to be suitable for the houting as well as the Eider in Germany; in Kiel fry was reared for this project.

Since then, parts of several streams in Denmark and Germany have been restored to their original winding beds. Falls were constructed together with fish passages to enlarge the spawning areas and to enable the houting to reach them. Traps were constructed to reduce the transportation of sand, improving the quality of the environment. Small bundles of spruce twigs have been placed in the streams for the houting's adhesive eggs.

During the period 1982-1986 about 10.000 specimens of houting fry were released into the river Vidå and during 1987-1990 more than 1.000.000 in six different streams

this project, of which the restocking experiments in Denmark did not exceed DFL 125.000,— per year.

The four specimens of the North Sea houting recently caught in the IJssellake are undoubtedly specimens of the Danish houting project. Since some years the opening regime of the sluices (e.g. in the Afsluitdijk) resulted in some chances for migrating fish species e.g. Sea trout (*Salmo trutta*), eel larvae (*Anguilla anguilla*) and others. In Denmark the sluices in the streams to the Wadden Sea are open during ebb-tide, resulting in a gradual gradient of current water. This is essential as houting will not jump over barriers as other salmonids do. It seems beneficial for houting if - after leaving the river - they can grow up in a lake.

The Lauwersmeer could act as such a basin, if spawning beds with hardbottom (e.g. gravel) could be constructed in adjacent streams. The questions remains whether the water temperature will be low enough (about 5-7 °C)

during the spawning period (November / December), and during the period of hatching (about 20°C), and whether the water quality meets the requirements needed. The eggs need oxygen-rich water without bacteria, the larvae zooplankton and absence of predators.

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Received: 15 November 1997
Distributed: 12 December 1997.