

IX. Red List of Lampreys and Marine Fishes of the Wadden Sea*

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INTRODUCTION

During the compilation of the red list on marine fishes and lampreys of the Wadden Sea area, several problems in the definition of criteria have to be faced which are important for the classification of the taxa. One major problem was the concept of 'taxa regularly reproducing within the area' on which the categories were based. For most of the North Sea species, populations in the sense of reproductive units comprise large circulation systems (like the complete North Sea or, for the eel *Anguilla anguilla*, even the whole North Atlantic), as the species disperse over long distances by large-scale migration or planktonic eggs and larvae.

The only taxon living exclusively in the Wadden Sea area is *Coregonus lavaretus oxyrinchus*. Other fish and lamprey species living in the Wadden Sea area are usually not isolated reproductive units, but part of larger populations. Therefore, for Wadden Sea species, the term „population“ is not used in the sense of isolated reproductive unit. The presence of a species in the Wadden Sea area is treated as a population if the Wadden Sea is an important part of the reproductive unit in which a decline of the population size may be a threat for the whole reproductive unit. Therefore, anadromous, catadromous, and other migrants are considered, even if they mainly reproduce outside the Wadden Sea area.

Delimitation of the survey area

For the present trilateral Red List of lampreys and marine fishes, the 20 m depth line is used as the seaward boundary.

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- * This list forms part of the Report on the RED LISTS OF BIOTOPES, FLORA AND FAUNA OF THE TRILATERAL WADDEN SEA AREA. For basic information concerning, for example, function of these lists, species taken into account, structure of the lists and abbreviations used, see also the general introduction to the Red Lists.
 - ** Author of the introductory text.

Threats and Conservation

Considering general threats for the Wadden Sea fishes and lampreys, marine and non-marine causes are distinguished. In the Wadden Sea, the major threat for several species is an intensive fishery for industrial and food purposes (e.g. Nijssen & de Groot, 1987). Most of the fisheries target species were considered over-fished and their populations showed a steady decline, but they were not classified as threatened due to their reproductional r-strategies including a possible rapid recruitment of stocks. Fisheries and stock sizes are under control of the EU, and regulations should enable the stocks to recover when fishing effort is reduced.

However, the North Sea is one of the most heavily fished areas in the world, and the fisheries cause a destabilization of the ecosystem. Therefore, conservation efforts should concentrate on non-target species, which are caught as by-catch or die in the discard of commercial fisheries. Several of these non-target species have slow growth and low recruitment rates.

An example for a threatened non-target species is the Sturgeon *Acipenser sturio*, immature specimens of which used to live in the Wadden Sea for 10-15 years before being able to spawn. This species is extinct in the entire Wadden Sea area, but still found in 3 rivers in southwestern Europe, but its status there is critical. The large and slowly reproducing rays *Dasyatis pastinaca* and *Raja clavata* are believed to have declined because of intensive trawling (de Vooy et al., 1991).

Several anadromous and catadromous migrants like *Petromyzon marinus*, *Lampetra fluviatilis*, *Acipenser sturio*, *Alosa alosa*, *Alosa fallax*, *Salmo salar*, and *Salmo trutta trutta* are threatened by degradation of rivers, especially by construction of dams and weirs hampering the migration of the species. The eutrophication of running waters leads to a degradation of the gravel areas necessary as spawning sites for these species by covering sandy areas with mud.

An additional threat to some Wadden Sea species is the loss of their habitat. Threatened by the destruction of seagrass beds are the pipefishes *Syngnathus acus*, *S. typhle*, and *Entelurus aequoreus*, and the stickleback *Spinachia spinachia* (e.g. Redeke, 1941; Nijssen & de Groot, 1987).

Further threats include the enormous influx of waste water, heavy metals and organochlorines through the rivers into the Wadden Sea area, and the eutrophication of the marine habitats.

Summary

In the Wadden Sea areas of Denmark, Germany and The Netherlands, a total of 162 fish and lamprey species is known. 72 of these species are migrants entering the area occasionally; the total number of resident species in the Wadden Sea area is 90.

In the Wadden Sea, in total, 20 species of fish and lamprey species are threatened in at least one subregion. Of these, 19 species are threatened in the entire area and are therefore placed on the trilateral Red List. 2 species of the listed fish and lamprey species are (probably) extinct in the entire Wadden Sea area. The status of 5 species of fish and lamprey species is critical, 5 species are (probably) endangered, the status of 6 is vulnerable and of 1 species susceptible.

For about 16 rare species which may also be threatened, data were not sufficient to estimate past and present population sizes. The contributors to the list would like to encourage researchers to intensify work on the ecology and the present population sizes of these rare Wadden Sea species (see Fricke et al., 1995).

REFERENCES

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RED LIST OF LAMPREYS AND MARINE FISHES OF THE WADDEN SEA*

EX – Extinct:

Acipenser sturio
(?) *Trachinus draco*

CR – Critical:

Alosa alosa
Coregonus lavaretus oxyrinchus
= *C. oxyrinchus*
Dasyatis pastinaca
Raja clavata
Salmo salar

EN – Endangered:

(?) *Echiichthys vipera*
Lampetra fluviatilis
Petromyzon marinus
Salmo trutta trutta
(?) *Syngnathus typhle*

VU – Vulnerable:

Alosa fallax
Eutrigla gurnardus
Liparis liparis
Liparis montagui
Spinachia spinachia
Syngnathus acus

SU – Susceptible:

(?) *Atherina presbyter*

* Question-marks indicate that in one of the subregions the status of threat is uncertain.

LIST OF THREATENED LAMPREYS AND MARINE FISHES
OF THE WADDEN SEA

	Red List (trilateral)	Threats	Status of threat in the sub- regions of the Wadden Sea Area			
			NL	Nds/SH	DK	
Agnatha						
<i>Lampetra fluviatilis</i> (Linnaeus, 1758)	Rivierprik Flußneunauge Flodlampret	EN	WAT, POL, EUT, EXL?	VU	EN	VU
<i>Petromyzon marinus</i> Linnaeus, 1758	Zeeprik Meerneunauge Havlampret	EN	WAT, POL, EUT, EXL?	VU	EN	VU
Chondrichthyes						
<i>Dasyatis pastinaca</i> (Linnaeus, 1758)	Pijstaartrog Stechrochen Pilrokke	CR	EXL	CR	EX	(*)
<i>Raja clavata</i> Linnaeus, 1758	Stekelrog Nagelrochen Sømrrokke	CR	EXL	EN	EX	*
Osteichthyes						
<i>Acipenser sturio</i> Linnaeus, 1758	Steur Stör Stør	EX	WAT, POL, EXL	EX	EX	EX (since 1942)
<i>Alosa alosa</i> (Linnaeus, 1758)	Eift Aise, Maifisch Majsild	CR	WAT, POL, EUT	CR	CR	CR
<i>Alosa fallax</i> (Lacepède, 1803)	Fint Finte Stavsild	VU	WAT, POL, EUT	VU	VU	VU
<i>Atherina presbyter</i> Cuvier 1829	Koornaarvis Ährenfisch Stribefisk	SU?	WAT	SU	-	(*)
<i>Coregonus lavaretus oxy- rhinchus</i> (Linnaeus, 1758) = <i>C. oxyrhinchus</i>	Houting Schnäpel Snäbel	CR/EX	WAT, POL, EUT, EXL?	EX	EX	SU
<i>Echiichthys vipera</i> (Cuvier, 1829)	Kleine Pieterman Kl. Petermännchen Lille fjæsing	EN?		EN	-	(*)

- * According to Danish scientists and authorities, the species reintroduced into the Danish Wadden Sea area is *Coregonus oxyrhinchus*, identical to *C. lavaretus oxyrhynchus*. The German experts do not agree to this, and a final agreement among the scientists must be left to the future.

		Red List (trilateral)	Threats	Status of threat in the sub-regions of the Wadden Sea Area		
				NL	Nds/SH	DK
<i>Entelurus aequoreus</i> (Linnaeus, 1758)	Adderzeenaald Große Schlangennadel Snippe	*	HAB	*	SU	*
<i>Eutrigla gurnardus</i> (Linnaeus, 1758)	Grauwe poon Grauer Knurrhahn Grå knurhane	VU	EXL	*	VU	?
<i>Liparis liparis</i> (Linnaeus, 1758)	Slakdolf Großer Scheibenbauch Finnebræmmet ringbug	VU		*	VU	?
<i>Liparis montagui</i> (Donovan, 1804)	Kleine slakdolf Kleiner Scheibenbauch Særfinnet ringbug	VU		-	VU	?
<i>Salmo salar</i> Linnaeus, 1758	Zalm Lachs Laks	CR	WAT, EUT, EXL, POL?	EX	CR	EX*
<i>Salmo trutta trutta</i> Linnaeus, 1758	Zeeforel Meerforelle Ørred	EN	WAT, EUT?, EXL, POL?	SU	EN	VU
<i>Spinachia spinachia</i> (Linnaeus 1758)	Zeestekelbaars Seestichling Tangsnarre	VU	HAB	EX	VU	*
<i>Syngnathus acus</i> Linnaeus, 1758	Grote Zeenaald Große Seenadel Stor tangnål	VU	HAB	*	EN	?
<i>Syngnathus typhle</i> Linnaeus, 1758	Trompetterzeenaald Grasnadel Almindelig tangnål	EN?	HAB	EX	EN?	*
<i>Trachinus draco</i> Linnaeus, 1758	Grote Pieterman Großes Petermännchen Fjæsing	EX?	EXL?	EX	EX	(*)

- * The salmon stocks now populating the Danish rivers and streams originate from strains bred in fish farms, and they are genetically different from the original stocks.

Status of threat:

EX = Extinct; **CR** = Critical; **EN** = Endangered; **VU** = Vulnerable; **SU** = Susceptible; * = not endangered; ? = status of endangerment is not exactly known; - = species does not occur; -(?) = species probably does not occur; (*) = it is unknown if or if not this species occurs.

Threats:

AFF = afforestation; **AGR** = agriculture; **CLI** = climatic change; **DIS** = disturbance; **EUT** = eutrophication; **EXL** = exploitation of living resources; **EXM** = mineral exploitation; **FOR** = forestry; **HAB** = loss of habitat; **PAR** = parasites; **POL** = pollution; **WAT** = water regulation.

For more detailed descriptions see the general introduction to the Red Lists.