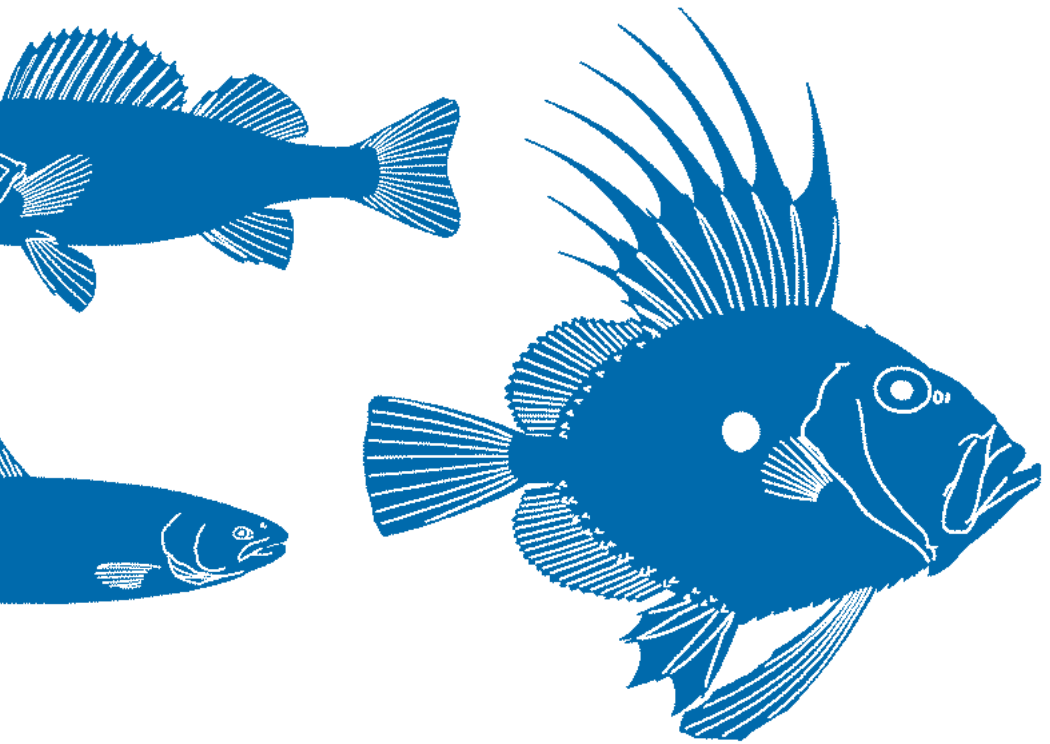


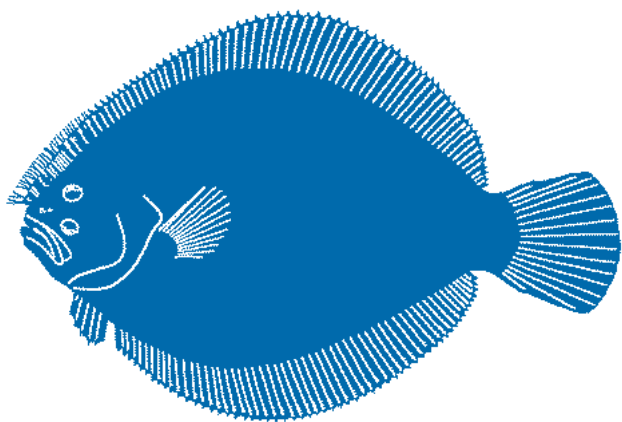
Key to the Marine and Freshwater Fishes of Britain and Ireland



A guide to the identification of more than 370 species

By Peter S Maitland and Douglas Herdson

Edited by Steve Coates



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By Peter S Maitland and Douglas Herdson

Edited by Steve Coates

Illustrated by Marc Dando

Maps drawn by Adam Waugh

Designed by Mytton Williams

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We would like to thank the following contributors for their advice and additions to the text – Bianca Bacchi, Miran Aprahamian, Katy Lewis, Liz Black, Barry Byatt, Rob Hillman, Nigel Hewlett & Gareth Davies. Thanks go to our colleagues at CEFAS, DARDNI, FRS, CEFAS and especially Peter Moorehead at the Northern Ireland Environment Agency for their advice and contributions to make this field key possible.

This field key is dedicated to the memory of Alwyne Wheeler, without who's passion for fisheries this guide would be impossible to produce.

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Preface

The origin of this book is J. Travis Jenkins's classical *The Fishes of the British Isles* (first edition 1925; second edition 1936), published by Warne, which has inspired many fish biologists over the years. When Alwyne Wheeler was invited in the 1970s to produce a revised edition of Jenkins's text, he 'accepted with pleasure because this was a book which had inspired him when young with a deep interest in fishes'. Alas, time had rendered it so much out of date and the world of the publisher changed so much that it became evident that a completely new text, with new illustrations, was called for.'. Instead, Wyn then produced his *Key to the Fishes of Northern Europe* (Warne 1978) noting that his 'chief hope is that it will be as inspiring to others as Jenkins's book was to myself, and that it will lead to a better understanding and appreciation of this fascinating group of animals'.

Over the 30 years since its appearance, Wyn's book has been widely used by fish biologists in Britain and elsewhere in northern Europe. However, many changes – including taxonomic and climatic as well as in distribution – have taken place since it was written and it became evident that a full revision was necessary to provide an up-to-date volume useful to fish biologists. It is hoped that this new volume *Key to the Marine and Freshwater Fishes of Britain and Ireland* will prove as useful as its predecessors. The arrangement and nomenclature has been substantially revised and largely follows Joseph Nelson's classic *Fishes of the World* (4th edition 2006).

This version is inspired by the life-times achievement of Alwyne Wheeler at the suggestion of Steve Coates. The original text used is with the kind permission of the Wheeler family and has been revised completely by Peter Maitland and Douglas Herdson. We are grateful to all colleagues within the UK, Ireland & Europe for their support, comments and suggestions. Special thanks go to our colleagues at Northern Ireland Environment Agency, CEFAS, DARDNI, SEPA & FRS and to Peter Stebbing who produced the illustrations to the Wheeler 78 key. Thanks are again due to Marc Dando for the illustrations and to Adam Waugh for the distribution maps.




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Key

Freshwater fishes are printed in blue and marine fishes in black. Types of fish found in both fresh and salt-water bear a blue dot.

Pages

			
Lampreys 20	Dogfishes 50	Skates & Rays 66	Sturgeons 90
			
Eels 99	Herrings 104	Freshwater Breams 115	Carps 119
			
Loaches 134	Catfishes 136	Marine smelts 140	Smooth-heads 143
			
Freshwater smelts 146	Whitefishes 150	Salmons 156	Pikes 168
			
Dragonfishes 170	Pearlsides 173	Oarfishes 181	Grenadiers 183
			
Hakes 191	Rocklings 192	Cods 200	Anglerfishes 220
			
Mullets 225	Sand smelts 234	Garfishes 238	Squirrelfishes 245



Dories 248



Sticklebacks 251



Pipefishes 255



Seahorses 257



Snipefishes 264



Gurnards 272



Bullheads 279



Poachers 287



Snailfishes 291



Seabasses 296



Perches 304



Jacks & Scads 311



Sea breams 324



Red mullets 337



Wrasses 340



Eelpouts 348



Sandeels 356



Weevers 361



Blennies 364



Clingfishes 374



Dragonets 378



Gobies 381



Mackerels & Tunnies 410



Swordfishes 424



Left-eyed flatfishes 435



Right-eyed flatfishes 442



Soles 455



Triggerfishes 461

Contents

Preface	03	Sturgeons <i>Acipenseridae</i>	91
Introduction	08	Order Elopiformes Tenpounders	95
How to use the drawings	10	Tarpons <i>Megalopidae</i>	96
Parts of a fish	11	Order Albuliformes Bonefishes	97
Glossary	12	Spiny Eels <i>Notacanthidae</i>	98
Fish and man in Europe	14	Order Anguilliformes Eels	99
Order Myxiniformes Hagfishes	18	Freshwater Eels <i>Anguillidae</i>	100
Hagfishes <i>Myxinidae</i>	19	Moray Eels <i>Muraenidae</i>	101
Order Petromyzontiformes Lampreys	20	Snipe Eels <i>Nemichthyidae</i>	102
Northern Lampreys <i>Petromyzontidae</i>	21	Conger Eels <i>Congridae</i>	103
Order Chimaeriformes Chimaeras	24	Order Clupeiformes Herrings	104
Rabbitfishes <i>Chimaeridae</i>	25	Anchovies <i>Engraulidae</i>	105
Order Lamniformes Mackerel Sharks	27	Herrings <i>Clupeidae</i>	106
Thresher Sharks <i>Alopiidae</i>	28	Order Cypriniformes Carps	113
Basking Sharks <i>Cetorhinidae</i>	30	Carps <i>Cyprinidae</i>	114
Mackerel Sharks <i>Lamnidae</i>	31	Spined Loaches <i>Cobitidae</i>	134
Order Carchariniformes Ground Sharks	33	Stone Loaches <i>Balitoridae</i>	135
Catsharks <i>Scyliorhinidae</i>	34	Order Siluriformes Catfishes	136
False Catsharks <i>Pseudotriakidae</i>	37	North American Catfishes <i>Ictaluridae</i>	137
Hound Sharks <i>Triakidae</i>	38	European Catfishes <i>Siluridae</i>	139
Requiem Sharks <i>Carcharinidae</i>	41	Order Argentiniformes Marine Smelts	140
Hammerhead Sharks <i>Sphyrnidae</i>	43	Argentines <i>Argentinidae</i>	141
Order Hexanchiformes Six-gilled Sharks	44	Smooth-heads <i>Alepocephalidae</i>	143
Frilled Sharks <i>Chlamydoselachidae</i>	45	Order Osmeriformes Freshwater Smelts	146
Cow Sharks <i>Hexanchidae</i>	46	Smelts <i>Osmeridae</i>	147
Order Echinorhynchiformes Bramble Sharks	48	Order Salmoniformes Trouts	149
Bramble Sharks <i>Echinorhinidae</i>	49	Whitefishes <i>Coregoninae</i>	150
Order Squaliformes Dogfish Sharks	50	Graylings <i>Thymallinae</i>	155
Spiny Sharks <i>Squalidae</i>	51	Salmons <i>Salmoninae</i>	156
Gulper Sharks <i>Centrophoridae</i>	53	Order Esociformes Pikes	167
Lantern Sharks <i>Etmopteridae</i>	54	Pikes <i>Esocidae</i>	168
Sleeper Sharks <i>Somniosidae</i>	55	Order Stomiiformes Dragonfishes	170
Rough Sharks <i>Oxynotidae</i>	57	Marine Hatchetfishes <i>Sternoptychidae</i>	171
Kitefin Sharks <i>Dalatiidae</i>	59	Order Aulopiformes Lizardfishes	175
Order Squatiniformes Angel Sharks	60	Lancetfishes <i>Alepisauridae</i>	176
Angel Sharks <i>Squatinae</i>	61	Barracudinas <i>Paralepididae</i>	177
Order Torpediniformes Electric Rays	62	Order Lampriformes Opahs	178
Electric Rays <i>Torpedinidae</i>	63	Opahs <i>Lampridae</i>	179
Order Rajiformes Skates	65	Ribbonfishes <i>Trachipteridae</i>	180
Skates & Rays <i>Rajidae</i>	66	Oarfishes <i>Regalecidae</i>	181
Order Myliobatiformes Stingrays	84	Order Gadiformes Cods	182
Stingrays <i>Dasyatidae</i>	84	Grenadiers <i>Macrouridae</i>	183
Eagle Rays <i>Myliobatidae</i>	87	Deep Sea Cods <i>Moridae</i>	189
Order Acipenseriformes Sturgeons	90	Hakes <i>Merlucciidae</i>	191

Rocklings <i>Phycidae</i>	192	Dolphinfishes <i>Coryphaenidae</i>	309
Cods <i>Gadidae</i>	200	Sharksuckers <i>Echeneidae</i>	310
Order Ophidiiformes Cusk Eels	218	Jacks & Scads <i>Carangidae</i>	311
Pearlfishes <i>Carapidae</i>	219	Pomfrets <i>Bramidae</i>	319
Order Lophiiformes Anglerfishes	220	Sea Breams <i>Sparidae</i>	324
Anglers <i>Lophiidae</i>	221	Drums <i>Sciaenidae</i>	336
Footballfishes <i>Himantolophidae</i>	223	Red Mulletts <i>Mullidae</i>	337
Deep-sea Anglers <i>Ceratiidae</i>	224	Bandfishes <i>Cepolidae</i>	339
Order Mugiliformes Mulletts	225	Wrasses <i>Labridae</i>	340
Grey Mulletts <i>Mugilidae</i>	226	Eelpouts <i>Zoarcidae</i>	348
Order Atheriniformes Silversides	233	Butterfishes <i>Pholidae</i>	352
Sand Smelts <i>Atherinidae</i>	234	Wolffishes <i>Anarhichadidae</i>	353
Order Beloniformes Needlefishes	236	Sandeels <i>Ammodytidae</i>	356
Flying Fishes <i>Exocoetidae</i>	237	Weevers <i>Trachinidae</i>	361
Garfishes <i>Belonidae</i>	238	Arctic Blennies <i>Stichaeidae</i>	364
Sauries <i>Scomberesocidae</i>	240	Triplefin Blennies <i>Tripterygiidae</i>	367
Order Beryciformes Squirrelfishes	241	Blennies <i>Bleniidae</i>	368
Roughies <i>Trachichthyidae</i>	242	Clingfishes <i>Gobiesocidae</i>	374
Alfonsinos <i>Berycidae</i>	243	Dragonets <i>Callionymidae</i>	378
Squirrelfishes <i>Holocentridae</i>	245	Gobies <i>Gobiidae</i>	381
Order Zeiformes Dories	246	Louvars <i>Luvaridae</i>	402
Smooth Dories <i>Parazenidae</i>	247	Barracudas <i>Sphyraenidae</i>	403
Dories <i>Zeidae</i>	248	Snake Mackerels <i>Gempylidae</i>	404
Order Gasterosteiformes Sticklebacks	250	Scabbardfishes <i>Trichiuridae</i>	407
Sticklebacks <i>Gasterosteidae</i>	251	Mackerels & Tunnies <i>Scombridae</i>	410
Pipefishes <i>Syngnathidae</i>	255	Swordfishes <i>Xiphiidae</i>	424
Snipefishes <i>Macroramphosidae</i>	264	Billfishes <i>Istiophoridae</i>	425
Order Scorpaeniformes Mail-cheeked Fishes	265	Blackfishes <i>Centrolophidae</i>	428
Flying Gurnards <i>Dactylopteridae</i>	266	Driftfishes <i>Nomeidae</i>	432
Scorpionfishes <i>Scorpaenidae</i>	267	Boarfishes <i>Caproidae</i>	433
Gurnards <i>Triglidae</i>	272	Order Pleuronectiformes Flatfishes	434
Armed Gurnards <i>Pteristiidae</i>	278	Left-eyed Flatfishes <i>Scophthalmidae</i>	435
Bullheads <i>Cottidae</i>	279	Right-eyed Flatfishes <i>Pleuronectidae</i>	442
Poachers <i>Agonidae</i>	287	Scaldfishes <i>Bothidae</i>	452
Lumpfishes <i>Cyclopteridae</i>	289	Soles <i>Soleidae</i>	455
Snailfishes <i>Liparidae</i>	291	Order Tetraodontiformes Plectognaths	460
Order Perciformes Perches	293	Triggerfishes <i>Balistidae</i>	461
Sea Basses <i>Moronidae</i>	296	Pufferfishes <i>Tetraodontidae</i>	463
Wreckfishes <i>Polyprionidae</i>	298	Sunfishes <i>Molidae</i>	465
Sea Perches <i>Serranidae</i>	299	Rare and vagrant marine fish of British and Irish waters	468
American Sunfishes <i>Centrarchidae</i>	301	References	472
Perches <i>Percidae</i>	304	Index	473
Bullseyes <i>Epigonidae</i>	307		
Bluefishes <i>Pomatomidae</i>	308		

Introduction

This book is a complete guide to the marine and freshwater fishes of Britain and Ireland and it aims to facilitate identification with the minimum of technicality. Both text and illustrations are designed to draw attention to the vital distinguishing characteristics of each species. Descriptions of the body form, fin ray and scale counts are not given except where essential; technicalities and jargon are avoided.

The body of the text for each species is arranged under four headings. Characteristics gives the salient external features of each species. Colour gives, in brief detail, the usual adult colour, with notes on special changes, e.g. in the breeding season, but it must be noted that the colours of fishes are fugitive, changing on death, and always modified by the intensity of the light, tone of the background, and often with the emotional state of the fish. Size gives the average and maximum total length and weight, and where appropriate, differences between the sexes. Where available, the Rod Caught Records for Britain and Ireland are given. Under Ecology are supplied details of habitat, depth range, food, breeding, and relations with man. Much of this information appears in very condensed form, necessarily so to keep this volume within limits.

The maps which accompany most accounts of species show the total range in which the fish has been recorded, except where otherwise stated. There are no maps for introduced species, because it is clear that further introductions might take place which would render them outdated. Maps for certain widely distributed oceanic species have also been omitted.

The scope of this key is restricted to the fresh waters of Britain and Ireland and the seas surrounding these islands. Sea fishes from north of Biscay to the Barents Sea are also included down to a depth of ca 1,000 m. Some very small oceanic fishes which are caught only by research vessels using special nets have been omitted, as have a very few species recorded once only within the area. Otherwise every fish known to be found on the shore, in shallow water, or in the sea above the continental shelf has been included. Many more species have been discovered in recent years in the deep Atlantic waters off the continental shelf. These are not dealt with here but are listed on page 468 Rare and vagrant fish of British and Irish waters & in full by Wheeler et al. (2004).

The fish fauna of Britain and Ireland is not rich. The freshwater fishes still show the effects of the Ice Ages which covered the greater part of the region. At their maximum the ice sheets extended far south, and the adjacent land, the periglacial zone, was frozen for much of the year. Those lakes and rivers which were unfrozen for as much as six months of the year were inhabited by only a few fishes such as Arctic Charr, Sea Trout, and Atlantic Salmon which entered the rivers from the sea. After the retreat of the ice, freshwater fishes migrated across Europe from the east, most notably from the Danube basin (which had never been so severely affected by the ice as northern Europe).

Even today, as one travels westwards from the Danube, the freshwater fish fauna gradually becomes poorer in terms of species. The eastern rivers of England were still in contact with continental rivers (notably the Rhine) until a relatively late date (the beginning of the Atlantic period, ca 7500 years ago, when Britain became separated from the continent). Ireland had become an island long before this and so no true freshwater fishes are native here. In the western rivers of England and Wales, and in Scotland, the native freshwater fishes, as in Ireland, are largely species such as Atlantic Salmon, Brown Trout, Arctic Charr, Three-spined Stickleback, and European Eel which gained access from the sea. Other species, which arrived in the same way, but are now found only as a few isolated populations, include the Vendace, the Powan of Scotland (and its equivalents – Schelly in Cumbria and Gwyniad in Wales) and the Goureen of Ireland. The fact that other freshwater fishes such as Dace and Common Bream are now found in many parts of Britain and Ireland, where they are not native, is due entirely to man's activities.

Europe's marine fishes likewise have suffered from human activities, but it is chiefly the species of economic importance which show this, mostly as a result of overfishing. Their distribution on the Atlantic seaboard owes less to the Ice Ages than to the present-day climate and oceanic circulatory systems. The northern European fish fauna is an amalgam of several biogeographical zones and as such has a certain richness. Many of the species are typically cool temperate in range, found virtually along the whole coast. Superimposed on this are two elements, the Lusitanian and the boreal fish faunas. The Lusitanian species are those which are at the northward limit of their range, around Britain and Ireland, either as residents or as

summer migrants, and in many cases both as residents and migrants. They are usually more abundant from south of Biscay to the Atlantic coast of North Africa. The boreal species normally extend only as far south as the North Sea coasts. There are more Lusitanian migrants than boreal ones, which is only to be expected as the fauna is richer to the south. In addition, there has been a notable increase in this element of the ichthyofauna in recent years – attributed by many to the effect of climate change.

In addition to these native elements, there is the massive northward movement of the Atlantic Ocean currents, known as the North Atlantic Drift, although it starts out in the western Atlantic as the Gulf Stream. This warm water, which comes from the central sub-tropical Atlantic, warms the north European coastline and is a major factor in controlling our climate. It brings with it many warm-water fishes such as blue sharks and barrelfishes, as well as exotic animals such as turtles, buoy barnacles, and By-the-wind Sailors, and it also bears tropical plant seeds. It enables the seasonal migrations of the increasing Lusitanian element such as tunnies, bass, grey mullets, and Ray's Bream to take place. Overall, northern Europe's marine fishes are a fascinating mixture of common, widespread species, migratory species, and rare wanderers, and among the latter may be previously unrecorded species. Many new, mainly southern, species have appeared for the first time in recent decades.

Note: The British and Irish rod-caught records for the fish are taken from British Record (rod-caught) Fish Committee meeting on 31st October 2007; and the Irish Specimen Fish Committee Report for 2008. DMH.

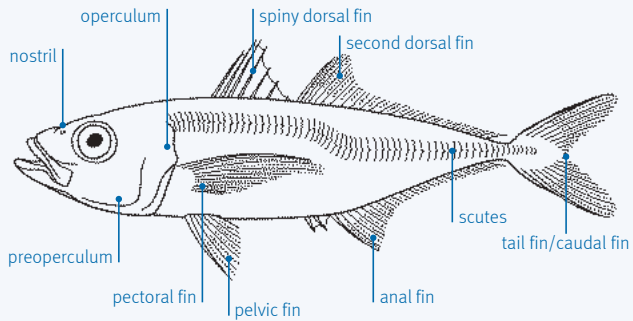
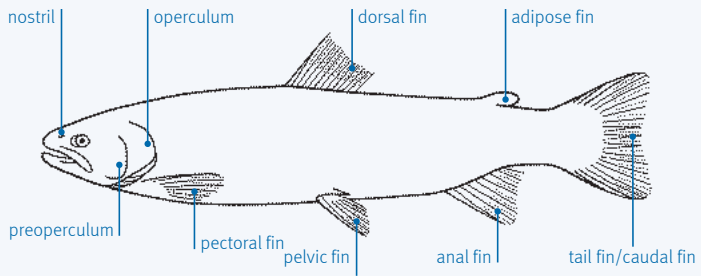
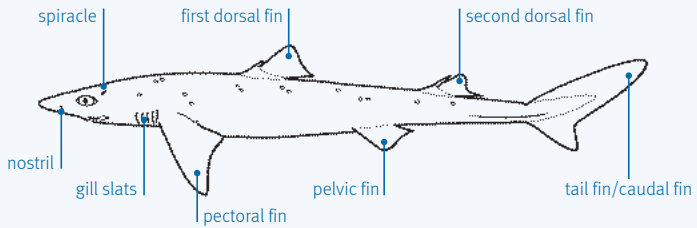
How to use the drawings

The paramount purpose of the drawings is to help the reader to distinguish one species from another. This has been done in the following ways:

1. All detail has been omitted except where it aids the identification of the species.
2. Blue indicator lines pick out specific characteristics.
3. The numbers of spines and rays have been given by numbers printed close to the relevant fins, and the fins have been simplified to a diagrammatic style. The numbers are given systematically, as in the following examples: 1+36-43 means 1 spine and 36 to 43 branched rays, and 16-18+8-10 means 16 to 18 spines and 8 to 10 branched rays. That is to say the spine count is always given first.
4. In some cases, scale counts have been included in the drawings, and the line of the count is indicated by dots.
5. To avoid confusion, features which lie beyond the vertical mid-plane, i.e. on the other side of the fish as drawn, have been omitted.

It is not possible to draw fishes (or other organisms) without discovering the amazing variety of their form, not just between species, but between individuals of the same species. As a result of natural variation it becomes almost a matter of choice which individual represents the standard of the species. If the reader were to select one person to be the standard for identifying the human species, the problem becomes clear. The reader should remember that when using the key, the fish to be identified may vary from the illustrated standard. In addition, it should always be borne in mind that a specimen could be a hybrid or even a new species to the area. A list of rare and vagrant species is included at the end of the species accounts.

Parts of a fish



Glossary

A

algae the lowest group of the plant kingdom; common in aquatic habitats, e.g. seaweeds

amphipods small crustaceans which are laterally flattened and lack a carapace, e.g. sand-hoppers

anadromous a fish which migrates from the sea to spawn in fresh water

B

barbel fleshy finger-like projection around the mouth, richly supplied with 'taste cells' at the surface

bathymetric range range of depths inhabited

bathypelagic living in mid-water in the deep sea

benthic bottom-living

bryozans minute animals living in colonies usually covering stones or shells in a moss-like growth

C

capsule membranous envelope

cartilaginous with a skeleton composed of cartilage not bone

catadromous a fish which migrates from fresh water to spawn in the sea

cephalopod mollusc with a distinct tentacled head, e.g. squid

cetacean member of the mammalian group including whales and porpoises

circumtropical found throughout the tropics

commensal animal or plant living in close association with another

copepods minute crustaceans usually free-swimming but some are parasitic and others benthic

crustacean member of a large class of jointed-limbed animals mostly aquatic with a hard shell

cusp point of a tooth

D

demersal close to the sea-bed, as in demersal fisheries

denticles small teeth, as on the skin of sharks and rays

E

embryo young animal before birth

euphausiids group of small pelagic crustaceans, e.g. krill

eutrophic a water mass enriched by nutrients and organic matter

G

genera groups of animal or plant species having common features distinct from other groups

gill rakers stout structures on the gill arch which filter and prevent food items being swept out of the gill opening

gills respiratory organs of fishes and other aquatic animals

gonads reproductive organs – testes in the male and ovaries in the female

gravid pregnant

H

hermaphrodite individual possessing both male and female reproductive organs

holothurian class of animals including the sea-cucumbers

hydroids minute animals which live in colonies; related to sea-anemones

hydrological concerning the study of water masses

I

incubation period of time eggs take to develop and hatch

inhalent opening through which water or air is drawn into a cavity

invertebrates animals without backbones

isopods small crustaceans such as woodlice

isthmus in fishes refers to the narrowing of the throat between the gill covers

K

krill a type of small pelagic crustacean (see euphasid)

L

larva young fish after hatching but still nourished by the yolk of the egg
lingual of the tongue

M

medusa free-swimming stage of jellyfish and related animals
meristic features of a fish which can be counted, e.g. fin-rays, scales, etc.
mesopelagic living in the middle layers of the open sea
metamorphosis change from one stage of life to another, e.g. postlarva to young fish
molluscs group of soft-bodied invertebrate animals, most of which have hard shells
mysids small swimming shrimp-like crustaceans, often called opossum shrimps

O

ocellus spot of colour surrounded by a ring of another colour
ostracods small crustaceans usually living within a paired shell
oophagous embryos feed on infertile eggs within the oviduct
oviduct canal through which eggs pass from ovary
oviparous producing young by eggs shed from body before hatching
ovoviviparous producing young by eggs which develop within the body and are expelled after hatching

P

papilla small fleshy protuberance of the body
parasitic an organism which lives on another and is nourished by it to the detriment of its host
pelagic living in the surface waters of the sea
placental form of development where the embryo is nourished by a connection with its mother
plankton animal or plant life passively drifting in the surface waters

polychaete a group of worms also called bristle worms, e.g. ragworm
postlarva stage of development after the yolk of the egg has been consumed
pseudoplacenta a false placenta

R

redd hollow in sand or gravel of a river bed, made by a fish as a spawning or nesting area
reticulation network of fine lines
riffle shallow stretch of river where flow is fast, usually over stones

S

school aggregation of fishes
seine a type of net
semicircular canals small tubes in the ear that detect movement (all jawed vertebrates have three in each ear)
spermatozoa male fertilizing element in semen of animals
sublittoral below the level of low tide mark
swim-bladder a thin-walled gas-filled chamber within the body of some bony fishes

T

tendrils fine threads, usually for attachment
tubercles small rounded hard projections

U

urogenital opening or canal connected with kidneys and gonads

V

vertebrates animals with backbones
viviparous form of development where young develop within the mother and are nourished by her
vomer bone in midline of the roof of the mouth

Y

yolk-sac remains of egg-yolk in the hatched fish larva

Fish and man in Europe

Ever since man has lived in Europe he has probably affected the fish fauna to some extent. Archaeology has shown that early man lived beside rivers and lakes and captured fish for food; pike bones are a conspicuous feature of many Mesolithic sites in Denmark and elsewhere in continental Europe. Early man was, however, living in balance with his environment and the removal of the relatively few large Pike, Atlantic Salmon, or Sturgeon that he speared or otherwise caught, made no difference to the stock of the species, nor did it disturb the ecosystem. It is all too clear today that man is no longer living as part of the natural ecosystem but has, in the past two millennia, altered the environment to such an extent that plant and animal life have suffered drastic changes. These changes are nowhere more apparent than in northern Europe.

The pollution of many rivers and lakes is an obvious example and in the worst cases the entire fauna has been exterminated, even if only locally in some rivers. However, pollution has many forms, all harmful to some degree although their effects vary. At one extreme are the discharges of untreated toxic waste from industrial processes and untreated domestic sewage, both of which may result in the total elimination of fish. Neither need pose a threat to the fauna as suitable treatment methods have been developed for domestic sewage and most industrial effluents, and the most intractable of the latter can be disposed of in other ways. The worst effects of pollution are usually seen in the lower reaches of rivers where toxic water may form a complete barrier to migratory fishes such as Sturgeon, Atlantic Salmon, Smelt, and Eel.

More insidious are the milder forms of pollution which produce less dramatic but as far-reaching changes in the fish fauna. Three examples can be cited. The unnaturally acid lakes and streams of parts of Scotland, England and Wales, caused by acid deposition originating in downwind industrial discharges, are quite uninhabitable by fish. Elsewhere they may contain slow-growing, partly starved populations due to the impoverishment of the insect and crustacean life which the fish require for food. Secondly, the discharge of treated sewage effluent, the run-off of agricultural fertilizers, and natural seepage from vegetation and the soil produce an enrichment of lakes and rivers known as eutrophication, which results in slow but profound changes in the fish fauna. In mountain lakes particularly, the outcome of eutrophication is a change from the domination by salmonids, Brown Trout, and Arctic Charr for example, to an abundance of cyprinid fishes such as Roach and Bream. Even lakes as large as Lake Constance have shown such changes, and here the sequence has been from salmonids, to whitefishes, to communities dominated by Perch and Zander. Presumably, if eutrophication continues here the final cyprinid stage will eventually be reached. Furthermore the entry into water courses of certain chemicals known as endocrine disruptors, from the plastics and pharmaceutical industries, have been linked with feminisation of male fish.

The presumed need to control the flow of rivers has also had profound effects on the fishes. Navigation locks built in rivers to permit the passage of ships, and weirs to retain the water when normal flow was too small to allow vessels to use the river, have imposed barriers to migratory fishes attempting to return from the sea to their upstream spawning grounds. In many places they have also altered the flow of rivers so that former natural spawning grounds have been changed, either buried under silt falling out of suspension from the slow-moving water, or washed out by fast-flowing water over the weirs. The effect has been that migratory species such as sturgeon, salmon, and shad have been reduced in numbers and locally exterminated as breeding fish, while the cyprinid fishes, especially Chub, Dace, and Roach, have increased in numbers.

Still waters in low-lying areas throughout Europe have been diminished by drainage schemes aimed at the betterment of agriculture, but at the expense of many specialized habitats for fishes. While agricultural drainage projects have been practised on a large scale since at least the 16th century, and are still practiced, a more modern threat has developed in that watery wastes have been used for the dumping of municipal rubbish. In recent years, many valuable aquatic habitats have been destroyed in this way, and others are threatened. Most large European estuaries have suffered disastrously from reclamation and industrial development, the large expanses of flat ground for building and proximity to water for transport and cooling have led to the construction urban and industrial areas, including many major ports and cities, on what were once productive natural features.

Mountain lakes have also been affected in several ways. As well as eutrophication, more direct effects result from the regulation of water level in those lakes which have been adapted as sources of drinking water supply, or which provide water for hydroelectric schemes. In such lakes the water level fluctuates considerably and the shallow shore, which is the most productive in terms of plant and animal life, and which often serves as a spawning place for many species of fish, is periodically left dry. This reduces the richness of both flora and fauna, and affects the size and condition of the fish population as well as changing the balance between one group of fishes and another.

The continuing and growing demand for fish for food, and even fishmeal for animal food and fertilizer, has led to overfishing. The once abundant stocks of Herring and Cod must now be protected by fishing quotas. The populations of sharks and rays with their low productivity and slow growth rates are particularly susceptible to being over-exploitation. The largest European fish, the Basking Shark, is now considered Vulnerable in the IUCN Red List; while the Common Skate, Angel Shark and north east Atlantic population of the Porbeagle are all Critically Endangered – even more at risk than the famous Giant Panda. The Spurdog was once considered the commonest shark in the world; it is now Vulnerable, and the northern European population is Critically Endangered.

Increases in sea temperature, which may be the result of climate change, threaten northern species such as Cod at their southern limits. While Lusitanian species, notably Grey Triggerfish, sea breams and jacks, extend their ranges northwards; some breeding in Britain and Ireland for the first time.

Continued: Fish and man in Europe

Mainland Europe, and to a lesser extent Britain and Ireland, now contain well-established populations of exotic, both North American and European, freshwater fishes. Many of these were imported in uninformed attempts to improve fishing, although in some cases the motives of the people concerned are hard to understand. As a result, North American catfishes and freshwater basses are now widely distributed in parts of Europe, often to the detriment of native fishes. In England fishes such as the Wels and Zander have been introduced from the continent; the latter has spread at a considerable rate and will eventually become established throughout lowland England. The introduction of exotic fishes has, when adequately studied, usually proved to be detrimental and should be regarded not as fishery improvement but as biological pollution.

Even more widespread has been the redistribution of native fishes within Europe. Large-scale movements of fish from one area to another have been carried out, usually as a means of improving fishing waters, but the result has been the spread of diseases and parasites, and the establishment of many fishes far outside their original area of distribution. This has contributed to the decline, and sometimes the local extinction, of some of Europe's rarest fishes.

Overall, the effects of man's activities have been wide reaching and often seriously damaging. Throughout northern Europe the obstruction of rivers and pollution of estuaries, along with heavy fishing, have seriously affected migratory fishes. The Sturgeon is now an exceedingly rare fish where once it was common, Atlantic Salmon and both Allis and Twaite Shads are locally extinct and uncommon in places where once they were abundant, and the Houting of the North Sea has not been seen here for many decades.

In highland, and other, lakes populations of Arctic Charr and whitefishes have been reduced and, in some cases, extinguished by the combination of man-induced changes in their habitat. In many parts of Europe the changes in river habitats have been adverse for such fishes as the Brown Trout, and Grayling. On the other hand, fishes such as the carp family members – Roach, Bream, Dace, and Carp, and the predacious Perch, Zander, and Pike have extended their ranges, having found the man-made changes in the fresh waters of Europe to their advantage. The impact of global warming will only exacerbate these changes. The balance therefore seems to have been that such fishes have become more abundant and more widely distributed, while the salmonids, such as Atlantic Salmon, Brown and Sea Trout, Arctic Charr, whitefishes, and Grayling have diminished. Unchecked, the process will continue and could result in an impoverished fauna for most of Europe, except for the northernmost and extreme western extremities. It is consequently a matter of urgency for all aspects of water use, fishery management, and proposals for changes in aquatic habitats of any kind to be scrutinized for the effects they may have on Europe's diminishing fish fauna.

Key to the Marine and Freshwater Fishes of Britain and Ireland

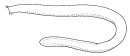
Order:

Myxiniiformes

Hagfishes

Hagfishes are unique in that they have only one semicircular canal. They have external gill openings but these may vary in number from 1-16 according to species. There is a single family.

In this order:

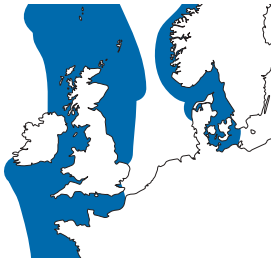
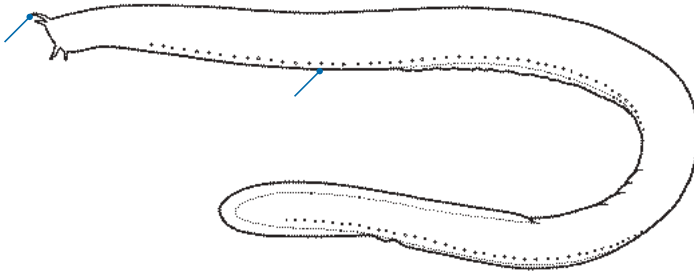


Hagfish

Family: Hagfishes *Myxinidae*

Hagfishes are one of the two living orders (Myxiniformes) of the group Agnatha, which is well known from fossils. They are primitive fishes which lack vertebrae, jaws, true fin rays, paired fins, and scales. The mouth is a slit surrounded by fleshy barbels but with a toothed tongue. Some species at least are hermaphrodite. They are all marine, occurring in temperate and tropical oceans. There are seven genera with some 70 species. Only one species lives in northern European seas.

Hagfish *Myxine glutinosa*



Characteristics

Eel-like but without eyes, jaws, gill covers, pectoral or pelvic fins; the body exceptionally slimy with rows of mucus pores. The mouth is a narrow slit with fleshy, broad-based barbels, the anterior pair flanking the single nostril in the mid-line. Teeth on both tongue and palate. A pair of ventral gill openings, placed well along the trunk; the left one is larger than, and posterior to,

the other. Six pairs of gills which are pouch-like; no gill arches.

Colour

Pale flesh pink. Occasionally brown or greyish above, pink below.

Size

Maximum attained 60 cm. Usually around 38 cm.

Ecology

A bottom-living animal, found only on muddy grounds, usually buried with merely the tip of the head showing. It lives at depths of 20-600 m, but is found in the shallower waters only in the north of its range. It is confined to water below 13°C. Its distribution is patchy rather than continuous. Low fecundity, laying only 15-30 large eggs

which have filaments at each end. The Hagfish is known to eat bottom-living invertebrates (crustaceans – which are its principal food, and polychaete worms) and also scavenges on dead fish; but is well known for attacking and boring into the tissues of fishes caught in set nets, traps, or on long-lines. Where Hagfish are common, fishing by such methods may be impractical owing to the damage to the catch.

Order:

Petromyzontiformes

Lampreys

The order Petromyzontiformes has three living families – the Northern lampreys, Petromyzontidae and the Southern lampreys, Geotriidae and Mordaciidae. One other family, Mayomyzontidae is known only from fossils. All lampreys have two semicircular canals and seven pairs of gill openings. The three living families have 10 genera with 38 species.

In this order:



River Lamprey



Brook Lamprey

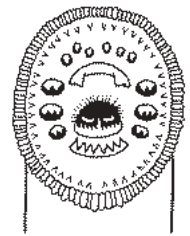
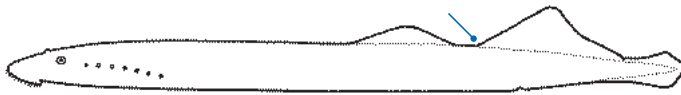


Sea Lamprey

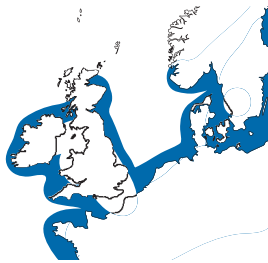
Family: Lampreys *Petromyzontidae*

The lampreys are members of one of the major groups of truly primitive fishes, the Agnatha. They lack jaws, fin rays, paired fins, and scales. Most are freshwater species, although some migrate to the sea to feed; all breed in fresh water. They are elongate, slender fishes with relatively small eyes, a distinctive series of openings along the sides of the anterior body, each opening to a separate gill pouch, and a characteristic sucker-like oral disc mouth. The prides or larvae live buried in mud where they filter-feed on microscopic organisms; the eyes and the oral disc are not developed until metamorphosis. There are eight genera with some 34 species. Three species occur in the fresh waters of Britain and Ireland.

River Lamprey *Lampetra fluviatilis*



Sucker discs



Characteristics

A circular mouth with few distinct and sharply pointed teeth; tooth-plate on the front of the disc with two well-separated teeth, lower (i.e. posterior) tooth-plate with 7-10 pointed cusps. Dorsal fins separate, the second dorsal close to the origin of the tail fin. In adults the eyes are distinct.

Colour

Uniformly coloured. Live specimens have a delicate greeny-brown back, merging into golden yellow sides, and a whitish belly. Some are leaden grey in colour, white ventrally. Teeth yellowish.

Size

Maximum length 50 cm; average length 30 cm. Females grow larger than males. Maximum length of larvae 13 cm.

Ecology

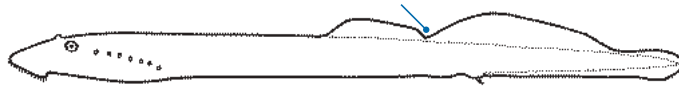
A migratory lamprey which comes into rivers from the sea from August to November, and in spring in northern rivers. In the sea it appears to live in estuarine and inshore waters. In fresh water the adults are found

in rivers and streams where they spawn in large depressions, which they have created in areas of gravel. After hatching, the young move to areas of sandy silt where they live in burrows for several years before metamorphosing to the adult form and migrating downstream to the sea. The River Lamprey has markedly decreased in numbers during historical times. Obstruction of rivers by weirs, navigation locks, and pollution has taken a heavy toll, and it is now a rare fish in some rivers where it was once abundant. A good food fish, it is fished for locally in parts of Europe (e.g. Finland) and eaten fresh or smoked. It is also used as an anglers' bait. The river lamprey is a UK BAP Priority species.

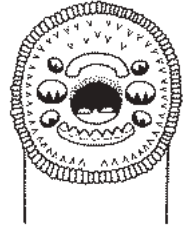
Brook Lamprey *Lampetra planeri*



Larva



Mature male



Sucker discs



Characteristics

Circular mouth complete but with weak blunt teeth, the tooth-plate in front smooth, the posterior plate in the oral disc with 5-9 weak, rounded cusps. The dorsal fins are joined at their bases and weakly so to the tail fin. The eyes are rather large and clearly visible in adults.

Colour

Dark brown above, sometimes almost slate grey, shading to yellowish or white on the underside.

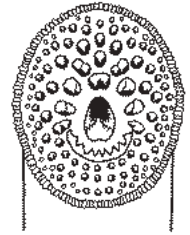
Size

Attains 16 cm, occasionally larger. Maximum length of larvae 16 cm.

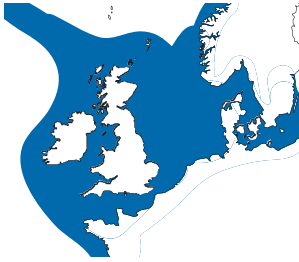
Ecology

A non-migratory lamprey living where habitat is suitable in streams and rivers. The larvae are usually found buried in beds of sandy silt and among the roots of emergent vegetation; they feed on minute organisms filtered from the mud. Adults do not feed. Probably the most common lamprey in northern Europe.

Sea Lamprey *Petromyzon marinus*



Sucker discs



Characteristics

Sucker large, teeth in the oral disc arranged in radiating rows, small teeth numerous, large sharply pointed teeth in front of disc, tooth-plate with 7-9 large, sharp cusps. Both dorsal fins well separated. Adults have large eyes.

Colour

Distinctive in adults. Grey, olive or yellow brown, heavily mottled with black or dark brown on the back; lighter ventrally.

Size

Maximum length about 90 cm; average for mature adults around 60 cm. Maximum weight 2.5 kg. Larvae grow to maximum length of some 15 cm.

Ecology

A migratory species which breeds and passes a larval life of at least four years in fresh water and then migrates to the sea to feed. Moderately widespread in fresh water, it is encountered most frequently in estuaries and inshore waters, but rarely in any numbers. Often found in the open sea attached to Basking Sharks, and occasionally to Sperm Whales. Adults are mainly parasitic on fishes including Shad, Cod, Haddock, Saithe and Sea Bass; Atlantic Salmon are also attacked. The Sea Lamprey is now much scarcer in western Europe than it was formerly, and in much of its range today it is rare. Pollution of the lower reaches of major rivers and the construction of dams and weirs have played a great part in this decline. The Sea Lamprey is not much used for food nowadays, although locally (e.g. in Portugal & France) it is still considered to be a delicacy; its flesh is very rich and oily. The sea lamprey is a UK BAP Priority species.

Order:

Chimaeriformes

Chimaeras

Chimaeras all have large pectoral fins and two dorsal fins, the first with a prominent spine, which in some species is venomous. There are three families with six genera and 33 species.

In this order:

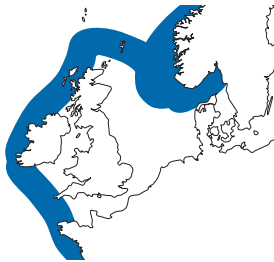
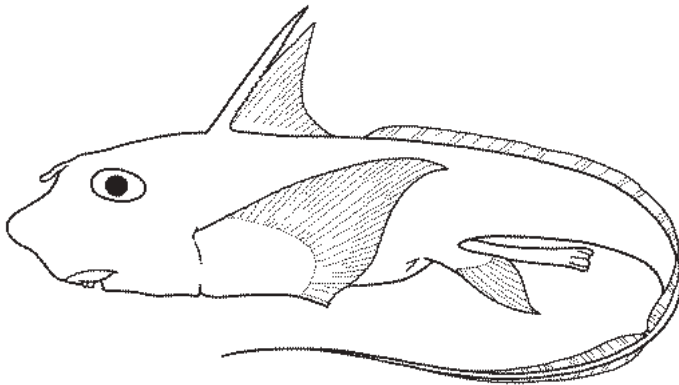


Rabbitfish

Family: Rabbitfishes *Chimaeridae*

The Rabbitfishes or Chimaeras are a small group related to the sharks and rays, and like them have a cartilaginous skeleton. They differ, however, in having fewer teeth; these are united in the form of plates, two in the upper jaw and one in the lower. The upper jaw is fused with the head skeleton; there is no spiracle, and only one gill opening on each side of the head, covered by a fleshy flap-like cover. The first dorsal fin has a strong spine, but otherwise all the fins are supported by fine horny rays. Male Rabbitfishes have claspers with simple or compound tips and a roughened surface. They also have a curious thumb-shaped organ with a spiny end on the forehead. The Rabbitfishes are all marine, and in the North Atlantic they occur on the edge of the continental shelf and in the deep sea. Worldwide, there are two genera with some 22 species.

Rabbitfish *Chimaera monstrosa*



Characteristics

Identified by its large head and comparatively short snout (which is bluntly pointed), high first dorsal fin with a strong spine, very large pectoral fins, and an anal fin which is divided from the long whip-like tail fin by a notch. The eyes are relatively large.

Colour

Light creamy-brown above with darker brown patches; ventrally white. The posterior edges of the second dorsal and anal fins are dark.

Size

Said to attain a length of 1.5 m, but in waters to the west of Britain and Ireland it rarely exceeds 1.1 m. Males seem to be slightly smaller than females.

Ecology

Lives close to the bottom and mainly in deep water from 300-500 m, in summer coming into shallower water and occasionally captured in 100 m. Rare in inshore waters. Its diet

has not been systematically studied, but remains of brittlestars, crabs, shrimps, and molluscs, as well as unidentifiable fishes have been found in the gut. The Rabbitfish deposits its eggs singly in long, tapering, light brown capsules, mainly in spring and summer, and in fairly shallow water. The capsule is 15-18 cm long. It is said to lay its eggs two at a time. It is not unknown to catch several hundred Rabbitfish in a deep-water haul, but this fish is not exploited. The flesh is said to be bitter. Like many sharks and rays, it tends to form single-sex schools, although the segregation is not absolute.

Sharks & Rays

The sharks and rays are a group of rather primitively organized fishes known as elasmobranchs, which differ from the bony fishes in a number of ways. There are several orders and families within the group. Elasmobranchs have a cartilaginous skeleton, lack true bones and thus fin rays (although some have a hard spine in each dorsal fin). The tail fin is asymmetrical, the upper lobe always being well developed. The skin is covered with dermal denticles, tooth-like structures with the base buried leaving the often sharply-pointed cusp sloping backwards. These denticles give sharks' skin its characteristic rough feel. All sharks and rays have a series of gill slits each side of the back of the head varying in number from five (most species) to six or seven. The jaws are well equipped with teeth which lie in rows, one behind the other, each row gradually moving towards the front of the jaw to replace teeth damaged or worn in use. Most sharks have sharply pointed teeth, with a keen edge, but some, for example, the smooth hounds, which feed on crustaceans and other hard-shelled organisms, have blunt and rounded teeth. Fertilization of the eggs in all elasmobranchs is internal. The male possesses a pair of claspers placed on the inner edges of the pelvic fins by which spermatozoa are transmitted into the female. A number of species lay eggs within a hard horny case; the majority produce living young. Most are ovoviviparous, but a few species are viviparous. Around fifteen species of shark occur in the coastal seas of northern Europe; at least as many more live in deep water. Rays differ from sharks by having enlarged pectoral fins attached to the sides of the head, ventral gill slits, and eyes and spiracles on the dorsal surface. There are about eighteen species of rays around the British Isles.

Order:

Mackerel Sharks

Lamniformes

These sharks all have two dorsal fins but no spines. There are five broad gill slits. The order has seven families worldwide with 10 genera and 15 species.

In this order:



Bigeye Thresher



Thresher Shark



Basking Shark



Shortfin Mako

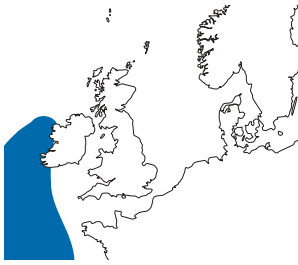
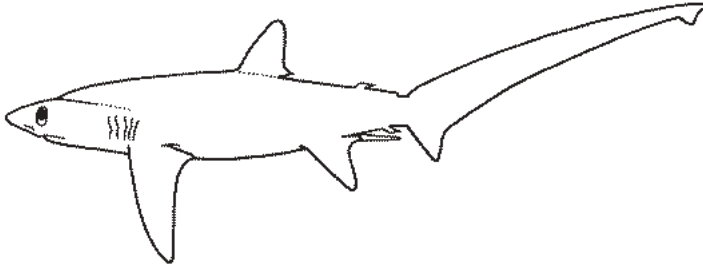


Porbeagle

Family: Thresher Sharks *Alopiidae*

The Thresher Sharks all have a very elongate curving upper lobe to the tail fin. There is one genus with three species, two of which have occurred in North west Europe

Bigeye Thresher *Alopias superciliosus*



Characteristics

First dorsal fin well back. No dorsal or anal spines; upper lobe of caudal fin very long and almost equal to the length of the rest of the fish. Eyes very large; pronounced horizontal groove from forehead to above the gills; curved pectoral fins with broad tips.

Colour

Purplish-grey above, cream below; posterior edges of pectoral and pelvic fins (sometimes also first dorsal) dusky. Light colour of abdomen not expanded over bases of pectoral fins.

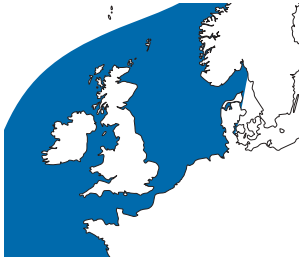
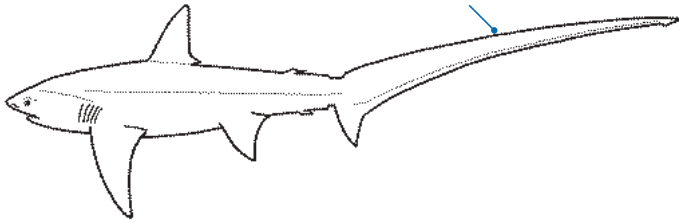
Size

Attains a maximum length of ca 4.9 m; maximum recorded weight 363.8 kg.

Ecology

A highly migratory species, found mainly in circumtropical seas, including the eastern Atlantic. Rare around Britain or Ireland. Found in coastal waters (sometimes close inshore) and much further offshore in deep water. Occurs down to depths of at least 500 m. Stuns its prey with the long tail fin, feeding on pelagic and benthic fishes and squids. Ovoviviparous, 2-4 embryos feeding on yolk sac and other ova produced by mother. Fished both commercially and as a game fish. Fins are used for shark-fin soup.

Thresher Shark *Alopias vulpinus*



Characteristics

Tail fin very long, the upper lobe may equal or exceed the length of the body. The snout is short and rounded; the teeth are small and triangular. The rather high first dorsal fin is entirely in front of the vertical from the pelvic fin origin.

Colour

Grey-blue to nearly black on the back, white ventrally may extend above the pectoral fins, which can themselves have a white tip.

Size

Maximum length 6 m, more usually 3-4 m. Weight up to ca 540 kg. British Rod-caught Record: 146.504 kg (1982, Portsmouth).

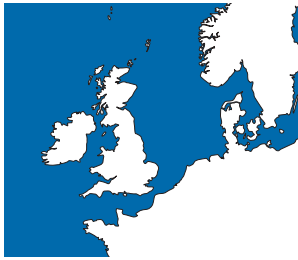
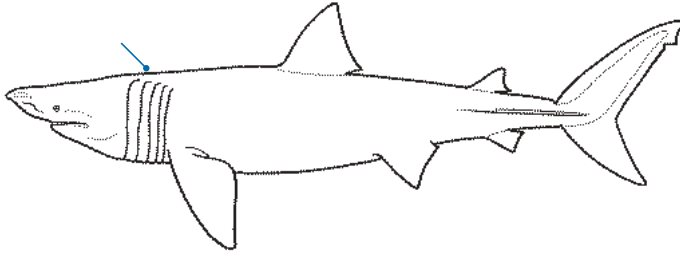
Ecology

A surface-living shark found offshore, but coming into coastal waters where they pup. Feeds especially on schooling fishes and squids, which it is said to herd together by means of its tail before attacking. Specimens examined have proved to contain large numbers of Mackerel, Herring, and garfish; members of the herring family are its most common prey. From 2-4 young are born at a time; it is ovoviviparous and oophagous. The young are approximately 1.5 m at birth; the gestation period is not known. This shark probably matures at around 3-4 m. The Thresher is a rather uncommon shark in northern European waters, but it chiefly occurs along the open ocean coasts and the English Channel. It is found in British and Irish waters, in most months of the year. They have a tendency to 'breach' (leap clear of the water). Young, evidently newly born, are occasionally captured in the summer months and the autumn.

Family: Basking Sharks *Cetorhinidae*

The main characteristic of Basking Sharks are the exceptionally large gill openings which extend almost to the top of the head. There is only one species in the family.

Basking Shark *Cetorhinus maximus*



Characteristics

Distinguished by the pointed snout and five enormously large gill slits which occupy the whole of the sides of the head and throat. The teeth are minute, closely set, and flattened, and the gill arches are set with long thin gill rakers.

Colour

Back greyish-brown, sometimes nearly black, lighter brown vertically with grey blotches anteriorly.

Size

Maximum proven length 11 m,

but it may grow to 15 m; average length in northern European seas is around 7.6 m. Maximum weight of 4000 kg is estimated.

Ecology

Seen mainly at the surface off open ocean coasts. Records of its occurrence are more numerous in summer; tending to live deeper in the winter. Usually seen singly, but occasionally in schools of up to a few hundred. It is at these times that courtship behaviour has been observed and breaching occurs. The Basking Shark, with a worldwide distribution in temperate and cool-temperate oceans, is the second largest living fish, the largest being the Whale Shark, *Rhincodon typus*, a tropical species; both are plankton eaters. It feeds by swimming around with its mouth wide open, sieving the water of whatever planktonic animal life is locally abundant. Little is known of its breeding habits. It is

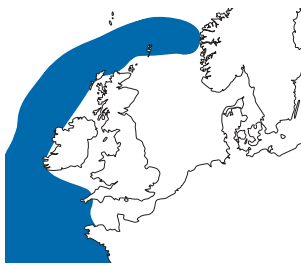
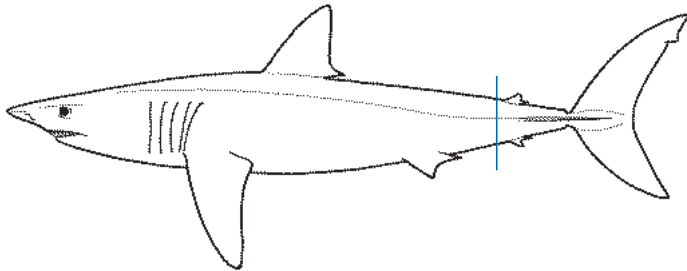
probably ovoviviparous. Gestation period has been suggested to be around 14 months and the young are over 1.5 m at birth. In European waters at least, the characteristic gill rakers may be shed in the winter, regenerating during spring. However, most appear to keep feeding on deepwater plankton concentrations during the winter months, and there is no evidence that the shark 'hibernates'.

The Basking Shark has at times been fished for locally on Irish, Scottish, and Norwegian coasts, mostly by harpooning or in large nets. These fisheries have never flourished or continued for long, possibly because local stocks were exhausted or driven away. It is listed by the IUCN in the Red Data book as Vulnerable and since 1998 has been protected in British waters. It is protected under the Wildlife and Countryside Act and is a UK BAP Priority species.

Family: Mackerel Sharks *Lamnidae*

The Mackerel Sharks are a group of large, predatory, sharks. All have stout muscular, streamlined bodies, with a high lobed tail fin (such a fin is characteristic of powerful swimming fish). These sharks are capable of maintaining a body temperature higher than that of the surrounding water, which is also an adaptation to more powerful swimming, and a feature they share only with spearfishes and tunnies. The family is worldwide in its distribution in tropical, warm temperate and temperate seas. It includes the potentially dangerous White Shark, *Carcharodon carcharias*, a species that has not been recorded north of Biscay. There have been no verified reports of unprovoked attacks on man in northern Europe by either of the members of the family which do occur around Britain and Ireland, although all should be regarded as potentially dangerous. Worldwide, there are three genera with five species.

Shortfin Mako *Isurus oxyrinchus*



Characteristics

A large shark with a rather slender shape and pointed snout. The first dorsal fin is placed vertically above the rear edge of the pectoral fin base; the small second dorsal fin origin lies in front of the anal origin. A strong keel on either side of the tail, but no smaller secondary

keel at the base of the lower tail fin lobe. Jaw teeth long, narrow and triangular, those on the lower jaw hanging forward clear of the lips; no basal cusps.

Colour

Deep blue, or blue-grey with a sharp transition to the snowy white underside.

Size

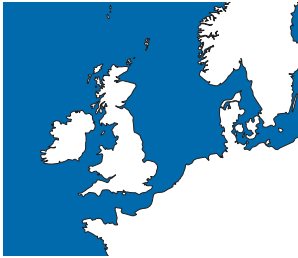
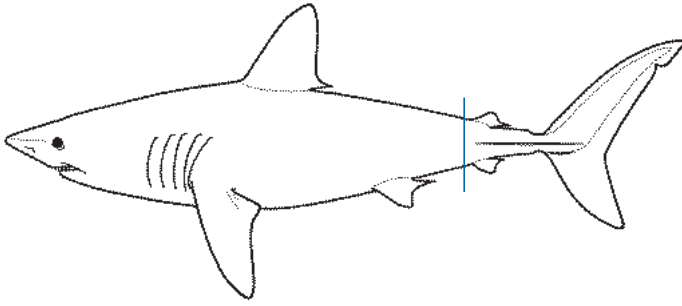
Maximum length 4 m, and weight ca 505 kg. Average in northern European waters ca 3 m and 227 kg. British Rod-caught Record: 226.786 kg (1971, Eddystone Light).

Ecology

A surface-living shark of the

open ocean which only very rarely comes inshore round Britain or Ireland. Mostly confined to the upper 20 m of the sea. Probably only a summer visitor to northern European seas, and not common. Considered the fastest shark in the world, it eats surface-living schooling fish, Mackerel, Pilchard, and Herring, as well as squids. In tropical waters feeds on a wide range of often large fishes, and is reputed to be dangerous to man. Known to be ovoviviparous and oophagous; an embryo of 50 cm with an enormously swollen, yolk-filled stomach has been described. Not known to breed in British or Irish waters.

Porbeagle *Lamna nasus*



Characteristics

A large round-bodied and thickset shark, with five moderately large gill slits. The first dorsal fin originates above the pectoral fin base; the second, which is comparatively small, lies above the equally small anal fin. A strong keel on each side of the tail, with a smaller shorter keel beneath it at the base of the lower tail fin lobe. Teeth large and triangular with a small cusp each side at the base.

Colour

Grey or greyish-blue on the back, merging gradually into pale cream on the underside. A distinctive pale patch by the free tip at the rear of the first dorsal fin.

Size

Maximum length *ca* 3 m, and weight *ca* 280 kg. The average length for British and Irish waters appears to be around 1.8-2.4 m. British Rod-caught Record: 230 kg (1993, Dunnet Head). Irish Rod-caught Record: 165.564 kg (1932, Keem Bay).

Ecology

A shark of the surface layers of the open ocean, it is widely distributed throughout northern European seas. The commonest large shark around Britain and Ireland and in shallower seas such as the North Sea. Regularly occurring around oil rigs. It eats a wide range of surface-living and demersal fish of varying kinds. At times, it also feeds heavily on squids. The flesh is a popular food in Europe,

but the stocks have been overfished. Ovoviviparous and oophagous, litters of 1-5 have been reported. The late embryos frequently have massive yolk-filled stomachs owing to their having consumed unfertilized eggs within the mother's oviduct. The young are born at a length of 60-80 cm. It is listed by the IUCN in the Red Data book as Vulnerable, but the north east Atlantic population has declined dramatically and the species is now Critically Endangered in northern European waters, but as of 2009 has no protection here.

Order:

Carchariniformes

Ground Sharks

All but one species in this order have two dorsal fins, without spines. There are five gill slits. The order is a large one and includes eight families, 49 genera and more than 220 species.

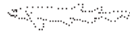
In this order:



Blackmouth Dogfish



Lesser Spotted Dogfish



Nursehound



False Catshark



Tope



Starry Smooth Hound



Smooth Hound



Blue Shark

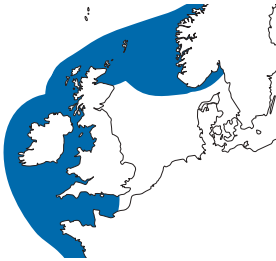
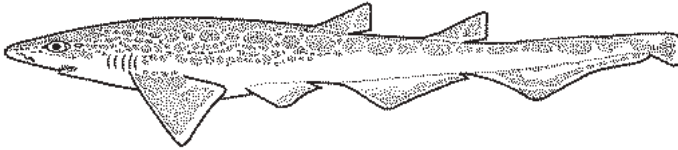


Smooth Hammerhead

Family: Catsharks *Scyliorhinidae*

The Catsharks (or dogfishes as many of them are known) belong to one of the largest families of sharks (Scyliorhinidae) which comprises about 60 species. Most are small, shallow-water sharks with two dorsal fins placed towards the tail, an anal fin and a long tail fin. Their build accords with their bottom-living life style, they frequently rest on the bottom. All lay eggs in brown, leathery purses, in many species with long tendrils at the corners which anchor them to algae or fixed objects. Many are boldly marked or coloured, including the three northern European species.

Blackmouth Dogfish *Galeus melastomus*



Characteristics

Snout rather broad and flattened, slightly pointed. Dorsal fins small and of equal size, the tail fin long. Nostrils with a flap, but widely separated, and spaced away from the mouth. A roughened ridge of large denticles along the back of the tail.

Colour

Dorsally, a warm brown with rounded, large dark brown blotches, extending as a regular pattern down the sides. Ventrally creamy-brown; inside of the mouth black.

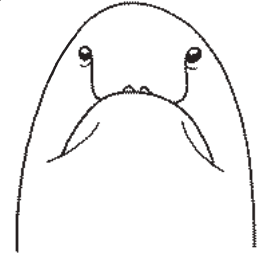
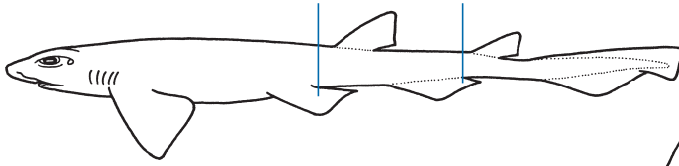
Size

Grows to 75 cm; average length 45-65 cm. British Rod-caught Record: 1.276 kg (2008, Red Bay).

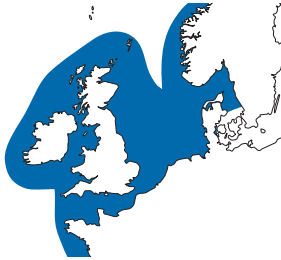
Ecology

A bottom-living dogfish found on the upper edge of the continental slope. Most common in 200-500 m, rarely captured in water as shallow as 55 m. Uncommon around Britain and Ireland. Mostly shrimps and prawns are eaten, but some fish remains have been found in the stomachs. Lantern fish have been recorded, which suggests that it forages off the sea-bed. The eggs are laid in summer in smooth, elongate light brown cases which have short horns at one end. The egg-case measures 6 by 3 cm. Females with up to 13 eggs have been found.

Lesser Spotted Dogfish *Scyliorhinus canicula*



Mouth and nasal flaps



Characteristics

A small shark with a slender sinuous body. The tail is long and low, the lower lobe of the tail fin scarcely developed. The dorsal fins lie far down the back; the origin of the first is behind the pelvic fin base. The nostrils are concealed by broad flaps which reach the mouth and are separated from one another by only a small gap; the internal nasal flap on the outer edge of the nostril is pointed. Internationally known as Small-spotted Catshark.

Colour

Back and sides sandy brown with numerous small dark brown spots; the underside is cream coloured, often eight or nine indistinct dusky saddles.

Size

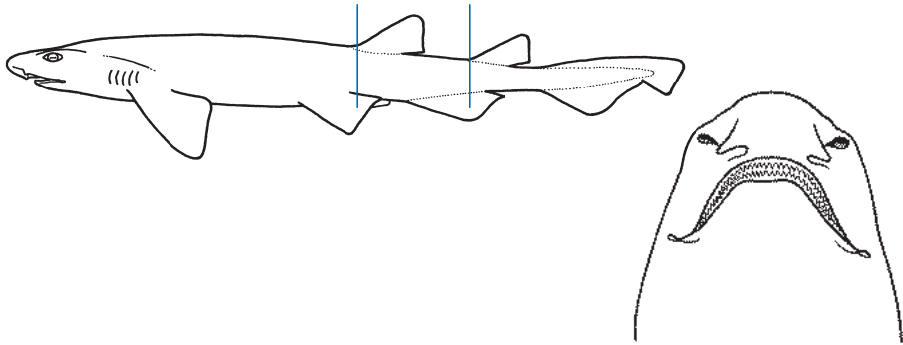
Rarely grows to a length of 1 m; more usually 60-70 cm. Weights of 2 kg are about maximal. British Rod-caught Record: 2.244 kg (1988, Kirkcudbright). Irish Rod-caught Record: 1.928 kg (1982, Valentia).

Ecology

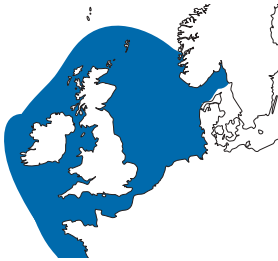
A common bottom-living shark which occurs in depths of 3-110 m, and less commonly down to 400 m. It inhabits sandy bottoms, fine gravel and even mud. The young and newly-hatched fish are found in the shallowest depths. This dogfish eats a very large range of bottom-living invertebrates. Its principal food consists of crustaceans, including various crabs and shrimps, molluscs especially whelks, and polychaete worms. Some, mainly bottom-living, fishes

are eaten. The eggs are individually enclosed in an elongated semi-transparent capsule with slender tendrils at each corner by which they are anchored to algae or other solid structures. Reproduction continues throughout the year, but egg-laying takes place in shallow water mainly between November and July. Incubation lasts for 5 to 11 months; the young hatch at a length of about 10 cm, and sexual maturity is attained at a length of about 50 cm. The Lesser Spotted Dogfish is an extremely common and widespread fish around Britain and Ireland and in other European seas. At times it occurs in large numbers in the catches of trawlers and it is common to find only one sex present in even large schools. Although at one time valueless to the fisherman, it is now marketed in England as 'Huss' or 'Rock Eel' but is also used as whelk bait and forms a small but valuable fishery.

Nursehound *Scyliorhinus stellaris*



Mouth and nasal flaps



Characteristics

Closely resembles the Lesser Spotted Dogfish, but the first dorsal fin is set vertically above the base of the pelvic fins. The anal fin ends under the middle of the second dorsal fin. A large, broad lobed flap covers each nostril but does not reach the upper lip; the nostrils are widely separated. The inner nasal flap is broad. Also known as Greater Spotted Dogfish or Bull Huss.

Colour

The back and sides are sandy brown or greyish-brown with a mix of small and large rounded dark brown blotches. The underside is creamy-white, but with dusky edges to the lobes of the tail and anal fins. The dark blotches are very variable in size and number; almost totally black specimens have been described.

Size

Attains a length of 1.5 m; average about 1.2 m. Maximum weight about 10 kg. British Rod-caught Record: 10.092 kg (1986, Somerset). Irish Rod-caught Record: 10.801 kg (2003, Sneem).

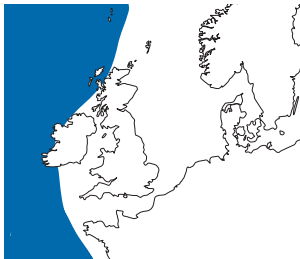
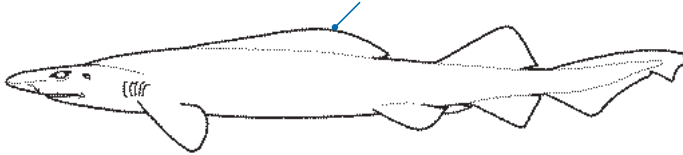
Ecology

A bottom-living shark which is found from depths of 1-2 m down to 125 m, and occasionally deeper. It usually lives on rough or rocky grounds. It eats a wide variety of invertebrates especially crustaceans and molluscs, and bottom-living fishes. The eggs are enclosed in tough elongate rectangular cases, 10-13 cm in length, each with a long curled tendril at the corners. They are deposited mainly in spring and summer, among algae around which the tendrils twine. The young take around 9 months to develop and measure about 16 cm at hatching. The Nursehound is common only to the south and west of Britain and Ireland. It is caught by anglers, but more often by commercial fishermen.

Family: False Catsharks *Pseudotriakidae*

The False Catsharks are little-known deep-water sharks, members of which have been found in the North Atlantic, North Pacific, and south-west Indian Oceans. Two species have been recognized, both rather stout-bodied, and with extremely long, low dorsal fins. One species occurs in northern European seas in deep water on the continental slope; it has been regarded, possibly mistakenly, as rare.

False Catshark *Pseudotriakis microdon*



Characteristics

A rather heavy-bodied, large, deep-water shark which has an extremely long-based, low first dorsal fin. The second dorsal is shorter and much higher. The teeth are minute, in closely packed mosaic rows.

Colour

Uniformly dark brown or greyish-brown.

Size

Attains a maximum length of 3 m.

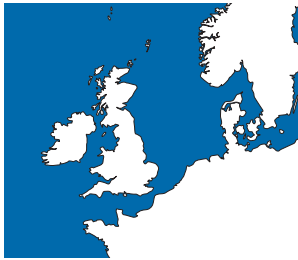
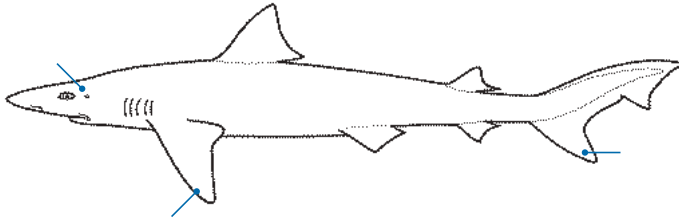
Ecology

A bottom-living shark found only in deep water between 200 and 1890 m. Very exceptionally, specimens occur in inshore waters. Live-bearing oophagous, producing two young in a litter. Young at birth are at least 70 cm. Females with very young embryos have been found off the Irish coast in July. Recorded only very rarely and, until recent deep-water trawling, known only from about a dozen specimens. A rarely seen shark caught by deepwater trawling and demersal longlines. This shark is probably widely distributed in deep water in the North Atlantic.

Family: Hound Sharks *Triakidae*

Hound Sharks have two dorsal fins and long labial furrows. Horizontal eyes with a nictitating membrane. Worldwide, there are nine genera with over 40 species.

Tope *Galeorhinus galeus*



Characteristics

A slender-bodied medium sized shark, with a moderate first dorsal fin, but small second dorsal opposite and similar to the anal fin in size and shape. The small teeth are triangular and sharply pointed. In the sides of the jaws they are oblique, with serrations on the shorter edge; in the centre of the jaws they are upright and serrated on each side.

Colour

Uniformly grey or greyish-brown on the sides and back, white ventrally. The outer margin of the pectoral fin is light on the dorsal surface.

Size

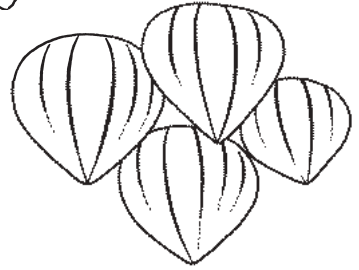
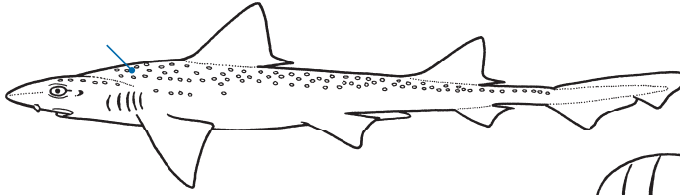
Attains a maximum length 1.95 m and a weight of ca 45 kg. A length of 1.2 m is more usual. British Rod-caught Record: 37.422 kg (1991, Essex). Irish Rod-caught Record: 30.164 kg (1979, Carlingford Lough).

Ecology

The Tope is found coastal waters, small specimens near to the shore and others down to 400 m. Usually it lives in small schools, close to the bottom, although when actively feeding it is found in mid-water. It is seasonally migratory in northern waters. This fish eats a wide range of small schooling fishes,

especially Whiting, Pouting, and Cod. It also feeds on bottom-living fishes, crustaceans, and echinoderms. The Tope is a live-bearing (ovoviviparous) shark. Between 20 and 40 young form a litter; the number increases with the size of the mother. The young are born in late summer after the mother has moved into shallow water. They are 40 cm long at birth. Gestation lasts around 10 months. Tope are a relatively popular quarry for the sea angler, but in England and Wales these must now be released at sea. Many of the Tope caught in inshore waters are gravid females, and heavy exploitation close to shore has seriously affected the stocks of this shark. A long-lived and vulnerable species, with females maturing after 10 years; there are now catch limits in British waters. It is listed by the IUCN in the Red Data book as Vulnerable.

Starry Smooth Hound *Mustelus asterias*



Dermal denticles



Characteristics

A moderately slender-bodied shark with five gill slits and a small spiracle on each side, with moderately large dorsal fins. The teeth are blunt and flattened and lie in a mosaic pattern in the jaw. Dermal denticles are broad and weakly ridged except towards the tips where the ridges (in large specimens) may wear completely. Nasal flaps are rather narrow.

Colour

Grey above and on the upper sides, sprinkled with small white (star-like) spots. Ventrally creamy-white.

Size

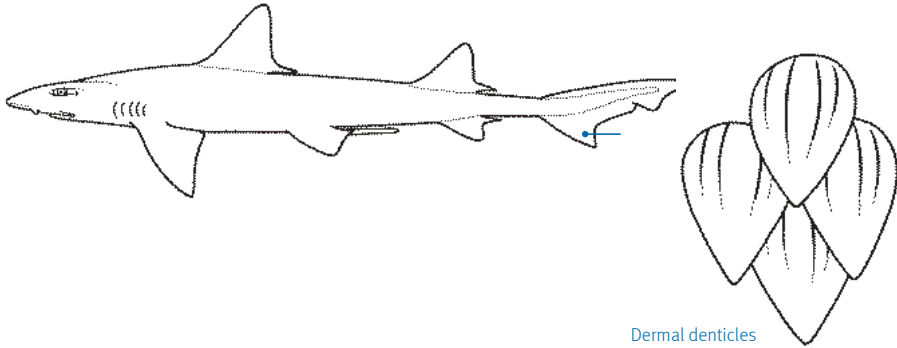
Grows to a maximum length of 1.4 m; the average length is near 1.2 m. British Rod-caught Record: 12.757 kg (1998, Minehead).

Ecology

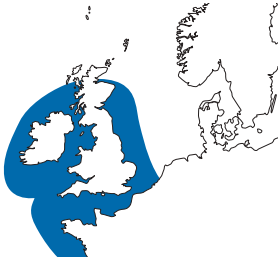
An inshore species usually found close to the sea-bed at least as deep as 100 m. It seems to be most common on sand and gravel grounds. The

Starry Smooth Hound feeds almost entirely on crustaceans including hermit crabs, edible crabs, and shore crabs, small lobsters and squat lobsters. Even hermit crabs living in whelk shells are eaten, and the remains of the commensal anemone, *Adamsia*, the mollusc shell and hermit crab have been found in the shark's gut. Ovoviviparous; the embryos develop within their mother, nourished by the yolk of the egg. There is no connection with its mother. Litter size varies between 7 and 15 (depending on the size of the mother); the young are about 30 cm at birth. The period of gestation is approximately 12 months. The young are born in summer in relatively shallow water. The Starry Smooth Hound is a common shark in inshore waters around Britain and Ireland. It is caught fairly frequently by inshore trawlers and by sea anglers.

Smooth Hound *Mustelus mustelus*



Dermal denticles



Characteristics

A slender-bodied shark with 5 gill slits and a small spiracle on each side; two moderately large dorsal fins. The teeth are blunt and flattened, and lie in the jaws in a mosaic pattern. The dermal denticles are relatively narrow with basal ridges but smooth ends. Nasal flaps are broad.

Colour

Back and sides plain grey, no noticeable white spots; ventrally creamy-white. Occasionally black blotches on back.

Size

Grows to a maximum length of 1.6 m, more usually between 1 and 1.2 m. British Rod-caught Record: 12.7 kg (1969, Norfolk). Irish Rod-caught Record: 7.521 kg (2000, Carne).

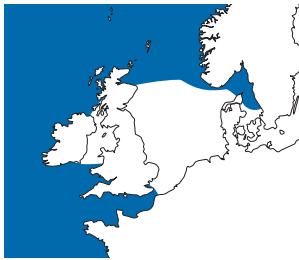
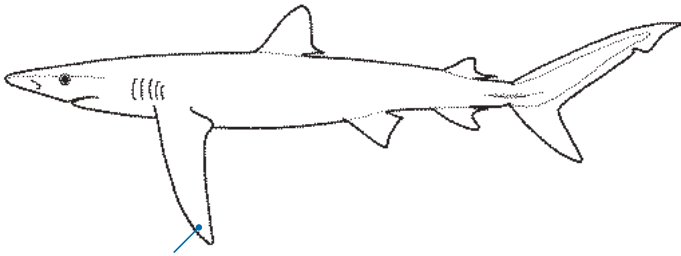
Ecology

Coastal, from near the shoreline down to depths of 350 m; most common in 5-50 m. It is mainly bottom-living and only occasionally found in mid-water. It mainly eats crustaceans, but also takes cephalopods and bony fish. Viviparous; the embryo is nourished through a pseudoplacenta formed by the connection of the yolk-sac membrane to the maternal membranes. Litters of up to 15 are known, the young being about 30 cm in length at birth. Generally less common in British waters than the Starry Smooth Hound from which it has only been clearly distinguished in last fifty years. Much of the information compiled by earlier biologists could have applied to either species.

Family: Requiem Sharks *Carcharhinidae*

This is the largest family of living sharks. They are most abundant in tropical and warm temperate seas; those which occur in temperate seas are often seasonal migrants. They are all typical sharks with slender bodies, long tail fins (the upper lobe being much the longer), and five gill slits. All have sharp triangular teeth and are entirely predatory; several species are known to be dangerous to man. Members of the family are active swimmers and are found in inshore coastal waters and on the high seas. Worldwide, there are 12 genera with over 100 species.

Blue Shark *Prionace glauca*



Characteristics

A long slender-bodied shark with a well-developed upper lobe to the tail and very long, curved pectoral fins. The snout is long and sharply pointed; there are 5 gill slits and it has no spiracle. The teeth are pointed, slightly oblique, and have serrated edges.

Colour

The back and upper sides are a deep indigo blue, the sides clear blue, and the ventral surface white. After death this beautiful blue colouring fades to grey.

Size

It attains a maximum length of 3.8 m, but in European waters is usually around 2.7 m. A maximum weight of 198 kg is recorded, but in European waters few weigh as much as 90 kg. British Rod-caught Record: 98.878 kg (1959, Cornwall). Irish Rod-caught Record: 93.442 kg (1959, Achill Head).

Ecology

A surface-living shark of the open sea. It makes seasonal migrations with summer warming of the sea which bring it into coastal waters (but not close inshore) in northern Europe. Feeds on a wide range of fishes, mostly near-surface schooling fish such as Mackerel, Herring, and Pilchard. Squids of various kinds are an important part of its diet. It also follows fishing boats and feeds on discarded offal and unwanted fish. Gives birth to live young; the embryos have a yolk-sac placental connection to the maternal uterus. Litters as large as 63 have been reported, but the number is dependent on the size of the mother. Very rarely, gravid Blue Sharks are caught in British waters. The young are 35-46 cm long at birth. The Blue Shark used

Continued: Blue Shark *Prionace glauca*

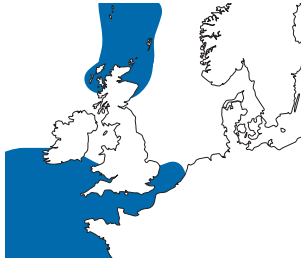
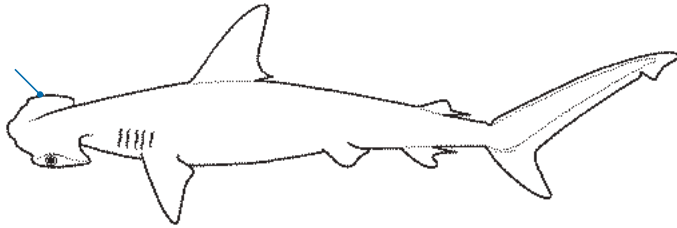
to be abundant offshore in the western Channel in summer; with sport fishermen catch some 3,000-5,000 annually in British and southern Irish waters in the 1960s. By the beginning of the twenty first century only a few hundred were being caught by anglers, and most are tagged and released. They move north-eastwards during early summer, entering the Channel in June where they will be found until about the end of September. The northward migration takes them in some years into western Scottish waters in July and August, and occasionally to southern Norway and into the northern North Sea.

Rarely, individuals are found as far south as eastern Scotland and Yorkshire in late summer and early winter. The great majority of Blue Sharks in the north-eastern Atlantic are females; males occur in a proportion of ca 1:5,000 in the Channel fishery. Most of the sharks are immature females. A small proportion are adults which have given birth to young, presumably in southern waters. The flesh is of low value, but these sharks are threatened globally by the trade in shark fin.

Family: Hammerhead Sharks *Sphyrnidae*

The Hammerhead Sharks are small family which all have the distinctive head shape, the sides of the head being greatly expanded with the eyes on the outer edge. They are all tropical and warm temperate marine sharks which seasonally venture into cooler waters. One species only has been reported in northern European seas, and that rarely. It is thought that the wide spacing of the nostrils and eyes might enhance their sensory abilities including the electromagnetic sensitivity, and that the hammer-shaped head acts as a 'bow plane' to give lift to the shark's front end when swimming. The family includes two genera with nine species.

Smooth Hammerhead *Sphyrna zygaena*



Characteristics

Head developed with flattened, laterally projecting 'hammer' lobes either side, with the eyes on the outer edges and the nostrils spread far apart. The front edge of the snout is smoothly rounded with notches at the level of the nostrils, but no central notch. The first dorsal fin relatively high.

Colour

A deep olive brown or greyish-brown above, light grey ventrally; the edges of the fins dusky.

Size

Grows to 5 m and 400 kg.

Ecology

Feeds on sharks, rays, other fish and some invertebrates. Recorded only occasionally in northern European waters, in the Bristol Channel, English Channel and the southern North Sea. Its status appears to be that of a rare vagrant from the south.

Order:

Hexanchiformes

Six-gill Sharks

These sharks all have just one dorsal fin and no spines. Most have six gill slits, but some have seven. The order includes two families with four genera and five species.

In this order:



Frilled Shark



Bluntnose Sixgill Shark

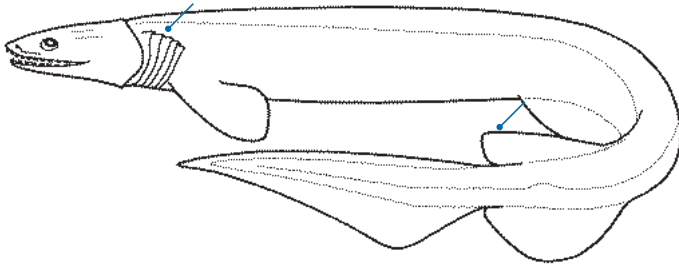


Sharpnose Sevengill Shark

Family: Frilled Sharks *Chlamydoselachidae*

The Frilled Sharks are a small family with only one living representative, the rather slender-bodied Frilled Shark. It possibly occurs worldwide in deep temperate seas but has been captured only in a few areas. Among its primitive features are the loose attachment of the lower jaw to the cranium, and the fact that only the first 3-4 vertebrae are calcified. There is just one described species.

Frilled Shark *Chlamydoselachus anguineus*



Characteristics

An extremely elongate shark which has small, low dorsal and anal fins opposite one another, and a rather long tail. The six gill slits are large and anteriorly are continuous under the throat. The teeth are three-pointed, in well-spaced rows, within large jaws.

Colour

Dark brown, or grey-brown, slightly paler ventrally.

Size

Females attain a length of 190 cm, males 165 cm.

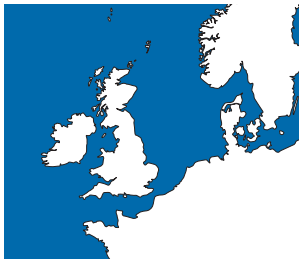
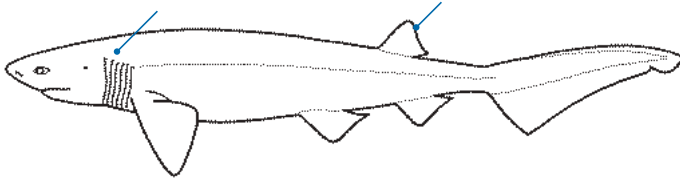
Ecology

An uncommon shark living mostly in mid-water and just above the bottom in 50-1500 m. It is ovoviviparous, the young being born in litters of up to 12. The eggs are large, and the embryo has a large yolk-sac by which it is nourished for the 12-month gestation period. Believed to be 40 cm at birth.

Family: Cow Sharks *Hexanchidae*

The Cow Sharks show many primitive features. They are worldwide in distribution and most common in deep water. All are rather elongate in body form with six or seven pairs of gill slits (most sharks have five pairs), a single dorsal fin, a long tail fin, and the teeth in the lower jaw with several parallel cusps, giving them a comb-like appearance. There are three genera and four species in the family.

Bluntnose Sixgill Shark *Hexanchus griseus*



Characteristics

Six long gill slits on each side which do not run under the throat. The body is relatively slender, and the upper lobe of the tail elongate, but the head is broad and the snout blunt. The single dorsal fin is placed far back, close to the tail.

Colour

Dark brown or grey above, lighter ventrally

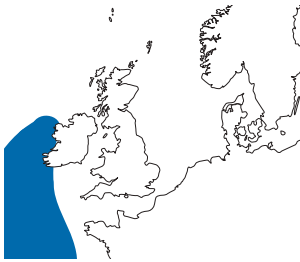
Size

Maximum length 5 m, average length ca 1.5-1.8 m. British Rod-caught Record: 4.309 kg (1976, Plymouth). Irish Rod-caught Record: 69.854 kg (1968, Kinsale).

Ecology

A relatively uncommon mid-water shark found in the warmer parts of its range in depths of 200-1,000 m, but in the cooler regions venturing nearer the surface. Mainly an open-ocean species, it is caught occasionally in inshore waters, but rarely close to the shore. An indiscriminate predator which eats squid, a wide range of fish (including Haddock, Hake, Anglerfish, Dab, and Spurdog), crustaceans and, on occasions, seals and cetaceans. Ovoviviparous; the young are born at a length of ca 60 cm, in litters ranging from 22-108 in number depending on the size of the female.

Sharptooth Sevengill Shark *Heptranchias perlo*



Characteristics

Seven pairs of gill slits. Head and body narrow; eyes large and fluorescent green. Dorsal fin small, originating over the inner margins of pelvic fins; anal fin small, no dorsal or anal spines. Teeth wide and comb-shaped.

Colour

Brownish grey above, sometimes with dark blotches; paler below. Fin margins light in colour; juveniles with dark-tipped dorsal and caudal fins.

Size

Males attain 1.37 m; females 1.4 m. Males reach 2.14 m.

Ecology

Circumglobal in tropical and temperate seas, including the North Atlantic. Rare around Britain and Ireland. Occurs inshore and on outer continental shelves, mainly from 100-400 m but sometimes down to 1,000 m. Feeds mainly on fish (small sharks and rays) and large invertebrates (shrimps, crabs, lobsters, cuttlefish and squid). Ovoviviparous with 6-20 young per litter. Some commercial fisheries – the flesh is regarded as poisonous to eat but the liver is used as a source of oil. Very active and aggressive when captured.

Order:

Echinorhiniformes

Bramble Sharks

A small order where the two small dorsal fins are placed well back, near the tail fin. There is just one family.

In this order:

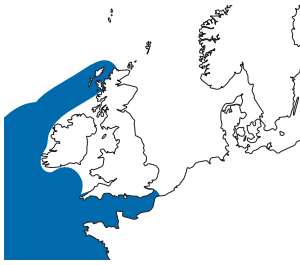
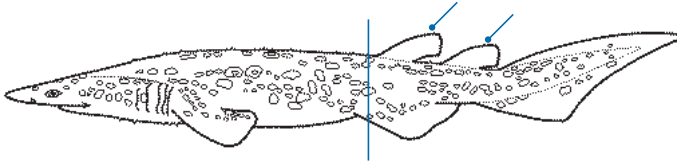


Bramble Shark

Family: Bramble Sharks *Echinorhinidae*

The Bramble Sharks have two dorsal fins without spines. Characteristically, the last gill slit is distinctly larger than the others. There is only one genus with two species.

Bramble Shark *Echinorhinus brucus*



Characteristics

A large shark with two very small dorsal fins situated close together and close to the tail fin, which is itself rather large and broad. The skin is very prickly, covered with rough denticles and scattered, broad-based large thorns. The jaw teeth are oblique with large central cusps, a smaller single cusp in the acute angle, and two cusps in the obtuse angle.

Colour

The back and sides are grey or olive brown, often with black or red spots and the whitish thorns; the ventral surface is yellowish-white.

Size

Attains a length of about 3.0 m and a maximum weight of ca 152 kg.

Ecology

Found close to the bottom in depths of 40-900 m, but occurs very occasionally in shallower water. It is said to eat fishes and crustaceans. Ovoviviparous; one Bramble Shark in the Mediterranean weighing 60 kg contained a single embryo of 164 g, 29.5 cm in length. The Bramble Shark is exceptionally rare in the seas of north-west Europe, and very few specimens have been reported in recent times. In the 19th century there were some 40 records in British waters alone, which suggests that either the species has become scarcer, or that climatic or hydrological conditions were more suitable over a century ago.

Order:

Squaliformes

Dogfish Sharks

Representatives of this order are distinguished by the possession of two dorsal fins, some with a strong spine in the front, none have an anal fin. They are widely distributed in the world's seas, mostly in the deep sea, although the spurdogs are common in shallow water on the continental shelf. A number occur in northern European waters; others are found in the deeper waters of the eastern Atlantic. Altogether, the order includes six families, 24 genera and about 100 species.

In this order:



Spurdog



Shovelnosed Shark



Velvet Bell



Portuguese Shark



Greenland Shark



Angular Roughshark



Sailfin Roughshark

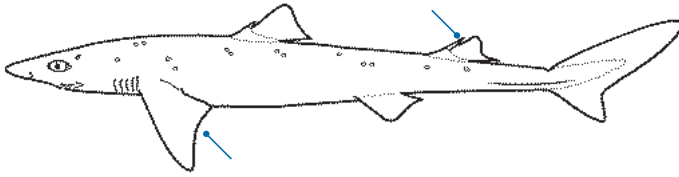


Darkie Charlie

Family: Spiny Sharks *Squalidae*

Spiny Sharks are distinguished by the possession of a strong ungrooved spine in the front of each dorsal fin and by the lack of an anal fin. Spiny Sharks are slender-bodied and, although the skin has a rough feel, the dermal denticles are not spiny. The family includes two genera with more than 10 species.

Spurdog *Squalus acanthias*



Characteristics

The Spurdog is distinguished as the only common small shark which has a spine at the front of both dorsal fins, and which lacks an anal fin. The fin spines are large, the second standing clear of the fin. Its body shape is slender with a pointed snout, large eyes, and moderate-sized spiracles.

Colour

Dark grey above, with scattered white spots (especially in juveniles) over the back and sides, forming fairly regular series on the mid-side. Ventrally lighter.

Size

Attains a maximum length of about 122 cm, rarely in excess of 100-110 cm. A maximum weight of around 10 kg is reached, but the normal weight is 6.3-6.8 kg. Females grow longer and heavier than males. British Rod-caught Record: 9.622 kg (1977, Cornwall). Irish Rod-caught Record: 10.319 kg (2008, Red Bay).

Ecology

Found near the sea-bed on soft bottoms from 10-200 m, exceptionally down to 950 m, and also near the surface. Probably it approaches the surface at night. Feeds on schooling fishes such as Herring, Sprat, Pilchard, sandeels, Whiting, and garfish. It also eats bottom-living species such as Cod, dragonets, and flatfishes, and invertebrates including squids and crabs. Live-bearing, the Spurdog is ovoviviparous. The litter size ranges from 3-32. The young are from 20-33 cm at birth. Both size and number at birth vary with the size of the mother and region. Gestation lasts between 18 and 24 months. Males become mature at 55-61 cm in length; females vary from 75-80 cm. Longevity 75, possibly 100 years. Typically it is encountered in large to very

Continued: Spurdog *Squalus acanthias*

large, unisexual schools. The Spurdog was a very common fish in the coastal and offshore waters of northern Europe, possibly the most abundant living shark. Formerly this shark was regarded as a nuisance or a pest because of the damage it caused in nets and to hooked fishes, but in the last century it was caught first for the sake of its liver oil (the liver is very large) and later for fish meal. More recently, the increased demand for 'Flake' or 'Rock Salmon' for human consumption lead to valuable fisheries.

Owing to the long gestation period, slow growth and the rather large size at which maturity is reached, the Spurdog is very liable to suffer from overfishing. It is listed by the IUCN in the Red Data book as Vulnerable and the northeast Atlantic population is now considered to be Critically Endangered.

Family: Gulper Sharks *Centrophoridae*

Gulper Sharks all have two dorsal fins with grooved spines. Worldwide, there are two genera with 14 species.

Shovelnosed Shark *Deania calceus*



Characteristics

A slender shark lacking an anal fin, and having a long, slender spine in front of each dorsal fin, the first of which is long and low. The snout is characteristic, long and flattened from above; its length from mouth to tip is more than the length from mouth to pectoral fin: it is often called a Birdbeak dogfish.

Colour

A pale, rather dull grey.

Size

Females grow to 117 cm, and weigh about 5.25 kg; males are smaller, attaining only 91 cm.

Ecology

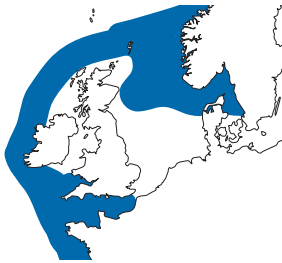
Essentially a deep-water shark which is found on the continental slope between 400 and 1,450 m, although also occasionally found up to 70 m. The Shovelnosed Shark lives on the bottom and probably hunts at night in mid-water. The remains of Mackerel, Scad, Blue Whiting, lantern fishes and other mid-water fishes have been found in the gut of this shark. It also eats cephalopods and shrimps. This shark is ovoviviparous; off the Irish coast the young are born in early summer. Gestation probably lasts at least a year. A litter may be as many as 17,

each around 25 cm in length at birth; 10-12 per litter is more usual. This is the most abundant of the larger deep-water sharks in the eastern North Atlantic. At appropriate depths catches of up to 100 can be made in a short trawl haul. The schools are usually sexually segregated; catches mostly consist of one sex. This shark becomes more common to the south of Britain and Ireland, but is by no means rare even off southern Iceland and the Faroes. It is also found in both the North and South Pacific Ocean.

Family: Lantern Sharks *Etmopteridae*

Lantern Sharks are all small sharks with two dorsal fins with grooved spines. Most species have luminous organs. The family includes five genera with 41 species.

Velvet Belly *Etmopterus spinax*



Characteristics

A small shark distinguished by having sharp spines at the front of each dorsal fin, that on the second fin the larger. Pectoral fins small and rounded. No anal fin. The dermal denticles are very fine, giving the skin a velvety feel. Gill openings small.

Colour

Dark brown, fading on the sides to grey-brown with a distinct greenish-black line along the lower side and black belly. Small luminous raised pores on the skin.

Size

Females grow to a total length of 60 cm; males attain a maximum of 50 cm.

Ecology

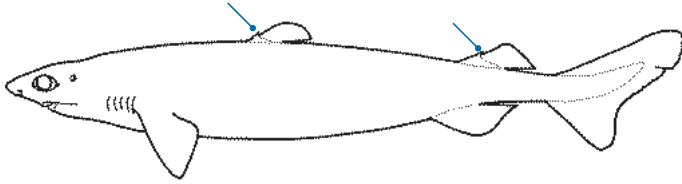
Living near the bottom on soft muddy grounds in depths of around 100 m to the north of its range and to 1,000 m in the south; most abundant in 200-700 m. Small lantern fishes and Blue Whiting, squids and crustaceans have been found in its gut. A live-bearer, litters vary in size from 6-20, according to the size of the mother. They are 12-14 cm in length at birth, and are born in late winter to spring off the south-western Irish shelf,

and through to July or August off the Faroes. Males become mature at about 33 cm, females at 36 cm. The life span extends to at least 3 years. This is probably the commonest spiny-finned shark to be found in deep water in the eastern North Atlantic. It lives in large schools (occasional trawl hauls of hundreds have been made). The Velvet Belly is also one of the smallest of sharks, and one of the very few sharks known to possess light-organs. Occasional specimens are caught (especially locally in the Norwegian Sea) which have a protruding clump on the dorsal fin or beneath the head. This is due to infestation by a parasitic barnacle *Anelasma squalicola*.

Family: Sleeper Sharks *Somniosidae*

Most Sleeper Sharks have no spines in the dorsal fins though a few species have small spines in both fins. Most species have luminous organs. There are seven genera with 17 species in the family.

Portuguese Shark *Centroscymnus coelolepis*



Characteristics

The spines in the dorsal fins are so small as to be almost completely enclosed in tissue, and easily overlooked. Snout rather blunt and rounded, the body thickset and solid, and both dorsal fins relatively small; no anal fin. Upper jaw teeth have a single, erect, dagger-like cusp, the lower teeth oblique; body covered with broad, smooth denticles.

Colour

A deep chocolate brown.

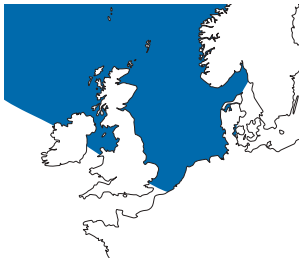
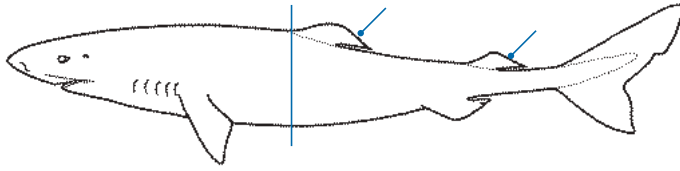
Size

Grows to 130 cm; males rarely exceed 100 cm.

Ecology

A deep-water shark found from 325-2,718 m, but most commonly between 400 and 2,000 m. Mainly bottom-living, although occasional specimens occur in mid-water. The remains of lantern fishes, smooth-heads, Silver Smelt, Blue Whiting, and deep-water squids have been found in the gut. May take bites out of live seals and cetaceans. Ovoviviparous, the females have litters of up to 18 young. Large nearly full-term embryos have been found in females in early summer off the Scottish coast. Deep trawling has shown that off the western coasts of Ireland and Scotland this shark is moderately common, but that it lives mainly in depths below the lower limit of commercial fishing.

Greenland Shark *Somniosus microcephalus*



Characteristics

Usually very large, but always with small but well-spaced dorsal fins. The first dorsal fin is placed approximately in the middle of the body. The gill slits are small. Teeth in the upper jaw are small, narrow, and knife-like, in the lower jaw the teeth are so strongly oblique that the outer side forms the cutting edge.

Colour

Dark; often deep brown, sometimes greyish with faint indistinct darker bands.

Size

Grows to at least 6.4 m and 1400 kg. The maximum length reported is over 7 m.

Ecology

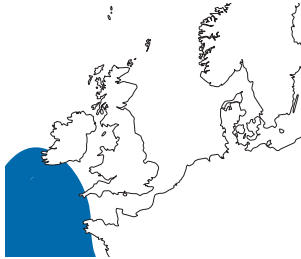
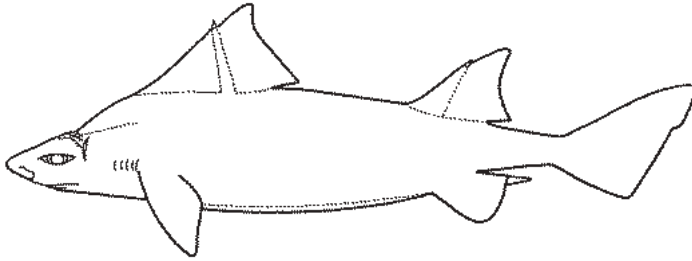
Bottom-living, but encountered near the surface especially when attracted by potential food. Most common in depths of 180-550 m, and sometimes as deep as 1,200 m. An omnivorous feeder on both pelagic and bottom-living fishes. Among the fish recorded are Haddock, Saithe, Cod, Plaice, Lumpfish, Redfish, Catfish, Halibut, Greenland Halibut, and Skate. Numerous molluscs, starfish, and crustaceans have also been reported. The Greenland Shark was well known as a scavenger on offal and waste from whaling stations. It also eats other refuse, and one specimen in the Faroes was found to contain the hindquarters of a sheep, part of a pig, and a hare, as well as a Halibut, and a Porbeagle Shark. A more sinister report was of one caught near the Isle of May, in January 1895, which contained a seaman's boot complete with part of a human leg! Live-bearing, but little is known of its breeding biology. A litter of 10 unborn young has been recorded, each 38 cm in

length. The smallest free-swimming specimens were 70 cm which is likely to be close to their length at birth. The Greenland Shark is relatively common in the northern seas of Europe, but around Britain and Ireland it is an uncommon wanderer, becoming even less common to the south. Off Greenland, in the Barents Sea and Norwegian Sea as far south as the Faroes, there were numerous local fisheries for this shark, mainly producing oil from the large liver, but also the meat, which is toxic when fresh, for man, and for dogs in the far north. This shark is said to be sluggish when captured. Most of these fisheries died out before the present century, and this shark has no value today. Most Greenland Sharks suffer from infestations of the parasitic copepod *Ommattoikoa elongata*, which attaches itself to the cornea of the eye.

Family: Roughsharks *Oxynotidae*

The roughsharks are deep-bodied sharks with coarse spines in their skins and lateral ridges on the abdomen. They can be distinguished by the large number of rows of teeth functional in the upper jaw. There is just one genus with five species in the family.

Angular Roughshark *Oxynotus centrina*



Characteristics

An unusual looking shark with a high body and foreshortened appearance. Spines on each dorsal fin; that in the first dorsal points slightly forward. Large spiracle vertically elongated. The skin is very bristly and textured.

Colour

A uniform grey to grey-brown.

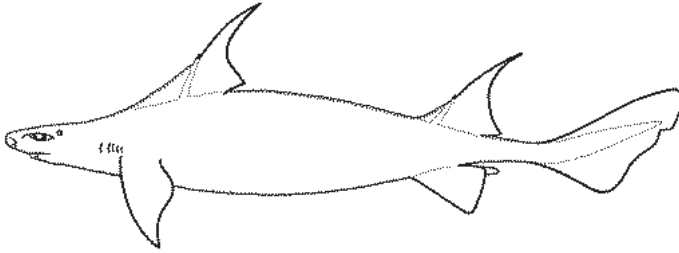
Size

Attains a maximum length of 1.5 m.

Ecology

Occurs mainly in the eastern Atlantic – Bay of Biscay and the Mediterranean Sea to Senegal, north to Cornwall where it is mainly a stray. Thus it is rare around Britain or Ireland. Lives on the outer continental shelf and upper slope at depths of 60-660 m. Feeds mainly on polychaetes. Viviparous, it produces about seven young at a time. Of minor commercial interest in some areas – used for oil and fishmeal; also dried salted and smoked for human consumption. It is listed by the IUCN in the Red Data book as Vulnerable.

Sailfin Roughshark *Oxynotus paradoxus*



Characteristics

A deep-bodied, solid-looking shark, with a high back and flattened belly giving the body a triangular cross-section. The head is small, with medium to small spiracles, and five gill slits. Both dorsal fins are tall, and each has a strong backward sloping spine running close to the front edge. Dermal denticles large and thorn-like.

Colour

Dark brown on the back, slightly lighter ventrally. The inner edge of the spiracle is light.

Size

Grows to 118 cm.

Ecology

Bottom-living on the lower continental shelf in depths of 350-600 m, exceptionally as shallow as 90 m. Recent exploration in deep water to the west of Britain and Ireland has shown that it occurs frequently, although never in great abundance, along most of the upper slope. It is ovoviviparous, the young being born alive at a length of ca 25 cm.

Family: Kitefin Sharks *Dalatiidae*

With the exception of one genus (*Squaliolus*), the Kitefin Sharks have no dorsal spines. All have luminous organs on the ventral surface. There are seven genera with some 10 species in the family.

Darkie Charlie *Dalatias licha*



Characteristics

A relatively slender-bodied shark with two small dorsal fins, and no anal fin; no spines in the dorsal fins. The snout is very short and blunt, the nostrils are large, but the spiracles are even larger. Lips thick and fleshy.

Colour

Dark brown, almost black, with the inner edge of the spiracle and corners of the mouth almost white.

Size

The usual maximum size for females is around 1.8 m and 20 kg; males are smaller, attaining at the most 1.6 m.

Ecology

Usually lives close to the bottom, but it has been taken in mid-water on the continental slope in 200-1,000 m. Rare around Britain or Ireland. It feeds heavily on Blue Whiting, less on Ling, Black Scabbardfish, Silver Smelt, and occasionally on Hake and smoothheads. This shark is ovoviviparous. The embryos develop in a distinct membranous envelope. Litter sizes vary from 3-16. The young are born at a length of 30 cm. Embryos in several developmental stages may be found at any time of the year. This is a common shark on the lower continental shelf. Like many sharks it forms unisexual shoals; frequently a trawl haul will contain 100 or so males and only 1 or 2 females, or the converse.

Order:

Squatiniiformes

Angel Sharks

This order has just one family – the Squatinidae.

In this order:

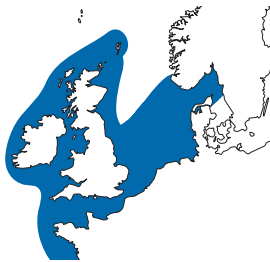
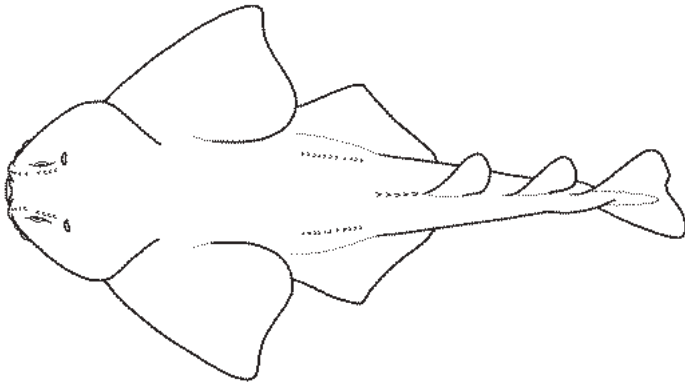


Angel Shark

Family: Angel Sharks *Squatinaidae*

The Angel Sharks, or Monkfish, are largely confined to temperate zones of the world's seas. Most are relatively small, the largest growing to 2.4 m, and live close to the sea-bed. Their general appearance is that of fishes midway between sharks and rays, but their laterally sited gill slits, mouth placed at the end of the head, rather than ventrally, and well-developed dorsal and tail fins all place them with the sharks. There is just one genus with 15 species. Only one of these species occurs in northern European waters; others are found in the Mediterranean.

Angel Shark *Squatina squatina*



Characteristics

Body greatly expanded from side to side, the pectoral and pelvic fins broad and lateral. The mouth is wide, with large nostrils each covered with a broad flap.

Colour

Sandy or greyish-brown above, finely dotted with darker markings; white on the underside.

Size

Grows to a length of 2.4 m and a weight of 32.6 kg. Females are generally larger than males. British Rod-caught Record: 29.936 kg (1965, Sussex). Irish Rod-caught Record: 33.113 kg (1980, Fenit).

Ecology

A bottom-living fish found on sand or mud in depths of 5-150 m. It lies in perfect concealment usually partially buried, although it can swim powerfully and for relatively long distances off the bottom. The Angel Shark feeds very extensively on bottom-living fishes, particularly flatfish such as Dab, Plaice, and Sole, as well as rays and other fishes. Some crustaceans, especially crabs, and molluscs are eaten. Live-bearing, technically

ovoviviparous; litters vary from 9-20, the young are ca 24 cm at birth. In the Mediterranean they are born from February to April, but later in the eastern North Atlantic. It is not known whether this species breeds in northern waters. Historically, the Angel Shark was a common summertime visitor to Britain and Ireland as a result of northward migration, but its numbers have crashed due to overfishing and it is now virtually extinct in the North Sea and rare elsewhere. It is listed by the IUCN in the Red Data book as Vulnerable, and in 2008 it was protected in English waters out to 6 miles under the Countryside and Wildlife Act. This species was regularly called the Monkfish or Monk, but this name is now used commercially for the Angler *Lophius piscatorius*.

Order:

Torpediniformes

Electric Rays

All members of this order have powerful electric organs.
Worldwide, there are two families with 11 genera and some 59 species.

In this order:



Marbled Electric Ray

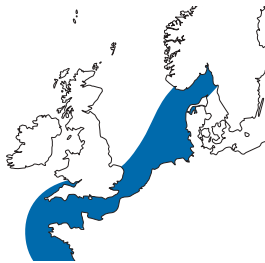
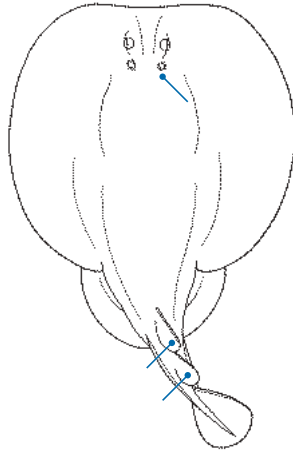


Electric Ray

Family: Electric Rays *Torpedinidae*

Electric rays or Torpedos are cartilaginous fishes related to the skates and rays, but differing principally in having a smooth skin and thick tail with a well-developed tail fin. Their most distinctive feature is the very well-developed electrical organ which makes up most of each pectoral fin, and which, in a large specimen, can give a painful and disabling shock. The current is some 7-10 amps and 220 volts. Electric rays are found in all subtropical and temperate seas, mostly in shallow inshore waters (although a few live in the deep sea). In general they are slow-moving and inoffensive, obtaining their food by stunning other fishes with their electric discharge. There are two genera with 22 species. Only two of these species are found in northern European waters.

Marbled Electric Ray *Torpedo marmorata*



Characteristics

Body disc-like, rounded with very smooth skin, a thickset tail, and large, broad tail fin. The dorsal fins are nearly equal in size, and close together so that they almost overlap. Edge of each spiracle with seven distinct large papillae pointing inwards.

Colour

Deep brown on the back with lighter mottling over the entire upper surface; ventrally cream coloured. Occasional pink specimens are found and in Mediterranean examples the back is uniformly dark.

Size

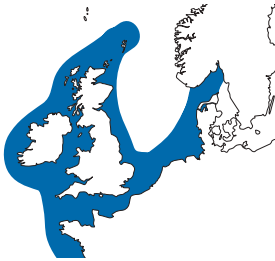
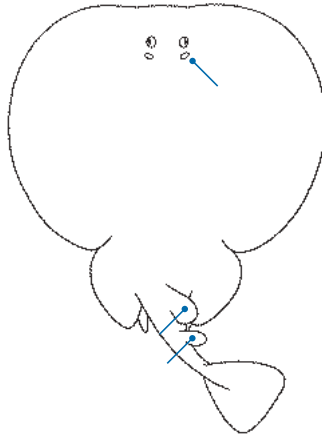
Grows to a maximum length of 1 m, and a weight of ca 6 kg. British Rod-caught Record: 6.341 kg (1990, Jersey).

Ecology

Entirely benthic and found on sandy and rarely muddy bottoms. Lives in shallow water from 10-30 m; in the Mediterranean, recorded down to 100 m. Is known to eat

Three-bearded Rockling and Whiting, but most suitably-sized, bottom-living fish are potential prey. Ovoviviparous, the female gives birth to litters of 5-8 at a maternal length of 32 cm, up to 32 young at 50 cm. This species is not known to breed in northern waters. The Marbled Electric Ray is not common in northern European waters, but it has been reported in Britain on numerous occasions, mainly in the western Channel and southern North Sea. It used to be found in summer or autumn, which suggested there was a northward migration earlier in the year; however it is now found in most months.

Electric Ray *Torpedo nobiliana*



Size

A large electric ray which grows to 180 cm, and a weight of 50 kg. A weight of 90 kg has been recorded for an American specimen. British Rod-caught Record: 43.571 kg (1975, Cornwall). Irish Rod-caught Record: 40 kg (2002, Achill).

Ecology

Bottom-living on mud and sand in 10 m down to 150 m, and exceptionally to 350 m. Its diet has been little studied. From isolated observations, such as the specimen which contained a dogfish and Poor Cod, it might be assumed that a large variety of bottom-living fishes are eaten. Live-bearing. No reports exist of gravid females in northern European waters, but an evidently newly-born young fish has been caught in the North Sea. This species is the more common of the two electric rays in northern European waters, although its distribution is mainly along the Channel and western coasts of Britain and Ireland. Being such a large fish its electrical properties

are formidable, and a big specimen can give a powerful shock (measured up to 220 volts at 8 amps). Repeated discharges become weaker. This species has been observed to spring at a passing fish, and wrapping the pectoral fins around it, stun or kill the victim which is eaten at leisure. The mouth of the Electric Ray is very small and clearly unsuited to attacking moving prey.

Characteristics

Body disc-like and rounded, with the pectoral fins joined to the body; skin smooth. The first dorsal fin is distinctly larger than the second, and both are widely spaced. The inner edges of the spiracles are smooth.

Colour

Dorsally uniformly dark, although varying from slate grey to liver brown. The underside is white, with only a trace of dusky colour around the disc margin.

Order:

Rajiformes

Skates

Most members of this order have a slender tail and usually thorns (derived from dermal denticles) along the back. Altogether there are four families with 32 genera and 285 species.

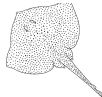
In this order:



White Skate



Common Skate



Blonde Ray



Sandy Ray



Thornback Ray



Shagreen Ray



Round Ray



Arctic Ray



Small-eyed Ray



Spotted Ray



Cuckoo Ray



Black Skate



Longnosed Skate



Starry Ray

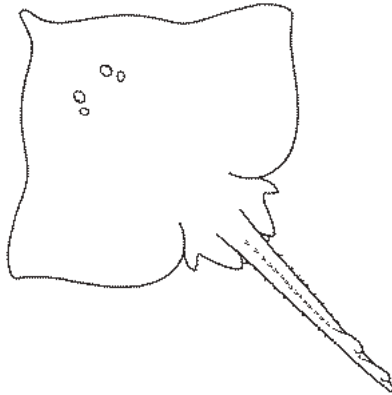


Undulate Ray

Family: Skates & Rays *Rajidae*

Skates and rays are all flattened cartilaginous fishes with broad pectoral fins attached to the head, which give the body its diamond shape, and a long tail. The mouth, nostrils, and the five pairs of gill slits are ventral, while the eyes and the spiracles are dorsal in position. The nostrils are well developed, and most skates depend on their sense of smell to detect food. They also possess quite well-developed electrical organs and these presumably serve to detect approaching prey, and possibly permit species recognition. The skates are typically bottom-dwelling, their diet composed entirely of benthic animals; the dorsal surface is pigmented to provide near-perfect concealment. Some, however, are semi-benthic only, foraging off the bottom and feeding on mid-water fishes; these species frequently have dark or dusky undersides. Male skates and rays have pelvic claspers by which spermatozoa are introduced into the genital opening of the female. Fertilization is thus internal, but these fish are oviparous and the eggs are laid in dark, oblong, leathery cases, with a projection at each corner. The family has 26 genera and 238 species worldwide. Some 20 species are known in the waters of the north-east Atlantic. The term skate can be applied to all members of this family, but in Britain it is most commonly used for the long-snouted species. Their identification frequently presents many problems, which are often compounded by differences in body shape or development of skin spines within the same species.

White Skate *Rostroraja alba*



Characteristics

The snout of this large ray is moderately long, prickly and rather triangular in outline, while the front edges of the disc are sinuous and distinctly concave from snout to wing tip. The angles of the disc are sharp, rather less than 90°. Adults are prickly on the back but have a bare patch in the middle of the back; ventrally they are prickly in the front only. The young are smooth-skinned, and have a row of spines in the mid-line of the

tail with weakly-ridged bases, and another two on either side of the tail. Also known as Bottlenosed Ray.

Colour

Greyish-brown on the back, young fish reddish-brown with indistinct light spots. The underside is conspicuously white with a dusky edge around the outer and posterior edges of the pectoral and pelvic fins. In young fish this band is conspicuous and dark.

Continued: White Skate *Rostroraja alba*

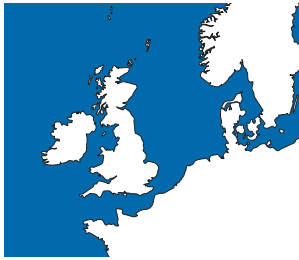
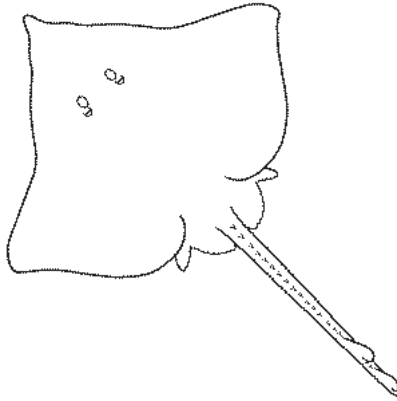
Size

Grows to a maximum of 2 m in length and 1.5 m in width, but the usual length range is 1.5-1.8 m. It can attain a weight in excess of 63 kg. British Rod-caught Record: 34.471 kg (1970, The Needles). Irish Rod-caught Record: 74.844 kg (1966, Clew Bay).

Ecology

Lives in inshore waters from 40-200 m and exceptionally to 366 m. Relatively rare around Britain or Ireland. The larger specimens tend to live in deeper water. The egg-capsule is flat on one surface, convex on the other, and of honeycomb texture. The body of the case is fairly square 16-19 cm long and 13-15 cm wide; the lower horns are short and hooked, the others long and flattened. The eggs are deposited from April to June (in the Mediterranean), and in late summer to the north of its range. Incubation takes 15 months, and the newly-hatched young are 29 cm long. The White Skate is uncommon in northern European waters, and although commoner in the Mediterranean, it is now an Endangered species.

Common Skate *Dipturus batis*



Characteristics

The Common Skate is one of several large, long-snouted species, the front edge of the disc being strongly concave as a result of the length of the snout. Young specimens are usually smooth-skinned, adult females have prickles on the front of the disc, and males are spiny on the back. Both sexes are prickly ventrally and have a row of 12-20 larger spines in the mid-line of the tail, with 1-3 spines between the dorsal fins.

Colour

Dark olive brown to grey above with light brown blotches and darker spots. Ventrally blue-grey or ash-grey, with lines of black pores conspicuous after the mucus has been removed.

Size

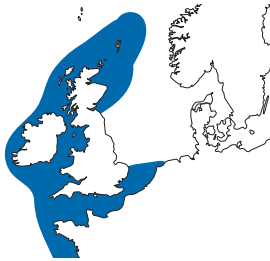
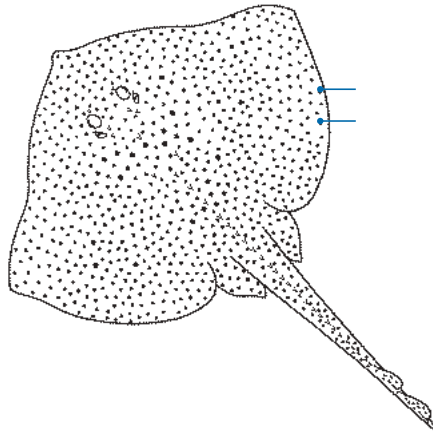
The Common Skate is the largest and heaviest European ray. Females can reach a length of 2.85 m and a width of 2 m; males attain a length of 2.05 m. A weight of 113 kg has been reported. British Rod-caught Record: 102.961 kg (1986, Tobermory). Irish Rod-caught Record: 100.256 kg (1913, Ballycotton).

Ecology

The depth-range is 30-600 m, but only young fish live in shallow water. Adults live mostly between 90-220 m. The Common Skate is an active predator feeding in mid-water as well as close to the sea-bed. It feeds extensively on fishes (other rays, Spurdog, Plaice, Angler Fish, Cod, Haddock, and Herring) and also on

crustaceans. The egg-capsules are large, 14-25 cm long and 8-14 cm wide, with a tuft of filaments at the base of each long horn; they are deposited on the sea-bed mainly between February and August. The newly-hatched young measure about 21 cm in length. Males become sexually mature at 1.5 m, females when slightly larger. This species was relatively common except in the shallowest inshore waters. Very large Common Skate that were common in the 1920-30 period are now seldom seen. Once an important commercial fish caught both by trawling and on lines, it is now commercially extinct in the Irish and North Seas. It is listed by the IUCN in the Red Data book as a Critically Endangered species; it is still occasionally taken in suitable areas around the south west and off Scotland.

Blonde Ray *Raja brachyura*



Characteristics

A ray with a relatively short snout and the outer corners of the pectoral fins almost right-angled. In half-grown and adult fish the back is entirely prickly, only the front edges of the disc being rough in the young. The eyes are large. In adults the tail bears a line of larger spines in the mid-line; young fish have spines along the back also. Adult females may have an interrupted series along the sides of the tail.

Colour

Ventrally white. The back is variable, generally light brown with a few creamy-white blotches and dense dark spots which extend up to the very edge of the disc and on to the tail, but they can be black but with the spots still visible.

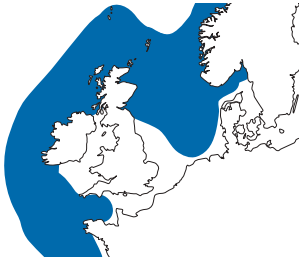
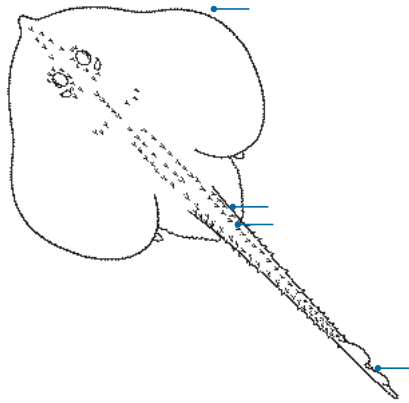
Size

Grows to a maximum length of 113 cm and a weight of over 17 kg. British Rod-caught Record: 17.491 kg (2000, Isle of Wight). Irish Rod-caught Record: 16.783 kg (2004, Cobh).

Ecology

In coastal waters down to 100 m, although most common around 40 m. It is not found in estuaries and usually young specimens only are encountered in very shallow water. It lives mainly on sandy bottoms. The Blonde Ray eats a wide range of crustaceans, nereid worms and fishes (especially Herring, Sprat, Pouting, sandeels, and Sole). In the English Channel females with well-developed eggs occur from February to August, most from April to July. The egg-case measures 10 - 14.3 cm in length, 7.2-8.0 cm in width, the horns being long. The case is flat at one side, while the other side is convex, widest at the middle and densely covered with loose fibres. The Blonde Ray reaches the northern limit of its range around Britain and Ireland, but is common there only on western coasts.

Sandy Ray *Leucoraja circularis*



Characteristics

A short-snouted ray, with rounded tips to the disc. The back is covered with rather fine prickles, except for a bare patch in the mid-line (most noticeable in large males); the underside is smooth except for the snout and front of the wings. Two rows of closely-packed, strongly-curved spines each side of the mid-line on the tail and posterior part of the body. The dorsal fins are large; their bases run together.

Colour

Light brown or reddish-brown above, usually with 4-6 yellowish-white spots on the disc and pelvic fins; ventrally white.

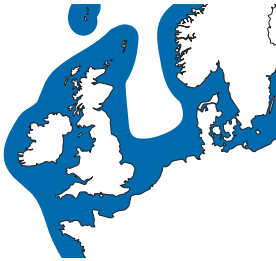
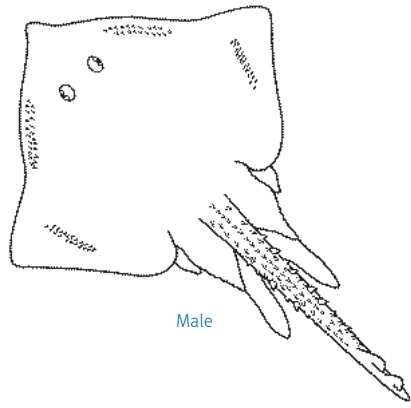
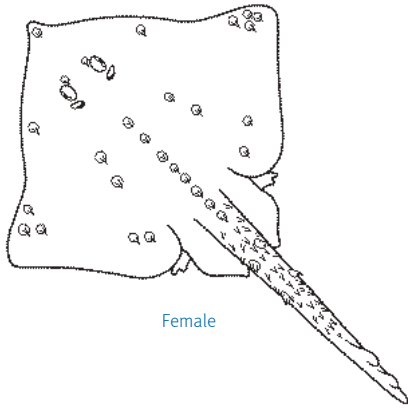
Size

Grows to a length of 1.2 m.

Ecology

Bottom-living, usually on sandy bottoms and in depths of 50-100 m, although exceptionally down to 275 m. The egg-capsule is transparent amber in colour, has fine threads on the sides, and measures 8.4-9 cm in length, 4.5-5.3 cm in width. The Sandy Ray appears to be localized in its distribution, for even within the bathymetric range which it favours, it is found only occasionally. In the Mediterranean it seems even scarcer. The biology of this ray is very little known.

Thornback Ray *Raja clavata*



Colour

Very variable dorsally, grey brown to light grey with light brown to yellowish mottling. Numerous small dark spots and yellowish blotches (sometimes surrounded with dark spots to form a faint ocellus). Ventrally a pale cream colour with greyish margins. Tail shows alternating light and dark bands.

Ecology

The commonest ray in shallow water, it is found on muddy, sandy, or gravelly bottoms, rarely even on rough grounds. An alternative name, Roker, is commonly used among fishermen in East Anglia. Its depth range extends to 280 m, but it is most common in depths of between 10 and 60 m. In the first days after hatching the young ray does not feed, but subsists on the residual yolk from the egg. Its first food consists of small crustaceans, mainly amphipods and small bottom-living shrimps. As it grows, it continues to eat crustaceans as the major constituent of the diet, including shore crabs, swimming crabs, and brown shrimps. Numerous fishes are eaten, chiefly sandeels, Herring, Sprat, various gadoids, and small flatfishes. The breeding cycle appears to govern its migrations. In the spring the mature females move into inshore waters, followed within a month or so by the mature males. Egg-capsules are laid in shallow water from

Characteristics

Distinguished by dense prickles over the entire back, and larger thorns in the mid-line from mid-disc to the dorsal fins. In sexually mature specimens these thorns are very large, with button-like bases (known as bucklers) present on the back and sides of the tail in males, and, in females, also well-developed ventrally. The snout is relatively short, the anterior edges of the disc sinuous, and the outer corners nearly right-angled.

Size

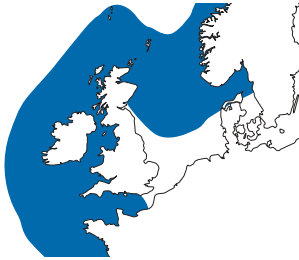
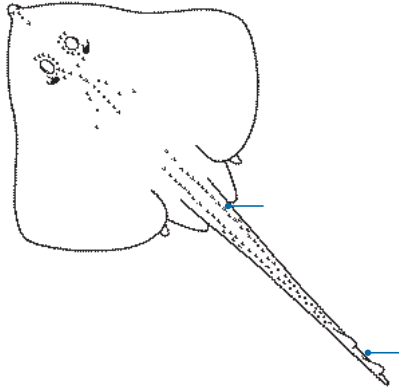
A maximum length of 85 cm, width 61 cm. Attains a weight of 18 kg. The largest specimens are always females. British Rod-caught Record: 14.260 kg (1981, Liverpool Bay). Irish Rod-caught Record: 16.782 kg (1961, Kinsale).

Continued: Thornback Ray *Raja clavata*

March to August, and the embryo takes from 16-20 weeks to hatch. Newly-hatched fish (about 8 cm in width) are very abundant in the English Channel and southern North Sea through the summer months. The egg-capsule is oblong with flanges along the sides and fairly long horns at each corner, and measures 6-9 cm long and rather less across; these capsules are often numerous in the flotsam in late summer and autumn. After the egg-capsules have been laid the adults mate again, but the sexes soon segregate into unisexual schools.

The Thornback Ray is the principal constituent of the 'skate' landed by inshore fishing vessels, the great majority taken in bottom trawls, but some on lines. It is also frequently caught by anglers.

Shagreen Ray *Leucoraja fullonica*



Characteristics

The snout is sharply pointed and is relatively long (about three times the distance between the eyes). The body is densely covered with coarse prickles on the back, which are present also on the underside of the disc, but only in the region of the snout and the anterior edges. About 8 thorns usually in a complete row around inner margin of eye. Two closely-packed series of larger spines run along the tail, but there are no spines in the mid-line except in the young. The dorsal fins are set well apart; there is no interdorsal spine. Upper jaw with central notch. Jaw teeth long, slender, and pointed.

Colour

Greyish-brown on the back, often quite pale, and usually unmarked. White ventrally.

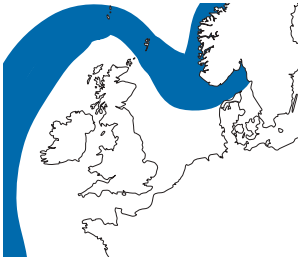
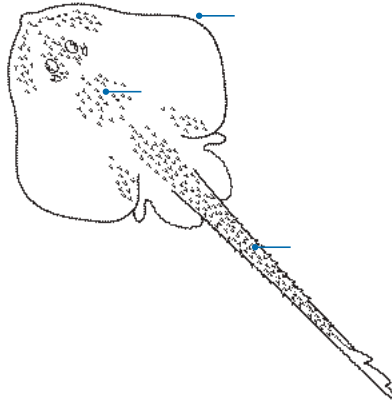
Size

Grows to a length of about 1.2 m.

Ecology

Bottom-living on rough ground, but actively feeding above the sea-bed, in moderately deep water, 35-500 m. Feeds heavily on fish, but some crustaceans and molluscs have been found in their stomachs. The egg-capsule is relatively small, ca 9 by 4.6 cm, amber-coloured and almost transparent. The horns of the capsule are very long, the longer pair being longer than the egg-case. Overall the Shagreen Ray is not a rare ray, although its occurrence seems 'patchy' and it may be locally abundant in some areas, but is rarely encountered in others. It is believed to migrate inshore in summer; probably a feeding migration. It has been reported from the Mediterranean Sea but this may have been due to earlier confusion between this species and *Raja rondeleti*, a similar Mediterranean ray.

Round Ray *Rajella fyllae*



Characteristics

A small ray with a very rounded outline to the disc, the young being almost circular. In adults the snout is rather more pronounced and the anterior edge is sinuous. The upper surface is coarsely prickly with the exception of bare patches on the pectoral and pelvic fin bases. Numerous long spines around the eyes and on the centre of the disc, the mid-line row of spines prominent, and 1-2 irregular rows of rather larger thorns on the sides of the tail. The tail is longer than the disc in large specimens.

Colour

Dark grey to chocolate brown above (young specimens have dark brown bands across the tail); ventrally pale grey with darker patches around the vent, on the tail, and front of the wings.

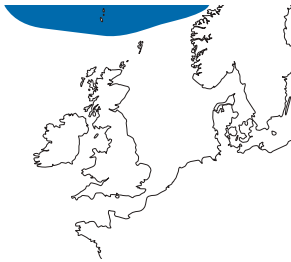
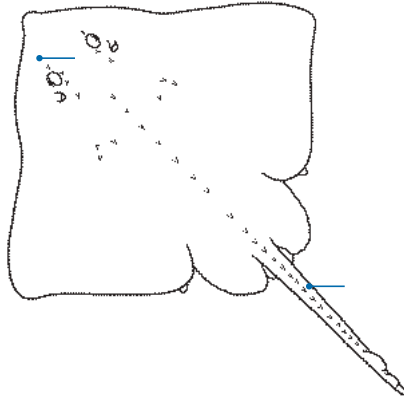
Size

Attains a length of 56 cm and a width of 31 cm.

Ecology

A deep-water ray found mainly between 300 and 800 m, although the recorded limits of its depth distribution are 170-2,055 m. It inhabits the shallower water to the north of its range, but is said to keep within temperatures of 3-6°C. The egg-capsule is small and smooth, 4-4.4 cm long, 2.4-2.8 cm wide. One pair of horns is very long and the tips cross. The newly-hatched young are ca 7 cm long, 4 cm wide. Despite its wide distribution, the biology of this ray is virtually unknown. Recorded to the west of Britain and Ireland on a few occasions in very deep water, although the Round Skate must be regarded as an Arctic species.

Arctic Ray *Amblyraja hyperborea*



Characteristics

Similar in appearance to the Starry Ray, but differing in having a distinctly wider interorbital region and a slightly more pointed snout. The upper surface of the disc is covered with small prickles with conspicuous star-shaped bases, while the ventral surface is smooth; there is a conspicuous row of large spines (22-30) in the mid-line of the back. The tail is distinctly short.

Colour

The back is dark, usually brownish-grey frequently with light spots. Ventrally, the young are yellow-white, but adults have conspicuous dark patches often symmetrically arranged and particularly prominent on the outer edges of the disc.

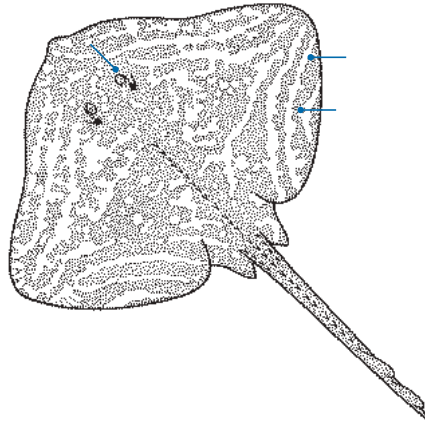
Size

Females attain a length of 92 cm; males reach 86 cm.

Ecology

A cold-water ray found north of the ridge between Shetland and the Faroes. It lives on muddy bottoms in temperatures below or slightly above 0°C. Its depth range is from 280-2,500 m, although it is only in the colder, northern extremities of its range that it lives in the shallower of these depths. Recent observations have shown that it feeds mostly on crustaceans (large numbers of euphausiids being found in the stomach) and various fishes (Blue Whiting, *Paralepis*, *Cottunculus*, and *Lycodes*). The egg-capsule is moderately large, 8-12.5 cm long and 5-8 cm wide; the horns at one end are much longer than those at the other. On hatching, the young ray is about 16 cm in length. This is one of the least known of European rays. Living in deep cold water, it is not often encountered and has been little studied. Its flesh is flabby and tasteless.

Small-eyed Ray *Raja microocellata*



Characteristics

The snout is relatively short, and the corners of the disc are almost right angles. The only sure means of identification are the small eyes (the combined length of eye and spiracle being less than half the distance between the eyes), the presence of prickles on the front half of the disc only, and the spines in the mid-line of the body and tail being closely packed and bent at a right angle.

Colour

Grey-green to medium brown on the back with large creamy blotches and wavy lines which run parallel to the margins of the disc. White ventrally. Also known as the Painted Ray.

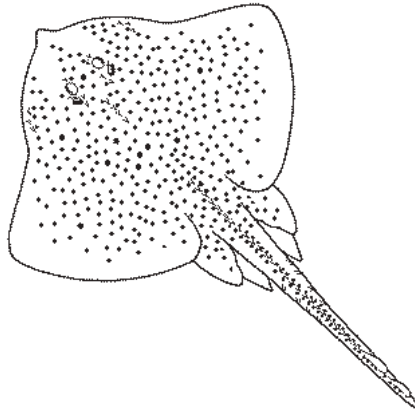
Size

Attains a length of 86 cm and width of 60 cm. The males are usually smaller. Grows to a weight of at least 8 kg. British Rod-caught Record: 7.938 kg (1991, Somerset). Irish Rod-caught Record: 7.807 kg (1994, Garryvoe).

Ecology

Lives in shallow water from close inshore down to depths of 100 m. It seems to be particularly common on sandy grounds, and in the English Channel at least it is found mainly in certain sandy bays and outer estuaries. Egg-capsules are deposited in summer in the English Channel. They measure 8.7-9.5 cm in length by 5.4-6.3 cm excluding the horns, two of which are very long and thin, the other pair being short and strongly curved. The Small-eyed Ray is comparatively scarce in northern European waters, extending as far north as the southern North Sea and Irish Sea. One of the commonest rays to the south of Britain and Ireland.

Spotted Ray *Raja montagui*



Characteristics

A short-snouted ray with the outer corners of the disc rather rounded, but nearly forming right angles. Fine prickles occur along the upper front edge of the disc in the young and extend back to the level of the eyes in adults; the posterior parts of the disc are always bare. A mid-line row of larger spines runs from the centre of the disc to the dorsal fin and consists of closely-packed spines. Rows of spines are prominent along the sides of the tail in young fish, irregular in adult females, and scattered in adult males.

Colour

Ventrally white; on the back warm brown, the majority with numerous fairly large black spots, which stop 2-3 cm short of the margins of the disc. A blue spot surrounded by a ring of large black spots forms a faint ocellus on the wings in most, which can be seen even in those specimens which lack the general spotting.

Size

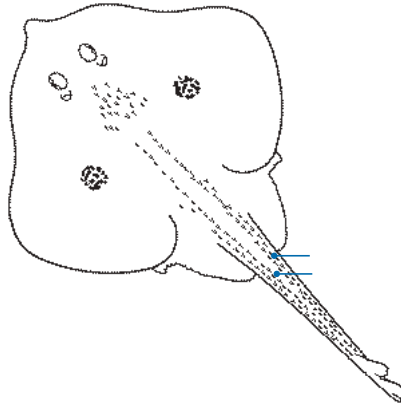
Attains a length of 75 cm and a width of 51 cm; males are generally smaller. British Rod-caught Record: 3.926 kg (1998, Cornwall).

Ecology

The Spotted Ray lives in moderately deep water, mainly between 60-120 m, although it is sometimes caught in 25 m. It is most common on sandy bottoms but is occasionally caught on rough grounds. It feeds almost entirely on crustaceans, amphipods, isopods, and shrimps when young, but the prey is larger as the ray grows and includes

crabs of several kinds and occasional fishes. The egg-capsules are deposited from April to July, and the embryo takes from 5-6 months to develop fully. The eggs are shed in shallow water. The egg-capsule is small and delicate, 6.4-7.7 cm long and 3.7-4.6 cm wide. One side is smooth, the other has a fine mat of fibres, and all four horns are short, one pair curling upwards and then down at the tip. The Spotted Ray is relatively common in the seas of northern Europe, but is less frequently encountered than the Thornback Ray because it lives in rather deeper water. It is caught in moderate numbers by trawlers, and by anglers.

Cuckoo Ray *Leucoraja naevus*



Characteristics

A short-snouted, round-winged ray, with the dorsal surface covered with fine prickles except for a rounded patch on each wing; smooth ventrally except for the snout. A double row of curved, close-packed spines either side of the mid-line and running the length of the tail and onto the body, often with additional rows of smaller spines between them. Young specimens have a mid-line row in addition.

Colour

The back is light brown to grey brown with light patches on the disc, and two very distinct black round marks in the centre of each wing with yellow markings. Ventrally it is white with irregular darker marks.

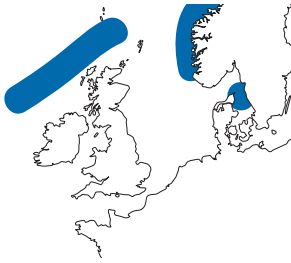
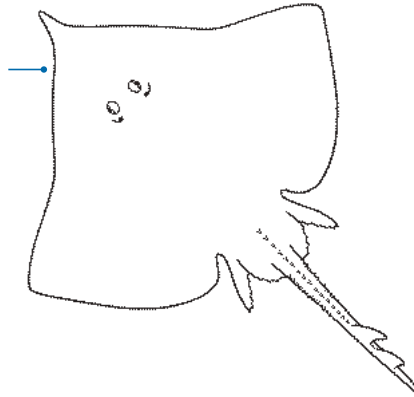
Size

Grows to 70 cm in length. British & Irish Rod-caught Record: 2.579 kg (1975, Causeway Coast).

Ecology

A bottom-living ray found in fairly shallow water from 20-150 m, and probably most abundant between 70-100m. It is reported to feed on amphipods and shrimps, and nereid worms throughout its life, but eats increasing quantities of fishes (chiefly Herring, gadoids, sandeels, and dragonets) as it grows. Fish are an important food to the adult. The egg-capsule is relatively small and rounded, and the shell black, one pair of horns being strikingly long while the others are short with incurved tips. The average size is 6.3 cm long, 3.7 cm wide. The newly-hatched young measure 12 cm in length. Incubation can take eight months. The Cuckoo Ray lays eggs all the year round, possibly most in December to May; about 90 eggs are produced each year. While this species is moderately common to the south of Britain and Ireland (as in the English Channel), its biology is little known.

Black Skate *Dipturus nidarosiensis*



Characteristics

A long-snouted ray with the anterior margin of the disc strongly concave; the length of the snout is one-third or more the width of the disc. The whole underside is covered with fine prickles, but only the front part of the back. There is a distinct row of spines along the mid-line of the tail, including the part between the dorsal fins.

Colour

Very dark brown, often almost black above; ventrally dark grey with black pores. Covered by a durable layer of black mucus.

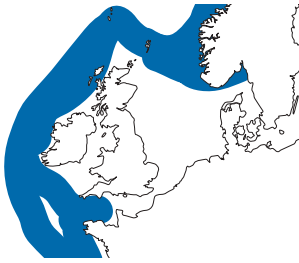
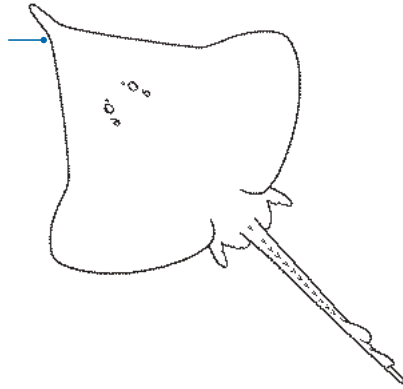
Size

Females grow to a length of 2 m, males to 1.75 m.

Ecology

Known from fjords on the Norwegian coast, southern Iceland and off the west coast of Britain and Ireland and down to Mauritania, mostly in 400-500m, exceptionally from 200 m down to 900 m. Lives in depressions on the bottom. It is said to eat fishes and crustaceans. Gravid females have been captured mainly in winter and spring (October to April). The egg-capsule measures 18.0-26.0 cm in length, 10.2-11.3 cm in width. The capsule is covered with a loose network of yellowish threads. This is one of the least-known European skates, its biology has been little studied, and relatively few specimens have been examined. It appears to be rare everywhere. It was first reported to occur off the western coast of Scotland on the evidence of a stranded egg-case identified as belonging to this species; it has since been captured in deep-water trawling to the west of Britain and Ireland.

Longnosed Skate *Dipturus oxyrinchus*



Characteristics

A large, relatively deep-water skate with an exceptionally long snout, the front edges of the disc being strongly concave. The skin on the back is smooth, except for fine prickles on the snout and anterior edges of the disc, but ventrally it is prickly. Larger spines are present on the tail, in the mid-line in juveniles, with weakly-developed lateral rows only in adults.

Colour

Dark brown or greyish, often with lighter rounded spots on the back. The underside is dark brown to bluish grey with small black dots scattered to the very edge of the disc.

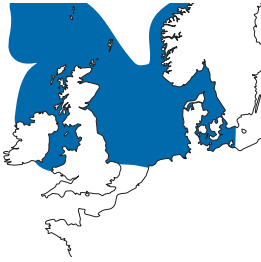
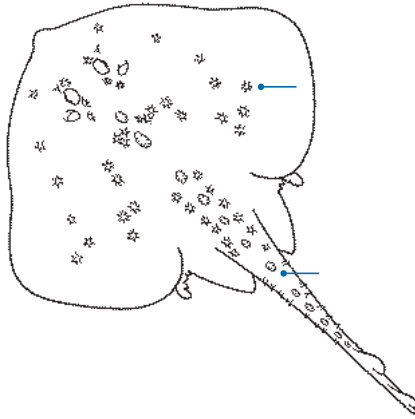
Size

Grows to a length of 1.5 m; males are rarely longer than 1.2 m.

Ecology

A bottom-living fish occurring between 90-950 m, although mostly deeper than 200 m. It lives mainly on soft bottoms, often in shallow depressions in the sea-bed. It eats crustaceans, including shrimps and crabs, and fishes, among which redfish, gurnards, dragonets, and small sharks have been recorded. The egg-capsules are ca 13-23 cm long and 7.5-12 cm wide in British and Irish waters; in the Mediterranean rather larger specimens have been found. The horns at the corners of the capsules are short, and the whole is covered with yellowish fibres. In Italian seas the eggs are deposited between February and April. The fish attains sexual maturity at 1.2 m. It is by no means uncommon in northern European waters, however its biology is little known. As a relatively deep-water fish it is not often caught, except in trawls or on long-lines worked at appropriate depths.

Starry Ray *Amblyraja radiata*



Characteristics

A short-snouted species with a rather rounded disc; the outer corners of the pectoral fins are smoothly curved. It is distinguished by the coarse prickles which cover the dorsal surface and by the large spines (12-19 in number) in the mid-line of the back and tail, each spine having a massive strongly ridged base. Similar large based spines occur indiscriminately on the back.

Colour

The back is pale brown and faintly marbled with cream and dark brown spots; the underside is white but greyish near the edges of the tail.

Size

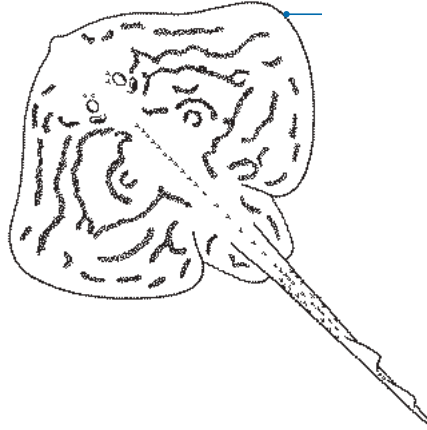
Attains a length of 76 cm and a width of about 50 cm, larger in American waters. Females are larger than males and considerably more spiny.

Ecology

The Starry Ray lives in moderately deep water. In European seas it is most common at depths of 50-100 m. In northern areas it is found at greater depths in colder water but rarely in temperatures below zero. The depth range for the species is from 20-1,000 m. It prefers sandy or muddy bottoms, but is occasionally found on shell or gravel. Fish and crustaceans make up the greater part of its diet. The egg-cases are deposited mainly between February and June, although mature females with well-developed eggs can be

caught throughout the year. The egg-case is small, 4.2-6.6 cm in length, 2.5-5.3 cm wide, with a distinct keel at the sides, and a mass of fine filaments on the faces. Newly-hatched fish are 9.3-10.9 cm in length. Females mature at a length of 39 cm, males at 42 cm. The Starry Ray is essentially a cold-water species which reaches the southern limits of its range in British and Irish waters. It is a common species (in appropriate depths) but is not found close inshore except in the north of its range.

Undulate Ray *Raja undulata*



Characteristics

The pectoral fins are rounded and the snout is short; the back is prickly except for the rear edges of the pectoral and pelvic fins. The snout is covered with coarse prickles, but the remainder of the underside is smooth. Young fish have a complete mid-line row of spines on the back. This becomes interrupted in larger specimens, which also have irregular rows of spines on the sides of the tail. The dorsal fins are widely separated, with one or two inter-dorsal spines.

Colour

Yellowish-brown to deep brown on the back, with long, very distinct, wavy dark bands margined with white or yellowish spots. White ventrally.

Size

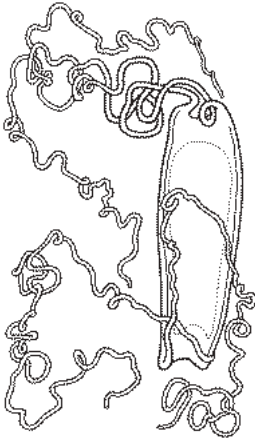
Grows to a maximum length of 1.2 m in the Mediterranean. British specimens rarely attain 1 m. Weights of over 9 kg have been reported. British Rod-caught Record: 9.652 kg (1987, Swanage). Irish Rod-caught Record: 8.165 kg (1977, Fenit).

Ecology

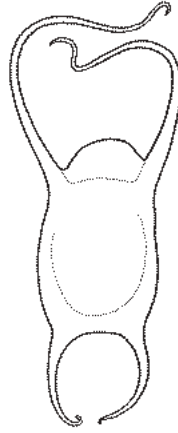
This ray is found on sandy bottoms in inshore waters, although rarely close to the shore. Its depth range extends to 200 m, but it is most common between 45 and 100 m. It is known to eat flatfishes (Plaice and Dab), gobies, and clupeoid fishes, squids, and crustaceans. Egg-capsules are 7-9 cm long, without the horns, and 4.2-6.0 cm wide, and are opaque reddish-brown in colour with fairly long horns. The eggs are deposited in late summer in

the English Channel, in spring in the Mediterranean. In northern European waters this ray makes little contribution to commercial fisheries or sport. Its biology is little known. It is one of the most distinctive of the northern European rays. It is found along the south coasts of England and Ireland, but uncommon elsewhere.

Egg-cases



Scylliorhinus



Raja



Chimaera

Order:

Myliobatiformes

Stingrays

Worldwide, this order has 10 families with 27 genera and 183 species.

In this order:



Common Stingray



Pelagic Stingray



Eagle Ray

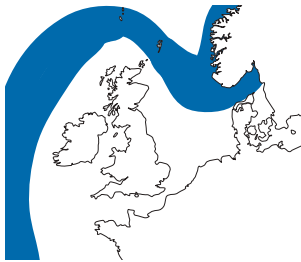
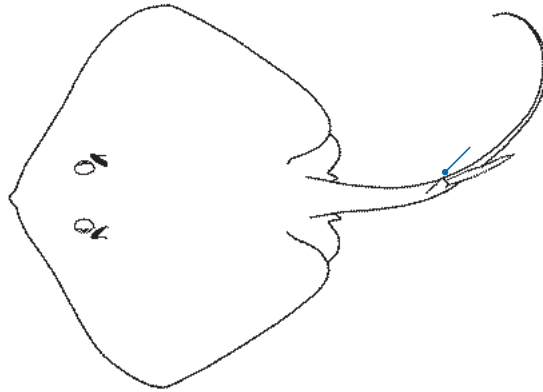


Devil Ray

Family: Whiptail Stingrays *Dasyatidae*

The Dasyatidae, like the Myliobatidae, are most abundant in tropical seas and locally in fresh water in the tropics. Their bodies are usually wide and less angular than the skates. They are characterized by the lack of tail fin or dorsal fins and the possession of a long serrated spine or spines close to the tail fin base. Glandular tissue on the underside of the spine secretes a venom which renders a stab from the spine most painful. Injuries can be serious and on occasions fatal, although fatalities are not recorded in European waters. The family includes six genera with some 68 species. Only two of these species occur in northern European seas.

Common Stingray *Dasyatis pastinaca*



Characteristics

Body shape typical of a ray, with large broad pectoral fins. Snout flattened, forming an obtuse angle. Mouth with plate-like teeth arranged in a pavement for crushing. Lacking a dorsal fin and having one, sometimes two or more, long serrated spines on the upper side of the tail. The tail itself is long and whip-like with no tail fin.

Colour

Above greyish, olive or brown, usually plain but occasionally with light blotches. Ventrally the body and wings are cream coloured, usually with grey edges.

Size

The maximum length observed in British waters appears to be 1.06 m, with a weight of over 30 kg. In the Mediterranean a length of 1.4 m may be attained. British Rod-caught Record: 32.715 kg (1996, Essex). Irish Rod-caught Record: 33.2 kg (1999, Tralee Bay).

Ecology

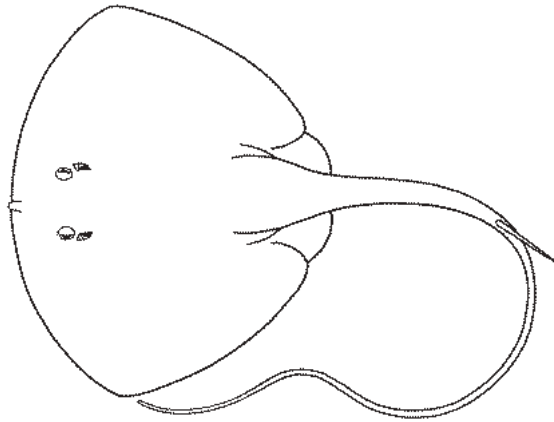
Bottom-living, but always found on soft bottoms usually of sand, occasionally mud, in depths of 4-73 m. It seems to be confined to shallow coastal waters and is even found in the outer parts of estuaries. The Common Stingray feeds exclusively on bottom-living organisms such as molluscs and crustaceans, especially crabs. Live-bearing

Continued: Common Stingray *Dasyatis pastinaca*

(ovoviviparous); the embryos in later stages of development are nourished by a secretion from the uterine wall. From 6 to 9 young form a normal-sized litter. Breeding may not take place in northern parts of its range; occasionally young specimens occur, but gravid females have not been reported. In northern waters the Common Stingray becomes noticeably more common during the summer and autumn months. It is not abundant enough to be targeted deliberately, but is moderately common around southern Britain, particularly in the southern North Sea, Thames Estuary and eastern Channel, and the south and west of Ireland. It is caught by anglers and more frequently by inshore trawlers. Will lash out with the tail when threatened so caution is need when landing specimens.

The 'sting' on the back of the tail is serrated on the sides and may measure up to 13 cm in length. The tissue lining the grooves ventrally is venom-laden and wounds from the spine are excessively painful. Most injuries are caused by the ray swinging its tail upwards and forwards, thus driving the spine into the leg of anyone standing on or near the fish. Specimens with two and sometimes more spines are not uncommon, the ventral ones being well-developed replacement spines.

Pelagic Stingray *Pteroplatytrygon violacea*



Characteristics

Anterior edge of disc a smooth curve with only a tiny snout protruding; eyes not protruding; pectoral disc angular. Tail less than twice length of body; lower caudal fanfold ending well in front of tail tip, but with no upper fanfold. No thorns on disc. Tail with extremely long sting.

Colour

No prominent markings – uniformly violet, purple or dark green both dorsally and ventrally.

Size

Attains at least 1.6 m.

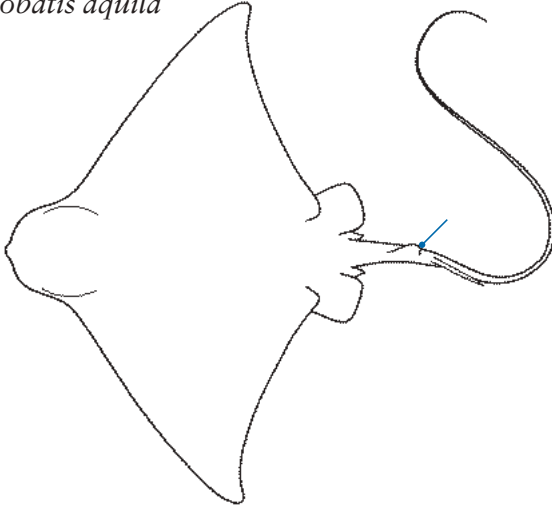
Ecology

Occurs mainly in open tropical and warm temperate waters, usually from 37-100 m but can be found as deep as 200 m. Probably, found in most tropical and subtropical seas, including the eastern Atlantic. Rare around Britain or Ireland, but has been recorded in the North Sea. Perhaps the only completely pelagic member of the family. Feeds largely on coelenterates, squid, crustaceans and fish. Ovoviviparous, with perhaps two litters each year; 1-9 young in each litter. Tail spine extremely venomous and dangerous to humans.

Family: Eagle Rays *Myliobatidae*

The Myliobatidae are most abundant in tropical seas. Their bodies are usually wide with angular tips to the wings. They are characterized by the possession of a small dorsal fin, and most species possess long serrated spine or spines close to the base of the whip-like tail. The head is raised from the disc with the eyes and spiracles on the sides. There are seven genera with 37 species, but only two species occur in northern European seas.

Eagle Ray *Myliobatis aquila*



Characteristics

A broad-bodied ray, with the pectoral fins long and pointed, and the forepart of the head distinct from the disc. This 'duck-billed' head distinguishes it from the true rays. The tail is long and whip-like with a small dorsal fin preceding a long, serrated-edged venomous spine. The teeth are flattened and broad with each row consisting of a large central plate and three smaller plates

on either side are arranged in mosaic form.

Colour

The back is grey-brown, sometimes with greenish or bronze tints; the underside whitish-cream with grey edges to the disc.

Size

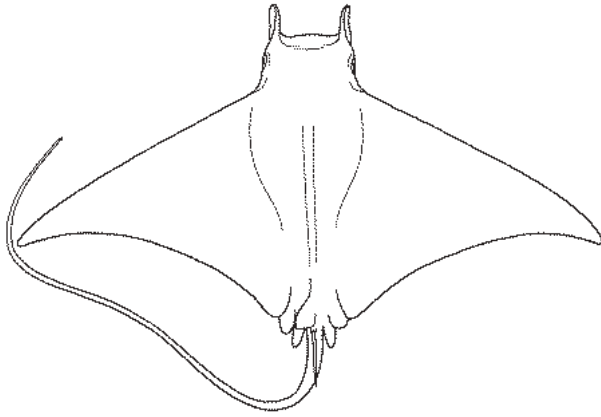
Grows to a length of 2 m, the width rather less. Attains a maximum weight of over 27 kg. British Rod-caught Record: 27.894 kg (1989, Isle of Wight).

Ecology

Partly bottom-living, but frequently found swimming strongly at, or near, the surface. Mainly encountered in coastal waters down to a depth of 100 m. Usually on sandy or muddy bottoms. Feeds entirely on

bottom-living invertebrates, particularly molluscs and crustaceans, the hard shells of which are crushed by the broad teeth. Not known to breed in northern waters. Development is ovoviviparous, the young in a late stage of uterine growth being nourished with a fluid from the maternal membranes. Litters of up to seven young are on record. In northern waters the Eagle Ray is a relatively rare vagrant found mostly during summer and autumn, presumably as a result of northward migration. Only in the western English Channel and off southwest Ireland is it at all common. Where this fish is abundant, its diet makes it a pest to shellfish beds; it has no commercial value to fishermen.

Devil Ray *Mobula mobular*



Characteristics

A giant ray, with broad disc and acutely pointed wing tips which may span up to 5.2 m. Each wing forms a separate lobe anteriorly on each side of mouth. Long thin tail with small dorsal fin and long spine and spinules. Teeth minute, in bands; gills modified for filtering plankton.

Colour

Dark brown to black dorsally, white below, with irregular dark spots.

Size

Up to 5.2 m wide.

Ecology

Subtropical seas, including the eastern Atlantic. A pelagic oceanic species which occurs over continental shelves and near oceanic islands. Feeds on small pelagic fish and crustaceans. Ovoviviparous, with 1-2 young per brood. One full term embryo was 166 cm disc width and weighed 35 kg. Rare, one off southwest Ireland in the nineteenth century. The Spinetail Devil Ray *Mobula japanica* could also occur in the area and any specimens should be critically examined. It is on the IUCN Red List as an Endangered species.

Order:

Acipenseriformes

Sturgeons

In this order:



Siberian Sturgeon



Sterlet



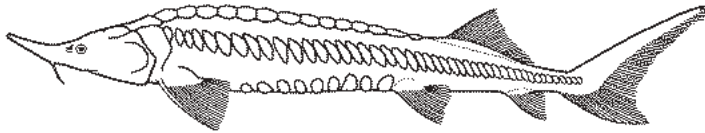
Common Sturgeon

Family: Sturgeons *Acipenseridae*

The sturgeons possess a number of primitive features, among them a heterocercal tail (the spine continuing along the upper lobe), a largely cartilaginous skeleton, and a spiral valve in the lower intestine. The body is elongate, with 5 rows of conspicuous bony plates (scutes) running along its length, and the head is covered with hard bony plates that meet to form conspicuous sutures.

Sturgeons are confined to the rivers and seas of the temperate northern hemisphere; some live entirely in fresh water but most are anadromous, living in the sea and migrating into rivers to spawn. Sturgeons the world over are now greatly depleted in numbers on account of overfishing, damming of rivers, and pollution. Four genera with some 25 species are recognized; formerly a single species occurred around Britain and Ireland but there is now a possibility of an additional two introduced species being present.

Siberian Sturgeon *Acipenser baeri*



Characteristics

Gill rakers fan-shaped, each ending in several tubercles; 42-47 lateral scutes.

Colour

Greenish-brown to near black dorsally, darkening with age; underside yellowish-white. Lateral bony plates in

juveniles light in colour.

Size

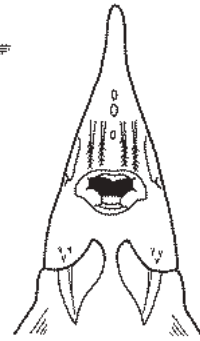
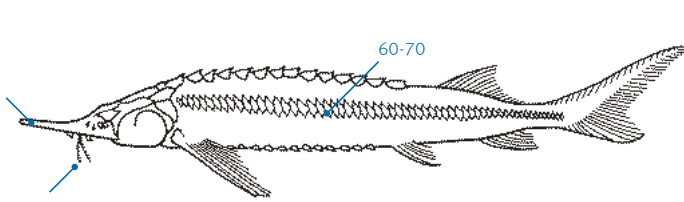
Most adults reach a length of 130-140 cm; maximum 2 m (210 kg); specimens 110 cm weigh 8 kg.

Ecology

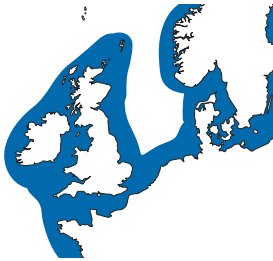
Native to the large rivers of Siberia from the Ob to the Pechora; also in Lake Baikal; recent introductions to Lake Ladoga and the Baltic Sea, together with escapes from fish farms mean that it is caught regularly in western Europe. Reproduction from May-June, in the main channels of large rivers over stony bottoms. Some fish are resident in rivers but others

live in estuaries and migrate to spawn. The population in Lake Baikal migrates over 1,000 km up the River Selenga to its spawning grounds. Eggs hatch in 10 days at 17°C. Young descend to the sea after a few years and become mature at about 12 years (males) to 16 years (females). They can live for at least 60 years. The eggs of one female aged 26+ years, weighing 24 kg, weighed 5.8 kg and numbered 420,000. Feeds mainly on bottom-dwelling invertebrates, especially midge larvae; in estuaries they eat crustaceans and worms. Very important commercially, for farming and fisheries (e.g. River Yenisei), for both its flesh and its caviar.

Sterlet *Acipenser ruthenus*



Mouth of *Acipenser ruthenus*



Characteristics

In general build similar to the Common Sturgeon, but with a more pointed, rather upturned snout. The bony plates along the back and sides are small and those on the sides are numerous (60-70 in number). The barbels in front of the mouth are finely fringed for half their length.

Colour

Dark green or grey on the back and upper sides, fading to yellowish ventrally. The lateral row of scutes is light in colour, in young fish forming a whitish stripe down the side.

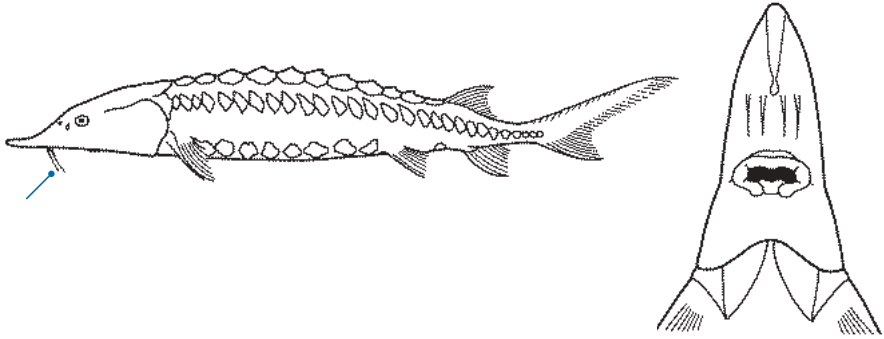
Size

A small species which attains a maximum length of 1.2 m and a weight of 16 kg. At 76 cm it may be 15 years of age, and weigh 2.265 kg.

Ecology

The only wholly freshwater sturgeon in Europe, it lives in rivers and large lakes, but is occasionally found in slightly salt water, as in the Caspian Sea. It eats aquatic invertebrates, especially bottom-living forms. It spawns on clean, stony river beds, often well towards the headwaters, from mid-April to June. It lays between 11,000 and 140,000 eggs, which hatch in 4-5 days. The young lie in the gravel for the first few days of life before dispersing. The Sterlet is represented by two stocks, one in European Russia, eastern and central Europe, and the other in Siberia. In the Volga, the Don, and the Dnieper Rivers this fish is common and forms a valuable fishery. It is sold in Britain as an aquarium and pond fish and has also been stocked in artificial lakes and reservoirs as a potential fishery resource.

Common Sturgeon *Acipenser sturio*



Mouth of *Acipenser sturio*



Characteristics

The elongate body, asymmetrical tail, and five rows of characteristic bony plates along the back, sides, and belly are all distinctive. The snout is long, the nostrils well developed, the mouth small and tubular; two pairs of long, smooth barbels are present halfway between the tip of the snout and the mouth but do not reach the mouth.

Colour

The back varies from greenish-brown to near black, darkening with age, while the underside is yellowish-white. In young fish the lateral bony plates are light in colour.

Size

A huge fish; females attain a length of 3.5 m and a weight of 317 kg; males are smaller. Large fish are exceptionally rare today.

Ecology

In the sea, a mainly bottom-living, shallow-water fish, although the occurrence of large Common Sturgeon so far from their spawning rivers suggests active, probably mid-water swimming. In northern European waters it is now so rare that little can be inferred from its capture, but taken overall it appears to be caught mainly on soft bottoms, chiefly sand or mud. In the rivers in which they spawn, this species stays in the lower reaches. The breeding stock enters the river in spring (April-May), the adults leaving after spawning, while the young fish stay in fresh water for up to three years. In the sea, Common Sturgeon eat molluscs, polychaete worms, crustaceans (chiefly shrimps and isopods), and fishes (gobies, sandeels, and, in the Black Sea, anchovies). The food of the

young while in fresh water is composed entirely of bottom-living insect larvae, small crustaceans, and molluscs. This fish spawns in deep, gravel-bottomed rivers, in 6-8 m of water. The eggs are sticky and black in colour and are quickly swept into the gravel. They hatch in 3-7 days at water temperatures of 14-19°C, the newly-hatched young being 9 mm in length. Depending on size, the female may contain between 800,000 to 2,400,000 eggs. In the Black Sea females attain sexual maturity at 8-14 years, the males at 7-9 years. They may live to 100 years. The Common Sturgeon is one of the fishes used in the production of caviar which is prepared by salting the unshed eggs of the ripe female. The flesh is also excellent and locally important as food. Possibly because of overfishing, coupled with pollution in estuaries, navigation locks, and weirs in rivers, this sturgeon is today an extremely rare fish. A land-locked population exists in Lake Ladoga (Baltic Russia),

otherwise the only known breeding population is in the River Gironde (France). It is listed as a Critically Endangered species and in north-western Europe, the sturgeon is a rare vagrant captured at sea. Throughout the 19th century there were numerous records of its occurrence far up British rivers, the majority in May and June, while the remainder fell between April and October. This suggests that spawning may have taken place in the larger British rivers at one time. It is protected under the Wildlife and Countryside Act and is a UK BAP Priority species. Details of any live encounters with *A. sturio* should be forwarded immediately to Mario Lepage at CEMAGREF, Bordeaux, France as part of the European conservation and reintroduction project. Email: mario.lepage@bordeaux.cemagref.fr
Tel: +33 557 89 08 10

Note

Recent evidence suggests that the American Atlantic Sturgeon *Acipenser oxyrinchus* replaced the Common Sturgeon in the Baltic from about 1000 A.D. until it became extinct there in the twentieth century. Hence, it is possible that some sturgeon encountered around Britain and Ireland could be of this species; which is difficult to separate from its sibling species, the Common Sturgeon. This may be further complicated by the German programme to reintroduce the Atlantic Sturgeon into the Baltic and its inflowing rivers.

Order:

Elopiformes

Tenpounders

This small order of large fish has only two families with two genera and eight species worldwide.

In this order:

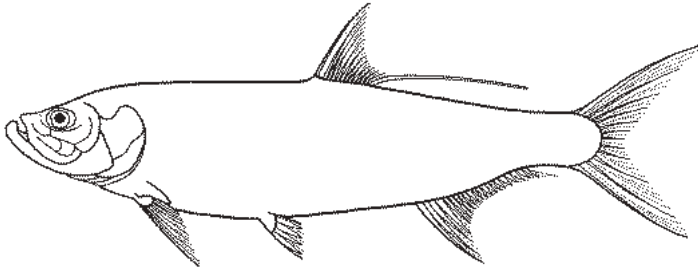


Tarpon

Family: Tarpons *Megalopidae*

These large streamlined fish all have a characteristic dorsal fin with the last ray very elongate. There are two species in the family, only one of which has been recored around Britain and Ireland.

Tarpon *Megalops atlanticus*



Characteristics

Dorsal fin with a short base at midbody; with 13-16 soft rays – the last ray extended as a heavy filament. Origin of pectoral fins very low; pelvic fins anterior to origin of the dorsal fin. Anal fin with 22-25 soft rays, with a long base. 41-48 scales in the lateral line with ramified tubes.

Colour

Back blue-grey, sides a shiny silver.

Size

May attain 2.5 m and weights of over 160 kg.

Ecology

Found in subtropical coastal waters, estuaries and rivers in the Atlantic and east central Pacific Oceans; in the eastern Atlantic north to France. Occurs in large schools and can inhabit oxygen poor waters thanks to a modified swim bladder which allows it to use air. Feeds mainly on smaller shoaling fishes such as sardines, anchovies, mullets and also crabs. The females are very fecund and may produce as many as 12 million eggs. Can live up to 55 years. Important in commercial fisheries and to game fishermen; spectacular leaps when hooked. One specimen recorded from an Irish estuary

Order:

Albuliformes

Bonefishes

Members of this order are characterised by the presence of an open sensory canal in the dentary and angular bones. The order includes three families with eight genera and some 30 species.

In this order:

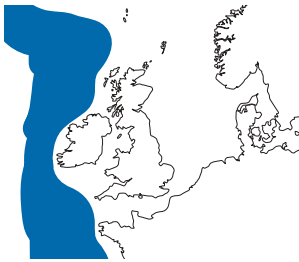
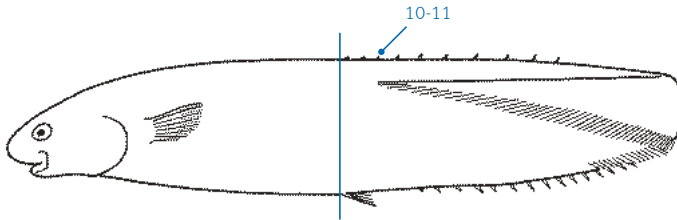


Spiny Eel

Family: Spiny Eels *Notacanthidae*

The spiny eels are mostly found in moderately deep to very deep water. Slender-bodied and eel-like in body form, they have a series of stout, sharp spines on the back, and similar spines in the anterior part of the anal fin (which continues as soft rays to the tip of the tail). Like their relatives, the thinner, long-snouted halosaurs, which have a small dorsal fin and live in deeper water, these fishes have a transparent, thin, leptocephalus larva, distinctly reminiscent of the larvae of eels. There are three genera with 10 species, only one of which occurs on the continental shelf of northern Europe.

Spiny Eel *Notacanthus chemnitzii*



Characteristics

Rounded, blunt snout with a transverse mouth placed ventrally, and with numerous small, rather flattened teeth in the jaws. The first dorsal spine is above the pelvic fin base, and the fin has 10-11 sharp spines only. The anal fin has between 20 and 21 slender spines.

Colour

Deep brown on the back and sides; grey-brown beneath the body cavity and head. The fins are dusky. Young specimens are pinkish-brown.

Size

Attains a length of 122 cm.

Ecology

Large specimens of this fish are occasionally caught and landed by trawlers fishing northern grounds; young specimens have been rarely taken to the west of Ireland. The Spiny Eel feeds on bottom-living invertebrates, particularly large pinkish actinarian sea anemones, and is presumed to feed in a head-down posture to do so. Ripe females have been caught in Icelandic waters in late autumn, and this may be the breeding season at these latitudes. Mainly caught at depths of 456-1463 m, but as shallow as 180 m in the north of its range. Possibly worldwide in all temperate oceans; distribution, like its biology, little known.

Order:

Anguilliformes

Eels

Eels are distinctive fishes by reason of their elongate body form, and long dorsal and anal fins, which usually merge with the tail fin. None have pelvic fins, and members of several families have no pectoral fins. Some eels have scaly bodies, but the scales are small and embedded in the skin. Eel larvae are transparent, shaped like a willow leaf, and live in the ocean's plankton. This larval type is known as a leptocephalus. Almost 800 species of eels are recognised worldwide in about 141 genera in 15 families. The majority are marine fishes distributed in all seas, except for the polar regions. Only four species (each belonging to a separate family – Anguillidae, Muraenidae, Nemichthyidae and Congridae) are common in northern European waters. Several other species, mostly small, live in deep water.

In this order:



European Eel



Mediterranean Moray



Slender Snipe Eel

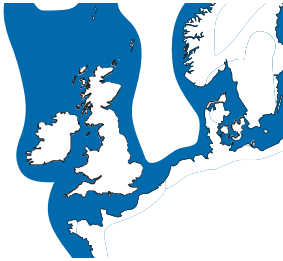
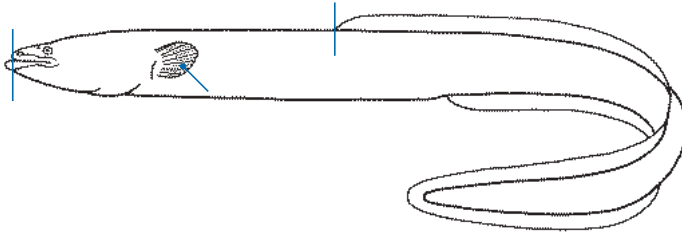


Conger Eel

Family: Freshwater Eels *Anguillidae*

These all have minute scales and crescentic lateral gill openings. There is just one genus with 15 species.

European Eel *Anguilla anguilla*



Colour

The freshwater yellow eel stage is muddy brown above, yellowish or even golden on the sides and underside. As the fish approaches sexual maturity the back is almost black, and the belly silvery; it is then known as a silver eel.

Size

Males grow to 50 cm; females grow to 100 cm. Specimens up to 12.7 kg have been recorded, but up to 4.5 kg is more usual. British Rod-caught Record: 5.046 kg (1978, Kingfisher Lake); Irish Rod-caught Record: 3.146 kg (1979, Lough Droumenisa).

Ecology

The European Eel is believed to breed in mid-Atlantic, the larvae being transported to Europe by ocean currents in three years. They undergo metamorphosis from larvae to elvers in coastal waters, and enter many rivers

in countless millions. Many eels stay in the mouths of rivers and on the seashore. The freshwater stage is a feeding and growing phase, and as they mature sexually they descend the river to the sea – the changes in colour and increase in the size of the eye being adaptations to life in the ocean's middle depths. Very few maturing eels have been caught in the open ocean and some of the detail of their life history is yet to be elucidated. The European Eel is a valuable food fish, although natural stocks are poor in some inland areas and elvers have to be imported. Currently there is considerable concern about the declining numbers in many parts of Europe.

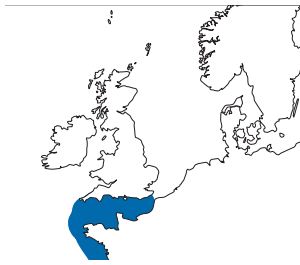
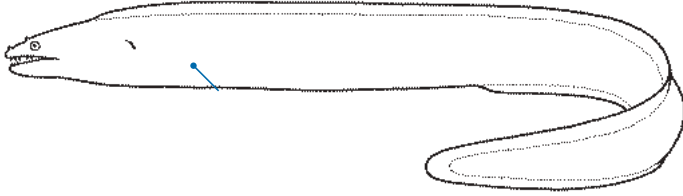
Characteristics

In fresh water, the only eel-like true fish – though can be confused with lampreys. Positively identified by its protruding lower jaw, small blunt teeth, rounded pectoral fins, and a dorsal fin origin which is closer to the vent than the gill openings. Minute scales are embedded in the skin.

Family: Moray Eels *Muraenidae*

Moray Eels all have very small round lateral gill openings and lack pectoral fins. Worldwide there are 15 genera with some 185 species.

Mediterranean Moray *Muraena helena*



Characteristics

An eel with a rather flattened deep body, pointed snout, and long very sharp teeth. The pectoral fins are absent and the gill openings are small slits high up on either side of the head. Dorsal and anal fins appear as ridges.

Colour

Dark brown or brownish-purple with regular yellow mottling posteriorly, the pattern less regular towards the head. Only slightly lighter ventrally.

Size

Grows to 130 cm.

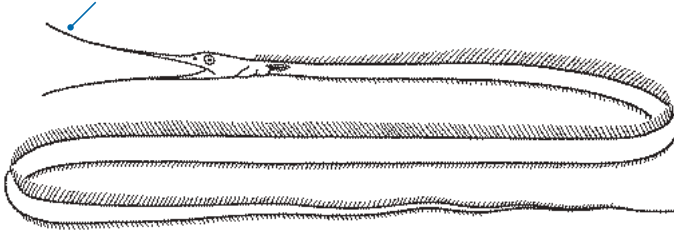
Ecology

The Moray Eel is an extremely rare fish north of central Biscay; around Britain or Ireland it has occurred only a few times in Cornwall in the nineteenth century and from Ireland and Channel Islands in twentieth. It frequents rocky shores, small specimens living intertidally under boulders, larger ones in crevices in rock faces below low-tide level. This fish is active mainly at night. Live Moray Eels are dangerous to handle. They bite savagely and the wounds often go septic.

Family: Snipe Eels *Nemichthyidae*

Members of this small family all have extremely long, non-occlusible jaws, the upper jaw longer than the lower. The family includes three genera with some nine species.

Slender Snipe Eel *Nemichthys scolopaceus*



Characteristics

A fragile, slender black eel with very elongate narrow jaws resembling a snipe's bill. The dorsal fin origin is well forward on to the head (in front of the pectoral fins), and the anal fin origin is close behind the pectoral base. The tips of the 'beak' are not flattened. The tail is long and filamentous, when not broken off.

Colour

Jet black when dead; fresh specimens are dark brown with an iridescent tint.

Size

The largest known specimen was 145 cm; most caught are around 102 cm.

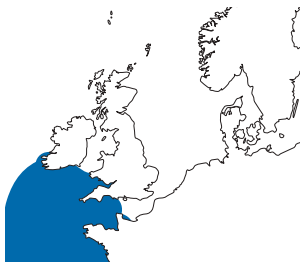
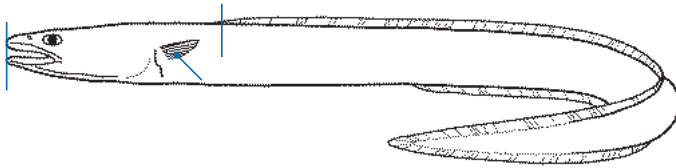
Ecology

The Snipe Eel is a moderately common deep-sea eel, found between the surface and 1,000 m. It is occasionally captured in deep-fishing commercial trawls, often tangled by its jaws in the warp or netting; more commonly it is caught by research vessels, but is occasionally found in the gut of other fishes. It feeds on small crustaceans and deep-water fishes. Its larvae are elongate, leaf-like and transparent, and are found in the upper 90 m, but only in the open sea.

Family: Conger Eels *Congridae*

Conger Eels all have a complete lateral line and many species grow to a large size. There are 32 genera with some 160 species worldwide.

Conger Eel *Conger conger*



Characteristics

A large marine eel which has a rounded cylindrical body, prominent pointed pectoral fins, and moderately large gill openings. The dorsal fin origin is placed well forward, vertically above the tip of the pectoral fin. The upper jaw is longer than the lower. Body scaleless.

Colour

Generally grey, but can be brown or even greenish, underside lighter. Deep-water specimens are light grey brown, lighter ventrally but with the

margins of the dorsal and anal fins black.

Size

A maximum length of 274 cm and a weight of 65 kg is attained. British Rod-caught Record: 60.442 kg (1995, Devon). Irish Rod-caught Record: 32.659 kg (1914, Valentia).

Ecology

The Conger Eel is a common fish on rocky shores and offshore. Many young, small fish can be caught in deep shore pools, particularly those with dense algal cover low down the shore. They move deeper as they get older. In soft-bottomed areas few Conger Eels are found, but they quickly colonise sunken wrecks, harbour walls, and loose stone groynes, and many can be caught in such man-made habitats. Mainly nocturnal in habit, spending the day in

crevices. The Conger Eel's food consists of a wide range of mainly bottom-living fishes, large crustaceans, especially crabs, and octopuses. It breeds in the Atlantic between Gibraltar and the Azores at depths of 3,000-4,000 m. It matures between 5 and 15 years and then the eels return to the spawning grounds to breed, releasing 3-8 million eggs, and die. -The larva is transparent and flattened, and lives at the sea's surface, drifting inshore for one or two years before undergoing metamorphosis to a small eel. The Conger Eel is not much esteemed as a food fish, but considerable numbers are caught by anglers.

Order:

Clupeiformes

Herrings

This is a large and economically important order with five families, 84 genera and some 364 species.

In this order:



Anchovy



Allis Shad



Twaite Shad



Herring



Pilchard

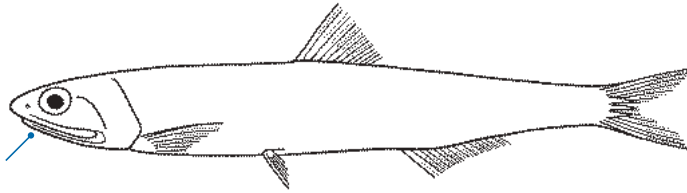


Sprat

Family: Anchovies *Engraulidae*

Members of this family are worldwide in temperate and tropical seas, and of enormous economic importance. Superficially similar to herrings, they are distinguished by the very large mouth which opens to reveal a huge gape. Like the herrings, anchovies are plankton feeders. The Anchovy is the single European representative of this large family, which has 16 genera and some 139 species.

Anchovy *Engraulis encrasicolus*



Characteristics

Quite unmistakable on account of its rounded protuberant snout, and very long lower jaw, which extends well behind the eye. The body is slender and rounded in cross-section, without a keel on the belly. The scales are large, fragile and exceptionally easily detached with handling.

Colour

The back is a clear green, sharply contrasting with the bright silvery sides and the silvery-white ventral surface. The gill covers have a yellowish tinge.

Size

A small fish which rarely attains a length of 20 cm, and is more usually between 9 and 12 cm. British Rod-caught Record: 49 g (2003, Hastings).

Ecology

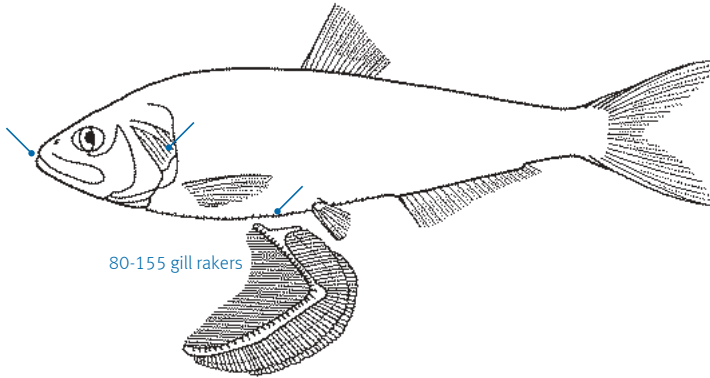
A schooling fish living in the surface waters of the sea and feeding on planktonic animals, especially small crustaceans and the larvae of invertebrates and fishes. In summer Anchovies migrate into inshore waters and are often found in bights and in estuaries. In winter they move offshore, and in the

North Sea probably migrate southwards. Spawning takes place from June to August, and the eggs and larvae are pelagic. The Anchovy is fished for off southern Europe and in the Black Sea, where it is an important commercial fish. Much of the catch is salted down in barrels and stored; part is canned in oil. Overfishing has depleted stocks in Biscay, but large shoals in the North Sea and southern Britain are providing irregular but valuable catches. Very rare off Ireland. Other species of anchovies form immensely valuable anchovy fisheries, and are an important source of animal feed and, indirectly, of fertilizer.

Family: Herrings *Clupeidae*

Members of the herring family form one of the most important of the world's fisheries resources. Most are marine fish which usually swim in schools at the sea's surface and in coastal waters. They are usually flattened from side to side, often have sharp scales on the belly, and have silvery sides. Their scales are large, easily detached, and there is no lateral line; the head is scaleless. There are 57 genera and 188 species, of which only five occur in northern European waters.

Allis Shad *Alosa alosa*



Characteristics

A large, deep-bodied, heavyheaded herring-like fish. The body is strongly compressed and there is a sharp keel along the belly of the fish. The upper lip has a deep notch in the mid-line, and there are weak radiating ridges on the gill covers. The gill rakers on the first gill arch are long and numerous, longer and more numerous than the red-coloured gill filaments opposite; the rakers number 80-155, depending on size.

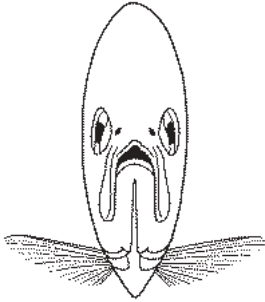
Colour

The back is deep blue, the sides golden shading to silver. There may be a single dusky blotch at the upper edge of the gill cover on each side, although sometimes it is absent, and there can be a row of up to 20 spots along the side. Juvenile allis shad very often have a row of spots along the flank and in many cases more than 13 and commonly up to 20.

Size

A comparatively large fish which grows to a total length of 83 cm and may attain a weight of 4.0 kg. British Rod-caught Record: 2.166 kg (1977, Chesil Beach).

Continued: Allis Shad *Alosa alosa*



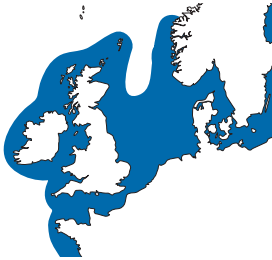
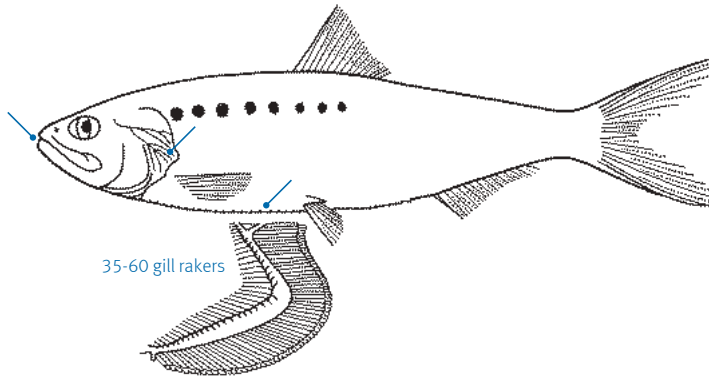
Head of Alosa

Ecology

The largest European member of the herring family. The Allis Shad is moderately rare in European waters for the same reasons that its relative, the Twaite Shad (with which it can hybridise), is now uncommon; if anything, this species has proved more vulnerable. Breeding populations are known in the R. Tamar and R. Gironde. It enters rivers in spring on most rivers running well upstream to fresh water, to spawn in May and June, usually at night where the current is swift. The eggs sink and lodge in the gravel bed of the stream. The majority of adults die after spawning, with very few spawning more than once. The young fish drop downstream in the autumn. This fish feeds on a wide range of planktonic crustaceans, although larger specimens eat small shoaling fish. The Allis Shad and its habitat are protected under the Wildlife and Countryside Act and is a UK BAP Priority species. In many rivers pollution of the lower reaches,

weirs or other obstructions have denied access for the fish, and it is now rare where once it was very common. In the UK it was once an important food fish.

Twaite Shad *Alosa fallax*



Characteristics

A deep-bodied, heavy-headed herring-like fish. The scales are very numerous, large and easily detached. The body is strongly compressed and the belly has a sharp keel, with the scales forming distinct teeth. The upper jaw is prominently notched in the mid-line, and there are weak radiating ridges on the gill covers. The critical feature for identification is the number of gill rakers on the first gill arch (35-60 according to size). The gill rakers appear to be fewer in number and shorter than the red-coloured gill filaments opposite. Any shad with 60-80 gill rakers may be regarded as a hybrid between the two shad species. The anal fin ray count may be used as a partial diagnostic feature between allis and twaite shad - although there is overlap. Allis shad anal fin rays numbered 21-27, whereas twaite shad had between 18 and 23 anal fin rays. However gill raker count is more accurate, though it may also be useful to have an external diagnostic feature like

anal fin ray count to attempt to distinguish the two species in the field. Also widely known as the Sardine.

Colour

The back is a brilliant deep blue shading to golden yellow on the sides and silvery on the belly. A line of dusky round blotches may run along each side at the level of the eye, but is sometimes faint or missing.

Size

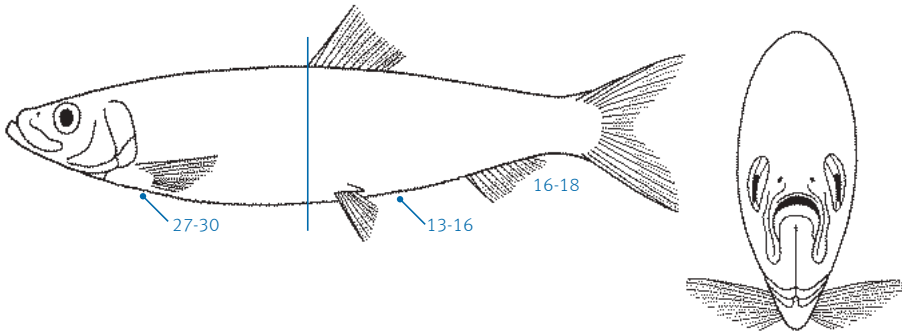
Attains a maximum length of 60 cm and a weight of 1.5 kg. British Rod-caught Record: 1.247 kg (1978, Garlieston). Irish Rod-caught Record: 1.54 kg (1999, St Mullins).

Ecology

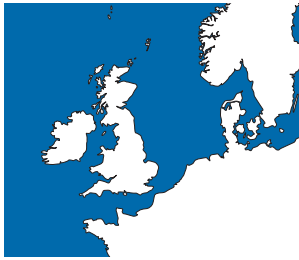
The Twaite Shad is the more common of the two shads in northern European waters. It is migratory, entering rivers to breed from April to June, spawning has been reported in tidal fresh water as well as in the non-tidal portion of rivers with fish migrating as far as 200

km from the sea. Twaite shad spawn more than once unlike most allis shad with twaite spawning populations known in the Usk, Wye & Severn. In many rivers pollution of the lower reaches, and weirs or other obstructions have denied access for the fish, and it is now rare where once it was very common. Twaite Shad feed on crustaceans and small fishes such as sand eels, young Sprats and Herring, but they do not feed during their spawning migration. It is not a prime foodfish, although it was at one time commercially exploited. A few are caught by anglers. It is protected under the Wildlife and Countryside Act and is a UK BAP Priority species. A land-locked freshwater population in Lough Leane, Ireland, is known as the Goureen *A. fallax killarnensis*, and has been suggested as a separate species *Alosa killarnensis*.

Herring *Clupea harengus*



Head of *Clupea harengus*



Characteristics

Flat-sided, with large fragile scales, easily removed in handling. The belly is rounded, although in young fish it is keel-like and has a sharp edge. There are 13-16 scales between the pelvic fin base and the vent; 27-30 between the throat and the pelvics. The anal fin has 16-18 rays. The dorsal fin origin is above or in front of the pelvic fin origin but behind the deepest part of the body. The lower jaw is prominent, the gill covers not ridged, and there is no deep notch in the mid-line of the upper jaw.

Colour

The back is deep blue, lightening on the sides to silvery-white on the belly. The gill covers and flanks are shot with golden or rose-coloured tints.

Size

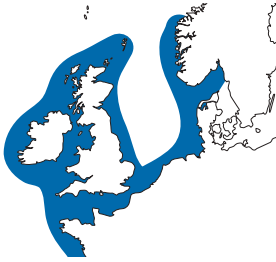
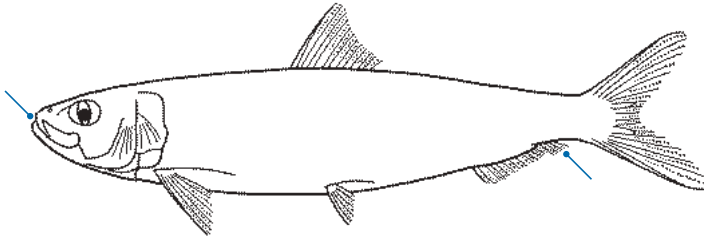
Grows to 45 cm and 1 kg. A number of small races have a maximum size of around half this length and weight. British Rod-caught Record: 481 g (1981, Sussex). Irish Rod-caught Record: 454 g (2008, Red Bay).

Ecology

The Herring was an extremely abundant fish off northern Europe, but now locally (as in the North Sea) overfished so that it is less economically valuable than it once was. It forms distinct breeding stocks often referred to as races, which are recognizable from their spawning grounds and seasons as well as meristic features, such as the number of vertebrae. The spring spawners shed their eggs close inshore, but others spawn in summer

and autumn offshore and on the edges of ocean banks. The eggs are shed close to the bottom and form a mat, often several eggs deep, over the gravel or shell beds of the bottom. The larvae are slender and about 0.6 cm on hatching; they are planktonic. The young fish form large schools and are particularly common inshore through their first year. In certain areas they form a substantial part of the catch of whitebait (the remainder being Sprats). Despite their comparative scarcity in the North Sea today, considerable quantities of Herring are still caught and they continue to be a valuable food fish. Occasional specimens are caught by anglers. At all stages of its life the Herring is preyed upon by numerous predators including seabirds, dolphins, and other fishes.

Pilchard *Sardina pilchardus*



Characteristics

Clearly herring-like in general body form, but with larger, easily detached scales, and a rounded body. The underside has a faint ridge, but nothing like the sharply-scaled belly of Herring or Sprat. The gill covers have distinct ridges radiating from a centre just behind the eye. The origin of the dorsal fin is above the deepest part of the body and in front of the pelvics, and the last anal rays are elongate.

Colour

The back is blue-green shading to gold on the sides and whitish-silver ventrally. There is a series of up to four dusky spots along the sides at the level of the eye.

Size

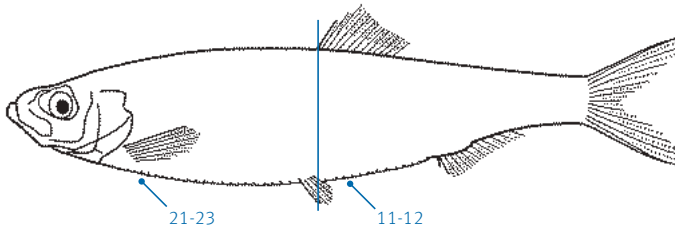
Attains a length of 25 cm.
British Rod-caught Record:
226 g (1987, Plymouth).

Ecology

The Pilchard is a pelagic schooling fish of wide distribution in European seas, although reaching the northward limit of its range in the vicinity of Britain and Ireland. Its abundance varies with climatic changes and their related effects on the sea, and during warm periods the Pilchard may be numerous in the English Channel and the southern North Sea. It spawns in spring and summer in the open sea; the eggs are pelagic as are the early larvae. An inshore and usually northerly migration follows spawning, the schools then being found close to the coast. It was during

this period that the most intensive fishery for the adult fish (as formerly off the Cornish coast) was carried out. The fishery in northern waters has now virtually died out, although small catches are still made in the English Channel and the southern North Sea. The young fish are heavily fished off the Biscay coast, and off Portugal they are canned as sardines. The largest pilchard fisheries are for related genera in the Pacific Ocean and off southern Africa.

Sprat *Sprattus sprattus*



Characteristics

A small herring-like fish with flattened sides and a sharply toothed keel to the belly. The free rear-edges of the belly scales form backward-pointing teeth which are very noticeable. There are 21-23 between the throat and the pelvic fin origin, and 11-12 between the pelvic fins and the vent. The origin of the dorsal fin is behind the base of the pelvic fins. The anal fin has 18-20 rays.

Colour

The back is dark green shading off on the sides to brilliant silver. Traces of golden colour on the gill covers and sides.

Size

Attains a maximum length of 16.5 cm; becomes sexually mature at 13-14 cm, at an age of two years.

Ecology

The Sprat is an extremely abundant, small pelagic fish in northern European waters. It is particularly common in inshore coastal waters, the young especially being found in estuaries and arms of the sea. At this stage (during their first year) they are fished for as whitebait. In summer, Sprats are found in depths of 10-50 m, but go deeper in winter. In all seasons they rise towards the surface at night. The Sprat spawns in spring and summer, the eggs and early larvae are planktonic, and the latter drift inshore as they develop. Sprats are extensively exploited and as well as being sold fresh, they are smoked, and preserved by canning in oil as Brisling (their Norwegian name). Many tonnes are taken by the industrial fisheries processed into fishmeal and used for animal feed stuff or fertilizer.

Order:

Cypriniformes

*Carp*s

The Cypriniformes is one of the largest fish orders with six families, 321 genera and some 3,270 species worldwide. Many of the species are of economic importance, both as food and as aquarium and pond fish.

In this order:



Silver Bream



Common Bream



Bleak



Barbel



Goldfish



Crucian Carp



Grass Carp



Common Carp



Common Gudgeon



Sunbleak



Chub



Orfe



Dace



Minnow



Topmouth gudgeon



Bitterling



Roach



Rudd



Tench



Spined Loach

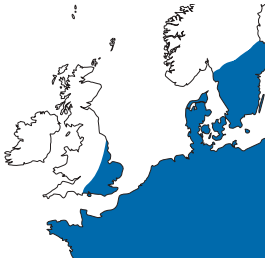
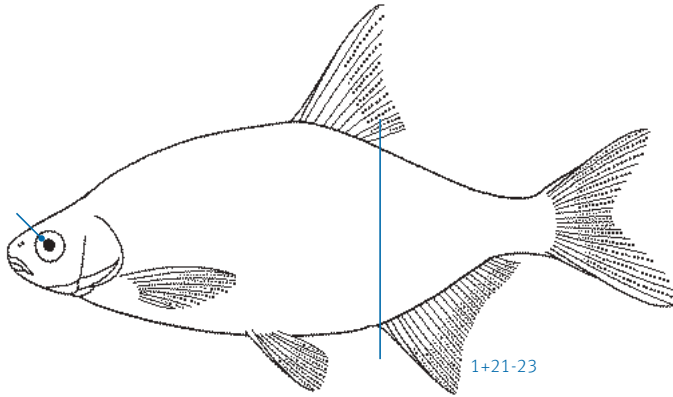


Stone Loach

Family: Carps and minnows *Cyprinidae*

This is the major group of freshwater fishes in Europe, and is also an important constituent of the fauna of the fresh waters of North America, Africa, and Asia. The members are typically 'fish-shaped' with scaly bodies, no adipose fin, a single dorsal fin (occasionally with a hard spiny ray anteriorly – as also in the anal fin); many have barbels. Internally, its members have a complex connection between the two-chambered swim-bladder and the inner ear, which gives them enhanced hearing; they can also produce sounds. The family is also characterized by having no teeth in the jaws, but well-developed teeth are present on the pharyngeal bones (behind the gill chamber) which grind food against a hard, horny pad in the roof of the pharynx. The pharyngeal teeth are a diagnostic feature in the distinction between closely related cyprinids. Unfortunately, the fish must be killed before the teeth can be extracted, and the pharyngeal bones cleaned of tissue. Information on the numbers of teeth and the number of rows is given for the left side first; i.e. 6+2:2+6 means that there are two rows, the outer with six, the inner with two teeth. Most species can, however, be identified with certainty on external features. Cyprinid fishes frequently breed together and produce hybrid offspring. These usually resemble one parent more than another, but are variable between the two standards - in the Roach x Rudd hybrid the offspring more closely resemble Roach than Rudd. Wherever it is important to identify a fish thought to be a hybrid, the body should be saved entire and sent to a competent authority. In the breeding season adult fish have a so-called nuptial livery; in males particularly, the head, paired fins, and the scales especially on the front of the body develop hard, white, conical outgrowths. The colour may also be enhanced. After spawning the fish lose the nuptial tubercles and the colour returns to normal. The family includes about 220 genera and some 2,420 species.

Silver Bream *Abramis bjoerkna*



Characteristics

Moderately deep-bodied and strongly compressed, with a high dorsal profile. Head small; the eye is large, its diameter greater than the snout length. Anal fin long, with 21-23 branched rays, its origin behind the last ray of the dorsal fin. Scales moderately large, 40-45 in the lateral line. Pharyngeal teeth 5+2:2+5, flattened and with a weak hook.

Colour

Light olive brown on the back, the sides conspicuously silver. Fins dark, except for the pelvics and pectorals that are distinctly reddish with grey tips.

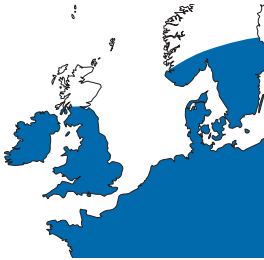
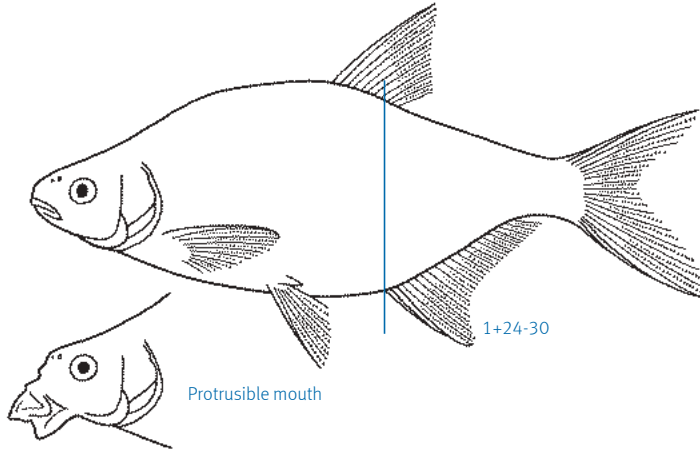
Size

Attains a length of 25 cm, exceptionally up to 36 cm; weight rarely in excess of 453 g. British Rod-caught Record: 964 g (2005, Sussex).

Ecology

An inhabitant of lowland rivers, lakes and ponds, usually found only where the current is slow in rivers, and close inshore among vegetation. It feeds both in mid-water among vegetation and on the bottom, eating insect larvae, crustaceans, small molluscs, and plants. The young feed on planktonic organisms. The Silver Bream spawns in summer, in schools among the water plants. The yellow eggs stick to the weeds, and hatch in 4-6 days at a length of 4.8 mm. This fish is not used for food, nor well regarded as a sport fish. In waters where fishery management is attempted, it may be a serious competitor with Common Bream and other fishes.

Common Bream *Abramis brama*



Characteristics

Deep-bodied with a high back and flattened sides. The head is comparatively small, with the mouth ventral and extending into a tube when feeding. The eye is small, between 1.3 and 1.4 in the length of the snout. The scales are small with 51-60 scales in the lateral line. The anal fin origin is beneath the rear end of the dorsal fin; its base is long, with 24-30 branched rays and its outline is strongly concave. Pharyngeal teeth 5:5, the teeth long and compressed.

Colour

Dark brown or greyish on the back; adults have golden brown sides, the young have silver, and ventrally are yellowish. The fins are grey or light brown, those underneath being reddish tinted.

Size

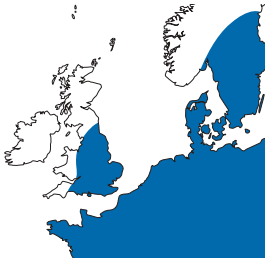
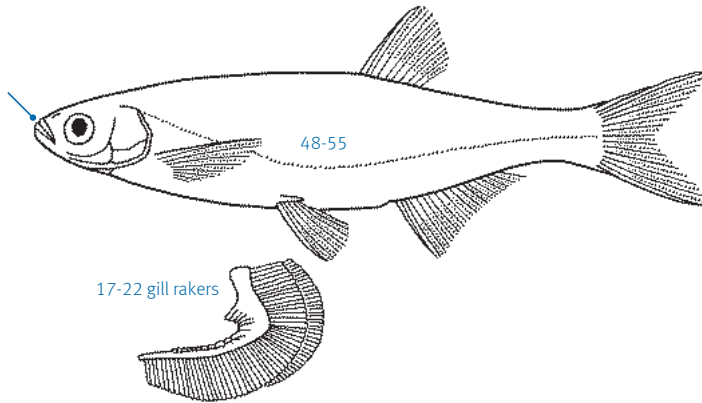
An average length of 41-51 cm and a weight of 3.6 kg is attained; exceptionally a length of 80 cm, and 9 kg in weight. British Rod-caught Record: 8.9 kg (2005, Cambridge Water); Irish Rod-caught Record: 5.528 kg (1997, Bolganard Lough).

Ecology

The Common Bream inhabits slow-flowing rivers, lowland lakes, and ponds; it also occurs in the brackish areas of the Baltic Sea. It feeds, usually in schools on the river bed, swimming slowly over the bottom in a head-down oblique stance, using its protrusible mouth to pick up insect larvae, worms, and molluscs. Schools feed in shallow water at night, often with their tails 'dimpling'

the water as they move. They spawn in late spring and early summer among dense vegetation, often in shallow water and at night. The yellowish eggs stick to the weeds, and hatch in 3-12 days, depending on temperature. Breeding males develop numerous spawning tubercles on the head and body. Common Bream are affected by temperature; in the northern parts of their range, growth is very slow and maturity may not be attained until 10 years of age. Small lakes may also become crowded with small, stunted individuals. In Europe this is a commercially important food fish. It is also a valuable fish for anglers, although all too frequently expected to grow well and provide sport in unsuitable habitats.

Bleak *Alburnus alburnus*



Characteristics

Slim-bodied and very silvery in colour. The anal fin is long-based (16-20 branched rays). The head is small with the mouth strongly oblique, and the lower jaw prominent. The eyes are large. Gill rakers on the first gill arch 17-22. Scales moderate in size, easily detached, 48-55 in the lateral line. Pharyngeal teeth 5+2:2+5, serrated and hooked at the tip.

Colour

Back and upper sides blue-green, lower sides and ventral surface brilliant silvery-white. The fins are grey, white ventrally.

Size

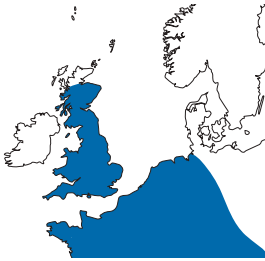
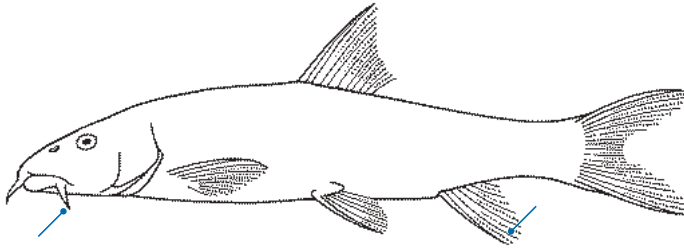
Usual length 12-15 cm; exceptionally attains 20 cm. British Rod-caught Record: 129.4 g (1998, River Lark).

Ecology

A schooling fish which is often extremely abundant in slow-flowing rivers, mainly in the lowland areas, but penetrating well upstream to moderate current regions. It also lives successfully in lakes. Although it prefers clean water, it survives well in turbid, even poorly-oxygenated rivers, as it swims at the very surface where conditions are more favourable. It feeds on animal plankton, especially small crustaceans, surface-living insects and aerial insects which fall into the water. Spawning takes place in shallow water, the eggs being shed among the stones or on nearby vegetation; it spawns in May

or June depending on the temperature. The Bleak is of little direct economic importance. It has occasionally been exploited as a fertilizer or as animal feed stuff; at one time its scales were used to produce pearl essence for the manufacture of artificial pearls. Because of its abundance it is often a valuable forage fish for larger predators - Trout, Pikeperch, Perch, Chub, and Pike, as well as for fish-eating birds.

Barbel *Barbus barbus*



Characteristics

Elongate body, almost round in cross-section but flat on the belly. Two pairs of barbels on the upper lip - one pair at the front of the snout, the other at the angles of the mouth; lips fleshy. Dorsal fin short-based but high, with a strongly serrated full-length spine; anal fin short and rounded. Scales small, deeply embedded, 55-65 in lateral line. Pharyngeal teeth 5+3+2:2+3+5, teeth pointed, their tips hooked.

Colour

A warm, greeny-brown on the back, golden yellow on the sides and ventrally. The fins are dark - except that the pectoral, pelvic, and anal fins are orange.

Size

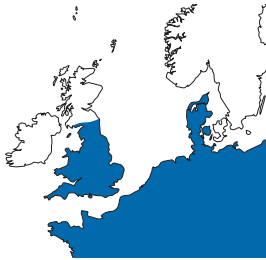
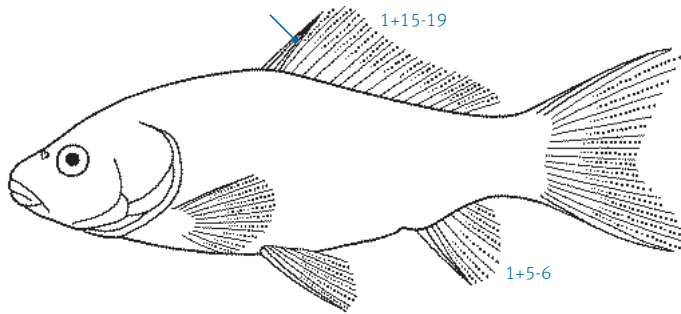
Attains a maximum weight of about 8 kg, and a length of 91 cm; the average length is about 50 cm and with a weight of 2.27 kg. British Rod-caught Record: 9.837 kg (2006, Bedford).

Ecology

The Barbel is a bottom-living fish found in the middle reaches of lowland rivers where the bed is clean gravel and the current is moderate. Outside this kind of habitat it may be found in weir pools in the lower reaches, and in deep pools in upstream regions. Typically it is most active by night and in the half-light, moving around in small schools usually of equal-sized fish. It feeds on bottom-living invertebrates, particularly aquatic insect larvae, crustaceans, and molluscs. Spawning takes place in late

spring, when the males develop prominent spawning tubercles in rows on the head and back. The yellowish eggs adhere to stones or lodge between them, and hatch in 10-15 days. In most rivers there is an upstream migration before spawning. The Barbel is a major sporting fish, and angling interests have ensured its wide distribution in England – and more recently into Scotland. Only locally is it fished for food. Its roe is slightly poisonous. Several subspecies are recognized across Europe.

Goldfish *Carassius auratus*



Characteristics

Moderately deep-bodied, the dorsal profile gently curved. No barbels at mouth. Dorsal fin long-based, with 15-19 branched rays and a deeply serrated spine at the front of the fin; anal fin with a similar spine and 5-6 branched rays. Outline of dorsal fin straight to slightly concave. Gill rakers on first gill arch 35-48. Pharyngeal teeth 4:4, narrow and smooth edged.

Colour

Goldfish, *C. auratus auratus*: when young, green-brown above, bronze on sides, yellowish ventrally; as adult, beautiful orange red. Gibel Carp, *C. auratus gibelio*: greeny-brown on the back and upper sides, golden on sides fading to silver or white ventrally.

Size

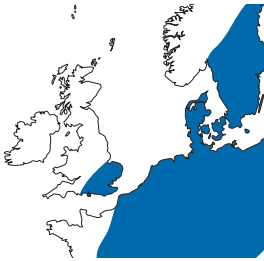
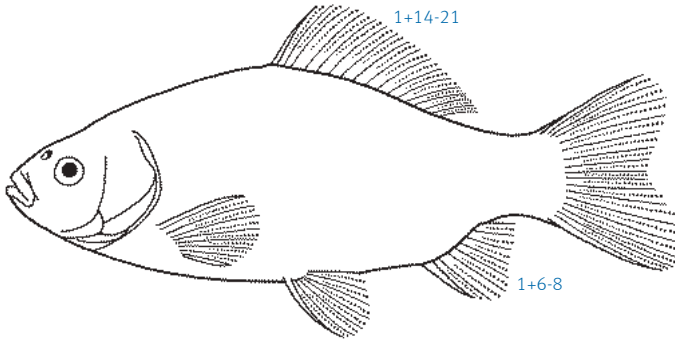
Maximum length *ca* 45 cm, and weight 2-3 kg; usually much smaller. British Rod-caught Record: 2.594 kg (1994, Surrey).

Ecology

Goldfish found in European fresh waters are all the result of the liberation of ornamental fish which have, in many places, established viable populations. They are widespread in lowland Europe and in England, but their distribution is impossible to establish with certainty as introductions continue intermittently. Some of the Goldfish are ornate, long-finned varieties. The Gibel Carp, sometimes called the Prussian

Carp, is native to eastern Europe, but has been introduced to western Europe, including England. It thrives in densely weeded small lakes, ponds and the lower reaches of rivers. It spawns among vegetation in June or July, the eggs sticking to the plants; hatching takes place in about a week. The goldfish will hybridise with crucian carp and carp and are often described as feral. Due to the difficulties of identification between crucian carp and the feral goldfish and hybrids of the two identification may be difficult. For further details on feral goldfish and crucian carp contact the Environment Agency National Fisheries Laboratory at Brampton, England.

Crucian Carp *Carassius carassius*



the pelvic, anal and pectoral fins have a red tinge.

Size

Grows to a maximum of 51 cm and 2 kg; owing to its ability to thrive in poor conditions, its average size is much smaller, often no more than 15 cm and 170 g. British Rod-caught Record: 2.085 kg (2003, Yateley Lake).

Ecology

Typically an inhabitant of marshy pools, overgrown lakes, and slow-flowing lowland rivers. It is very tolerant of low oxygen levels and can live in conditions which few other fish could survive. As a consequence it is often stocked in marginally viable fishery ponds, although it rarely grows well in such places. However, in good conditions it can attain a good growth rate. It is also resistant to cold and to organic pollution. The Crucian Carp feeds on plants, insect larvae and, when young, on planktonic crustaceans. It breeds in May and June, but is dependent on the temperature

(the minimum being 14°C). The eggs are deep gold and stick to the water plants, hatching in 5-7 days, although the fry remain attached to the plant leaves for a further two days until the yolk is absorbed. The Crucian Carp is a food fish of some value in Europe, but is not favoured in carp fisheries as it competes for food with the faster growing Common Carp. The crucian carp is under increasing threat from direct competition with goldfish and carp and hybridisation with these two species. Due to the difficulties of identification between crucian carp and the feral goldfish and hybrids of the two, assessment of the present distribution of crucian carp is very difficult. For further details on crucian carp identification and field guide to crucian carp contact the Environment Agency National Fisheries Laboratory at Brampton, England.

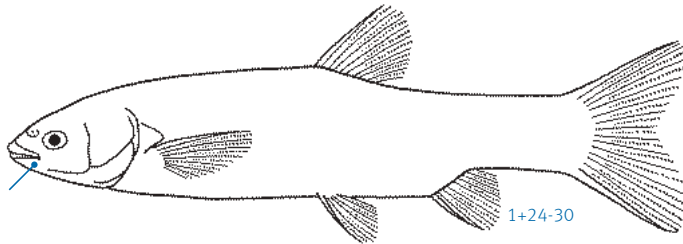
Characteristics

The body is deep and the back distinctly high. There are no barbels at the mouth. Dorsal fin long-based with 14-21 branched rays, with anteriorly a full-length, lightly serrated spine. Anal fin with a similar, lightly serrated spine and 6-8 branched rays. Outline of dorsal fin convex. Gill rakers on the first gill arch 26-31. Pharyngeal teeth 4:4, narrow and smooth-edged.

Colour

Olive-green, or reddish-brown on the back, a bronze tint on the sides fading to yellowish ventrally. Young fish have a dusky blotch on the tail. The fins are dark grey-brown, but

Grass Carp *Ctenopharyngodon idella*



Characteristics

Slender-bodied, but with a large, broad head, eye small, mouth terminal and very wide, reaching back to the front of the eye. Dorsal and anal fins short-based, the former rounded in outline and its origin in front of the pelvic fin origin, the anal with 8 branched rays. Scales moderately large, 43-45 in the lateral line. Pharyngeal teeth usually 2+5:4+2, flattened with folded sides and a groove on the grinding surface.

Colour

Back dark greeny-brown, the sides with a golden tinge, with each scale dusky at the base; fins dark.

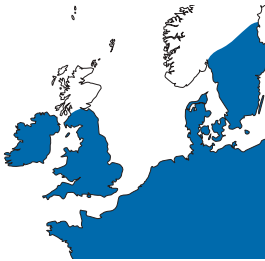
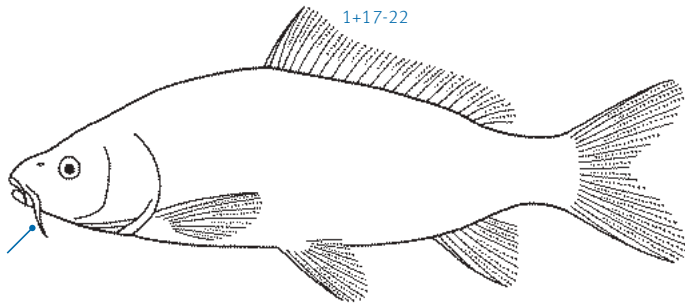
Size

Attains a length of 1.25 m and a weight of ca 35 kg.

Ecology

The Grass Carp is native to the River Amur and the region to the south, including much of China. It has been introduced to many parts of central and eastern Europe (and even to Britain experimentally). It feeds mainly on plant matter once it is more than a few inches in length (until then it eats animal plankton) and has been introduced as a means of keeping under control plant growth in navigation and drainage channels. In some parts of Europe it is propagated in fish farms; it is not known to breed in Britain or Ireland.

Common Carp *Cyprinus carpio*



Characteristics

Four barbels, two long ones at the corners of the mouth, shorter ones on the upper lip. Dorsal fin base long with 17-22 branched rays and a strong, toothed spine in front. Dorsal fin outline concave anteriorly. King or wild Common Carp have fully scaled bodies; Leather Carp are scaleless or almost so; Mirror Carp have exceptionally large scales along the sides and at the base of the dorsal fin. Pharyngeal teeth 3+1+1:1+1+3; teeth with flattened crowns.

Colour

Variable; wild Common Carp are brownish-green on the back and upper sides, shading to golden yellow ventrally. The fins are

dusky, ventrally with a reddish tinge. Coloured Carp (Koi) are bred for ornamental purposes.

Size

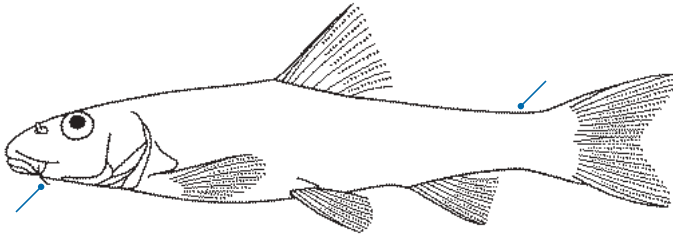
Growth is variable with local conditions. In southeast Europe (where conditions are optimum) an average length of 51-61 cm and weight of 1.8-4.5 kg is attained; in northern Europe it is rather less. A maximum weight of 32 kg has been recorded in Italy. British Rod-caught Record: 29.855 kg (2005, Conningbrook Lake); Irish Rod-caught Record: 13.523 kg (1998, The Lough, Cork).

Ecology

The natural conditions that suit Common Carp are lowland lakes and rivers where there is abundant vegetation to provide food and shelter. They thrive in warm-water conditions, and require temperatures of at least 18°C to spawn. Consequently the success of populations introduced to northern Europe is dependent on warm weather during spring and summer. Common Carp feed mainly on bottom-living insect larvae, small

snails, crustaceans, and some vegetable matter. They are most active at night, and feed little at low temperatures. The diet of the young includes small planktonic crustaceans, but the larvae, after they have utilized the yolk from the egg, feed on minute rotifers and algae, and the young stages of water-fleas. Breeding takes place in late spring in relatively shallow water overgrown with water plants. The eggs (1-1.5 mm diameter) are attached to plants and hatch in 3-8 days, depending on temperature. The newly-hatched fry remain attached to the plants until the yolk of the egg is exhausted. The Common Carp is very popular as a food fish in Europe (and elsewhere), and is well suited for raising in fish farms; carp farming is now a considerable industry. This is also a popular anglers' fish and many waters are stocked with large specimens. Owing to its popularity as a food or sporting fish, it has been widely introduced to other parts of the world (North America, southern Africa, New Zealand, Australia, etc.).

Common Gudgeon *Gobio gobio*



Characteristics

An elongate but round-bodied fish with a large head. Tail moderately short and deep. The snout is prominent with a ventral mouth, thick lips and a barbel at each corner of the mouth. The scales are moderate in size, firmly attached with 38-44 along the lateral line.

Colour

A 'check' pattern of dark brown with greeny-brown shading on the back to deep yellow on the sides, along which runs a series of large, rounded, dark blotches; silvery-white ventrally. The dorsal, tail, and anal fins are heavily spotted.

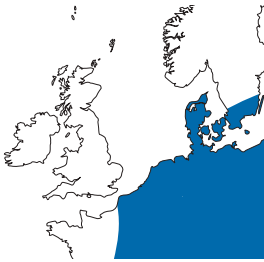
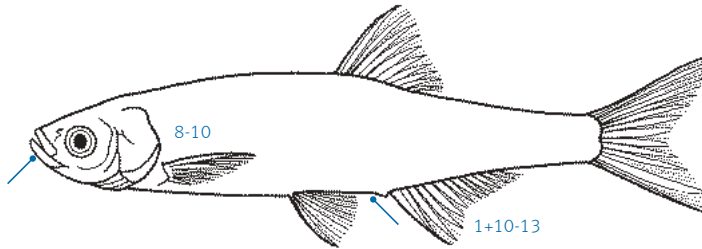
Size

Usually around 10-15 cm, but can attain 20 cm in length. Maximum weight ca 226 g. Females are larger than males of the same age. British Rod-caught Record: 141.8 g (1989, River Nadder).

Ecology

Widely distributed in a variety of habitats from lakes and slow-flowing lowland rivers to moderately fast-running rivers well upstream; also occurs in low salinity areas of the northern Baltic. It is a bottom-living fish usually found in small schools in shallow water; in winter it occurs in deeper water. It feeds on bottom-living insect larvae, crustaceans, and molluscs, although young fish eat planktonic crustaceans. Spawning takes place in early summer, usually in shallow water and at night. The eggs adhere to plants and stones, and hatch in 10-30 days depending on temperature. Few Common Gudgeon live longer than three years, although exceptional 7- and 8-year-old fish have been recorded. A minor angling fish and of little importance as a food fish.

Sunbleak *Leucaspilus delineatus*



Characteristics

A slender fish with large, thin, easily detached silvery scales. Head is small with a large eye, and a strongly oblique mouth. Lateral line incomplete, extending over first 2-13 scales (cycloid) only; sharp keel between pelvic fin and vent; pelvic fin with 10 rays.

Colour

The back is olive-green, changing to a metallic silver on the sides and belly.

Size

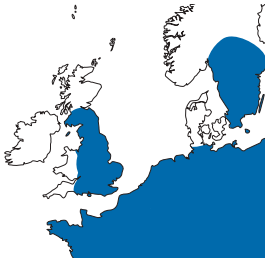
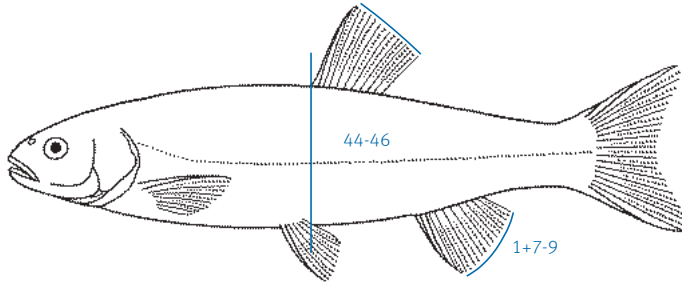
Usual length is 5-9 cm; maximum 12 cm.

Ecology

Occurs in central and eastern Europe from the Rhine basin in the west to the Volga basin in the east. Introduced in recent years to England where it is successfully established in several waters; for example Sedgemoor Drain, Somerset, where it was first discovered in March, 1990, and in a fish farm at Skegness, Lincolnshire, where it was found in June 1991. Found in small ponds, and the lower reaches of some lowland streams and rivers. Breeds June-July, spawning among weeds in shallow water. The female develops a small tube-like pore at the genital opening by means of which the eggs are looped around water plants. The male acquire distinct spawning tubercles

on the head and gill covers, and guards the spawn. Matures after two years and lives only about five years. Feeds on invertebrates (especially crustaceans and some insect larvae) and fine plant material. Of local commercial importance in net fisheries in parts of Russia. Rarely angled for but occasionally kept in aquaria. Also known as Motherless Minnow or Belica.

Chub *Leuciscus cephalus*



Characteristics

Rather thickset about the head and 'shoulders' but basically slender; the head is very broad, the snout blunt, and the mouth large. The dorsal fin is placed just behind the base of the pelvic fins; it has 8-9 branched rays and a convex free edge. The anal fin is rounded and conspicuously convex; it has 7-9 branched rays. Scales 44-46 in the lateral line; pharyngeal teeth 5+2:2+5. It is also known as the Ide.

Colour

Dark green or grey-brown on the back, the sides silvery, ventrally silvery-white; each scale is dusky edged. The fins are dark except for the pelvic and anal fins which are yellowish, even orange.

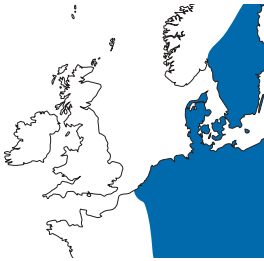
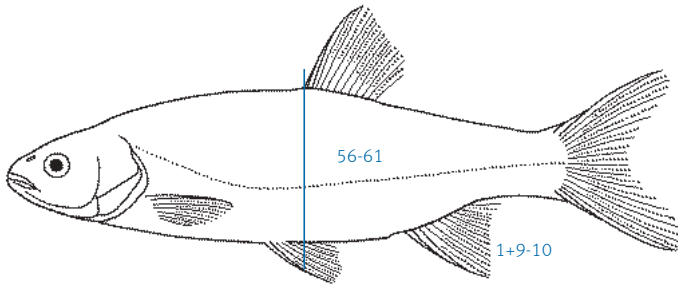
Size

On average between 30-50 cm; exceptionally it may attain 61 cm. Weights range from an average of ca 2.7 kg to a maximum of 8 kg. British Rod-caught Record: 4.224 kg (2007, Southern Stillwater).

Ecology

The Chub is a river fish found most abundantly in the middle reaches, but extending upstream into more typically fast-flowing trout streams as well as downstream to the lowland reaches. This versatility also enables it to thrive in large lakes. It is a schooling fish, particularly when young, but large Chub are often solitary. When young, it feeds mostly on aquatic invertebrates, mainly insects, their larvae, and crustaceans. The larger fish feed on bigger prey; many small fishes are eaten as well as crayfish and lampreys, and very occasionally water voles and frogs. The Chub spawns from May-June, usually in shallow water on gravel beds, often in the smaller tributaries. The eggs are sticky and adhere to plants and stones. The young hatch in 8-10 days. Chub grow slowly and live for up to 12 years. This is a popular sporting fish, but quite valueless as food because of its soft flesh and numerous bones.

Orfe *Leuciscus idus*



Characteristics

A moderately slender-bodied fish with a broad head, 'humped' back and curved lateral line. The snout is blunt and the mouth oblique. The dorsal fin origin is just behind the base of the pelvic fins and has 8 branched rays; it has a straight free edge. The anal fin is concave on the free edge, with 9-10 branched rays. Scales are moderately small with 56-61 in the lateral line. Pharyngeal teeth cylindrical and smooth, 5+3:3+5.

Colour

Variable, though in general on the back greenish-brown, the lower sides silvery, the belly white; ventral fins are reddish. The ornamental Golden Orfe is a deep orange variety of the wild fish.

Size

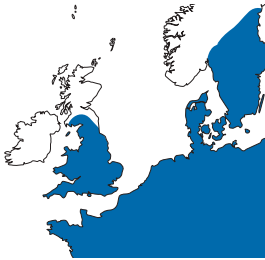
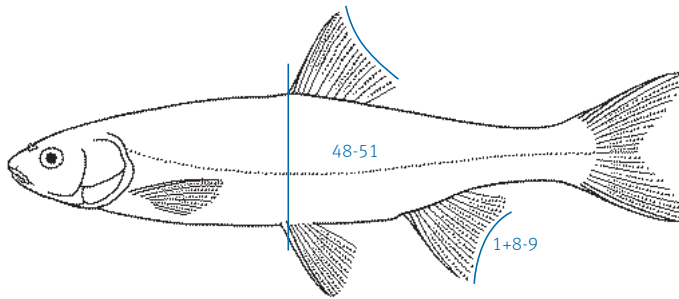
Average length 30-43 cm, and average weight ca 680 g; exceptionally grows to 1 m and a weight of ca 4 kg. British Rod-caught Record: 3.778 kg (2000, Lymm Vale).

Ecology

In Europe the Orfe is a fish of the lower reaches of large rivers, lowland lakes, and the brackish estuaries of rivers. It lives in schools in clean deep water, although it comes into shallow fresh water to spawn in April and May. It spawns over sandy or gravel areas, the eggs being attached to water plants and stones. The adults migrate from the deep water to spawn. It feeds, when adult, on larger insect larvae, crustaceans,

and molluscs; large ones even consume small fishes. Young Orfe eat small planktonic crustaceans. In eastern Europe the Orfe is fished commercially. Elsewhere it has become rather rare owing to pollution in river mouths and possibly overfishing. It is popular as an angler's fish and the golden variety is very suitable for keeping in lakes and ponds. Several rivers in Britain contain Orfe as a result of escapes or the release of unwanted fish.

Dace *Leuciscus leuciscus*



Characteristics

A rather slim-bodied fish with a narrow head and a small inferior mouth. The dorsal fin, which originates above the pelvic fin base has 7-8 full length branched rays; the anal fin has 8-9 branched rays. The outer edge of both fins is concave. Scales in the lateral line number 48-51; pharyngeal teeth 5+2:2+5 (occasionally 3 in the inner row).

Colour

Greenish-olive above, the sides silvery, and silver-white ventrally. The iris of the eye is yellow. The fins are greyish, but the pectoral, pelvic and anal fins are yellow to pale orange.

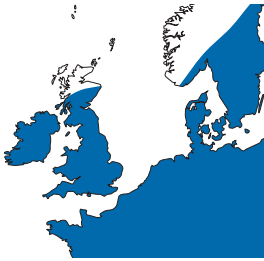
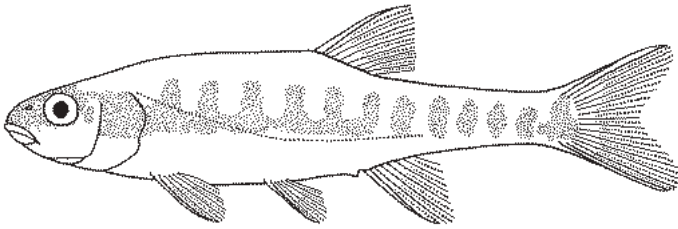
Size

Generally attains a length of 15-25 cm, exceptionally 30 cm, and a maximum weight of 600 g. British Rod-caught Record: 599 g (2002, River Weir); Irish Rod-caught Record: 510 g (1966, River Balckwater).

Ecology

A fish which is typically found in the middle reaches of rivers and in brooks, although it also occurs in lakes and lowland rivers but never numerously. It requires a moderate current and clean water, and is usually present in large schools. It feeds on insects, both larvae and flying adults, and will take quantities of terrestrial arthropods which fall on to the water. Crustaceans and some vegetation are also eaten. The Dace spawns early in the spring, often at night and usually in gravel shallows below a riffle. The eggs are small (1.5 mm), pale orange in colour and take up to 25 days to develop at 13°C. They mature mostly in their second year; few Dace live longer than 7 years. Although small, the Dace is a moderately popular angling fish; it is not used for food.

Minnow *Phoxinus phoxinus*



Characteristics

A small slender-bodied fish with short-based, rounded dorsal and anal fins. The scales are minute and the lateral line is short and interrupted to form an incomplete line.

Colour

Back and upper sides olive brown, ventrally whitish; along the sides a series of dark blotches which often appear as a lateral stripe, the last, at the base of the tail fin, most conspicuous. Young fish are lighter and may be confused with young salmonids (note lack of adipose fin). Breeding males have numerous head tubercles, touches of green, with brilliant red undersides and black throats.

Size

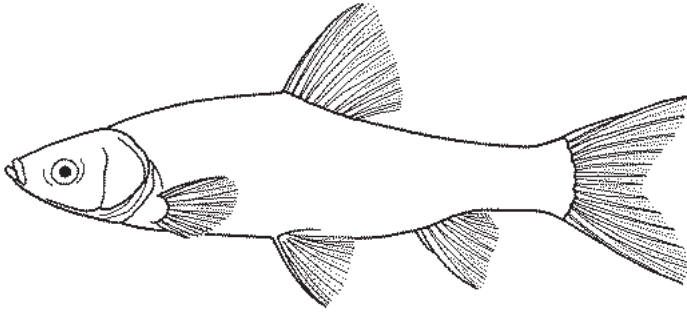
Rarely more than 8 cm, but very exceptionally growing to 12 cm. Females are larger than males of the same age. British Rod-caught Record: 24 g (1998, Whitworth Lake).

Ecology

Typically a fish of the upper reaches of rivers, even in mountainous regions (up to 1980 m altitude in the Alps). It is also common in high altitude lakes and in small lowland streams where the water is clean and moderately fast flowing. It schools in shallows at or near the surface in summer; in winter it retires to deeper water, and in times of high river flow hides under stones or close to the banks. It spawns in spring (May to June) on gravelly shoals, often just below a riffle; the sticky eggs are shed among the stones. They hatch in 5-10 days depending on temperature. The Minnow feeds on a wide range of aquatic animals, principally insect larvae and crustaceans, but it will eat

algae and plants, and even leap for flying insects. It is often extremely abundant in suitable rivers and makes an important contribution to the food-chain of fresh waters. It is eaten by many fish-eating birds, and larger fishes. Locally, in parts of Europe, it is caught for human consumption by means of traps or seine nets.

Topmouth gudgeon *Pseudorasbora parva*



Characteristics

Mouth slightly superior and oblique; lateral line straight; 34-38 lateral scales; narrow dark line from head to tail.

Colour

Bluish-grey on the back changing to silvery on the sides and white on the belly. A darkish lateral stripe from head to tail.

Size

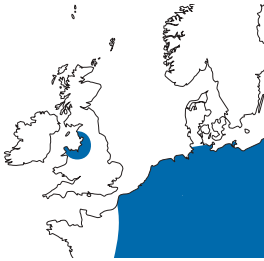
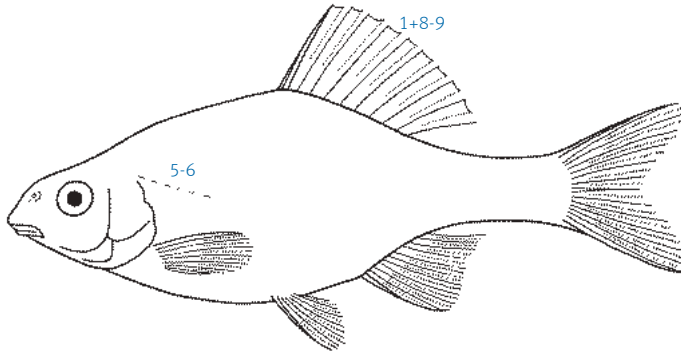
4-6 cm; maximum 11 cm.

Ecology

Introduced to Europe from Asia, where it is native to the Amur River and other eastern catchments. Now introduced to many parts of Europe, including England and Wales where it is established in several catchments. Occurs mainly in slow flowing rivers and lakes. Spawning can start in spring right through to autumn at water temperatures between 14-26°C. Batch spawning with some guarding of the eggs by the males. Average adult age is 2-3 years (maximum age is 3 years). Feeds mainly on

invertebrates, especially planktonic crustaceans, and fish fry. Of little commercial or angling importance, though it has been intentionally stocked in some waters in Europe as a forage food for piscivorous fish. Can predate, out-compete, and spread parasites to native species, and attempts are being made to control its populations. Also known as False Harlequin and Stone Moroko. ILFA regulations have prevented the keeping of *Pseudorasbora parva* since 1998, and is now banned from sale (ILFA risk category 5) and should not be kept at all, even in aquaria.

Bitterling *Rhodeus sericeus*



Characteristics

A rather deep-bodied fish with moderately well attached scales, although the lateral line pores are present on only the first 5 or 6 scales. The head is small, the eye moderate and the mouth transverse. The dorsal fin is relatively long, with 8-9 branched rays.

Colour

Warm grey-brown on the back, the sides are silvery with a pinkish flush, and towards the tail there is a bright metallic streak. Ventrally silvery. At spawning, the males are much more brightly coloured.

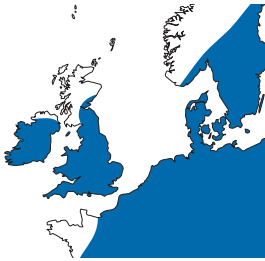
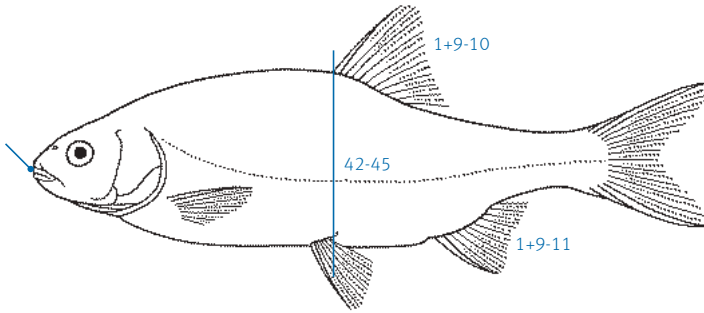
Size

Usually attains a size of 6-7 cm, but may grow to 9 cm. British Rod-caught Record: 21 g (1998, Barway Lake).

Ecology

The Bitterling is typically a fish of small lakes, ponds, and overgrown lowland rivers. It feeds on a wide range of small animals, especially planktonic crustaceans, plant plankton, and vegetation. Its breeding habits are unique amongst European fishes in that the female develops a long (often of body length) egg-depositing tube from the genital opening. The eggs are laid within the gill chamber of freshwater mussels (Swan or Pearl Mussels) and are fertilized by the male ejecting sperm into the inhalent current of the mussel's gills. The eggs are moderately large (ca. 3 mm) and develop within 3-4 weeks, protected by the mussel. Breeding male Bitterling are brilliantly coloured and have conspicuous white tubercles on the head; they adopt a territory around a mussel which is defended against intruders. The Bitterling can act as host to the parasitic young stages of the mussel.

Roach *Rutilus rutilus*



Size

Depending on local conditions of food availability and density of population, average Roach attain a length of 35 cm and a weight of 1 kg; exceptionally specimens attain 53 cm and up to 2 kg. British & Irish Rod-caught Record: 1.932 kg (2006, Stillwater, N.I.).

its eggs amongst the dense vegetation in shallow water and has a high propensity to hybridise with Rudd and Common Bream. The yellow eggs (1-1.5 mm in diameter) stick to the plants and hatch in 9-12 days, at 12-14°C. Growth rate varies enormously with food supply, and many Roach populations living in barely suitable conditions consist of stunted old fish. However, where food is plentiful and conditions are good the Roach can show good growth; an age of 12 years is occasionally attained. Because of its abundance and ability to survive in poor conditions the Roach is an important fish in the economy of rivers and lakes. It is important prey for fish-eating birds, and for other fishes such as Pike, Perch, Eel, and Chub. It is a popular sporting fish for the angler and (mainly in eastern Europe) is regarded as a food fish.

Characteristics

A moderately deep-bodied cyprinid with a rather short head. The dorsal fin is high, has 9-10 (rarely 11) branched rays; its origin is above the base of the pelvic fins. The scales are relatively large, 42-45 along the lateral line. Anal fin moderate, with 9-11 branched rays. Pharyngeal teeth 5:6; the smaller ones slightly hooked.

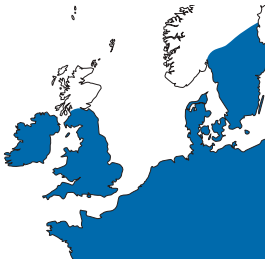
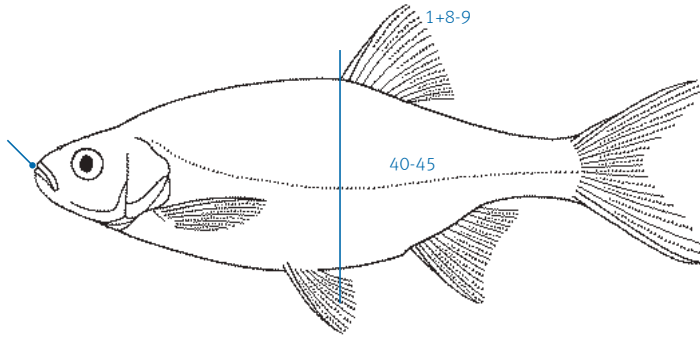
Colour

Iris of the eye red; back dull bluish or greeny-brown, the sides intensely silvery, sometimes brassy-yellow. The fins are grey-brown except for the pelvic and anal fins which are orange to bright red; the pectoral fins have reddish tints.

Ecology

The Roach lives in lowland rivers and lakes, being possibly more common where the current is slow, but thriving as well in moderately quick streams. Because of its adaptability it can live in canals, ponds, and in mildly polluted water, and has thus become widely distributed across much of Europe. It is also found in brackish water in the Baltic, Black, and Aral Seas. Several subspecies have been recognized from eastern Europe. It is unselective in its diet and eats insects, insect larvae, crustaceans and snails, as well as vegetable matter; almost all smaller animals are eaten if abundant. The Roach spawns in spring (April-June), shedding

Rudd *Scardinius erythrophthalmus*



Characteristics

A deep-bodied cyprinid with a small head. The mouth is moderate in size and steeply angled. Dorsal fin origin well behind the base of the pelvic fins, with 8-9 branched rays; anal fin short-based with 10-11 branched rays. Scales moderate, 40-45 along the lateral line. A sharp keel between the pelvic fins and vent. Pharyngeal teeth 5+3:3+5; strongly serrated.

Colour

Deep greeny-brown on the back, often with bronze-yellow sides and belly; young fish are more silvery. All the fins are reddish, the ventral ones brilliant blood red. The iris of the eye is golden with a red fleck above.

Size

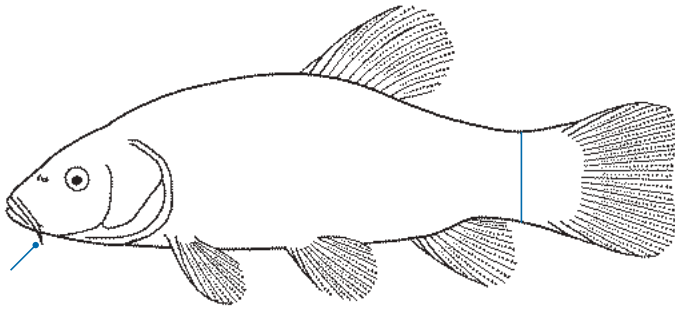
An average length of 30 cm and weight of 0.8 kg is reached in good conditions; exceptional specimens reach 45 cm and 2 kg. They are more usually stunted, rarely weighing more than 113 g. British & Irish Rod-caught Record: 2.100 kg (2001, Freshwater Lake, N.I.) .

Ecology

The Rudd is typically an inhabitant of lakes and backwaters of rivers; it is unusual to find it even in lowland streams where the flow is slow. Rudd often colonize and live well in small man-made lakes (peat cuttings, marl and gravel pits), canals, and drainage channels. They swim in schools near the surface or in mid-water, and eat considerable

quantities of surface-living and even aerial insects, as well as crustaceans, insect larvae, and some plant material. Young Rudd eat small algae and crustaceans. The Rudd spawns from April to June around submerged vegetation and reed-beds and may hybridise with Roach and Common Bream. The eggs stick to the plants and hatch in 8-15 days depending on the temperature. They respond quickly to the availability of food. In small food-poor waters they grow slowly, and swarming stunted populations of Rudd are well known. In suitable conditions they grow well. Rudd may live for 19 years. This fish is caught by anglers, but is not considered to be a prime sporting fish (although it has a place in waters where other fish might not survive). Its role as predator on insects and crustaceans, and as prey for larger fishes is considerable in lowland lakes.

Tench *Tinca tinca*



Characteristics

Rather thickset and elongate body with a deep rounded tail and rounded fins; scales very small, embedded, and covered with heavy mucus. A pair of thin barbels, one each side, at the corner of the mouth. The iris of the eye is redish in colour Pharyngeal teeth 4:5, the tips swollen and with a slight hook. Males have the second ray in the pelvic fin swollen and the fin rays are longer, reaching past the vent.

Colour

A deep greeny-brown above, often with bronze sides and a yellowish tinge to the belly. The fins are dark brown or grey.

Size

Attains a maximum length of 70 cm and a weight of ca 8 kg. Large fish are more usually ca 2-3 kg. British Rod-caught Record: 6.900 kg (2001, Hertfordshire); Irish Rod-caught Record: 3.697 kg (1995, Ballyeighter Lough).

Ecology

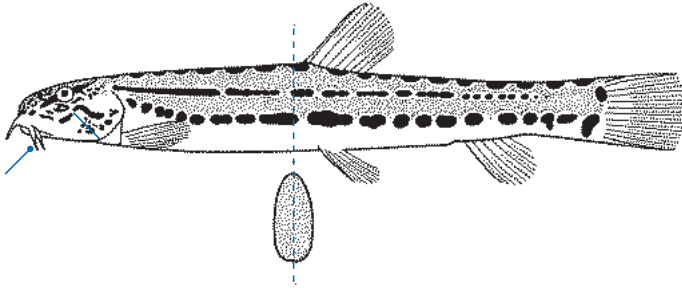
The Tench is a fish of still waters, mostly lakes and ponds, less often the lowland reaches of rivers, where it is found in dense vegetation. It is mainly a bottom feeder, and eats insect larvae, pond snails, crustaceans, and occasionally plant life. It spawns in shallow water in late spring and early summer, the eggs being shed among water plants often on the plants' leaves. The small, green eggs hatch in 6-8 days and the fry remain attached to vegetation for a few days. Once they have absorbed the egg yolk, they begin to feed actively on planktonic crustacean larvae, rotifers, and other minute animals. The Tench is very tolerant of low oxygen conditions and can survive for some time out of water.

It is thus able to inhabit small, overgrown pools where many other fish would die, although it never grows to a large size in such conditions. In Europe it is raised as a supplementary crop in carp farms, and finds a ready sale as a food fish. It is also a popular angler's fish. It has been introduced to other parts of the world, for example Australia, New Zealand, and North America.

Family: Spined Loaches *Cobitidae*

A family of small, mostly slender-bodied fishes, related to the carp family. All are freshwater fishes distributed from Britain eastwards across Europe and Asia. They attain a peak of abundance and diversity in tropical Asia; from where several popular aquarium fish originate. Most loaches are slender with a single dorsal fin, no spines in the fins, a wealth of barbels around the mouth and a spine below the eye. The family includes 26 genera and 177 species, but only one species is found in Britain.

Spined Loach *Cobitis taenia*



Colour

Light brown on the back, sandy brown on the sides and lighter on the belly. A conspicuous regular row of rounded dark blotches running along each side.

Size

Usually up to 11.5 cm, exceptionally to 13.5 cm.

Ecology

A loach which is typically found in slow-flowing, even stagnant rivers and drainage canals. It is either buried under the surface silt or hidden in dense growths of blanket-weed, a filamentous alga, at the surface of the silt. Also found in lowland lakes and reservoirs which are connected to such rivers. It is probably active at night, or in conditions of low light intensity. It feeds

on small crustaceans, especially ostracods and copepods, and rotifers. It spawns from April to June, the eggs being deposited on algae. This loach can be kept in aquaria, but is not active enough to be an attractive pet fish. It gulps air at the surface in poorly oxygenated conditions, absorbing the oxygen through its gut. Numerous subspecies and related species have been described in Europe and northern Asia. The spined loach is a UK BAP Priority species.

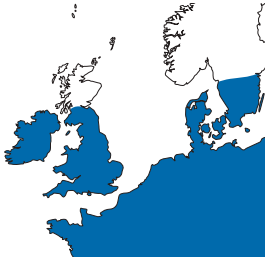
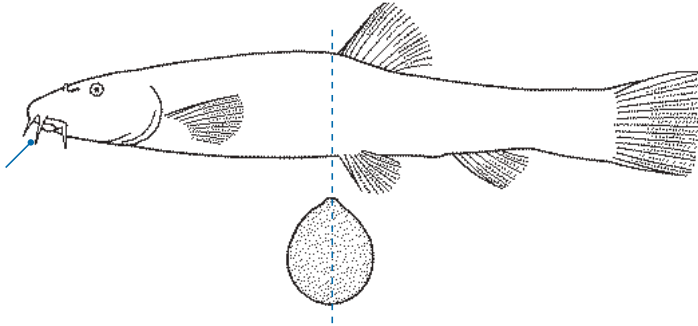
Characteristics

The body is elongated and very compressed from side to side; the head is small with very small barbels around the mouth. A small double-pointed spine is found beneath each eye, usually retracted into the skin.

Family: Stone Loaches *Balitoridae*

Formerly grouped with the family Cobitidae, the Stone or River loaches are now considered to belong to a separate, but related, family – the Balitoridae, which has 59 genera and some 590 species. A single species occurs in Britain.

Stone Loach *Barbatula barbatula*



Characteristics

A comparatively slender-bodied loach, with a cylindrical anterior body and flattened tail. The head is moderate in size, with six long barbels around the mouth. No spine beneath the eye.

Colour

Greeny-brown above, yellowish-brown on the sides, yellow ventrally. Indistinct and irregular darker blotches on the sides.

Size

Generally about 10 cm long, exceptionally grows to 15 cm. British Rod-caught Record: 13 g (2005, Windmill Fishery).

Ecology

An inhabitant of running water, most commonly in small rivers, but occurring in lowland reaches and, possibly more often, in upland streams. It is also found in gravel-shored lakes, and in brackish water in the Baltic. It is active at night and in dull light, but usually spends the daytime hidden under stones or in dense weed-beds. It feeds on bottom-living invertebrates, mainly crustaceans, insect larvae, and worms. The Stone Loach spawns

in April to June, the dull white eggs being shed in 2 or 3 batches among stones and in weed-beds. The eggs hatch in 14-16 days at temperatures of 12-16°C. It attains a maximum age of 7 years. It is sensitive to pollution and low oxygen levels. This fish has no direct economic importance, but is a frequent food of Brown Trout, Eels, and large Chub, and is also eaten by aquatic birds and mammals.

Order:

Siluriformes

Catfish

This large order includes 35 families with some 446 genera and 2,867 species worldwide. Only two of the families are represented in northern Europe: the Danube Catfish (Wels or Sheatfish) belongs to the Siluridae and is native, while the bullheads or North American catfishes (Ictaluridae) have been introduced. All the species concerned are freshwater fishes, with a broad head and abundant barbels around a wide mouth. They are mainly found in lowland rivers and lakes, living close to the bottom. The silurids are distributed across Europe and Asia, while the ictalurids are North American and are found from Canada to Guatemala.

In this order:



Black Bullhead



Brown Bullhead

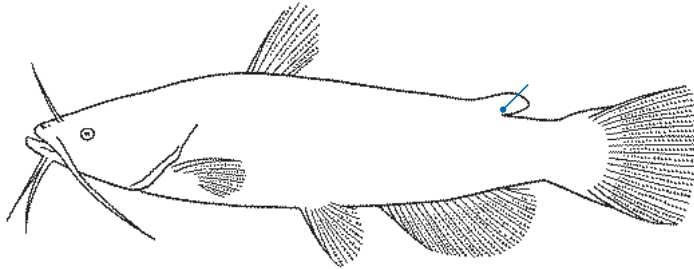


Wels Catfish

Family: North American Catfishes *Ictaluridae*

All ictalurids have four pairs of barbels and a spine on the dorsal and each pectoral fin. There are seven genera with some 46 species – one recently extinct.

Black Bullhead *Ameiurus melas*



Characteristics

Moderately stout-bodied with a broad head, wide mouth with four pairs of barbels, the longest being the pair on the upper jaw which are flattened at the base. The dorsal fin is short-based, the anal fin only relatively long, and a long low adipose fin is present; tail fin rounded. The trailing edge of the pectoral fin spines are only faintly barbed at the base. Anal fin with 17-21 rays. 17-19 gillrakers on the first gill arch.

Colour

Back dark brown, the sides greenish with a golden tinge, ventrally yellow or dull white. Dorsal fin membrane black. Males at spawning jet black above with bright yellow belly.

Size

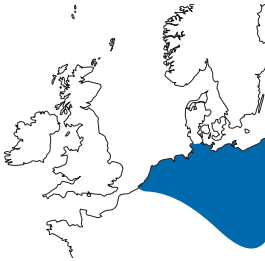
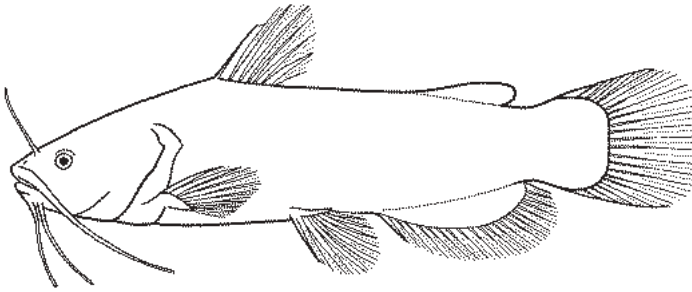
Usually up to 30.5 cm in length and 425 g in weight. Exceptional North American specimens of 66 cm length and 3.6 kg have been reported.

Ecology

The Black Bullhead inhabits small lowland streams, lakes, ponds, and parts of larger rivers where the bottom is silty. It is a hardy species and can stand moderately high temperatures and poor conditions of oxygenation. In Canada it spawns in summer; the female first excavates a nest in which the eggs are laid. The nest contains from 200-6,000 eggs

(depending on the female's size); they are pale cream in colour and clump together in a mass. Both male and female fan and protect the eggs which, at normal temperatures, hatch in five days. The newly-hatched young form a tight school and are guarded by one of the parents. The Black Bullhead is now widespread in Europe (and occurs sparsely in England), where it was introduced in the late 19th century,

Brown Bullhead *Ameiurus nebulosus*



Characteristics

Very similar to the preceding species, but the trailing edge of the pectoral fin spines is strongly barbed almost to the tip. Anal fin with 21-24 rays. 13-15 gillrakers on the first gill arch.

Colour

Back and upper sides brown, often mottled, ventrally yellowish white. Dorsal fin membrane dusky.

Size

Usually from 20-36 cm in length. Can grow to 55 cm and 2.7 kg in North America.

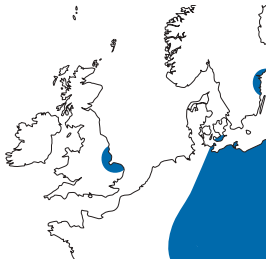
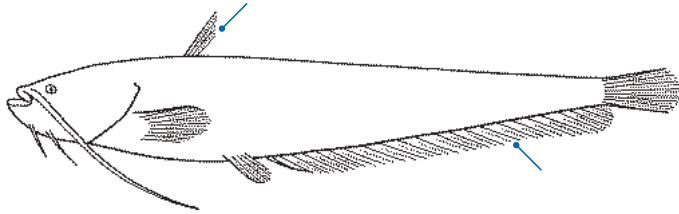
Ecology

The Brown Bullhead is widely distributed in eastern and central North America, and has been distributed by man elsewhere in the New World, New Zealand, and Europe. It occurs in the rivers and lakes of Belgium, the Netherlands, and probably north Germany, and has been imported accidentally into England, though not yet proven to be established there. Its biology is very similar to that of the Black Bullhead. Channel Catfish (*Ameiurus punctatus*) and White catfish (*Ameiurus catus*) have also been recorded in the wild.

Family: European Catfishes *Siluridae*

The members of this family have either to one or two pairs of barbels on the lower jaw and no spines on the pectoral fins. There are 11 genera worldwide with some 97 species. Only one occurs in Britain, as an introduced species.

Wels Catfish *Silurus glanis*



with a weight of ca 10 kg, but exceptionally attaining 3 m and 200 kg. An old record from the river Dnieper reported a fish of 5 m and 300 kg. A 59kg specimen has been caught from Witch Lakes (Suffolk).

Ecology

An inhabitant of slow-flowing deep lowland rivers and adjacent still waters, such as lagoons, marshes, and lakes. It can live in brackish water in both the Baltic and Black Seas. It is largely nocturnal, although in deep, clouded water it may be active on dull days during daytime, but mostly it feeds at sunset and just before dawn. It keeps close to the bottom or lies under tree roots or in hollows in the bank. It feeds on fishes, mainly Eel, Burbot, Tench, Bream, and Roach, but also takes waterfowl, water voles, and amphibians. When young it eats smaller prey -

chiefly invertebrates and young fish. The Wels spawns from mid-May to mid-July, the eggs being laid in a shallow depression in the bottom excavated by the male. The eggs are ca 3 mm in diameter, stick together in a large mound, and are guarded by the male until they hatch. The early young feed on small planktonic animals. Growth is rapid after the first year and it commonly lives for 20 years. In eastern Europe and the USSR this species is of considerable importance as a commercial fish. Much of the catch is of wild fish, but in Hungary, at least, it is stocked in fish farms and raised for marketing at 3-4 kg. It is an attractive by-product as it can be fed on unwanted fish from other farming operations. Within the UK, where it is introduced, it is present in over 250 sites where it is favoured as an angling species.

Characteristics

Elongate body with a broad head, wide mouth with three pairs of barbels, the longest on the upper lip. A long anal fin, dorsal fin very short-based; adipose fin absent. Also known as Danube Catfish or Sheatfish.

Colour

Dull brown or green on the back, variously mottled with yellow and creamy ventrally.

Size

Usually around 1 m in length

Order:

Argentiniformes

Marine Smelts

An order of marine, mainly deep water fish with a complex posterior branchial organ. There are six families 57 genera and about 202 species in this order, of which two families are recorded from northern Europe.

In this order:



Greater Argentine



Argentine



Baird's Smooth-head



Risso's Smooth-head

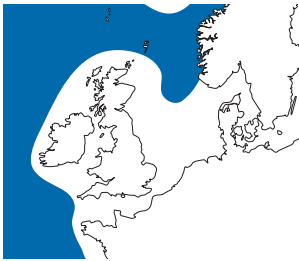
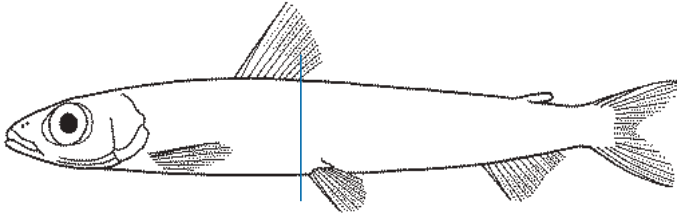


Atlantic Gymnast

Family: Argentines *Argentiniidae*

The Argentines are a small family of marine fishes, mostly found in deep water near the edge of the continental shelf. Most are relatively small fishes with large eyes, moderate to large scales, small teeth in their jaws, and an adipose dorsal fin. They occur worldwide in temperate and tropical waters. There are two genera with some 23 species. Two species only are known in the seas of northern Europe.

Greater Argentine *Argentina silus*



Characteristics

A slender but thickset fish with a pointed head, very large eyes, small mouth and feeble teeth, and an adipose fin. The eye diameter is larger than the snout length. The last ray of the dorsal fin is in front of the pelvic fin base. The scales are moderately large, with rough edges, and not easily dislodged; 64-69 occur between head and tail fin. 18-22 gill rakers on the first gill arch.

Colour

Pale greeny-yellow with a marked silvery sheen on the sides and belly.

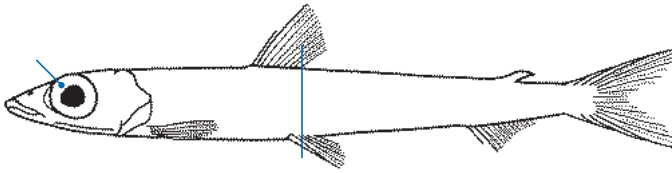
Size

Can attain 60 cm in length.

Ecology

A deep-water argentine, living near the edge of the continental shelf mainly between 180 and 550 m, exceptionally from 90-900 m. It probably lives close to, rather than on, the bottom and is found most abundantly over muddy bottoms. It feeds on small fishes, crustaceans, and squids - many of them mid-water animals. It is commonly caught in deep-water trawls, but its flesh is soft and insipid, and therefore not marketed as food.

Argentine *Argentina sphyraena*



Characteristics

A long slender fish with a pointed head, small mouth, moderately large eyes, and an adipose fin on the back close to the tail. The diameter of the eye is equal to the distance between the tip of the snout and the orbit edge. The last ray of the dorsal fin is above the base of the pelvic fins. Scales fragile, usually missing, but with almost smooth free edges; 50-54 scales between the head and tail fin. 11-14 gill rakers on the first gill arch.

Colour

Olive green above, a prominent silvery stripe along each side, greyish-white ventrally.

Size

Attains a maximum length of 35 cm; females are generally longer than males of the same age. British Rod-caught Record: 147 g (1978, Loch Long).

Ecology

A relatively common, even locally abundant, fish on muddy bottoms in depths of 50-200 m. Exceptionally, it has been found as shallow as 18 m and as deep as 400 m. It feeds on bottom-living worms and molluscs, but principally on crustaceans and small fishes, many of them mid-water species, which suggests that this fish forages off the sea bed, possibly at night. In its turn it is eaten by a number of other sea fishes. It has little economic value except that it has been exploited as an industrial fish for the production of fish meal. It spawns from March to July; the eggs and larvae are pelagic. This species of argentine may live to an age of 16 years.

Family: Smooth-heads *Alepocephalidae*

The Smooth-heads or Slickheads are a family of mainly small fishes found in the deep sea, usually in mid-water. They are characterized by their small mouths, weak teeth, and a small dorsal fin placed far down the body near the tail. Many of them have large thin scales on the body but smooth, rather slimy skin on the head. There are 23 genera with some 90 species; however only three species occur in European waters, two of them among the largest in the family.

Baird's Smooth-head *Alepocephalus bairdii*



Characteristics

A slender-bodied fish with soft, flabby-textured flesh, smooth head and large, very easily dislodged, scales (trawl-caught fish are usually scaleless). 63-67 scales (or scale pockets) in the lateral line. Snout profile straight, jaws equal in length, eyes moderately large. 28-30 gill rakers on the first gill arch. Body round in cross-section, not ridged at the dorsal fin.

Colour

Deep purplish-brown on capture, fading to dark brown.

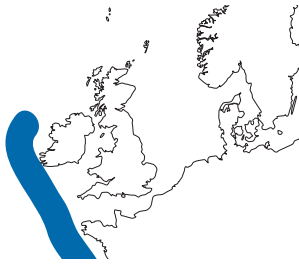
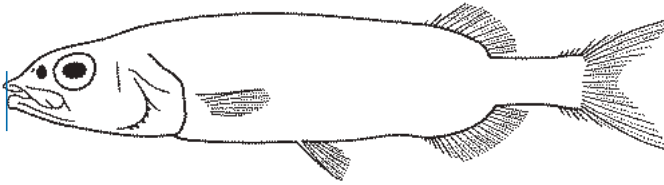
Size

Attains length of 1.15 m, rarely beyond 1 m.

Ecology

A deep water smooth-head found between 365 and 1,000 m, although most abundant around 600-800 m. It is confined to soft muddy bottoms, and occurs occasionally in commercial trawl catches. Locally, very large numbers have been captured together, possibly as a result of seasonal spawning movements; several hundred were caught in April 1973, the females containing large ripe eggs. Its principal diet appears to be the bathypelagic jellyfish, *Atolla*. Despite its abundance locally it is useless as a food fish, the flesh having a most unpleasant smell, flavour and texture.

Risso's Smooth-head *Alepocephalus rostratus*



Characteristics

An elongate fish with a soft flabby texture, and smooth-skinned head. Scales large, easily dislodged but with 53-55 scales in the lateral line. Snout concave with the upper jaw slightly longer than the lower; eyes large. 23-25 gill rakers on the first gill arch. Back with a central ridge giving it a deeper body.

Colour

Dark purplish-brown when fresh, fading to brown after death.

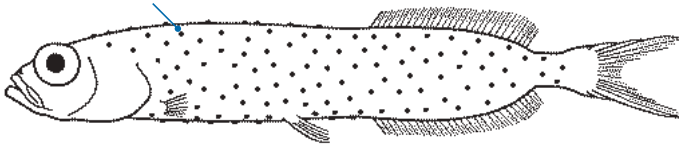
Size

Attains a length of 70 cm.

Ecology

Deep-water fish living on the edge of the continental shelf in depths of 300-1,000 m. It is caught over soft, muddy bottoms, occasionally by deep-fishing commercial trawlers, but seems rare and is never taken in any numbers.

Atlantic Gymnast *Xenodermichthys copei*



Characteristics

A slender, scaleless fish with a moderately small head, large eyes, and dorsal and anal fins equal-sized and opposite one another. The skin is soft and slimy, and has raised light-organs on the sides and ventral surface.

Colour

Entirely black with a deep violet tinge on the sides when fresh.

Size

Attains 15 cm in length.

Ecology

Occurs in mid-water from ca 100-1,000 m, but common, at times even abundant, between 366 and 732 m. Its biology is little known and this fish is rarely seen except when it is found in the stomachs of larger fishes such as Blue Ling and Hake. It is too small to be captured in commercial fishing nets.

Order:

Osmeriformes

Freshwater Smelts

Most members of this family spawn in fresh water. Worldwide, there are three families with 22 genera and 88 species.

In this order:



Capelin

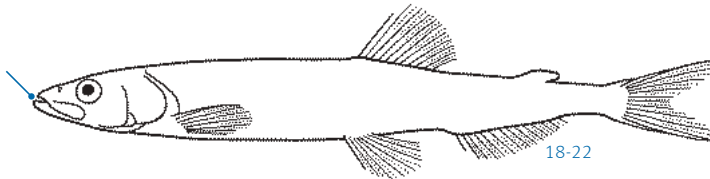


Smelt

Family: Smelts *Osmeridae*

The true smelts, belonging to the family Osmeridae, are small relations of salmon and trout species, and like them are widely distributed in the North Atlantic, Arctic, and particularly the North Pacific Oceans. They are basically marine coastal fishes, many entering rivers and breeding in fresh water; some populations live in fresh water permanently. Most are small fishes with slender bodies, fragile scales, and an adipose fin on the back. Eleven genera and 31 species are known worldwide. Two species only are found in northern European waters.

Capelin *Mallotus villosus*



Colour

On the back, transparent olive to bottle green; below, the sides are silvery and the belly is silvery-white. The edges of the scales have dusky specks.

Size

Attains a maximum size of 23 cm. Males are slightly larger than females in each year class.

Ecology

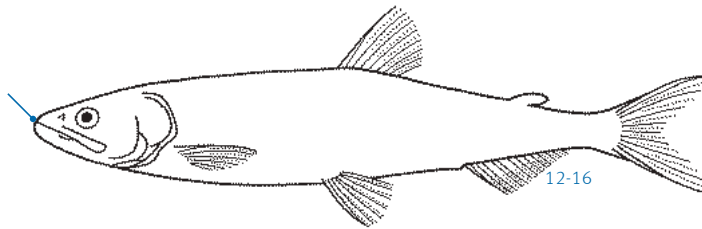
The Capelin is extremely abundant in the Arctic parts of the North Atlantic, Arctic and North Pacific, and forms a major constituent of the diet of many larger fishes, seabirds, and cetaceans, as well as the human inhabitants of the region. It is vital to many food-chains in the Arctic. This fish spawns in late spring and early summer in large

schools on the shoreline, or in very shallow water. In many places the breeding fish ride up the shore on the crest of a wave, shed their spawn or milt into the gravel and then are swept back on the next or succeeding waves. The eggs are buried in the gravel and hatch in 2-3 weeks. Capelin rarely live longer than five years. They feed almost exclusively on small planktonic crustaceans.

Characteristics

A slender-bodied fish, with a large rayless adipose fin and a long-based anal fin (18-22 principal rays). The scales are very small, firmly attached, and pointed above the lateral line and on the belly. Males have a strongly arched anal fin base, larger fins, and ridges develop on the back and the belly before spawning.

Smelt *Osmerus eperlanus*



Characteristics

Similar to trout in general build, especially in having a rayless, adipose fin on the back. The anal fin is long-based with 12-16 principal rays. The dorsal fin is set well back. The mouth is large and the jaws have strong teeth. When fresh, it has a strong smell of cucumber.

Colour

The back is light olive green, the underside is creamy-white and there is an indistinct silvery line along the sides.

Size

Attains a maximum length of 30 cm; non-migratory freshwater populations are smaller and rarely reach 20 cm. British Rod-caught Record: 191 g (1981, Fleetwood).

Ecology

An inshore migratory fish which is most common close to river mouths and in the estuaries themselves. Isolated populations live in freshwater lakes in Scandinavia and Russia (and formerly inhabited Rostherne Mere in England, where it is now extinct). These populations are relicts from migratory stocks in the immediately post-glacial period. Small Smelt feed on planktonic crustaceans, but larger Smelt mainly eat young fish. It enters rivers during winter; spawning takes place upstream in fresh water in spring, the eggs being shed over sand or gravel, or among submerged plants to which they adhere. Many of the eggs break away and float in the water suspended by the parachute-like outer membrane.

Lake Smelts spawn in the shallows of the lake. The Smelt has suffered greatly from the pollution of the lower reaches of rivers and more so from the erection of navigation weirs and dams in rivers. It was formerly a valuable food fish in many rivers; but, in Britain and Ireland is now confined to a few river systems, and the populations in those should be regarded as vulnerable. The smelt is a UK BAP Priority species.

Order:

Salmoniformes

Trouts

All members of this order have an adipose fin and a pelvic axillary process. Most have parr marks when they are young. Many members have a high sport or commercial value. Worldwide, there is only one family in this order but it contains three distinct subfamilies with 11 genera and some 66 species.

In this order:



Vendace



Pollan



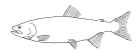
Powan



Houting



Grayling



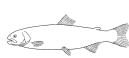
Pink Salmon(f)



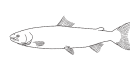
Pink Salmon(m)



Coho Salmon



Rainbow Trout



Atlantic Salmon



Brown Trout



Arctic Charr

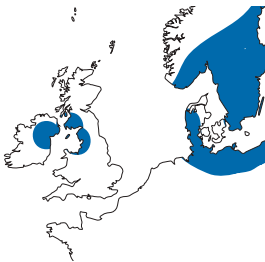
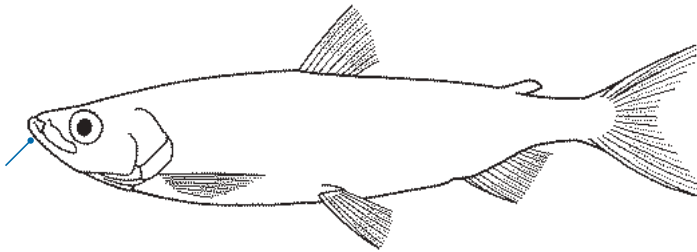


Brook Charr

Family: Whitefishes *Coregoninae*

The whitefishes are related to the salmon family and like them have an adipose fin on the back. Whitefishes are distinguished by the possession of large scales, fewer in number than any other salmonids, have toothless jaws and a small mouth, and a deeply forked tail. They are also silvery – hence their name. They are distributed in Arctic rivers and brackish seas, and in mountain lakes across the northern parts of Europe, Asia, and North America. As a group they offer a most confusing situation to the taxonomist. The lake-dwelling populations have been isolated from one another since soon after the last Ice Age and have evolved as local forms in response to local conditions. In some cases, where one species has been introduced, the presence of two species in the lake has resulted in hybridization, with sometimes both parent species and the hybrid present, more usually a rather variable type intermediate between the parent species. Whitefishes are also well known for their plasticity, that is the modification of features by environmental conditions. There are three genera and some 32 species in the family. Six species are recognized from northern Europe; more than 50 forms, subspecies or species have been recognized in the past. Four species are known from Britain and Ireland.

Vendace *Coregonus albula*



Characteristics

The Vendace shares the features of the other whitefishes, but has a long curved, lower jaw which protrudes beyond the tip of the snout. Gill rakers on the first arch number 36-52.

Colour

The back is dark greeny-blue; the sides and belly are silvery to white. The dorsal, tail, and pectoral fins are dusky, but not pronouncedly dark coloured. Tip of the snout is dark.

Size

A small species which grows to 20-26 cm, but may exceptionally attain 35 cm. The maximum weight appears to be ca 1 kg.

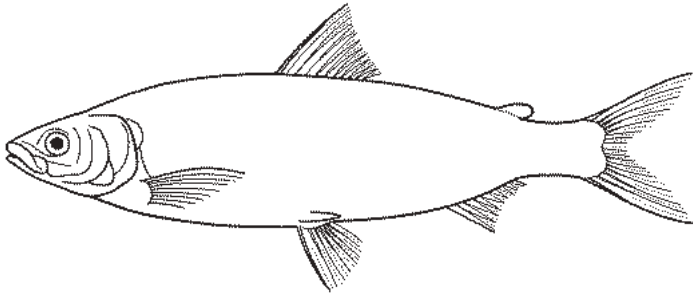
Ecology

The Scottish and English Lake District Vendaces belong to this species, which is widely distributed from northern Europe and the lakes of the Volga to the Baltic Sea basin. It is found in lakes and, in the north of its range, in rivers; only in the north and east of

Continued: Vendace *Coregonus albula*

the Baltic does it venture into brackish water. It migrates from there into nearby rivers to spawn in early winter; the lake-dwelling populations spawn in shallow water in winter, but usually live in deep water. Most populations feed on planktonic crustaceans, but some (usually those living in eutrophic conditions) feed on molluscs and larger crustaceans. In the Baltic countries it is fished for with traps and seines, especially when it is migrating up rivers. Some of the lake-dwelling populations are threatened with extinction as man-made changes to the environment and the introduction of predators and competitors affect them adversely. The original Scottish population is now extinct, but a safeguard stock of the English population has now been established in Scotland. The Vendace is a UK BAP Priority species.

Pollan *Coregonus autumnalis*



Characteristics

Mouth terminal, 74-86 lateral cycloid scales, 35-51 (commonly 41-48) gill rakers. Also known as Arctic Cisco.

Colour

The back is a dark greenish-brown grading to a silvery-green along the sides and a silvery-white on the belly.

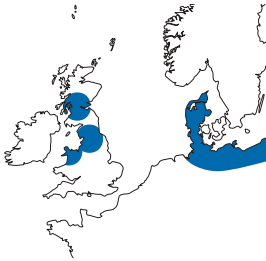
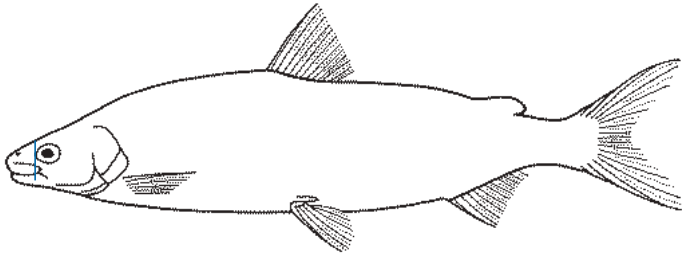
Size

30-35 cm, 450 g; maximum 38 cm, exceptionally 45 cm (1.3 kg) in Canada and even 50 cm (2 kg) in Siberia.

Ecology

Occurs in western Europe only in Ireland (e.g. Lough Neagh); also found in northern Eurasia and North America, where it is anadromous, occurring in coastal waters and the lower parts of arctic rivers. Breeds from October-December over areas of gravel and stones. Yellowish eggs (2.5 mm) hatch in March and the young reach 20 cm in 2 years and are adult at 3-4 years. They normally live for 5-7 years (maximum 9-10). 2,000-8,000 eggs per female (exceptionally 90,000 in very large females). They feed mainly on zooplankton when young, zooplankton and bottom invertebrates when older. Fished commercially in Ireland using seine and gill nets. Important commercially in both Siberia and North America. The Pollan is a UK BAP Priority species.

Powan *Coregonus lavaretus*



Characteristics

A variable species in snout shape; some forms have bluntly rounded snouts, others elongate snouts. The gill rakers on the first gill arch number 33-39 (exceptionally as few as 25); the rakers are usually smooth-edged. The upper jawbone reaches to the front of the eye. Powan (Scotland), Gwyniad (Wales) and Schelly (England) are local names.

Colour

The back is bluish or blue-green, the sides silvery; the dorsal, anal, and tail fins are greyish, as are the tips of the pectoral and pelvic fins.

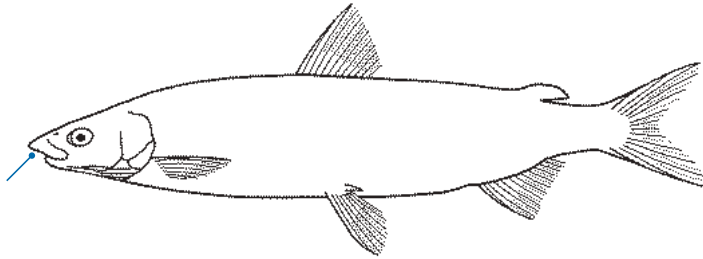
Size

Varies greatly with the habitat. In the Baltic Sea attains 70 cm and 10 kg in weight, but in many lakes, especially ones in which food is scarce, rarely reaches 20 cm in length.

Ecology

Widely distributed in the Baltic and North Sea basins, but found in brackish water only in the north of its range. In the Alps it is restricted to mountain lakes, in many of which it has survived since late glacial times. It feeds on planktonic crustaceans, although in brackish water it eats larger crustaceans and tends to feed close to the bottom. The migratory populations enter rivers to spawn in winter; lake populations also spawn in winter on gravelly shallows. The eggs take from 60-70 days to hatch, and the fry emerge from the gravel only in spring. It has been suggested (Kottelat 1997) that these should be regarded as distinct species – Powan *Coregonus clupeoides*, Gwyniad *C. pennatii*, and Schelly *C. stigmaticus*. The Powan is a UK BAP Priority species.

Houting *Coregonus oxyrinchus*



Characteristics

In its typical form this species is characterized by its very long pointed snout, and by having 35-44 gill rakers (mean 40) on its first gill arch. In other respects it resembles whitefishes in general.

Colour

Greeny-blue on the back with silvery sides and belly. The dorsal fin, the extreme tip of the pectoral fin and the snout are dark; all other fins are clear.

Size

Attains a length of 50 cm and a weight of ca 2 kg. Several stunted lake populations attain less than half of these dimensions.

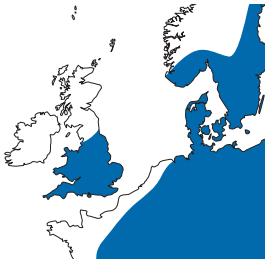
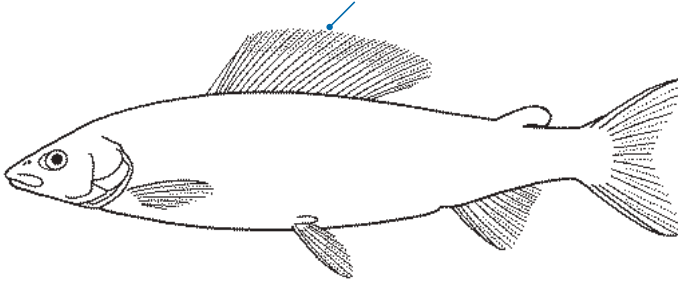
Ecology

This species was originally distributed in the southern North Sea and the western Baltic Sea, and was found in the rivers Rhine, Weser, and Elbe, and large lakes in southern Sweden. It occurred in British waters a few times on the south-eastern coast. There is now reason to believe that the North Sea population is extinct, and the Baltic stock is reduced in numbers owing to pollution of estuaries, and obstructions in rivers. This species is closely related to *Coregonus lavaretus*, and some authorities regard it as only a variety of that species.

Subfamily: Graylings *Thymallinae*

Only four species of grayling in a single genus are recognized today: two are native to Mongolia, one occurs in North America, and one in Europe. All are found in fresh water. All the known species have a high dorsal fin, with numerous rays, the typical adipose fin of the salmonoid fishes, numerous moderately large scales, and a forked tail fin. They have small teeth in both jaws.

Grayling *Thymallus thymallus*



Characteristics

Elongate but stout body with a small head and lightly toothed jaws. The dorsal fin is high and many rayed (17-24); adipose fin present. Fresh fish have faint smell of thyme.

Colour

Basically silvery on the sides and ventrally, on the back steel blue shading to silvery-green on the upper sides. The dorsal fin has several parallel rows of dusky spots on the membrane.

The sides of the body have lengthwise stripes of violet. In the breeding season the colours are heightened, the dorsal fin having an orange-red margin. Young fish have dusky parr marks.

Size

Rarely grows longer than 50 cm; exceptionally attains 60 cm. A maximum weight of 2.5 kg is reported from Europe. British Rod-caught Record: 1.899 kg (1989, River Frome).

Ecology

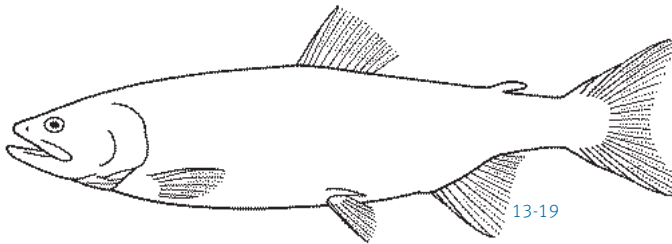
The Grayling is essentially a river fish found especially in clean, cool, well-oxygenated rivers, often at moderate altitudes. It also occurs in natural lakes, especially in mountain regions. Its natural distribution has been obscured by frequent attempts to introduce it for sporting purposes.

In many parts of Europe pollution of streams and the building of hydro-electric plants have adversely affected this sensitive fish. It feeds mainly on bottom-living insect larvae, crustaceans, and molluscs. It will also feed on insects at the surface. Less often the larger Grayling eat small fishes. Grayling spawn in spring on gravelly shallows, the eggs being laid in a shallow redd cut by the female. Spawning is often preceded by display on the part of the brightly-coloured male. The fry hatch in 3 to 4 weeks, and disperse quickly from the redd. Growth is rapid and the young may reach 7-12 cm in the first year. The Grayling is a good food fish, and much esteemed in parts of Europe, but it is best prepared and eaten when very fresh as the distinctive thyme-like smell is quickly lost. It is also popular as a sporting fish.

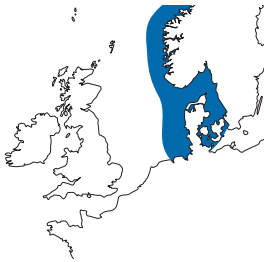
Subfamily: Salmons *Salmoninae*

The members of the subfamily Salmoninae are medium to large fishes with fully scaled bodies and scaleless heads; a lateral line is present. Superficially they resemble herrings, but they are rounder bodied. No spines are present in the fins, the pelvic fins are abdominal in position, and all species have a small adipose fin on the back. They are essentially northern hemisphere fishes, although some species have been widely introduced in the southern hemisphere. Members of the family live in fresh water, although many species make regular feeding migrations to the sea. They are also well adapted to cold water, and charr and the related whitefishes are the dominant fishes in Arctic fresh waters. There are seven genera and some 30 species worldwide. Seven species are found in British and Irish waters, four of them having been imported from North America.

Pink Salmon *Oncorhynchus gorbuscha*



Female



Characteristics

Typically salmon-like in general appearance, but with a long upper jaw extending beyond the level of the eye. Scales small, 147-205 along the lateral line (more than any salmonid except the Huchen in European waters). Immediately distinguished by its long-based anal fin which has 13-19 principal rays. Dorsal fin rays 10-15; gill rakers on the first gill arch 24-35; those near the middle of moderate length. Breeding males have a pronounced humpback, as well as a hooked snout, gaping mouth, and large teeth. Also known as Humpback Salmon.

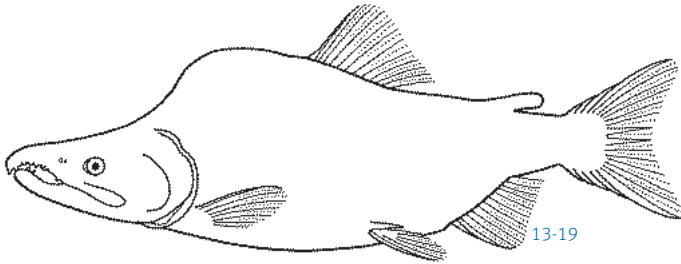
Colour

In the sea, steel blue or blue-green above, sides silvery, underside white, with large smudgy black spots on the back and upper sides, and particularly on the tail fin. Breeding males have dark head and back; the sides are pale red with green-brown blotches.

Size

A relatively small salmon, growing to about 6.3 kg and a length of ca 48 cm. British Rod-caught Record: 1.609 kg (2007, River Tweed).

Continued: Pink Salmon *Oncorhynchus gorbuscha*



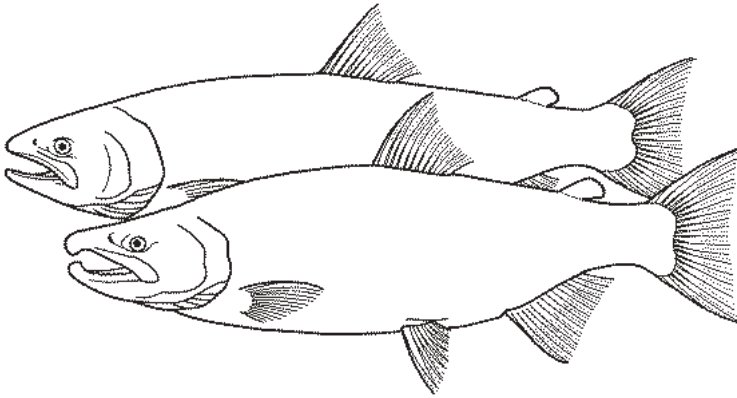
Male

13-19

Ecology

The Pink Salmon is native to the North Pacific and the Arctic Oceans, and breeds in rivers from the Sacramento River, California, to the Mackenzie River, and in north-east Asia from Peter the Great Bay to the Lena River. It has been introduced to the Atlantic, both to the rivers of Newfoundland and those in the Kola Peninsula (Barents Sea). A number of specimens have been captured in Icelandic, Norwegian, and British waters, presumably strays from the Barents Sea stock which appears to be established. So far they have been captured only as single specimens, and there is no evidence that they have become more widely established.

Coho Salmon *Oncorhynchus kisutch*



Characteristics

Salmon-like in appearance, with a long upper jaw which extends beyond the level of the eye. Scales moderately large, 121-148 along the lateral line, which is almost straight. Anal fin long-based, with 12-17 principal rays. Dorsal fin with 9-12 principal rays; adipose fin well developed; a very obvious long scaly process in the axil of the pelvic fin. Gill rakers 18-25, coarsely toothed.

Colour

In the sea, steel-blue or greenish above, brilliant silver below. Small black spots on back, upper sides, base of dorsal fin and upper lobe only of tail fin. Breeding males are darker, blue green, with a red stripe on the sides, and leaden grey ventrally.

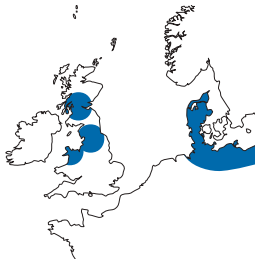
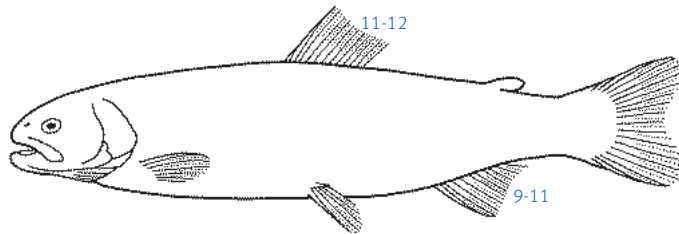
Size

Grows exceptionally to 14.04 kg, more usually to around 3.6 kg, at which weight it measures around 76.2 cm. British Rod-caught Record: 681 g (1977, Guernsey).

Ecology

This salmon, native to the Pacific coast of North America, has been introduced into the Great Lakes of America where it is now common. Introductions have been made in French rivers where, in 1973 and 1974, a considerable number of young fish escaped confinement. In 1976 and 1977 a number of adults were caught on the coasts of Normandy, Brittany, and in the Channel Islands. The spread of this species along the French coast, and into southern British rivers, is possible.

Rainbow Trout *Oncorhynchus mykiss*



Characteristics

Essentially trout-like in body form and with the upper jaw extending back to the rear edge of the eye. The head is usually small, but varies with maturity and sex. The tail fin is slightly concave. Scales are very small with 15-16 in a row between the adipose fin and the lateral line; 11-12 major dorsal rays, anal fin with 9-11 major rays. Gill rakers moderate, 16-22 on the first gill arch.

Colour

Variable with type of habitat, size and sex. Rainbow Trout are typically brown on the back, silvery-white ventrally with a very distinct iridescent (rainbow) stripe along the sides. The

Kamloops type are silvery, and the migratory Steelhead is brilliantly silvery. All types are densely spotted on the back and dorsal, adipose, and tail fins.

Size

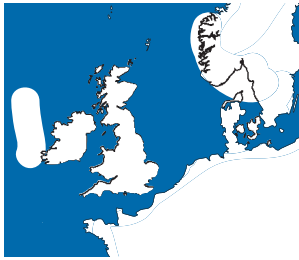
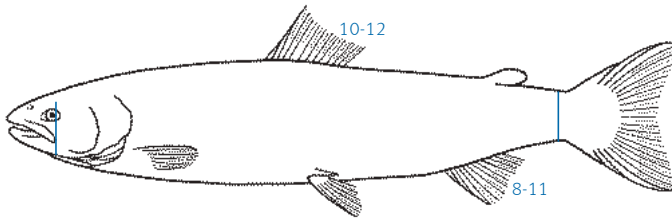
Rainbow Trout attain 1 m and 15.9 kg; Steelhead Trout grow to 1.2 m and 16.3 kg; the Kamloops Trout usually do not exceed 2.7-3.6 kg, but have been recorded at 23.6 kg. These are North American figures. British Rod-caught Record: 10.921 kg (1960, Hanningfield Reservoir).

Ecology

Native to the eastern Pacific Ocean and rivers from north-west Mexico to Alaska, mainly west of the Rocky Mountains; now introduced across North America and into many other regions including New Zealand, Australia, South America, Africa, southern Asia, and Europe. It lives in similar habitats to the Brown Trout, but can tolerate higher temperatures and slightly poorer quality water. Growth is rapid when adequately fed.

Huge numbers are now raised on fish farms in Britain and Ireland. They are bred for food as well as for stocking angling waters, for although the species has been introduced since 1890, relatively few self-sustaining populations have been established. Three forms are recognized: Rainbow Trout which is typically an inhabitant of small streams; the Kamloops Trout which live in moderately deep to deep, cool lakes with shallows adequate for food production; and Steelhead Trout which migrate to the sea. In general, all types feed on insects and their larvae, crustaceans, and snails; some fishes are eaten as well as fish eggs. Fishes are eaten mainly by the largest trout, but Rainbows will grow to large proportions on a diet of small crustaceans if they are abundant. This species has been widely known by the invalid scientific name of *Salmo gairdneri*.

Atlantic Salmon *Salmo salar*



Characteristics

The body is typically trout-like, elongate with slightly compressed sides, and deepest in the region of the dorsal fin. The caudal peduncle is narrow and the upper and lower rays of the fin stand out from the outline; the tail fin itself is shallowly forked. The upper jawbone extends to the level of the rear of the eye, not beyond. There are 10-13 scales between the base of the adipose fin and the lateral line; 10-12 major dorsal fin rays and 8-11 major anal rays. A few teeth are present on the palate in a staggered row, but there is no patch of teeth on the head of the vomer. The gill rakers on the first arch are slender and number 15-20.

Colour

Smolts and adult Atlantic Salmon returning from the sea are green or blue on the back, silvery-sided, and white beneath. As the adult approaches spawning it becomes darker, brown or bronze with red spots and dark fins. Fish which have spawned are very dark in colour, often with heavy red patches. The young fish (parr) are dark above with a series of 8-11 dark, rounded parr marks on the sides, and a single reddish-orange spot between each blotch.

Size

Salmon can attain a length of 1.5 m and a weight of 36 kg. British Rod-caught Record: 29.029 kg (1922, River Tay); Irish Rod-caught Record: 25.855 kg (1874, River Suir).

Ecology

The Atlantic salmon is possibly the most famous fish of the North Atlantic both for its value as a commercial resource and for its sporting qualities. It has

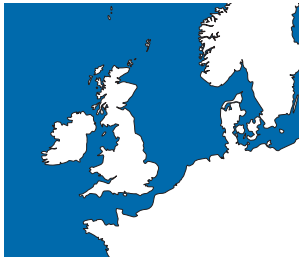
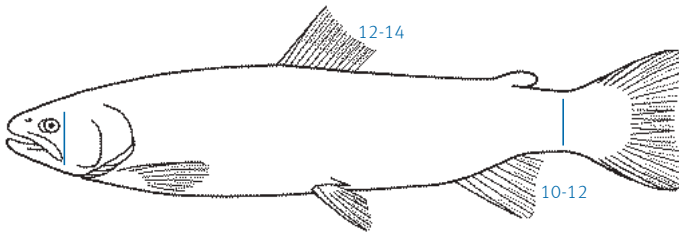
also been seen by some as a symbol of the decline in the quality of the environment. Prior to the late 18th Century, most of the rivers in England and Wales supported salmon populations, apart from the low gradient rivers of East Anglia. Many then declined considerably up to the early 20th century as a result of the industrial revolution. Now, due to considerable investment and effective regulation together with a decline of extractive and heavy industries, there are more catchments in England and Wales with salmon than at any time for the last 150 years (Mawle & Milner; In: Mills, D. (ed), 2003). Salmon spawn far upstream in fresh water, usually in November and December, the eggs being laid on a redd or nest hollowed out in gravel by the female. At spawning time the adult male develops a hooked lower jaw (kype). Over the redd, the large males are often joined by sexually active male parr, which join in the spawning. The eggs fall into the redd, where they are

Continued: Atlantic Salmon *Salmo salar*

covered over by more gravel disturbed by the female, and develop there until they hatch out in April; for about a month the fry live in the gravel sustained by the yolk of the egg. They begin to feed actively in midsummer in the small streams they inhabit. As they grow, the parr spread out along the stream in which they may spend up to three years before migrating to the sea. In the sea, Atlantic Salmon travel widely. Substantial numbers move to the Norwegian Sea and probably more make a trans-Atlantic migration to West Greenland; both areas are rich feeding-grounds. The fishery off West Greenland exploits salmon that would have returned to Europe and North America as multi sea winter fish. The large catches of these fish in the past was a source of concern for sometime. However, following significant quota reductions and other initiatives since the late 1980s, exploitation of these fish is believed to have fallen to very low levels. After three or four years (although in some

cases only one or two years) the mature fish return to the spawning rivers. Many die after spawning, but some females survive the downstream journey (as kelts), to spawn a second or third time. The Atlantic salmon is a UK BAP Priority species.

Brown Trout *Salmo trutta*



Characteristics

The caudal peduncle is deep, rather flattened, and the upper and lower tail fin rays seem to merge with the outline. The tail fin is square-cut, or at the most very slightly concave. The upper jaw bone extends well beyond the level of the eye. The scales are small, 13-16 between the base of the adipose fin and the lateral line. There are 12-14 major dorsal fin rays and 10-12 major anal fin rays. Teeth are numerous on the palate, present both on the shaft of the vomer and as a patch on the head of the vomer. Gill rakers on the first arch number 14-17 and are short and stubby.

Colour

In streams, brownish overall, darker on the back and silvery on the sides and ventrally, with numerous black spots extending below the lateral line. Spots often have a lighter halo; also numerous rusty red spots on the sides. Dorsal and tail fins only lightly spotted; adipose fin with an orange edge. In large lakes, larger rivers and estuaries, trout are silvery with the spotting reduced; the adipose fin is orange tinted.

Size

Maximum size variable according to habitat. In small streams, Brown Trout may not exceed 23 cm; in larger lakes or rivers they can grow to 1 m in length and a weight of 8.6 kg. British Rod-caught Record: 14.401 kg (2002, Loch Awe); Irish Rod-caught Record: 11.850 kg (1894, Lough Ennell). Sea Trout may attain 1.4 m and 13.6 kg. British Rod-caught Record: 12.85 kg (1992, River Test); Irish Rod-caught Record: 7.428 kg (1983, Shimna River).

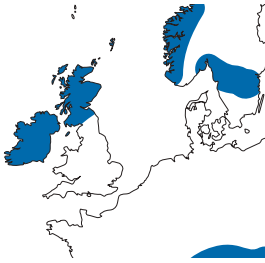
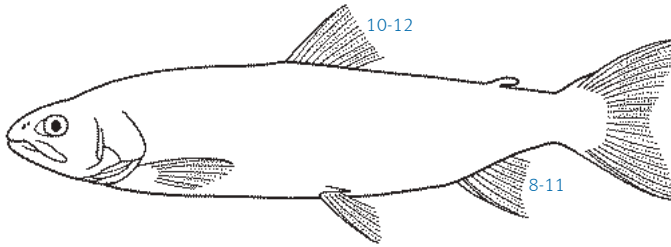
Ecology

The Brown Trout shares many of the biological features of its close relative, the Atlantic Salmon, but forms two basic ecotypes: migratory (Sea Trout) and non-migratory (Brown Trout). There is no justification for regarding them as subspecies. Trout spawn in winter from October to January, the eggs being shed in redds cut by the female in river gravel, usually in upstream reaches, although many spawn in the gravel below weirs. The eggs hatch in 6-8 weeks, depending on the water temperature, and the fry remain in the gravel for a further 4-6 weeks before beginning to feed. Both types of trout feed on small crustaceans and insect larvae when young. Brown Trout tend to continue this diet with larger specimens, known as Ferox Trout, eating fish extensively; Sea Trout feed heavily on fish and larger crustaceans in the sea. Trout require cool water of relatively high quality to thrive, and consequently have suffered from pollution and water

Continued: Brown Trout *Salmo trutta*

abstraction rather more than other fishes. Their popularity with anglers, however, has led to the stocking of large numbers of fish in lakes and rivers. The brown trout is a UK BAP Priority species.

Arctic Charr *Salvelinus alpinus*



Characteristics

Body trout-like in general form. Scales are very small, 123-152 along the lateral line. Upper jawbone reaches just to the level of the rear of the eye (lake charr), but just past the eye in migratory charr. 8-11 principal anal rays; 10-12 principal dorsal rays; gill rakers on the first gill arch 19-32, Teeth in the centre of the palate concentrated on the head of the vomer in a patch, not as a staggered row in the mid-line.

Colour

Extremely variable: sea-run Arctic Charr are steel-blue above, silvery on the sides and ventrally, although the belly may be orange-red, and with numerous red or pink spots on the sides; non-migratory populations are greeny-brown above, often reddish below, but always with reddish and white spots on the sides. In both types the leading edges of the pectoral, pelvic, and anal fins are light (but followed by reddish fin colour - not black). In spawning populations the colours, especially ventrally, are heightened, and spawning males are probably the most brilliantly coloured of all European fishes.

Size

Very variable in length and weight. Migratory Arctic Charr grow to 1 m in length and 12.2 kg in weight; lake races often attain no more than 25 cm. British Rod-caught Record: 4.309 kg (1995, Loch Arkaig).

Ecology

Like other members of the family, the Arctic Charr is represented by two physiological types: a migratory form which, feeding in the sea, grows to a large size, and a freshwater form which does not migrate. The migratory type is found today only in Arctic waters, in the eastern Atlantic coming as far south as Iceland and Oslo Fjord, Norway. In most of Europe, apart from the far north, Arctic Charr exist as mountain lake populations, relicts of the immediately post-glacial period when migratory charr occurred further south and bred in the rivers of Europe. Arctic Charr spawn in winter or early spring, usually in water of moderate depth, but in some lakes two or more populations are found spawning at different times and places. Anadromous or migratory forms spawn in early winter in rivers, shedding their eggs among gravel in a redd prepared by the female. In Arctic rivers the eggs and the newly-hatched young lie under the gravel, and emerge when

Continued: Arctic Charr *Salvelinus alpinus*

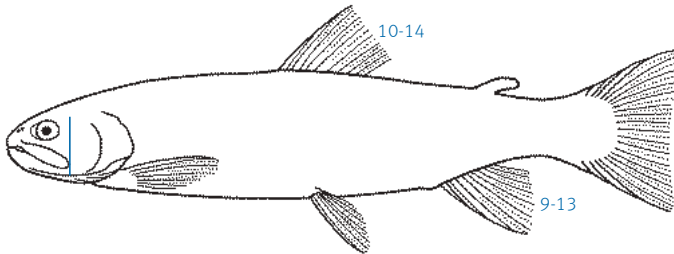


Palatine teeth

the ice breaks up in early summer. Growth rates vary from population to population; in general, however, growth is slow. Anadromous fish in Canadian waters attain full size at around 20 years, and 40-year-old fish are known. Lake populations are equally slow-growing. All types are carnivorous, many of the lake populations feeding throughout their lives on small planktonic crustaceans. They also eat insects, insect larvae, and molluscs; larger fish eat smaller fishes. Arctic Charr are fine sporting fish and also extremely good to eat. Except in Arctic waters where the large anadromous type is available, they are rarely more than locally important. In Europe, on account of their localized distribution in isolated lakes, they are very vulnerable to human interference.

Many small populations are believed to have become extinct because of pollution, competition from, and possibly predation by, introduced fishes, and man-made alterations to their habitat. The Arctic char is a UK BAP Priority species.

Brook Charr *Salvelinus fontinalis*



Characteristics

Typically trout-like in body form but more closely related to the Arctic Charr. Scales are very small, between 110-130 along the lateral line. Upper jaw reaches well past the level of the eye. 9-13 principal anal rays; 10-14 principal dorsal rays; 14-22 gill rakers on the first gill arch. Teeth in the roof of the mouth well developed in a patch on the vomer, not the palate.

Colour

Very variable; olive green to brown on the back, sides lighter, silvery below. Creamy spots on sides, amalgamating into wavy lines on the back. Dorsal and tail fins with black wavy lines. The front edge of pectoral, pelvic, and anal fins dead white with a black sub-marginal band.

Size

May attain a maximum weight of about 4.5 kg, but one Canadian fish weighed 9.4 kg. British Rod-caught Record: 3.713 kg (1998, Fontburn Reservoir).

Ecology

The Brook Charr originates in eastern North America, approximately from northern Canada to Cape Cod, southwards to Georgia, and westwards to the Upper Mississippi and the Great Lakes, thence northwards to Hudson's Bay. It is an excellent sport fish which has been widely introduced to western North America, South America, New Zealand, Asia, and many parts of Europe, including Britain. Brook Charr live in cool, well-oxygenated streams and lakes, but in the extreme north of their range they migrate to the sea. They feed on insects, insect larvae, crustaceans, and small fishes mainly; but are unselective in their feeding habits. In Europe this species occasionally hybridizes with Brown Trout, as well as being intentionally hybridised by fish farmers to produce the boldly striped, so-called Tiger Trout.

Order:

Esociformes

Pikes

All members of this order have the dorsal and anal fins located well back towards the tail. There are two families, four genera and some 10 species worldwide.

In this order:



Pike

Family: Pikes *Esocidae*

The Esocidae is small family of predacious northern hemisphere freshwater fishes. All have similar body shape, elongate with a pointed snout, large jaws, and dorsal and anal fins opposite one another and placed close to the tail fin. Five species are recognised, only one of which – the Pike – is found in Europe; it is also distributed in northern Asia and North America.

Pike *Esox lucius*



Colour

Usually greeny-brown, flecked with lighter golden green to form curved lines and speckles on the back and sides. Fish can be recognised individually by their unique patterns. Yellowish ventrally.

Size

In Britain and Ireland Pike can attain a weight of 24 kg and a length of 1.3 m; up to 34 kg in Russia. The largest fish are females, males rarely growing heavier than 4.5 kg; 6.3 kg is probably a maximum. British Rod-caught Record: 21.234 kg (1992, Llandegfedd); Irish Rod-caught Record: 19.391 kg (2005, White Lough).

Ecology

The Pike is typically an inhabitant of lowland rivers and lakes, especially those

which contain submerged marginal vegetation. On account of its popularity as an anglers' fish, it has been introduced to many atypical habitats and geographical regions. Its life style is predatory, lying in wait amongst vegetation and attacking its prey at great speed over a short distance.

As a young fish it lives among dense vegetation and feeds on invertebrates, especially crustaceans and insect larvae.

As it grows it begins to feed on larger prey and, when well grown, there are few fishes it will not eat. Large Pike eat other fish mostly, but will also take waterfowl, amphibians and small aquatic mammals. They feed by sight not by scent.

Both sexes mature in their second or third year. Spawning takes place in early spring at the water's edge or over flooded

Characteristics

Unmistakable on account of its body form. The dorsal and anal fins are opposite and close to the tail fin; the pelvic fins are abdominal in position. The head is broad, although the snout is pointed; a series of large teeth in the lower jaw, dense but smaller teeth in the roof of the mouth.

Continued: Pike *Esox lucius*

water-meadows, the sticky eggs being shed over the vegetation. Often two or more small males accompany each much larger female. Spawning takes place during daylight. Pike live to a maximum of 15 years; in exceptionally large, probably unexploited waters, an age of 24 years has been reported. The Pike is a valuable food fish in continental Europe, and both there and in Britain and Ireland is well regarded as an anglers' fish. Unfortunately, as a predator on smaller fish, the population is never very numerous in any water and a relatively small amount of exploitation can exhaust the stock. In many parts of Europe the Pike has been over-exploited and has had to be artificially restocked.

Order:

Stomiiformes

Dragonfishes

Members of this order all have luminescent organs (photophores). Some have a chin barbel and may, or may not, have pectoral, dorsal or adipose fins. Worldwide, there are five families with 53 genera and some 390 species. All are marine

In this order:



Half-naked Hatchetfish



Silver Hatchetfish



Pearlsides

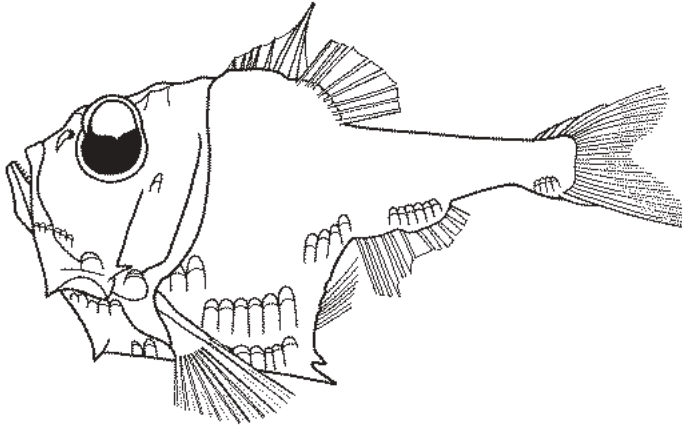


Transparent Hatchetfish

Family: Marine Hatchetfishes *Sternoptychidae*

The Marine Hatchetfishes are a very distinctive family of small marine fishes living mainly in mid-water in the deep sea. All the members of the family have a deep, compressed body with a sharp edge to the belly and a narrow tail. Most are silvery on the sides with large light-organs on the belly. They are found worldwide in the oceans and are often very common, forming a major constituent in the diet of many larger, predatory fishes. There are ten genera with some 67 species. Seven are found in the eastern North Atlantic, of which four occur at times in the coastal waters of northern Europe.

Half-naked Hatchetfish *Argyropelecus hemigymnus*



Characteristics

Body small and compressed laterally. Mouth small. Several bony spines before dorsal fin which has 8-9 soft rays; anal fin with 11-12 soft rays. Posterior spines on keel in front of pelvic fins. Slender abdomen and caudal peduncle. Rather tubular upwardly directed eyes.

Colour

Bright silvery during daylight, but dusky at night. Head and anterior of body dark and rear pale, except for one dark band above the anal fin and another on the tail base. Prominent rows of photophores ventrally, on chest, abdomen, above the anal fin and on tail base.

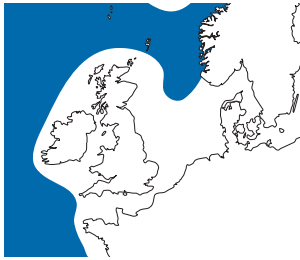
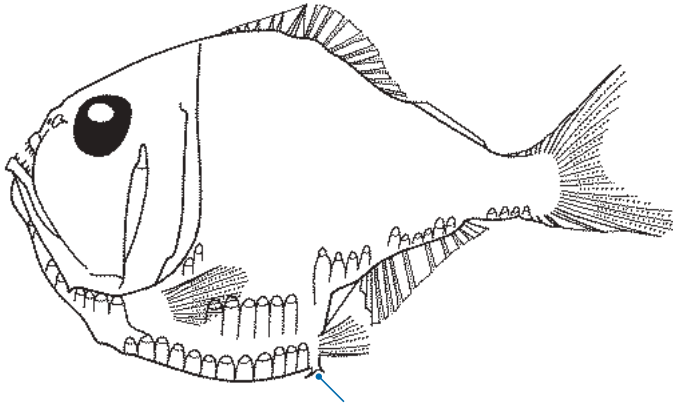
Size

Males smaller, up to 2.8 cm; females larger to 3.9 cm.

Ecology

Widespread through all tropical and subtropical oceans and some temperate waters including the eastern Atlantic. Pelagic species at depths of 100-700 m, mainly 250-650 m. Adults make regular vertical migrations, singly or in small groups. Feeds on planktonic crustaceans and small fish. Oviparous with planktonic eggs and larvae.

Silver Hatchetfish *Argyropelecus olfersii*



Characteristics

Deep-bodied with a steeply-angled jaw and large eyes which are directed upwards. Conspicuous light-organs on the lower sides and belly. A prominent double-pointed spine in front of the pelvic fins. The caudal peduncle is short.

Colour

Back dark greyish-brown, the sides silvery. Prominent rows of photophores ventrally in four groups.

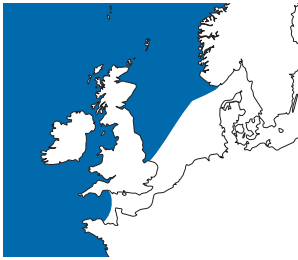
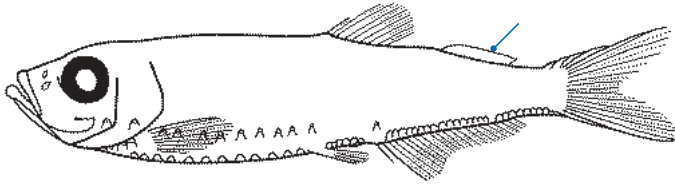
Size

Attains a length of 9 cm.

Ecology

A mid-water fish found from 400-600 m by day and from 200-300 m at night, and exceptionally on the surface. Moderately common on the edge of the continental shelf and occasionally close inshore on open ocean coasts. On occasions caught in considerable numbers. It features in the food of members of the cod and tuna families.

Pearlsides *Maurolicus muelleri*



Characteristics

A small fish with a large eye and moderately large mouth. The dorsal fin is placed vertically behind the pelvics; it has a long, very low adipose fin on the back, and the anal fin has a long base. Very obvious light-organs on the lower side of body.

Colour

Beautiful greenish-blue on the back, brilliant silver on the sides and belly; the light-organs gleam pale blue.

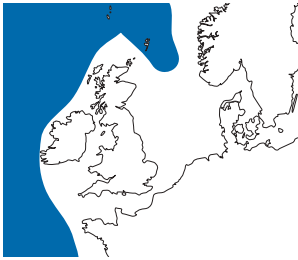
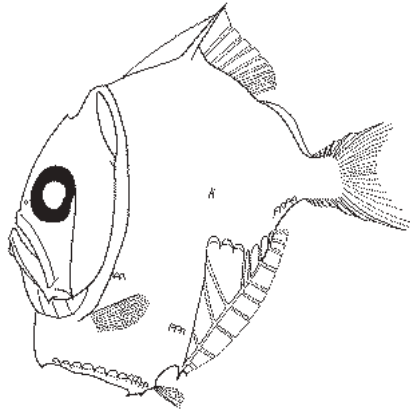
Size

Attains a total length of 6.5 cm; usually much smaller.

Ecology

A mid-water fish living between 200 and 500 m, but found only in the deeper water during daylight. At night it comes nearer the surface, and can be captured occasionally in the upper 30 m of the sea. It is fairly frequently stranded on the shore, especially on the open ocean coasts of Europe. It is preyed upon by Tuna, Hake and several members of the cod family; its young are taken by Herring. It feeds on small crustaceans and other planktonic animals. This is one of the few deep-sea fishes to be captured regularly in shallow water; it occurs worldwide in tropical and temperate oceans.

Transparent Hatchetfish *Sternoptyx diaphana*



Characteristics

Similar in body shape to the hatchet-fish, but even deeper, so that the depth is only slightly less than the body length. The eyes are laterally placed. A thin transparent bony blade on the back in front of the dorsal fin. Triangular transparent membrane present above anal fin.

Colour

Dark olive green on the back, silvery on the sides and ventrally, with small oval blue-green light-organs in clusters on the belly and tail.

Size

Attains 5 cm.

Ecology

Found mainly in deep water between 500 and 800 m, exceptionally down to 3,000 m, and occasionally shallower. Apparently stays at the same depth day and night. Moderately common on the edge of the continental shelf, rarely straying into coastal water. Worldwide in tropical and temperate Atlantic, Indian, and Pacific Oceans; absent in the Mediterranean.

Order:

Aulopiformes

Lizardfishes

This large order of elongate fish with large mouths has 15 families with 44 genera and some 236 species worldwide.

In this order:



Longnose Lancetfish

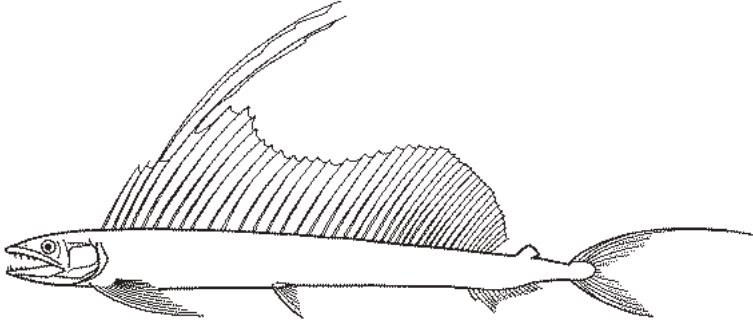


Sharpchin Barracudina

Family: Lancetfishes *Alepisauridae*

All members of this small family have a slender body with no scales or light organs. There are two genera with three species. Only one of these is known from the waters around Britain and Ireland.

Longnose Lancetfish *Alepisaurus ferox*



Characteristics

Mouth large with two erect fangs on palatines. Dorsal fin sail-like very high with 30-45 rays and about three rays (usually 3rd to 5th) very long. Small adipose fin.

Colour

Generally quite pale, though iridescent and darker dorsally; lateral adipose keel dark. All fins dark brown or black; peritoneum black.

Size

Attains a length of 2.15 m; maximum recorded weight is 4.5 kg.

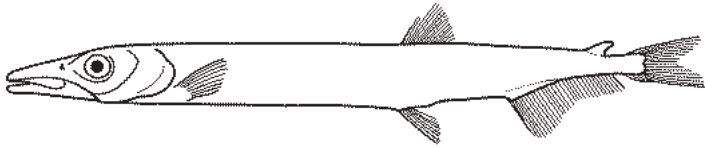
Ecology

Circumglobal, including the eastern Atlantic, though mainly in tropical and subtropical waters. The first record of this species in Britain was off St Kilda in 1911; subsequently, several specimens have been taken off the west coast of Ireland. Sometimes in inshore waters, but mainly pelagic from the surface down to at least 1,000 m. Feeds nocturnally on fish, crustaceans, cephalopods and tunicates. Oviparous, with planktonic larvae.

Family: Barracudinas *Paralepididae*

In some members of this family the dorsal fin is absent but there is usually an adipose fin. There are 13 genera with some 56 species worldwide. About ten species in the north east Atlantic of which one has been found in British waters.

Sharpchin Barracudina *Paralepis coregonoides*



Characteristics

Very elongate body, with dorsal and pelvic fins posterior to mid-point, the pelvic origin being below the origin of the dorsal. Very large jaws, angle of these below the eye, which is prominent. No photophores. Anal fin with 22-25 rays.

Colour

Silvery over most of body though darker on back.

Size

Attains 50 cm. British Rod-caught Record: 54 g (1987, Ayr).

Ecology

Found only in the north Atlantic and adjacent seas. Depth range from 50-1,000 m. Feeds largely on fish, crustaceans and various large zooplankton. Spawns from March to September.

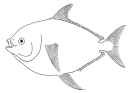
Order:

Lampriformes

Opahs

Fish belonging to this order have no true spines in the fins. There are seven families with 12 genera and some 21 species worldwide.

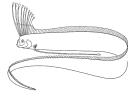
In this order:



Opah



Dealfish

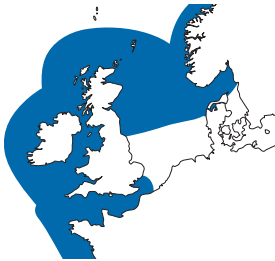
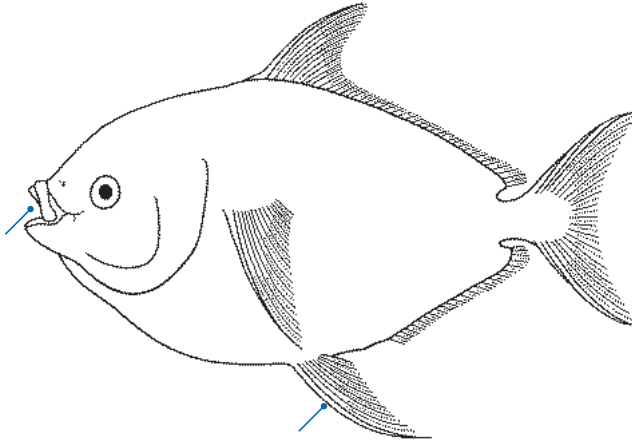


Oarfish

Family: Opahs *Lampridae*

The Opah is one of only two species in the family Lampridae; it is a fish which is found worldwide in tropical and temperate seas. Despite its total dissimilarity of body form, its closest relatives are the dealfishes and the oarfish which share the basic similarity of protrusible jaws. The fins in all three have no spines, although in the Opah the rays are solid and stout.

Opah *Lampris guttatus*



Characteristics

Unmistakable on colour alone, but having a deep though thickset body, lateral line arches high at the front, long-based dorsal and anal fins, the former with a high lobe, and long, curved pectoral and even longer pelvic fins. Mouth protrusible but toothless.

Colour

Deep blue on the back shading through green to pinkish-silver on the belly; rounded milky-white spots on the body. The fins are all blood red.

Size

Grows to at least 1.5 m in length and a weight of 73 kg. Specimens of up to 270 kg have been reported. British Rod-caught Record: 58.057 kg (1973, Penzance).

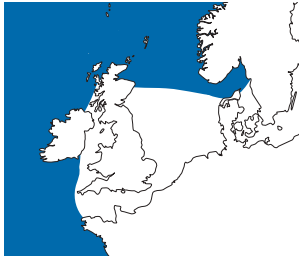
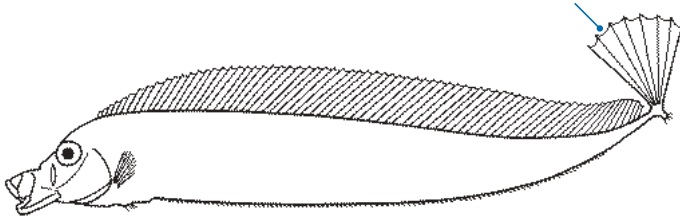
Ecology

This striking fish is known mainly from chance captures in fishing nets and occasional strandings. Its normal life style is as a mid-water fish in the open sea at 100-400m depth - a relatively little explored region. It feeds mainly on squids and fishes, including Blue Whiting, Silvery Pout, and Hake. Not often captured in European waters and therefore not commercially fished for, although its flesh is of excellent flavour. Very rarely specimens are caught by anglers.

Family: Ribbonfishes *Trachipteridae*

Members of this unusual-looking family have no anal fin and a caudal fin which is placed at right-angles to the body. There are three genera with some 10 species but only one occurs in north European waters.

Dealfish *Trachipterus arcticus*



Characteristics

Long, slender and compressed body with a long-based dorsal fin, the longest rays of which are just past the mid-point of the body. Pelvic fins minute; anal fin absent; tail fin merely a fan of eight long, upwardly directed rays. Head bones paper-thin and fragile.

Colour

Bright silvery overall with 1-5 rounded dark blotches along the upper sides; fins all orange-red.

Size

Attains a length of 2.5 m.

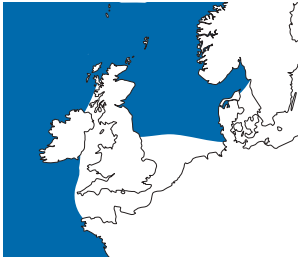
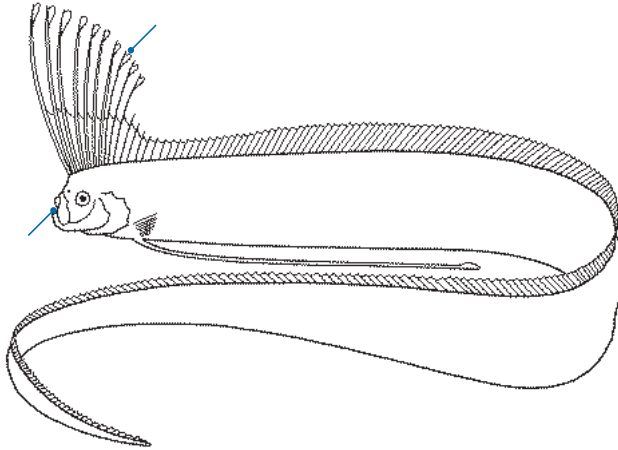
Ecology

A mesopelagic fish which appears to be most common at depths of 180-1000 m, although paradoxically most that have been examined were stranded on shore or caught at the surface of the sea. It probably rises nearer to the surface at night. Occasionally small schools are reported, but mostly it is captured singly. It feeds on deep-water fishes, squids, and shrimps. It is not a very common fish and is of little use as food.

Family: Oarfishes *Regalecidae*

These unusual fish have no scales and no anal fin. The pelvic fin has only one ray and is long and slender. There are only two monotypic genera, one of which occurs in north European waters.

Oarfish *Regalecus glesne*



Characteristics

Long, slender, compressed body with a long-based dorsal fin, the front rays of which are high and form a crest over the head. Pelvic fin rays also elongate; these and the long dorsal rays have fleshy expanded membranes at their tips. Head bones paper-thin and virtually transparent. No teeth in jaws.

Colour

Body is silvery with interrupted oblique dusky bars. Fins deep red.

Size

Attains a maximum length of 7 m, making it the longest bony fish.

Ecology

Presumed to be a mid-water fish in the open ocean, although most specimens described have been caught at the surface or found stranded - presumably sick fishes. Its preferred depth range seems to be 300-600 m, at which depths it feeds mainly on euphausiid crustaceans (shrimp-like 'krill'). It has been seen hanging vertically in the water with the pectorals held out at right angles to the body. When young it is eaten by deep-feeding tunas and lancet-fishes. Adults are rarely caught in their natural habitat.

Order:

Gadiformes

Cods

None of the species in this large order have true spines in the fins. In most species the pelvic fins are inserted below or in front of the pectoral fins. There are nine families, 75 genera and some 555 species in this large order. Many species are of commercial importance but only one species is confined to fresh water.

In this order:



Hollowsnout Rattail



Roundhead Rattail



Roughhead Rattail



Softhead Rattail



Smooth Rattail



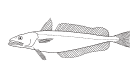
Roughsnout Rattail



North Atlantic Codling



Hakeling



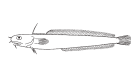
Hake



Five-bearded Rockling



Northern Rockling



Four-bearded Rockling



Silver Rockling



Bigeye Rockling



Shore Rockling



Three-bearded Rockling



Greater Forkbeard



Arctic Cod



Torsk



Navaga



Silvery Pout



Cod



Burbot



Haddock



Whiting



Blue Whiting



Blue Ling



Spanish Ling



Ling



Pollack



Saithe



Tadpole Fish



Norway Pout



Bib



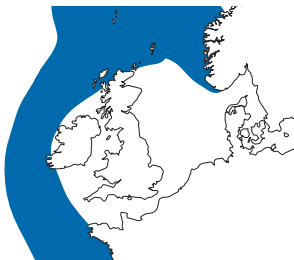
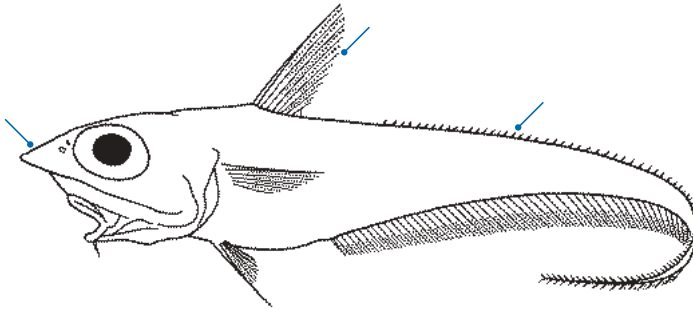
Poor Cod

Family: Grenadiers *Macrouridae*

The Macrouridae are related to the true cod fishes, living in deep water conditions on the continental slope in all oceans from subarctic to Antarctic. Their general body shape is elongate, with a large head, very short trunk, and a long rat-like tail. Most species have a barbel on the chin, a short-based first dorsal fin, very low or poorly-developed second dorsal fin, and a very distinct large anal fin which runs from the vent to the tail tip.

Some rattails have a light-producing organ in the mid-line of the belly. The light is produced by luminous bacteria in the organ and a clear patch of skin permits the light to shine through. Some species even have a lens-like patch of tissue to intensify the light. Many grenadiers are capable sound-producers, the males having drumming muscles attached to the swim-bladder, which produce the noise. Most live close to the sea bed, their body form being adapted to swimming with the head, with its sensitive barbel, lower than the tail. There are 27 genera and some 350 species. Six of these species live in relatively shallow water in northern Europe.

Hollownout Rattail *Coelorinchus caelorhincus*



Characteristics

Slender-bodied with a short-based rather high first dorsal fin with a strong but smooth first dorsal spine; second dorsal fin very weakly developed.

Snout sharply pointed with a strong ridge running beneath the eye; eye large, orbit oval, longer than high. A scaleless black area in mid-line of abdomen; vent close to anal fin origin.

Colour

Dull grey-brown to slate-grey on the back and sides; black ventrally, around the gill cover, over the body cavity and to the anal fin origin.

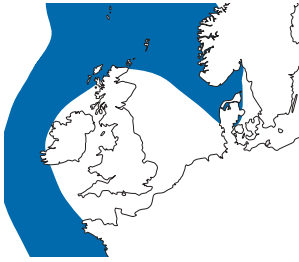
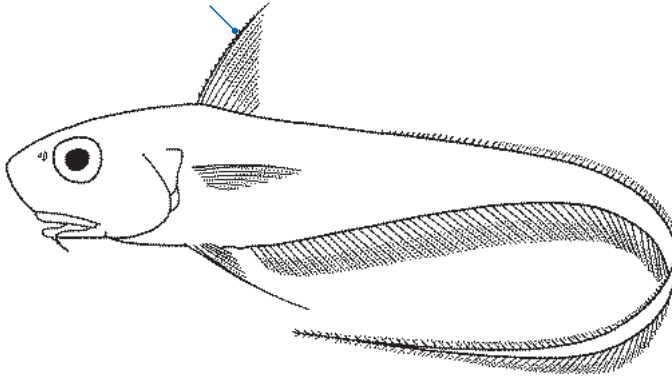
Size

Grows to 38 cm.

Ecology

Found mainly in depths of 200-500 m with an absolute range of 140-750 m. It is relatively common on the continental shelf of N. W. Europe. Five subspecies are found in the Atlantic Ocean; only *C. caelorhincus* is shown on the map.

Roundhead Rattail *Coryphaenoides rupestris*



Characteristics

Head rounded, with blunt snout and large almost terminal mouth; no noticeable bony ridge running beneath the eye. First dorsal fin high with the first spine serrated on front edge. Scales moderately large with numerous small spines; throat region naked.

Colour

Dull brown on back and upper sides, silvery on lower sides and belly; throat and gill chamber membranes dull brown.

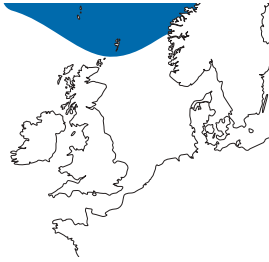
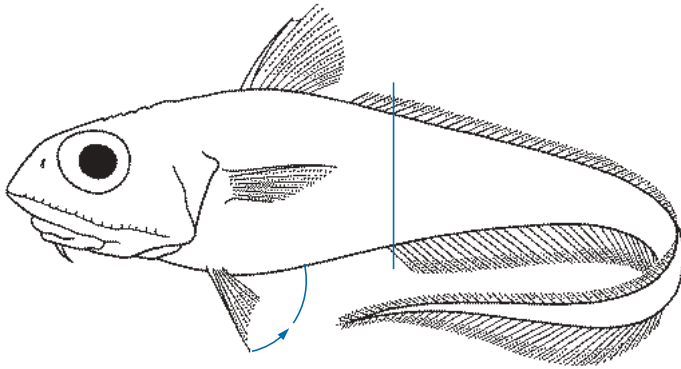
Size

Attains 1 m.

Ecology

Widely distributed in the North Atlantic in depths between 400 and 1200 m, usually in shallower depths further north. Its food consists mainly of deep-water prawns, amphipods, and lantern fishes. It breeds in summer, producing at least 16,000 eggs. Its biology is little known; but it is facing over-exploitation in the North Atlantic.

Roughhead Rattail *Macrourus berglax*



Characteristics

A heavy-headed rattail with a long trunk, the anal fin origin being posterior to the origin of the second dorsal. First dorsal fin high with a strongly serrated spine. A strong, rough-edged ridge along the head below the eye; scaleless beneath the ridge; head and body scales all with a long central spine and smaller spinules (giving the fish a rasp-like surface).

Colour

Greyish overall, slightly darker beneath the head.

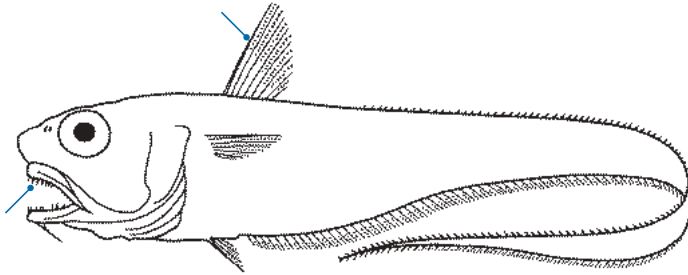
Size

Attains 1.1 m, probably more.

Ecology

A common fish in the subarctic waters of the North Atlantic which lives in moderately shallow depths of 200-600 m, in the far north even as shallow as 100 m. It feeds on Capelin, prawns and amphipods, molluscs, and brittlestars, and is occasionally taken on hooks set on long lines for halibut and other fish. It is quite palatable, but of limited use to commercial fishermen on account of the wasteful large head and long tail. It is believed to spawn in winter to spring.

Softhead Rattail *Malacocephalus laevis*



Characteristics

Moderately deep-bodied, with a large head, rounded snout, and large jaws with curved teeth. The eye is large. First dorsal fin high, the spiny ray with a smooth edge; second dorsal low and poorly developed. Scales small, each with fine teeth giving a sand-papery feel; head evenly scaled. Two small clear 'windows' between the pelvic fins; the vent closer to the anal fin than the pelvics.

Colour

Greyish on the back, silvery reflections on the sides, black tissue around the gill covers, dark along the ventral mid-line. Light-organs between the pelvic fins.

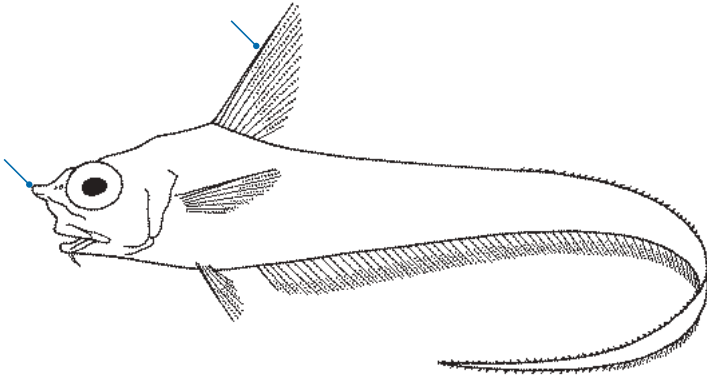
Size

Attains 56 cm in total length.

Ecology

A relatively shallow rattail which lives on the upper continental slope mainly in depths of 300-750 m, although ranging from 200-1000 m. It is known to feed on small crustaceans and, from its dentition, it might be assumed to catch and eat larger, more active, prey such as squids and fishes. A common rattail off the European Atlantic coast.

Smooth Rattail *Nezumia aequalis*



Characteristics

A rather deep-bodied rattail with short head, large eye and an angular dorsal profile. The first dorsal fin is short-based but high with a serrated spine in front. A weak ridge running across the cheek below the eye with large scute-like scales in two rows, smaller scales beneath the ridge. Body scales moderately large, with fine spines on their surface; vent in a scaleless black patch. Snout with 3 bosses, 1 central and 1 each side, bluntly pointed; mouth moderately small.

Colour

Dark bluish-grey on the back, sides and belly slightly silvery, head brownish. The naked area around the vent jet black; the tip of the first dorsal, pelvic fins, and anal fin black.

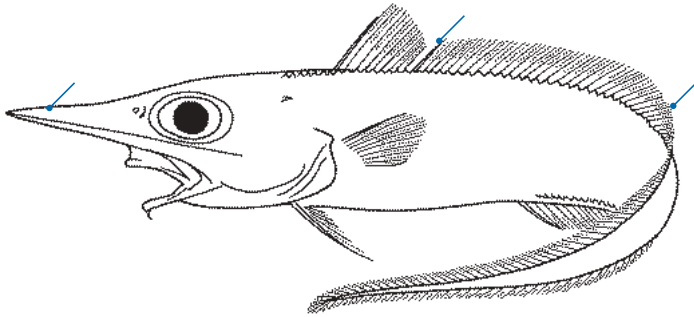
Size

Attains a maximum length of 41 cm.

Ecology

A relatively deep-water rattail which has been caught at depths of 200-2320 m, but in European waters is taken mainly between 640-1000 m. A fairly common species on muddy sea bottoms.

Roughsnout Rattail *Trachyrincus scabrus*



Characteristics

Typical of the family in general body shape, except that the first dorsal fin is low and rounded with no hard spiny rays, and the second dorsal rays are longer than those of the anal fin; the two dorsal fins are close together. Snout sharply pointed; chin barbel small; scales large and spiny.

Colour

Plain pale brown above, slightly lighter ventrally.

Size

Attains 60 cm.

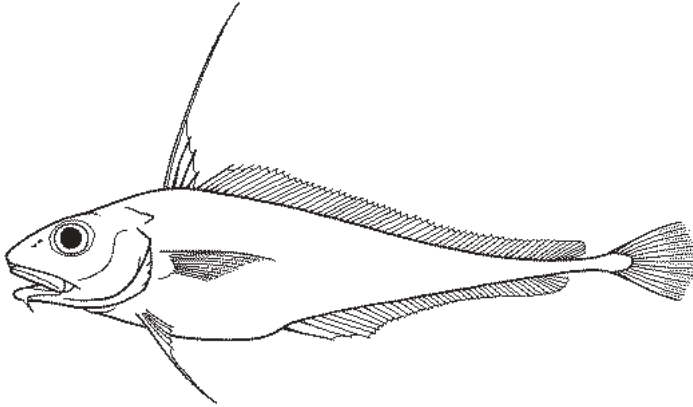
Ecology

Common in deep water, 550-1100 m from off western Ireland southwards. Found mainly on the lower continental shelf on muddy bottoms. Feeds on small crustaceans.

Family: Deepsea Cods *Moridae*

Members of this family are all deep sea cods with a narrow tail base and may have 1-3 dorsal fins and 1-2 anal fins. The chin barbel may be present or absent. Worldwide, there are 18 genera with some 105 species.

North Atlantic Codling *Lepidion eques*



Characteristics

Small barbel on chin. Posterior nostril immediately anterior to eye, which is large. Lateral line system on head with pit organs but no pores. Two dorsal fins, the first short with first ray very long (longer than head); second dorsal with long base stopping just short of the very slender tail base; a single long and low anal fin.

Colour

Body generally pale, fin tips and tail dark.

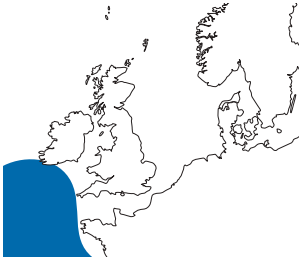
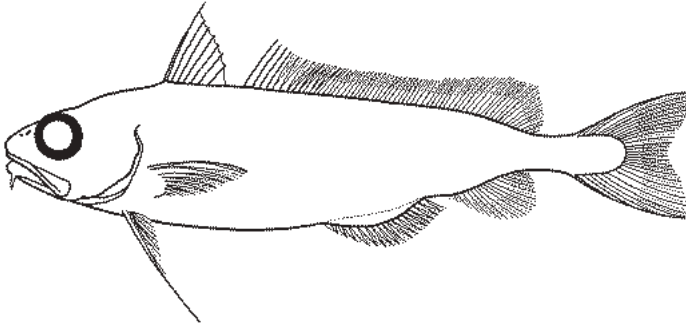
Size

Can attain 44 cm.

Ecology

Temperate waters of the north Atlantic. Frequent, mainly in schools, off the continental shelf of northern Europe in depth of 500 metres or more. Can be found at depths of 127-1850 m. Feeds mainly on crustaceans but also on polychaetes. Of little fisheries interest.

Hakeling *Mora moro*



Characteristics

Small barbel on chin. Eyes large, diameter greater than snout length. Second dorsal fin with 54-59 soft rays. Long anal fin originates near midbody, deeply indented at midlength – usually appearing as two well separated fins. No ventral light organ.

Colour

Generally grey; fins darker towards tips.

Size

Attains 80 cm.

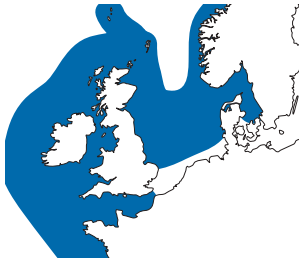
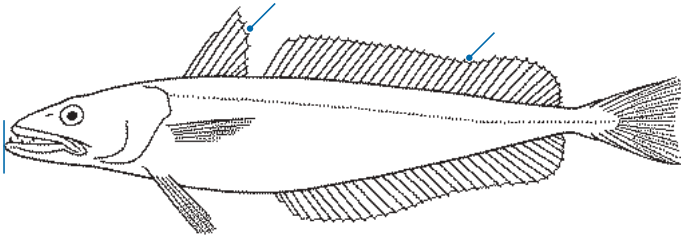
Ecology

Eastern Atlantic and tropical oceans, relatively common to the south of the British Isles. Recorded from the upper continental slope, as shallow as 50 m, but mainly bathypelagic from 450-2500 m. Feeds on fish, crustaceans, molluscs and other invertebrates. Probably spawns during winter or early spring. A minor commercial species in some waters.

Family: Hake *Merlucciidae*

The hakes are a group of cod-like fishes which were included in the cod family but are now regarded as distinct enough to be accorded family status as the Merlucciidae. They are widely distributed on the continental shelf of most temperate seas, both in the northern and southern hemispheres; they are important food fishes. They are slender fishes with a large head and long jaw but no chin barbel, two dorsal fins, the first being short-based, and a single anal fin. There are five genera with 22 species; only one of these is found in European seas.

Hake *Merluccius merluccius*



Characteristics

Slender body, head large, jaws well developed with large curved teeth. No chin barbel. First dorsal fin triangular in shape, second dorsal and anal long-based and with a shallow dip about two-thirds of their length. Lateral line straight; scales moderately large.

Colour

Blue-grey on the back, silvery on the sides and silvery-white ventrally. Inside the mouth and gill cavity black. Lateral line dark.

Size

Attains 1.80 m in length, but is rarely in excess of 1 m; a weight of 15 kg has been reported, but 5 kg is probably near the average maximum today. British Rod-caught Record: 11.706 kg (1997, Loch Etive). Irish Rod-caught Record: 11.496 kg (1962, Belfast Lough).

Ecology

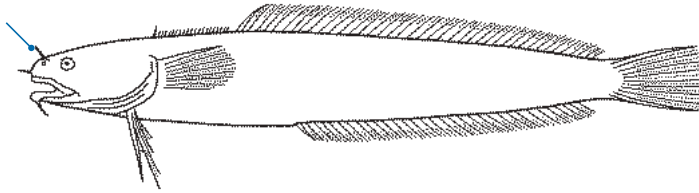
The Hake is a moderately deep-water fish which inhabits the middle and lower continental shelf in depths of 165-550 m,

but may be in shallower water in summertime. It lives near the bottom rather than on it and makes feeding forays into mid-water at night. Its food consists principally of fishes and squids, but young hake eat crustaceans in quantity. Spawning takes place in spring and summer (the later further north) over the shelf edge; the eggs and larvae are pelagic and tend to drift into shallower waters south of Ireland and in northern Biscay, where the young are found during their first year of life. The Hake is an important food fish which is caught by trawls, gillnets and longlines. The stocks have been heavily fished and large specimens are now very uncommon.

Family: Rocklings *Phycidae*

The rocklings are small to medium-sized, elongate members of the cod group, with two or three barely separated dorsal fins and a single, usually long, anal fin. They have a chin barbel and some possess snout barbels. This family is mainly found in the Atlantic and contains five genera and 25 species.

Five-bearded Rockling *Ciliata mustela*



Head of *Ciliata mustela*



Colour

Dark brown above, sometimes with a reddish tinge; lighter grey-brown below.

Size

Grows to 25 cm. British Rod-caught Record: 454 g (1995, Aberystwyth).

Ecology

A common fish in the intertidal zone on all kinds of shores, living in rock pools and pools formed by pilings on sand and mud. Also occurs down to 20 m on muddy, sandy and shell gravel bottoms. It breeds in winter and early spring in deeper water; the eggs and larvae are pelagic. This rockling eats small crustaceans, and occasionally small fishes. Young Five-bearded Rocklings are silvery with greenish backs and live near the surface until

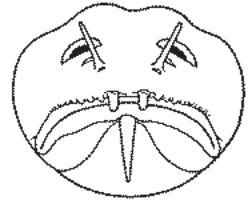
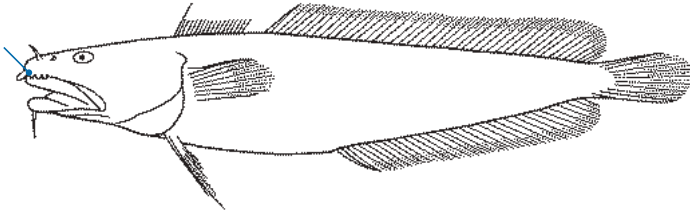
they come close inshore.

It is eaten by numerous seabirds and, being particularly abundant in spring, is frequently an important diet for the nestlings of such birds as terns and puffins.

Characteristics

A small, slender-bodied codfish with two dorsal fins, the first merely a single long ray followed by a fringe of low rays, the second dorsal fin long; a single anal fin. Five barbels, one on the chin, a pair on the front of the upper lip, and a pair on the anterior nostrils. Head short, its length less than a fifth of the body length.

Northern Rockling *Ciliata septentrionalis*



Head of *Ciliata septentrionalis*



Characteristics

Two dorsal fins, the first a low fringe of fine fin rays (the first ray longest), the second long-based; a long-based anal fin. Five barbels around the mouth, one on the chin, a pair on the front of the upper lip, a pair on the anterior nostrils; and small lobes along the fold of skin above the upper jaw. Head long, its length more than a fifth of the body length.

Colour

Medium brown above and on the sides; lighter ventrally.

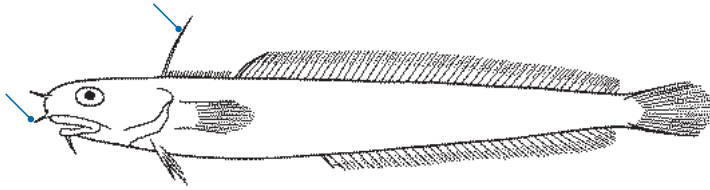
Size

Grows to 18 cm.

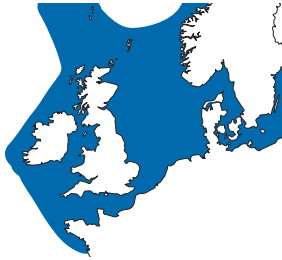
Ecology

A little-known rockling which is found mainly below low water level, although it is occasionally caught on the shore. It seems most common in depths of 10-50 m, sometimes down to 90 m. It lives among rocks and on sandy and muddy bottoms. Its food consists of small crustaceans and worms. As this rockling has frequently been found in cod stomachs, it evidently features in the diet of this fish, at least locally.

Four-bearded Rockling *Enchelyopus cimbrius*



Head of *Enchelyopus cimbrius*



Characteristics

Slender-bodied with a long-based dorsal fin of uniform height preceded by a low first dorsal fin of fine rays, the first of which is very long (nearly as long as the head length). A single long-based anal fin. Four barbels: one on the chin, one in the mid-line of the upper jaw, and a pair on the anterior nostrils' rims.

Colour

Dull reddish-brown or sandy above, grey on the sides, white ventrally; bluish-grey over the body cavity. A rounded dark blotch at the far end of the dorsal and anal fins.

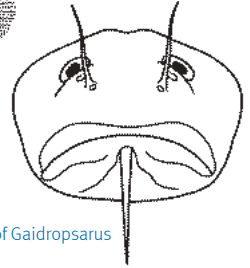
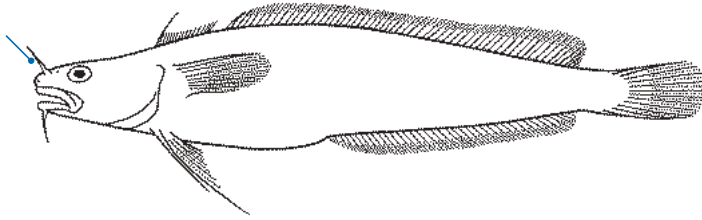
Size

Attains 41 cm; usually 25-30 cm. British Rod-caught Record: 40 g (1981, Gourrock).

Ecology

A bottom-living rockling which is generally captured on muddy or sandy bottoms in 20-250 m; it has been caught as deep as 550 m. In the northern parts of its range it is found in the shallower of these depths; to the south it is usually caught in deep water. In general, it is not a common fish. It feeds chiefly on crustaceans, and to a lesser extent on worms and molluscs. It breeds in deep water in late spring and summer; the eggs and larvae are pelagic.

Silver Rockling *Gaidropsarus argentatus*



Head of *Gaidropsarus*



Characteristics

The low fine first dorsal fin rays are preceded by a long ray, usually twice as long as the eye diameter. Second dorsal and anal fins long-based and low. Three barbels; one on the chin, one on each anterior nostril. Vertebrae 46-49.

Colour

Uniformly light reddish-brown, paler ventrally; the second dorsal, anal, and pectoral fins with orange edges. The juvenile is green on the back, silvery beneath.

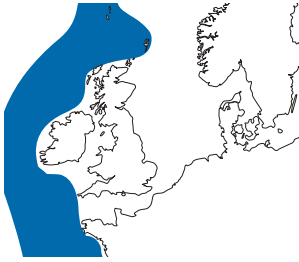
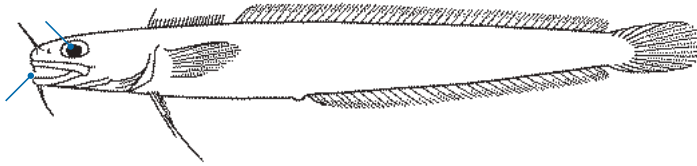
Size

Attains a maximum length of 45 cm.

Ecology

This rockling is found only in cold deep water on the lower continental shelf of the northern Atlantic Ocean and the Norwegian Sea. Its extreme depth range is 150-1,400 m, but it is common only below 500 m. As an adult it lives on soft bottoms. The pelagic juveniles are at times extremely abundant off the north-west coasts of Europe.

Bigeye Rockling *Gaidropsarus macrophthalmus*



Characteristics

A slender-bodied rockling with the low fringe-like first dorsal fin preceded by a longer ray, which is typical of the rocklings. Second dorsal fin is long-based, of uniform height; anal fin similar but shorter. Three barbels, one chin and one on each anterior nostril. Eyes large; mouth large, gape extending well beyond eye level; front teeth of upper jaw fang-like, 2-4 in number.

Colour

Back mottled with medium brown; the sides reddish; pink ventrally.

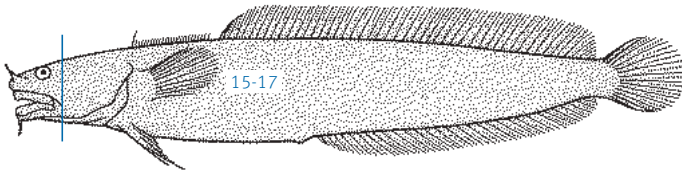
Size

Attains at least 13 cm, possibly 25 cm.

Ecology

A deep-water rockling found on the bottom between 150 and 510 m, always well offshore. It is apparently rare, for it has been reported on few occasions, but this is probably because it is difficult to catch in most kinds of fishing net. Its biology is virtually unknown. A closely related, apparently larger species is found in Biscay and the Mediterranean.

Shore Rockling *Gaidropsarus mediterraneus*



Characteristics

Typical rockling shape with a low fringe of fine rays in the first dorsal fin, preceded by a single long ray. Second dorsal and anal fins long-based, of uniform height. Three barbels, one on the chin, one on each anterior nostril. Pectoral fin with 15-17 rays.

Colour

Uniform reddish-brown or dull brown on back and sides; lighter ventrally. Juvenile fish are clear greeny-blue above, brilliantly silvery below and on the sides.

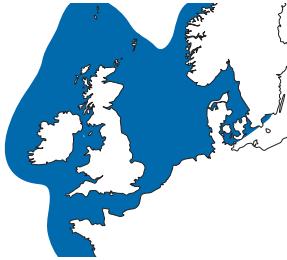
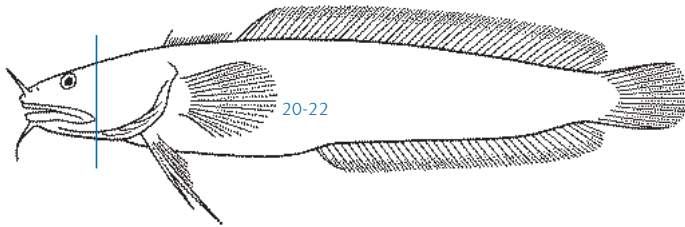
Size

Attains a maximum length of 50 cm and a weight of ca 500 g; mostly between 15 and 25 cm. British Rod-caught Record: 730 g (1992, Dorset).

Ecology

A common rockling on rocky shores, in tide-pools and under algae-covered rocks. It is unusual to find it on other than rocky bottoms. It is found at least as deep as 27 m, but it may live deeper than that on rocky reefs. It spawns offshore in early summer, the eggs and larvae being pelagic. Juvenile fish live near the surface. They change to a bottom-dwelling life when they drift inshore at a length of ca 4 cm. These young fish first become common in shore pools in late September and October. The Shore Rockling feeds principally on crustaceans, especially amphipods and small shore crabs, small worms, and occasionally fishes. This rockling is often very abundant in intertidal situations and must play a considerable part in the ecology of rocky shores. It is frequently an intermediate host of the seabird trematode worm parasite *Cryptocotyle sp*; its skin displaying the black cysts of the worm larva.

Three-bearded Rockling *Gaidropsarus vulgaris*



Characteristics

A large rockling possessing a low fringe of rays in the first dorsal fin preceded by a longer ray, and a second dorsal and an anal fin both long-based and of uniform height. A large mouth with three barbels, one on the chin and one on each anterior nostril. Pectoral fin large and rounded with rays 20-22.

Colour

Body basically salmon pink, occasionally light brown with bold dark brown cross-bars and blotches on the back and upper sides. Pinkish ventrally. Juveniles have brilliantly silvery sides and belly, and clear green backs.

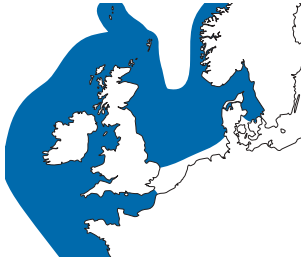
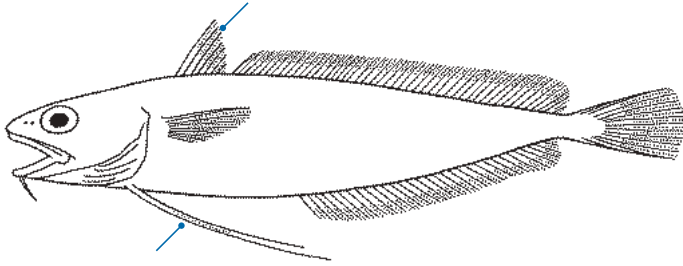
Size

Attains 60 cm; mostly about 40 cm in length, and 0.75 kg in weight. British Rod-caught Record: 1.726 kg (2001, Cornwall). Irish Rod-caught Record: 1.389 kg (1990, Arklow).

Ecology

This, the largest of the rocklings, is found between depths of 9 and 120 m. It lives near rocks but often inhabits open ground, especially coarse gravel and sandy bottoms. It has been captured as deep as 150 m. It feeds mainly on crustaceans, but also eats smaller bottom-living fishes. The eggs and larvae are pelagic, as are the juveniles. They become bottom-living before they are 6 cm long. Occasionally captured by anglers, this rockling has no commercial value; it is too uncommon to play much part in the food-chains of the sea except that the young are preyed upon by several fish-eating seabirds.

Greater Forkbeard *Phycis blennoides*



Characteristics

Moderately stout-bodied but tapering sharply towards the tail. Scales large and easily detached. Two dorsal fins, the first short-based, triangular in shape, the second like the anal fin long-based. Pelvic fins very long, a single branched ray extending beyond the vent. A barbel on the chin.

Colour

Warm greyish-brown above, light grey or silvery ventrally. The dorsal, tail, and anal fins have dusky edges and the lateral line is dark.

Size

Grows to 110 cm and ca 3.5 kg, but rarely over 60 cm. British Rod-caught Record: 2.133 kg (1969, Falmouth Bay).

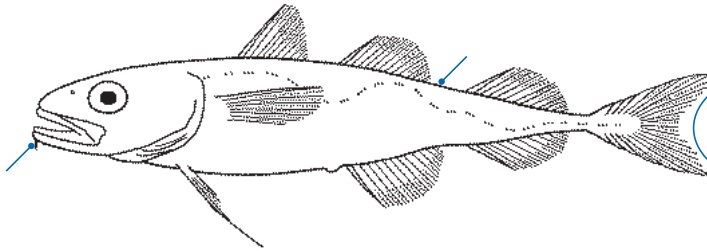
Ecology

Usually occurs on muddy or sandy bottoms in depths of 100-350 m, but occasionally is captured close inshore in shallower depths. A schooling fish, which is often caught in large numbers, the Greater Forkbeard mainly feeds on crustaceans and occasional fish. It spawns in spring and early summer. Considerable quantities have been caught to the south-west of Britain and Ireland but it is not an important food fish. Its flesh is soft, but palatable. It is, however, important commercially in the Mediterranean.

Family: Cod Fishes *Gadidae*

The members of the cod family are (with one exception) all marine fishes. Most are found in the colder temperate waters of the northern hemisphere, generally on or close to the continental shelf. Few are found in the deep sea and then only near the surface or in the southern hemisphere. Their fins lack spines, and they usually have two or three dorsal and one or two anal fins; they lack snout barbels but a barbel on the chin is normal, and they all have small to minute scales. There are 16 genera with some 31 species, many of which live in European waters.

Arctic Cod *Boreogadus saida*



Characteristics

A rather slender codfish with three dorsal fins and two anal fins, all of which are separated with large spaces. The first anal fin origin is behind the origin of the second dorsal fin. Tail fin concave. Lower jaw protruding. Lateral line not continuous, a sharp dip beneath the second dorsal fin origin and wavy thereafter.

Colour

Light brownish above, the upper sides are lighter with a yellowish tint; the belly is silvery.

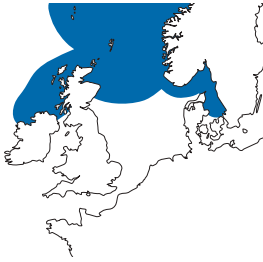
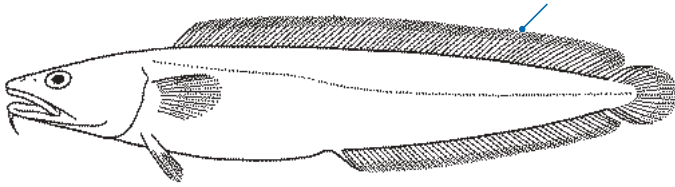
Size

Attains a length of 32 cm.

Ecology

A small Arctic cod which is commonly found in close proximity to the polar ice, both far out to sea and in inshore waters. Found in almost fresh water in river mouths. It spawns from November to February, relatively few eggs being produced by each female. Its food consists principally of crustaceans, mainly shrimps, mysids and copepods. It is an important food fish for many of the larger mammals and birds of the Arctic seas. It has also been exploited in a minor way as an industrial fish, but has potential for increased catches.

Torsk *Brosme brosme*



Characteristics

Rather heavy-bodied with a single long-based dorsal fin, and a single anal fin, both joined at their bases to the tail fin. A prominent chin barbel. The lateral line curves sharply down at the level of the vent to follow the mid-line. Scales minute, embedded in thick skin. Also known as Tusk.

Colour

Greyish-brown, lighter on the sides and ventrally; dorsal, tail and anal fins with a dark submarginal band and white edges.

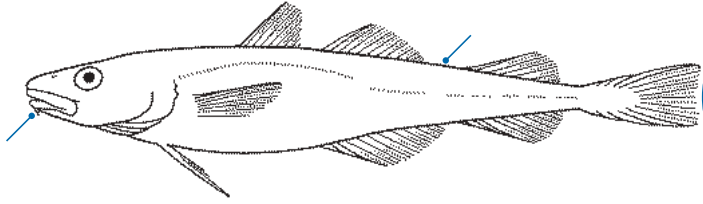
Size

Grows to a maximum length of 110 cm, and weight of 15 kg; more usually about 50 cm. British Rod-caught Record: 7.163 kg (2005, Shetland). Irish Rod-caught Record: 4.858 kg (2006, Rosguil).

Ecology

The Torsk lives in deep water mainly at depths of 200-500 m, but exceptionally from 50-100 m. It is relatively common in north-west Irish waters. It lives alone or in small schools, close to the sea bed, especially where it is rocky. Its food consists of crustaceans, molluscs, and other bottom-living fishes. It spawns at about 200 m from April to July (the later spawnings being further north). The female is very prolific and may lay between two and three million eggs, which develop close to the surface. It lives for a maximum of about 20 years. The Torsk is fished for by lines and trawl, chiefly by Norwegian and Russian boats. Mostly it is dried and salted as stock fish; less is marketed fresh or frozen.

Navaga *Eleginus navaga*



Characteristics

Moderately deep-bodied, with a short chin barbel, three dorsal and two anal fins, all well spaced out, and a square-cut tail fin. The lower jaw is slightly shorter than the upper. The lateral line is continuous only to the beginning of the second dorsal fin where it curves sharply downwards and becomes interrupted.

Colour

Back and sides grey with brownish and dark spots on the back; ventrally silvery-white. Margins of dorsal fins and tail fin white, the latter with a wedge shaped white patch.

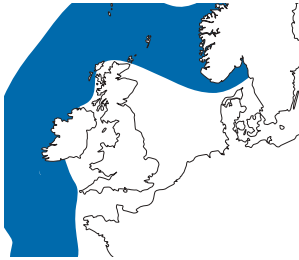
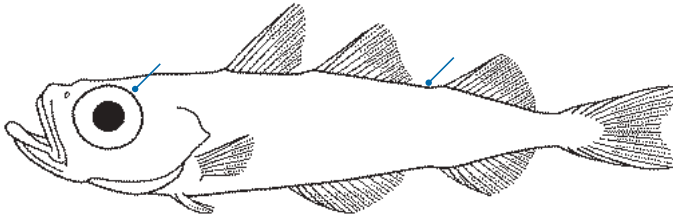
Size

Usually grows to only 35 cm but occasionally attains 42 cm in length.

Ecology

A northern codfish found only on the Arctic coasts of Europe; a relative, *E. gracilis*, is found in similar situations in the Arctic Pacific. The Navaga is found close to the ice and on the continental shelf in shallow water, occasionally entering the outer waters of estuaries. It spawns over sandy or rocky bottoms in 8-10 m, usually in January. The eggs sink to the sea bed. It feeds mainly on crustaceans and worms, but eats small fishes as well, including sticklebacks, Capelin, sandeels, and small gadoids. It is in turn eaten by a wide range of larger fishes and Arctic mammals, and the young by seabirds. It is also targetted commercially by the Russian fishing fleet.

Silvery Pout *Gadiculus argenteus*



Characteristics

A small open-sea gadoid with three dorsal and two anal fins, each with fragile fin rays and well spaced from the next. The eyes are large; the mouth is steeply angled, chin barbel absent, and the snout and forehead have clearly visible cavities under the skin. The scales are large and fragile.

Colour

Mainly dull and silvery; small dark flecks on the head.

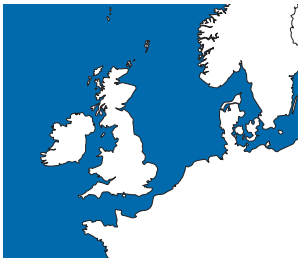
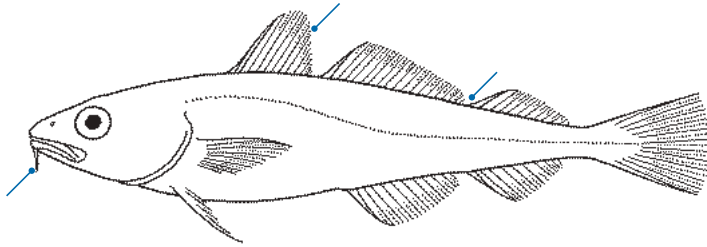
Size

Attains a maximum length of 15 cm, more commonly 13 cm.

Ecology

A deep-water, open-sea fish which is most common in depths of 200-500 m over the edge of the continental shelf. It occurs in large schools. It breeds from mid-winter to spring, later further north, the eggs and larvae being pelagic; spawning occurs in deep water. The Silvery Pout rarely lives for as much as three years. It has no particular economic importance, but it is eaten by a number of larger valuable fishes. The northern stock in the north east Atlantic is recognized as a subspecies, *G. argenteus thori*.

Cod *Gadus morhua*



Characteristics

A stout-bodied codfish, its muscular head with a fairly long chin barbel, relatively small eye, three dorsal fins all close together at the base and rounded in outline, and two anal fins. The first anal fin originates behind or beneath the interspace between first and second dorsal fins. Upper jaw overhangs the lower. Lateral line continuous, with a smooth curve above the pectoral fin. Tail square or rounded.

Colour

Background colouring variable, greenish or sandy brown with darker or lighter mottling on back and sides. White ventrally. The lateral

line is conspicuously light.

Size

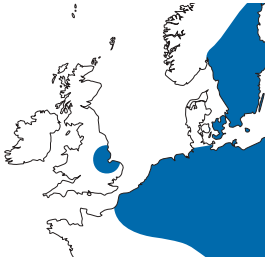
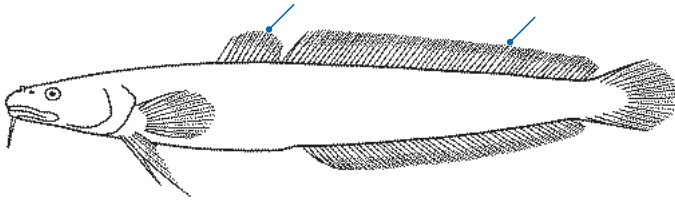
Historical records of 90 kg fish exist, but the maximum likely today is around 45 kg. Average Cod measure about 120 cm and weigh 11.3 kg. British Rod-caught Record: 26.478 kg (1992, Whitby). Irish Rod-caught Record: 19.051 kg (1921, Ballycotton).

Ecology

The Cod is widely distributed in a variety of habitats from the shoreline to well down the continental shelf, in depths of 600 m. To the south of its range it is found in shallow water only during the winter, and there, as elsewhere, it is the younger, smaller fish which live close inshore. It usually schools at least 30-80 m off the bottom, although it forages for food on the sea bed and in mid-water. The food of the Cod consists of a wide range of crustaceans, worms, brittlestars and fishes especially, among which are included Herring, sandeels, Capelin, and smaller gadoid

fishes. When young, Cod feed mainly on small crustaceans, as they also do when pelagic post-larvae. The Cod spawns from February to April in water about 200 m deep, the eggs being widely spread by currents. The adults make considerable migrations to reach the spawning grounds, for although there are numerous such grounds, the Cod in the North Atlantic exists as a number of more or less isolated populations or races. These discrete stocks could be overfished individually, even when Cod were common elsewhere. The Cod has been exploited ever since man began to fish in the seas of Europe. Its value as a prime food fish is enormous, and when salted and dried it keeps for winter use, or for export, so that its consumption is not confined to the Atlantic seaboard of Europe or North America. Many spawning stocks are now at their lowest ever and the Cod is IUCN listed as Vulnerable.

Burbot *Lota lota*



Characteristics

The only codfish living in fresh water. ling-like in appearance with the typical cod-family chin barbel, and nostrils with raised rims. Two dorsal fins, the first short and rounded in outline, the second long; a single anal fin. Scales small and embedded.

Colour

Dull greeny-brown above with pronounced darker mottling, the blotches extending on to the sides. Yellowish ventrally.

Size

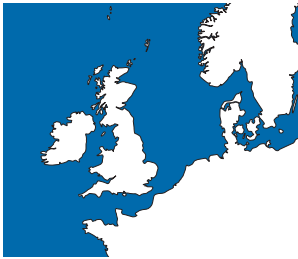
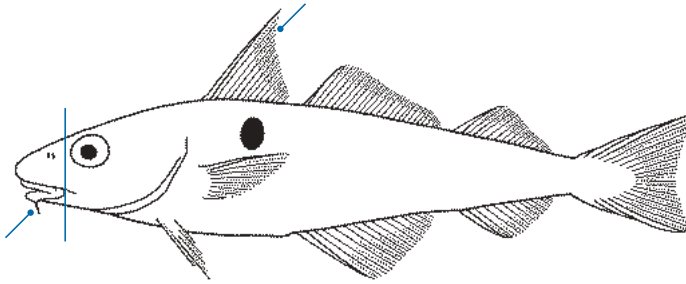
Attains 1.5 m, most commonly about 51 cm.

Ecology

The Burbot inhabits the lowland reaches of rivers and lakes in their flood plains. It is found in brackish conditions in the Baltic Sea. Its life style is sedentary, usually hiding among tree roots or in crevices, under the bank or among the roots of water plants by day, and being most active in the early evening and at dawn. Young fish eat invertebrates, chiefly bottom-

living insect larvae, crustaceans, and leeches; adult Burbot eat large quantities of fish as well as crustaceans and insects. The Burbot spawns in winter (December to March); the females release up to 3 million eggs. The eggs fall to the bottom and develop among the gravel of the spawning bed. The Burbot is occasionally caught by anglers in continental Europe; it is also locally fished for as food, as its flesh is of fine quality and the liver is especially valued. The Burbot was moderately abundant in the fens and rivers between Yorkshire and Cambridgeshire, but it had become extinct in England by the early 1970s. The burbot is a UK BAP Priority species and its keeping or release are prohibited, except under licence; but there are plans to attempt its reintroduction.

Haddock *Melanogrammus aeglefinus*



Size

Attains a maximum length of 76 cm and a weight of 4.53 kg, although the usual commercial length is between 38-63 cm. The largest recorded was caught off Iceland; it was 112 cm and weighed nearly 16.76 kg. British Rod-caught Record: 6.215 kg (1978, Falmouth). Irish Rod-caught Record: 4.945 kg (1964, Kinsale).

Characteristics

Three dorsal fins, two anal; the first dorsal is triangular in shape with long fin rays. Head relatively small, eye moderately large, small chin barbel, very short jaws with the lower jaw distinctly shorter than the upper.

Colour

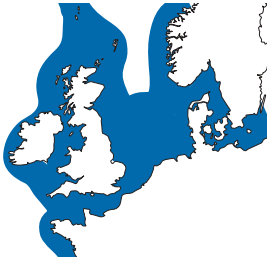
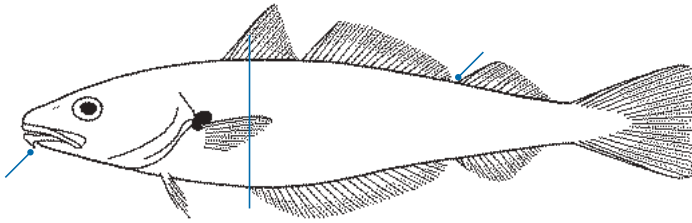
Dark greenish-brown on the back, greyish-silver on the sides, white ventrally. A conspicuous rounded black blotch between the pectoral base and the lateral line; the lateral line is black. Leucistic "Golden Haddock" are seen from time to time.

Ecology

The Haddock lives close to the sea bed in depths of 40-300 m; it feeds almost exclusively on bottom-living animals, chiefly brittlestars, worms, and molluscs. Occasionally it eats small fishes (Capelin and sandeels) and also herring eggs. The larval and postlarval Haddock feed on copepods and their larvae, and later on small crustaceans. Haddock spawn between February and June, but mostly in March and April. The eggs are buoyant and spherical, 1.2-1.7 mm in diameter, and float at or near the surface. The fry are pelagic and are frequently found accompanying large jellyfishes.

Young Haddock begin to live close to the bottom at a length of about 5 cm. To some extent this is a migratory fish; in the north of its range it is found in inshore shallow waters during the summer and retires to deep water in winter. In the warmer, southern end of its range, the reverse is true. Haddock may enjoy favourable years when survival of the larvae and fry is particularly good, and a strong year class is established, which results in great abundance often followed by an apparent extension of the range. The Haddock is an important commercial fish throughout the North Atlantic. It is marketed fresh, smoked, or frozen. The Haddock is IUCN listed as Vulnerable.

Whiting *Merlangius merlangus*



Characteristics

A slender-bodied codfish with a narrow rather pointed head; the upper jaw is just longer than the lower. Three dorsal fins, all closely joined at their bases; two anal fins, the first long, its origin beneath the middle of the first dorsal base. Medium to large fish are without a chin barbel; a minute barbel is present in young fish.

Colour

The back is sandy to greeny-blue, the sides and belly are conspicuously white, silvery when alive. A distinct black spot at the upper base of the pectoral fin.

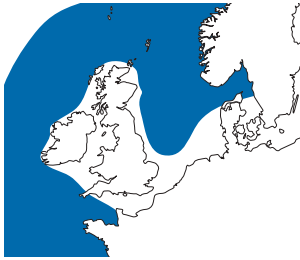
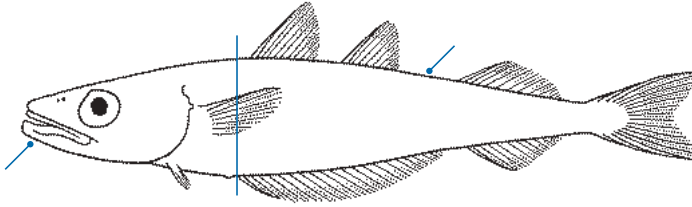
Size

Usually around 30-40 cm, but occasionally reaches a length of 70 cm. Attains a weight of 3 kg. British Rod-caught Record: 3.061 kg (1981, Falmouth). Irish Rod-caught Record: 2.226 kg (1981, Kenmare Bay).

Ecology

The Whiting is a very common fish in shallow inshore waters. It is most abundant between 30 and 100 m, exceptionally down to 200 m. It lives both in mid-water in these depths and inhabits sandy as well as muddy bottoms. The smallest fish are found close inshore. Young Whiting of 3 cm are often found sheltering amongst the tentacles of live jellyfishes. Adults feed on small fishes especially sandeels, young Herring and Sprat, young gadoids, shrimps, and other crustaceans. The young fish eat more crustaceans than fishes. The Whiting breeds between January and July, but mostly in spring, in shallow water, and without making extensive migrations. The Whiting is a valuable food fish which is extensively fished in European seas. It also forms an important constituent of the diet of other, larger fishes and seabirds. The Black Sea population is recognized as a subspecies, *M. m. euxinus*.

Blue Whiting *Micromesistius poutassou*



Characteristics

A slender-bodied codfish with three dorsal fins all separated by long gaps, and two anal fins, the first of which is very long-based, its origin in front of the first dorsal fin origin. The head is pointed, and the lower jaw is slightly longer than the upper. No chin barbel.

Colour

Back blue, sides and belly silvery-white. The back fades to grey soon after death.

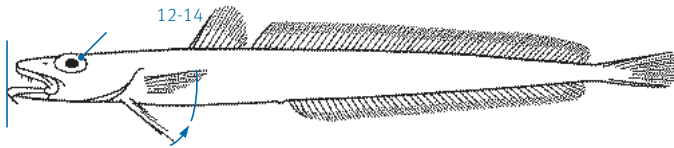
Size

Attains 45 cm in length, more usually around 35 cm. British Rod-caught Record: 793 g (1997, Loch Fyne).

Ecology

The Blue Whiting is an oceanic fish living mainly in midwater over the edge of the continental shelf. It is most abundant 100-300 m below the surface in depths of 1,000 m or more. Occasionally it is captured in shallow inshore water. Its food consists mainly of crustaceans, but small fishes are eaten also. It is an important food fish for many larger fishes such as Ling, Cod, Hake, Opah, and deep-water sharks. It is fished commercially for processing as fish meal, and is potentially an important economic fish, the full value of which has yet to be attained.

Blue Ling *Molva dypterygia*



Characteristics

Body very long and slender. A rather short barbel on the chin, and the lower jaw protrudes beyond the upper; eye large, nearly equal to snout length. The pelvic fins are moderately short and do not extend beyond the tips of the pectorals. First dorsal fin rounded but short-based (with 12-15 rays); second dorsal and anal fins long-based and low.

Colour

Plain greenish-brown above, lighter ventrally; dusky patches at the ends of the second dorsal and anal fins, the fin edges pale.

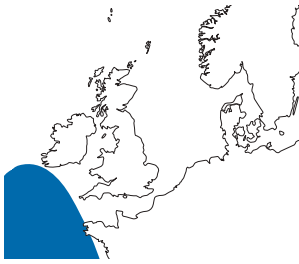
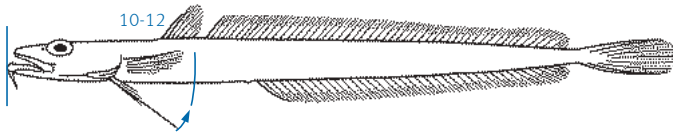
Size

Attains a maximum length of 1.5 m, and a probable maximum weight of 17 kg.

Ecology

The Blue Ling is a deep-water species which generally lives at greater depths than its relative, the Ling, although occasionally the two species are caught together. It is most abundant between 350 and 550 m, but is found down to 1,000 m. It spawns in the deeper part of this bathymetric range, but is slow-growing, taking 5-6 years to attain sexual maturity. Spawning takes place from April-May. It is exploited commercially on a small scale, especially by Scandinavian and Icelandic vessels; and is caught mainly on long lines. Occasionally it is taken by trawling in deep water. Its flesh is palatable and is marketed fresh as well as salted.

Spanish Ling *Molva macrophthalma*



Characteristics

Elongate, the body long and slender. A rather short barbel on the chin, and the lower jaw projects forward and beyond the upper; eye large, almost as long as snout length. Almost identical to the Blue Ling, except that the pelvic fins are very long and continue well beyond the tips of the pectoral fins, and the first dorsal fin is short-based and rounded with 10-12 rays.

Colour

The back and upper sides are greenish-brown, the belly silvery-yellow. The dorsal, anal and tail fins are greyish with light blue edges; the pelvic fins are blue.

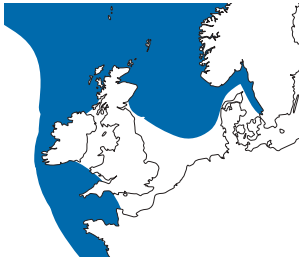
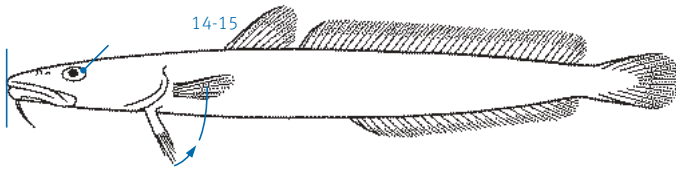
Size

Attains a length of ca 90 cm and a weight of around 7 kg.

Ecology

This ling is the only species to be found off southern Europe and reaches the limit of its northern distribution off southern Ireland, being rare further north. It is a deep-water fish, living in 200-1,000 m, usually over muddy bottoms. It spawns along the edge of the continental shelf in deep water. Its biology is little known. In the Mediterranean and off the Spanish coast, where it is common, the Spanish Ling is fairly important commercially. Some authorities consider the Blue Ling and Spanish Ling to be two subspecies *Molva dypterygia dypterygia* and *M.d. macrophthalma* respectively of the same species.

Ling *Molva molva*



Characteristics

A long-bodied cod-like fish with a single barbel on the chin, two dorsal fins (the first short-based and rounded in outline with 14-15 rays, the second long and of even height) and a single anal fin. The upper jaw is longer than the lower, the eye is moderately small (about 1.5 times in the snout length), and the pelvic fins are short and do not reach as far back as the pectoral fins.

Colour

Dull brownish-green and mottled on the back, lighter below; a dark spot on the hind edge of the first dorsal fin, similar but fainter spots on the second dorsal and anal fins; the edges of these fins light in colour.

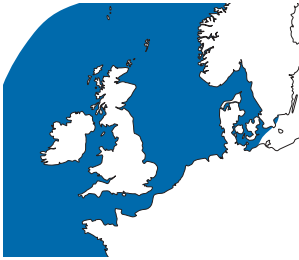
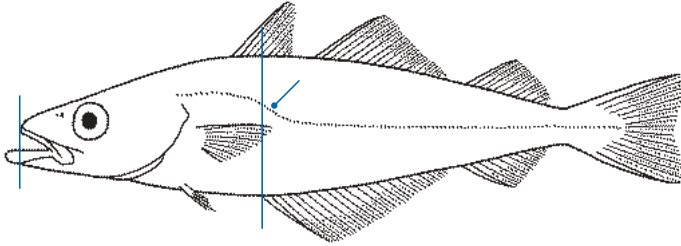
Size

Attains a length of 2 m and a weight of 40 kg; usually 1-1.5 m in inshore waters. British Rod-caught Record: 26.987 kg (1989, Bridlington). Irish Rod-caught Record: 24.948 kg (2004, Cork Harbour).

Ecology

The Ling is essentially a deep-water fish occurring most abundantly at 100-400 m depth, although large numbers live in shallower water where the bottom is suitable, on open ocean coasts. It is most common on rocky grounds, but also colonizes the numerous wrecks found in inshore waters. Its food is mainly fishes, including Norway Pout, Cod, and Blue Whiting, but it eats numerous larger crustaceans. It breeds between March and July, most of the spawning grounds lying to the west and north of Britain and Ireland. A single female may produce up to 60 million eggs which float at the surface while they develop. Ling are mainly caught on lines, both by commercial fishermen and anglers; few are captured in trawls. It is a valuable commercial fish especially in northern European countries. Some of the catch is marketed fresh, a little is smoked, but most is salted and dried for local consumption and export to southern Europe.

Pollack *Pollachius pollachius*



Characteristics

Typical of the cod family in body form, with three dorsal fins and two anal fins, the first of which is long and originates beneath the first dorsal fin. The lower jaw upturned and protruding beyond the upper; there is no chin barbel. Lateral line with a sharp curve over the pectoral fin, dipping to the mid-line posteriorly. Gill rakers on the first gill arch, 25-28.

Colour

Dark brownish-green on the back, shading to yellowish-green on the sides, white beneath. The lateral line is dark. Young are patterned yellow and blue.

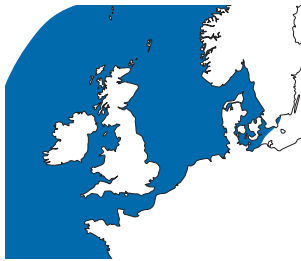
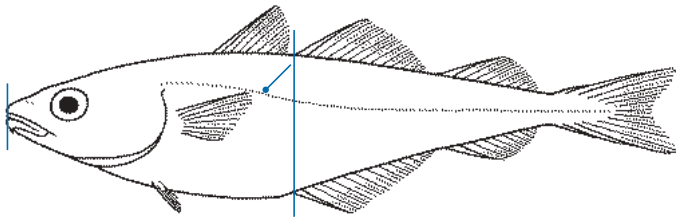
Size

Attains a length of 130 cm and a weight of up to 18 kg. Usually around 50 cm and 4 kg. British Rod-caught Record: 13.267 kg (1987, Dungeness). Irish Rod-caught Record: 8.704 kg (1904, Ballycotton).

Ecology

The Pollack is widely distributed in European waters, particularly in inshore areas. Large fish are most abundant near rocks or on rough ground, swimming in schools; smaller specimens tend to be less restricted and occur over sandy shores and even in estuaries. Its depth range is from the surface to 200 m. It feeds mainly on fishes, attacking shoals of sandeels, clupeids and other small fish from below, and on large numbers of crustaceans. The young eat crustaceans. It spawns between January and April in deep water at 100-200 m; the eggs and larvae are pelagic and drift shorewards. Young of the first year are particularly common close inshore and may be found among kelp forests. Pollack are caught by nets, but more are captured on lines or are taken by anglers. Their flesh is dry, rather coloured, but edible.

Saithe *Pollachius virens*



Characteristics

Similar to the Pollack in build and number of fins; the first anal fin originates beneath the space between first and second dorsal fins. The jaws are equal in young fish; the lower jaw protrudes slightly in adults, which also lack the chin barbel (it is minute in the young). The lateral line is straight from gill cover to tail. 35-40 gill rakers on the first gill arch. Few other fishes have as many widely-used names: Coalfish, Coley, Billet, Black Pollack, and Glassan or Glosshan are samples. In North America this fish is called the Pollock.

Colour

Very dark green on the back and upper sides, sharply giving way to dull silvery sides and belly. The lateral line is creamy coloured.

Size

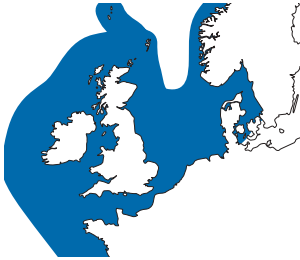
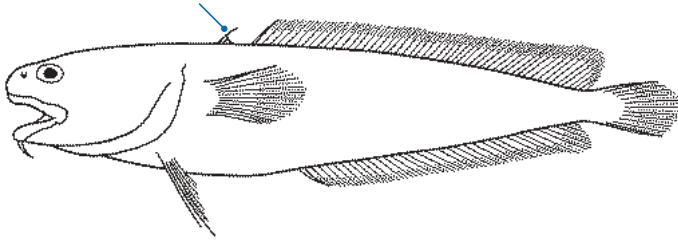
Grows to 130 cm, and 22 kg in weight. Mostly captured at around 70-80 cm. British Rod-caught Record: 16.923 kg (1986, Eddystone). Irish Rod-caught Record: 15.1 kg (2003, Castletownshend).

Ecology

A northern species the Saithe is widely distributed in the North Atlantic, living in large schools near the surface and in mid-water at depths of 200-250 m. From Scotland northwards the young fish are particularly abundant in inshore waters; in their first year they may be found in intertidal pools, and in their second close to the shoreline. These young feed on small crustaceans and fishes, especially sandeels, Herring, and Capelin (in the north). Larger Saithe feed almost entirely

on fishes, especially members of the cod and herring families. Saithe spawn from January to April in depths of 100-200 m. The eggs and larvae drift near the surface and are carried from the deep-water spawning grounds to the shallower nursery areas. This is a very important commercial fish, caught mainly by Scandinavian, German, and Russian vessels, in trawls and seines. The catch is sold fresh, frozen, smoked, and even dried and salted. It is also taken in some numbers by anglers.

Tadpole Fish *Raniceps raninus*



Characteristics

Stout-bodied and broad-headed, the head about as broad as it is long; a small barbel on the chin. The first dorsal fin minute (3 small rays), the second dorsal and anal fins long-based.

Colour

Uniform dark above, varying from leaden brown to liver-coloured; the mouth and lips are white, the edges of the fins light in colour. Ventrally greyish.

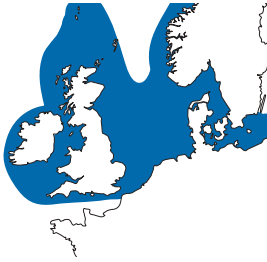
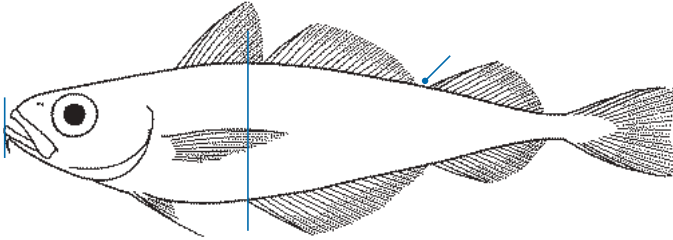
Size

Attains a maximum length of 30 cm, mostly around 15 cm. British Rod-caught Record: 630 g (2003, Tynemouth).

Ecology

A small, solitary and secretive bottom-living fish found in shallow water, in the region immediately below tide marks in the north, usually somewhat deeper to the south, and down to 100 m. It is most common among algae-covered rocks, but is also captured over sandy and muddy bottoms. It can spend much of its time in small caves and is probably little-recorded rather than rare; but its distribution appears to be sporadic. Its food is composed mainly of shrimps and sometimes small fishes and worms. It spawns in late summer and early autumn, usually inshore. The eggs are small and pelagic as are the larvae; the young live on the sea bed from a length of about 2 cm.

Norway Pout *Trisopterus esmarkii*



Characteristics

A small codfish with three dorsal fins and two anal fins; the latter fins touch at the base but the dorsals have small interspaces. The first rays of the anal fin are beneath the last rays of the first dorsal. The lower jaw is slightly longer than the upper; eye diameter slightly longer than snout; chin barbel short and rather thin. About 33-43 gill rakers on the first gill arch.

Colour

Back yellowish-brown shading to silvery white beneath. A small dusky spot on the upper edge of the pectoral fin base.

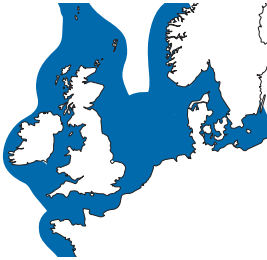
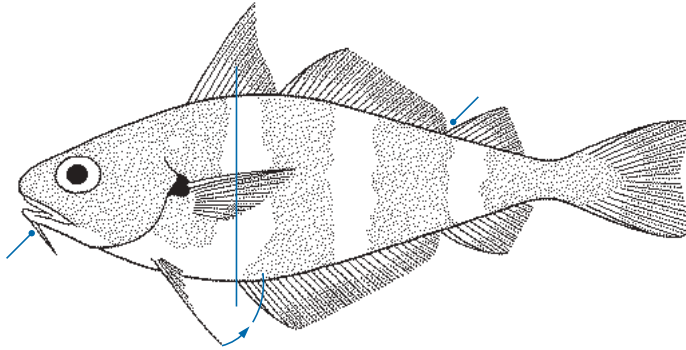
Size

Attains a maximum length of 25 cm, more usually between 13 and 19 cm.

Ecology

An extremely common small gadoid in northern European waters; it is most common offshore in depths of 80-200 m, although it also occurs in numbers in shallower waters to 40 m, especially in the north. It spawns in deep water over the edge of the continental shelf mainly from March to May. Sexual maturity is reached at the end of the first (rarely) or second year. It feeds mainly in the daytime on crustaceans and fishes. Because it is abundant, it is an important link in the food chains of the sea both as predator, and as prey for fishes, cetaceans, and many seabirds. It is too small for human food, but is used extensively for fish meal to feed farm animals and fish in farms.

Bib *Trisopterus luscus*



Characteristics

A moderately large, deep-bodied codfish with three dorsal fins the first of which is high, and two anal fins, the bases of which all overlap. The origin of the anal fin is well forward under the middle of the first dorsal fin. The chin barbel is long, the eye diameter equals the snout length, and the pelvic fins are long, reaching back to beyond the vent. About 14-22 gill rakers on the first gill arch. This fish is also known as Pout or Pouting.

Colour

Back a beautiful coppery-brown, yellowish on the sides and white beneath. Four or five darker broad vertical bands over the sides, which are usually lost after death. A conspicuous black spot at the base of the pectoral fin.

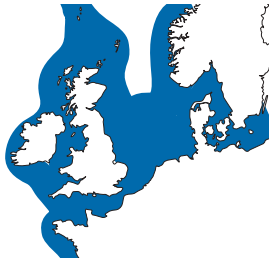
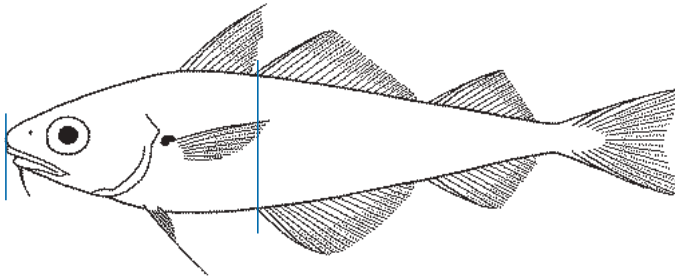
Size

Attains a length of about 45 cm, more commonly between 20 and 32 cm. Maximum weight attained about 2.5 kg. British Rod-caught Record: 2.494 kg (1969, Devon). Irish Rod-caught Record: 2.197 kg (1983, Kilmore Quay).

Ecology

A very common fish in inshore waters, particularly in rocky areas where large schools form about reefs or wrecks. Small Bib are very abundant in shallow water over sand. Its depth range extends from about 3 to 300 m, the largest fish living at the greatest depths. It spawns in moderately shallow water from March to April. Its food consists mainly of crustaceans, particularly shrimps, small squids, and fishes. It is not greatly exploited, its flesh being soft and spoiling quickly, but it is fished for locally. Quantities of young fish are caught to process into fish meal; larger ones are caught by anglers.

Poor Cod *Trisopterus minutus*



Characteristics

A small codfish with three dorsal fins and two anal fins all touching at their bases or very close. The origin of the first anal fin is beneath the space between the first and second dorsal fins or anterior to it. The upper jaw overlaps the lower; the eye diameter equals the snout in length. Chin barbel long; three-quarters or more of eye diameter. About 25-32 gill rakers on the first gill arch.

Colour

Back yellowish-brown, the sides lighter - even coppery coloured; the belly is silvery grey. Upper base of the pectoral fin with a small black spot.

Size

Usually measures from 15-20 cm, exceptionally reaching 26 cm. British Rod-caught Record: 358 g (2003, Torquay).

Ecology

The Poor Cod is extremely abundant in coastal waters of 20-300 m, although it is not so common close inshore as its relative the Bib. It occurs in schools, close to the bottom and in mid-water. It spawns in winter and spring (the latter further north) usually in depths of 50-100 m. It feeds on crustaceans of various kinds, but the larger ones also eat small fishes. The Poor Cod is too small to be fished for as a food fish, but is caught in great quantities for processing as fish meal. It is also a frequent food fish for larger fishes and small cetaceans, such as dolphins. The Mediterranean is inhabited by the subspecies *T. minutus capelanus*.

Order:

Ophidiiformes

Cusk-eels

In this order, the bases of the dorsal and anal fins are very long, extending to and normally joined with the tail fin. Worldwide, there are five families with 100 genera and some 385 known species, with several species undescribed.

In this order:

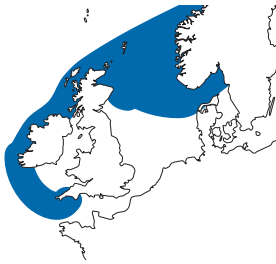
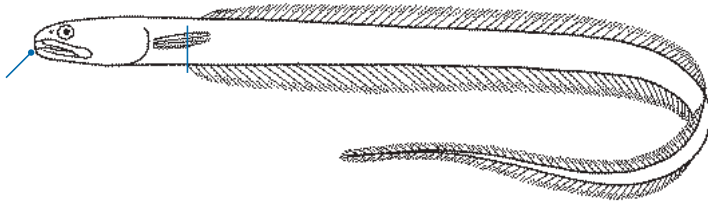


Pearlfish

Family: Pearlfishes *Carapidae*

The Carapidae is small family of scaleless slender-bodied fishes, few exceeding 25 cm in length, but found worldwide in tropical and temperate seas. Many of the species whose biology is known live in association with invertebrate hosts, taking refuge within the body cavity of sea-cucumbers, tunicates, sea-urchins, and clams. Occasionally specimens are found 'fossilized' within the nacrous layers of the clam's shell. Pearlfishes pass through an extended larval life during which they are pelagic, the very elongate larva having a long-lobed filament from the front of the dorsal fin. There are seven genera with 31 species but only one species occurs in northern European waters; others are known from the Mediterranean.

Pearlfish *Echiodon drummondii*



Characteristics

The very elongate shape is characteristic, as is the absence of pelvic fins, and the placement of the vent on the throat. The anal fin is longer and better developed than the dorsal fin. The mouth is large, and there is a pair of fang-like teeth in the front of each jaw.

Colour

A pale pink with tints of silver on the body and gill covers, dark mottling faintly along the dorsal fin and tail.

Size

Attains a maximum length of 32 cm.

Ecology

The biology of this fish is little known. It is evidently widely distributed, but only locally common in deep water on the lower continental shelf at 140-275 m. It has been captured on fishing grounds where the sea-cucumber, *Parastichopus tremulus*, is common and may live in semi-parasitic association with it; on the other hand, many

specimens of the holothurian have been examined without revealing a single Pearlfish; consequently it is probably free-living. Many small crustaceans have also been found in the gut of Pearlfish, so it evidently catches active prey as well as any parasitic feeding. The early planktonic larvae are relatively common in northern European waters.

Order:

Lophiiformes

Anglerfishes

Members of this order are characterised by having the first ray of the dorsal fin modified to form a 'line and bait' to attract prey to the mouth. There are 18 families, with some 66 genera and 313 species worldwide.

In this order:



Black-bellied Angler



Angler



Atlantic Footballfish

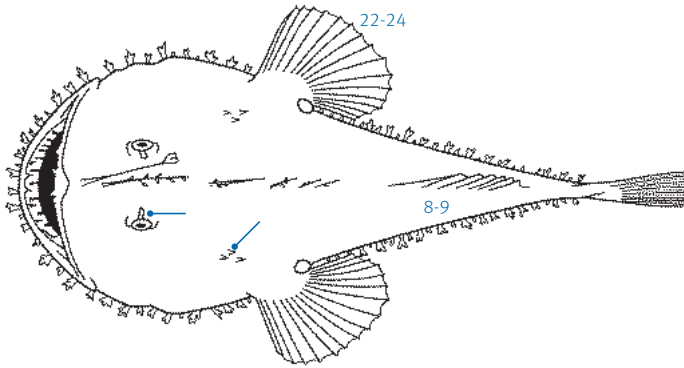


Deep Sea Angler

Family: Anglers *Lophiidae*

Angler fish are so-called because they possess a fishing lure at the tip of a specially modified dorsal ray with which they can entice prey close to their capacious jaws. All angler fish have huge wide jaws with well-developed teeth in a flattened head, loose scaleless skin, rather small fins and generally bizarre body form. They are all marine fishes, some of them inhabiting the deep-sea. They are also known as goosefishes. There are four genera with some 25 species, two of which have been recorded around Britain and Ireland.

Black-bellied Angler *Lophius budegassa*



Characteristics

Similar externally to the more common Angler, but always with three fairly large points on the spine above the gill opening, and a small fleshy flap above the upper edge of the eye. Second dorsal fin with 8-9 rays; anal fin with 8-9 rays; pectoral rays 22-24; vertebrae 25-26.

Colour

Usually light sandy brown above and dead white ventrally; the colour of the back is very variable. The inner face of the pelvic fins is white, in the largest specimens pale grey. Underside of pectoral fins white with a yellow band towards the tip. The lining of the body cavity is black and this shows through the belly skin as dull grey.

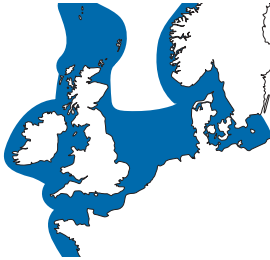
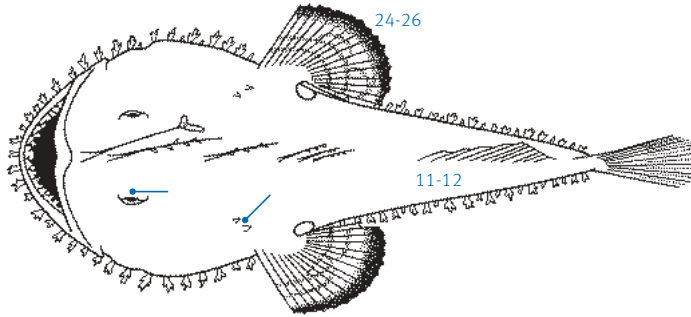
Size

Attains a total length of 100 cm.

Ecology

This is a bottom-living fish which is usually found on sandy bottoms between 100 and 600 m, although occasionally it is caught in shallower water. It breeds, in the Mediterranean, in autumn and winter, the larvae and postlarvae being planktonic and common through to spring. It feeds in a similar manner to the more common Angler fish, but there is little recorded on details of its diet. This species has only recently been recognized in northern European waters and is little known.

Angler *Lophius piscatorius*



Characteristics

The broad, rather flattened head, short, rather thickset tail, and the very large mouth with long teeth are distinctive. First rays of the dorsal fin separate and elongate. There are two (sometimes three) points to the spine above the gill opening; there is no skin flap on the upper edge of the eye. Second dorsal fin rays 11-12; anal rays 9-10; pectoral rays 24-26; vertebrae 29-30.

Colour

Very variable on the back, ranging from reddish-brown to greeny-grey with irregular markings. Ventrally, dead white with distinct black edges to the pelvic fins and dusky pectoral and anal edges.

Size

Attains a maximum length of 2 m and a weight of ca 58 kg. Specimens in excess of 1.2 m are uncommon. British & Irish Rod-caught Record: 42.985 kg (1985, Belfast Lough).

Ecology

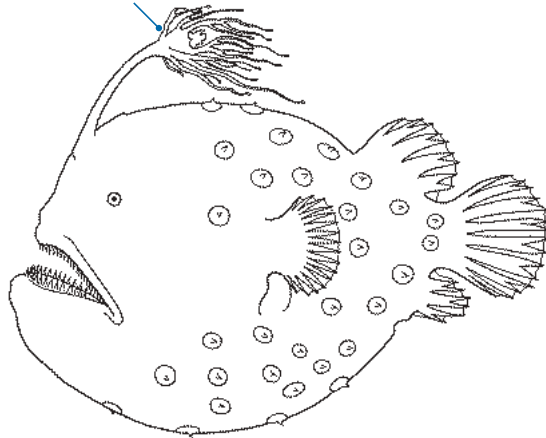
A common, bottom-living fish from 2-3 m below tide mark down to 550 m, although it is most common below 18 m. It lives on sandy, shell, or gravel bottoms and is found less abundantly on muddy or rough grounds. The angler fish feeds on a wide range of smaller fishes, mostly associated with the sea bed, which have been enticed close to its mouth by delicate movements of its fishing lure. Spawning takes place in spring and early

summer over deep water offshore. The eggs are shed in ribbon-like gelatinous sheets which may be as much as 9 m long and 90 cm wide. The eggs are carried within this sheet in a single, or occasionally double, layer. They hatch when the larvae are about 4.5 mm long. A little later the larvae are free-swimming with most remarkable elongation of the fin rays. These gradually shorten comparative to the growth of the body. The young fish live on the sea bed when they are about 8 cm in length. A considerable market for the Angler Fish has developed in recent years. They are beheaded, skinned and the fleshy tails marketed as Monk. They have tasty flesh, if rather fibrous, and reminiscent of crustacean meat.

Family: Footballfishes *Himantolophidae*

These are all unusual-looking rounded fish, with a blunt short snout, short fins, pelvic fins absent, and numerous bony plates on the skin, each with a single spine. There is just one genus with some 18 species, only one of which occurs in northern European waters.

Atlantic Footballfish *Himantolophus groenlandicus*



Characteristics

A moderately large, almost spherical-bodied angler with the skin is mostly smooth but studded with large spines which have broad bases. On the snout a thick fishing rod ends in a massive lure with a short bulb-like organ in the centre and long tentacles around it. Dorsal, anal, and tail fins with stout, relatively short rays.

Colour

Deep brown to jet black; the tips of the lure tentacles and the central bulb shining white.

Size

Females attain 61 cm in length, males do not exceed 4 cm.

Ecology

Occasionally captured on the deeper fishing grounds of the European Atlantic. Like the other deep-sea anglers, this is a mid-water fish preying on a range of animals that are attracted to its luminous lure. The adults live at 100-300 m; the young have been caught near the surface and at depths of 3000 m. Unlike some deep sea anglers the dwarf male is free-living. It is sparsely distributed in all oceans.

Family: Deep-sea Anglers *Ceratiidae*

The females of fish in this family all have unusual fleshy appendages in front of the dorsal fin, modified originally from the first two or three rays of that fin. There are two genera with four species worldwide – only one of these is known from northern European waters.

Deep Sea Angler *Ceratias holboelli*



Female



Characteristics

A large, gross, flabby-skinned angler, the skin densely covered in sharp, pointed bony spines giving it a rasp-like feel. Adult females have a small eye and a long fishing ray rising on the head. The dorsal, anal and tail fin rays are very thick and fleshy; there are 4 rays only in the two former fins. Adult males have much reduced fins and are found attached to the females.

Colour

Dark brown to black, the skin is often abraded leaving grey patches.

Size

Females grow to 120 cm, though much of this is the long tail; males to 6 cm.

Ecology

This, the largest deep-sea angler, is occasionally captured on the deeper fishing grounds of the northeast Atlantic, in depths of 100-1000 m. Its biology is little known. Larval stages are pelagic round-bodied fishes with loose skin, but the males never grow large and as sub-adults attach themselves by their jaws to a maturing female. Eventually the male becomes parasitic on the female, their vascular system uniting so that the male is nourished by its mate. They are sparsely distributed in all oceans.

Order:

Mugiliformes

*Mullet*s

Only one family is included in this order.

In this order:



Thick-lipped Grey Mullet



Golden Grey Mullet



Thin-lipped Grey Mullet

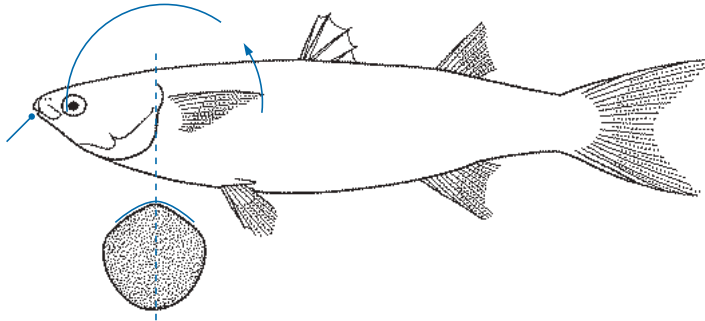


Flathead Grey Mullet

Family: Grey Mulletts *Mugilidae*

The Grey Mulletts are mainly marine fishes found in all tropical and temperate seas, and in many tropical areas in fresh water. In temperate zones (as in northern Europe), they are attracted to estuaries and are sometimes found there in fresh water. The numerous species are closely similar in appearance having a torpedo-shaped body, rather broad wide head, two dorsal fins - the first having four spines, and large scales. Most species feed on the rich organic layer at the surface of the bottom mud, but some browse the filamentous algae on rocks and pier pilings. They have a thick-walled gizzard-like stomach and a very long intestine, both adaptations to their nourishment-poor diet. There are some 17 genera with about 72 species worldwide. Four species only occur in northern European waters.

Thick-lipped Grey Mullet *Chelon labrosus*



Characteristics

Typical of the grey mulletts in its body shape with a short-based, four-spined dorsal fin. The edge of the eye is only slightly covered with clear adipose tissue, which may reach the iris but never covers it; the upper lip is broad (its depth more than half eye diameter), the lower part with coarse papillae and

close-packed small teeth, preorbital bone (at corner of mouth) has a right angle and the rear edge is finely toothed. Underside of lower jaw with narrow midline space. Pectoral fin when folded forward reaches beyond the pupil of the eye.

Colour

Dark green or blue-grey above, with silvery sides striped with 6-7 lengthwise grey bands, white ventrally. Juveniles may show golden patches on the operculum. Ventral fins white except for the anal fin which is dusky.

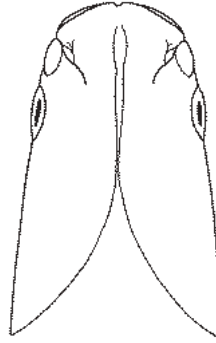
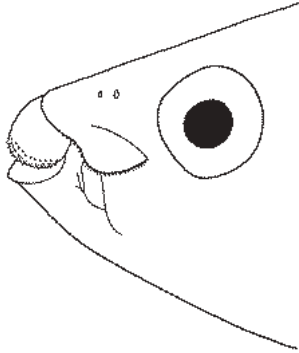
Size

Attains a length of 75 cm and a weight of ca 6.5 kg. British Rod-caught Record: 6.427 kg (1979, Glamorgan). Irish Rod-caught Record: 4.128 kg (1993, Cork Harbour).

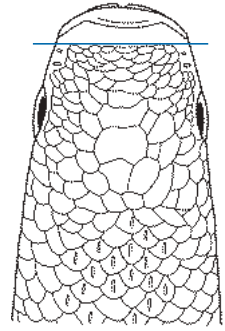
Ecology

A common inhabitant of all European coastal waters except the most northern. To some extent migratory, moving north with summer warming of the sea and south before winter. It is particularly common close inshore in harbour mouths, estuaries, in sandy bays, and in the channels of saltings; in calm water it can be seen cruising in schools at the surface with its snout almost breaking through.

Continued: Thick-lipped Grey Mullet *Chelon labrosus*



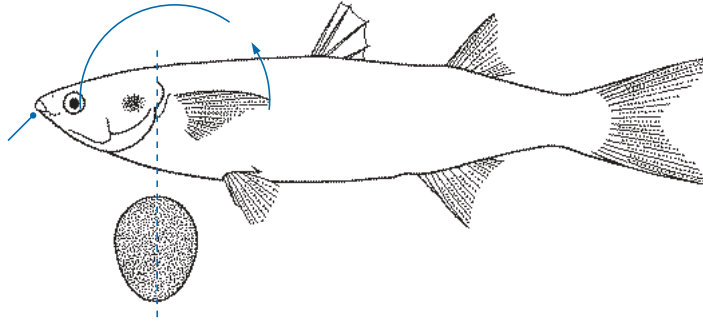
Underside of head



Top of head

It feeds on the rich organic material on the sea bed, gulping in mouthfuls of surface mud and algae, rejecting the greater part of the indigestible mud through the gills and swallowing the plant matter, nematode worms, copepods, and other animals with a good mixture of sand. Large Thick-lipped Grey Mullet also feed on molluscs and small crustaceans. This species is of some value to the fisheries of northern Europe, as it is in the Mediterranean. It is also a good sport fish even if hard to hook and capture.

Golden Grey Mullet *Liza aurata*



Characteristics

The body shape is more rounded and slender than the Thick-lipped Grey Mullet, with a narrower upper lip (its depth less than half eye-diameter) and adipose eyelid very narrow. Teeth on edge of upper lip moderately large; preorbital bone (at corner of mouth) finely toothed and pointed. Snout scaled only as far as the rear nostrils. The pectoral fin, when folded forward, covers the rear edge of the eye.

Colour

Grey-blue above, silvery on sides, often with a golden tint, with grey length-wise stripes; a conspicuous golden spot on the cheek and gill cover. Anal fin light; no spot at pectoral fin base.

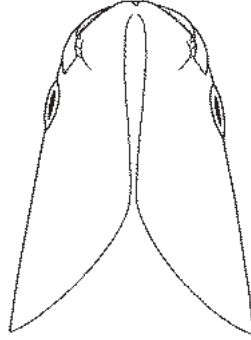
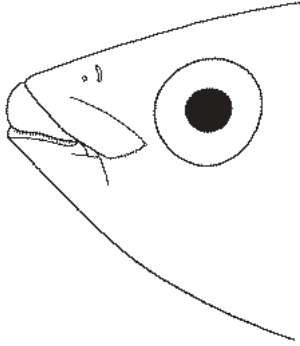
Size

Attains 50 cm in length and up to 1.4 kg in weight. British Rod-caught Record: 1.601 kg (2005, Christchurch). Irish Rod-caught Record: 1.191 kg (2006, Cork Harbour).

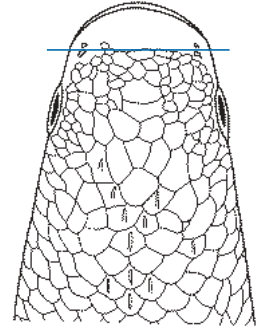
Ecology

This is probably the least abundant of northern European grey mullets, although it is by no means rare in the English Channel and on the south-west coasts of Britain and Ireland. It enters harbours and river mouths, but only rarely moves into fresh water. Its biology has not been studied in northern waters; its diet is composed of algae and bottom detritus.

Continued: Golden Grey Mullet *Liza aurata*

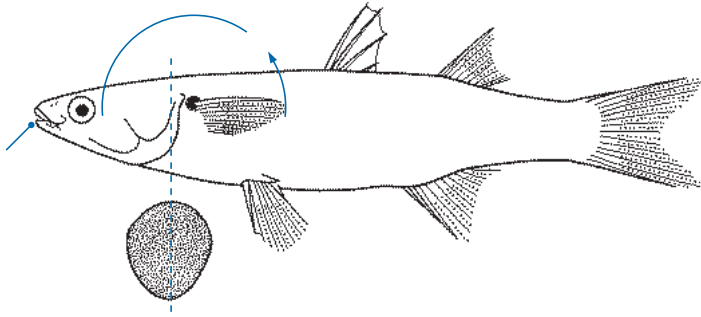


Underside of head



Top of head

Thin-lipped Grey Mullet *Liza ramada*



Characteristics

Typical grey mullet body shape with a narrow upper lip (its depth less than half eye-diameter) and a narrow adipose eyelid. Teeth on edge of upper lip minute and bristle-like; preorbital bone coarsely toothed and rounded. Underside of lower jaw with wide midline space. Pectoral fin short and does not reach eye if folded forwards.

Colour

Grey-blue above, silvery on sides with faint grey stripes running length-wise; white ventrally. Anal fin dusky; a dark spot at the base of the pectoral fin.

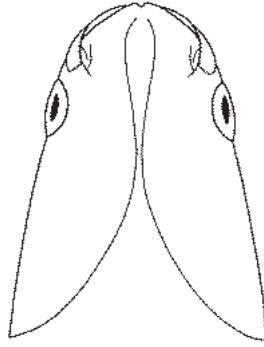
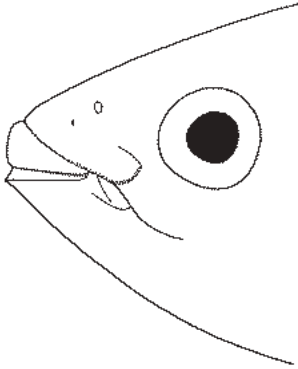
Size

Attains a length of 60 cm and a weight of ca 3.5 kg. British Rod-caught Record: 3.175 kg (1991, Oulton Broad).

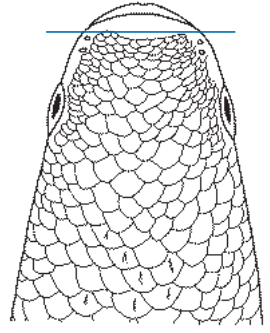
Ecology

The Thin-lipped Grey Mullet is moderately common on the Biscay coast of France, is uncommon and mainly a summer migrant on the Channel coasts, and is rare north of this with the exception of southern Ireland. This species stays close to the shore, enters lagoons and estuaries, and will penetrate well into the fresh waters of rivers. It is the most abundant grey mullet in fresh water in northern Europe. It is also migratory with the seasons. It spawns in the sea and has been proved to spawn on occasions as far north as southern England. Its biology is largely unknown, but is likely to be similar to that of the other mullets.

Continued: Thin-lipped Grey Mullet *Liza ramada*

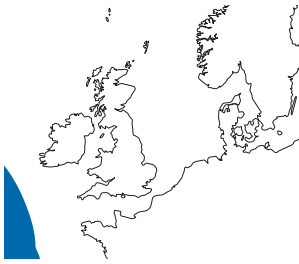
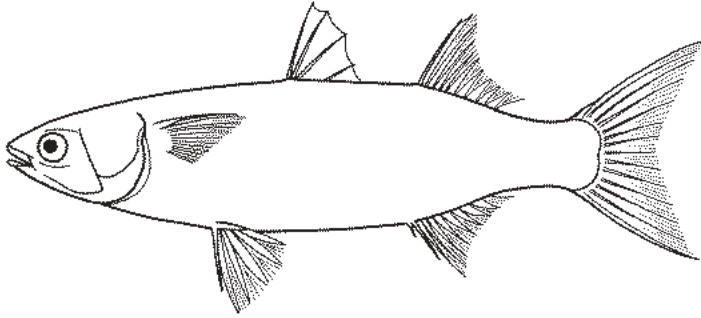


Underside of head



Top of head

Flathead Grey Mullet *Mugil cephalus*



Characteristics

Robust and broad-headed with a thick, soft, transparent adipose eyelid well developed, covering eye to pupil. Preorbital bone shorter than upper jaw. Underside of lower jaw with midline space broad at the front. Lips thin. A large axillary scale at the base of the short pectoral fin.

Colour

Olive-green on the back; sides silvery with well marked dark stripes, sometimes with golden reflections, shading to white ventrally.

Size

Normally 30-60 cm but can grow to 1.2 m in length; maximum weight usually about 6 kg, but may reach 12 kg.

Ecology

Found widely in all oceans, including all round Atlantic coastal areas of southern Europe (as well as the Mediterranean and Black Seas) and North America at depths of 0-120 m. It has been introduced to the Caspian Sea. Enters fresh waters via large estuaries and coastal lakes and has a wide tolerance of salinity. Spawns in the sea from June-August. The young mature after 3-4 years; the females producing 800,000-2,600,000 eggs. The food is mainly filamentous algae and other plant material, but also various invertebrates. Of considerable commercial value, including aquaculture; large catches are made by nets and traps in several countries. A single individual of this species was caught in the Camel estuary, Cornwall.

Order:

Atheriniformes

Silversides

Most silversides have two separate dorsal fins, the first with flexible spines. As the name implies, most species are silvery in colour and have a marked silvery lateral stripe. There are six families with 48 genera and some 312 species, the majority of which are primarily found in fresh water.

In this order:



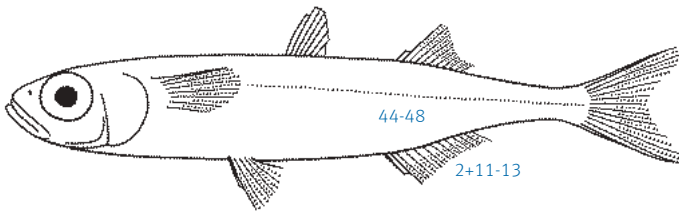
Big-scaled Sand Smelt

Sand Smelt

Family: Sand Smelts *Atherinidae*

A large family of small fishes (Atherinidae) which are widely distributed in tropical and warm temperate seas worldwide, and in many regions in freshwater. Also known as Silversides, due to the bright silvery line running from head to tail along the body. They are schooling fishes of shallow inshore waters; in northern European seas they are largely seasonal in their occurrence. They are mostly rather slim fish with two dorsal fins, the first of which has slender spines, the body is fully scaled, the eye large and the mouth protrusible. There are 12 genera with some 60 species; only two species are known in northern European waters.

Big-scaled Sand Smelt *Atherina boyeri*



Characteristics

A slender bodied fish with a relatively large larger head; its length is less than 4.5 times in the body length. Scales moderate, 44-48 between the upper base of the pectoral fin and the tail fin. 11-13 branched rays in the anal fin. 21-26 gillrakers on the first branchial arch.

Colour

Greenish on the back with the scales outlined with dark dots; intense silver band on the sides, and silvery-white ventrally.

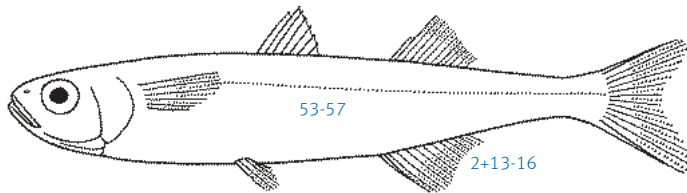
Size

Attains a maximum of 13 cm. British Rod-caught Record: 8 g (1980, Aberthaw).

Ecology

Rare in northern European waters and still to some extent little known. In the British Isles it was first reported on the Cornish coast in 1846, and not found again until the mid-1950s, when it was caught in warm-water marine docks at Swansea and Barrow-in-Furness. Subsequently it has been caught on the coast of Holland and in the Severn estuary. It is an estuarine species which appears to be attracted to low salinity, although it occurs also in the sea and in freshwater. Its food is mainly small crustaceans with occasional worms and molluscs.

Sand Smelt *Atherina presbyter*



Characteristics

Slender-bodied with two dorsal fins, the first with 7-8 slender spines. Head small, its length more than 4-5 times in body length. Scales are relatively small, 53-57 between the upper base of the pectoral fin and the tail fin. 13-16 branched rays in the anal fin. 27-30 gillrakers on the first branchial arch.

Colour

Back and upper sides clear green, with black speckles around the edges of the scales. An intense silver line along the sides; ventrally white or silvery-white with iridescent reflections.

Size

Attains a maximum length of 21 cm and weight of 73 g; mostly *ca* 15 cm. British Rod-caught Record: 72 g (1975, Guernsey).

Ecology

The Sand Smelt is a common inshore and estuarine fish which becomes more common during summer (presumably as a result of northward migration). It is most abundant on sandy and muddy bottoms in 0-20 m. It is often seen in harbours and can easily be caught in shore seines. Young fish are occasionally found on the British coast in summer in rock pools and saltings pools, high up the intertidal zone, swimming in tight schools. They are believed to have hatched in such locations. Breeding takes place in late spring to midsummer. The eggs are nearly 2 mm in diameter and have short filaments by which they attach to marine algae and submerged plants. Sand Smelts feed on small crustaceans and rarely on young fish. Their jaws are strikingly protrusible. This species is not fished for commercially although its flesh is palatable. It is a frequent prey of terns, and no doubt other predators.

Order:

Beloniformes

Needlefishes

All species in this order have a fixed, non-protrusible upper jaw.
There are five families with 36 genera and some 227 species worldwide.

In this order:



Atlantic Flying-fish



Garfish



Short-beaked Garfish

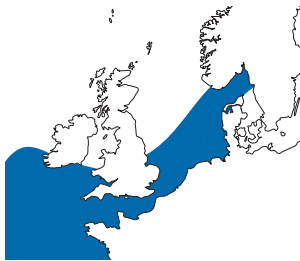
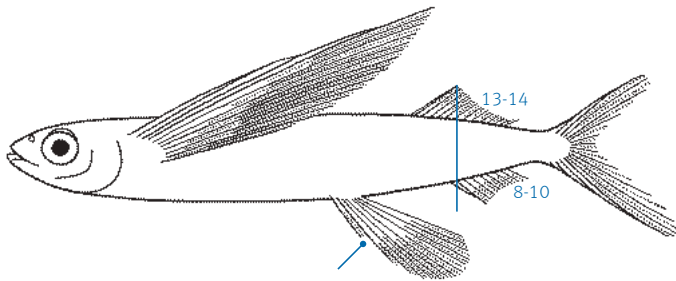


Skipper

Family: Flying-fishes *Exocoetidae*

The flying-fishes are mainly tropical marine fishes which venture into temperate seas in the warmer seasons of the year; they comprise the family Exocoetidae. They live near the surface of the sea, feeding on surface-living organisms and escaping from predators (such as the dolphinfish) by 'flying'. In fact, they do not fly but glide as long as their outstretched fins can sustain the body weight; the propulsive force is provided by active under-surface swimming. Two major groups of flying-fish are recognized: the four-winged group are skilful and accomplished gliders having enlarged pelvic and pectoral fins; the two-winged group with enlarged pectoral fins only are poor 'fliers' by comparison. There are eight genera with some 52 species. In northern European waters only one species has been identified more than once; it belongs to the former group. Isolated captures of other species have been noted.

Atlantic Flying-fish *Cheilopogon heterurus*



dorsal rays; 8-10 anal rays;
30-38 pre-dorsal scales.

Colour

Deep blue on the back, silvery on the sides and belly. The pectoral and pelvic fins are greyish with a poorly-defined lighter band running across their width. Dorsal fin clear or lightly pigmented.

Size

Attains 31 cm.

Ecology

This is the only flying-fish to have been positively identified more than once in northern European waters. Most of the

numerous 19th-century records attributed to other species were probably referable to this species. It is a surface-living fish which is also found in the Pacific Ocean and probably in the Indian Ocean as well. The distribution shown is of the Atlantic subspecies *C. heterurus*. In the Mediterranean it breeds in spring (May to July), and the eggs have numerous fine threads over their surface, one of which is greatly elongate. The young have a fringed chin barbel at first. This fish is most likely to occur in northern waters in late summer to early winter.

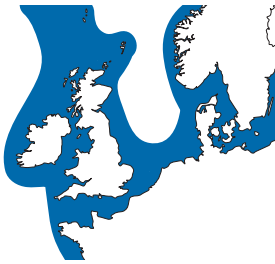
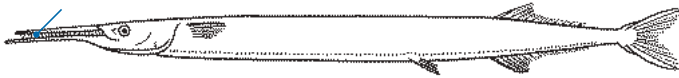
Characteristics

Both pectoral and pelvic fins well developed, lower lobe of the tail fin elongate. Dorsal fin low (height half or less of head length) and conspicuously longer-based than anal fin, the first ray of the anal beneath the 6th or 7th dorsal ray. 13-14

Family: Garfishes *Belonidae*

The Belonidae are surface-living predatory fish with a long, slender body and elongate jaws. They are mainly marine tropical and warm temperate fishes, although some live in tropical freshwaters. The bones are green. There are 10 genera with 34 species worldwide, many of them closely alike in appearance, and most live in shallow inshore waters. About 12 species are restricted to fresh water. Only two species have been recorded around Britain and Ireland.

Garfish *Belone belone*



Characteristics

The long slender body and elongate, many-toothed jaws, the teeth being comparatively large and widely spaced (6-15 in a distance equal to the eye diameter on the middle of the upper jaw) Lower jaw is longer than upper in juveniles and a small difference may persist in adults. Relatively long-based single dorsal and anal fins. 27-40 gill rakers. The lateral line runs along the lower sides

from head to tail.

Colour

Brilliant greeny-blue back and upper sides, the sides and belly gleaming silver with yellowish patches. Pectoral fins rosy; eyes yellow, encircled with red.

Size

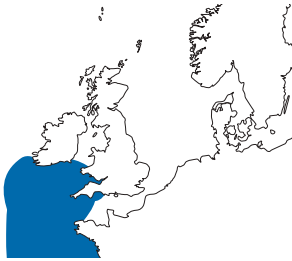
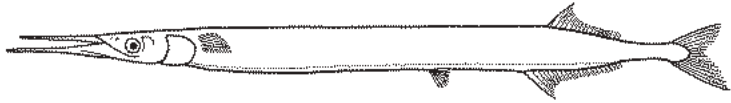
Attains a maximum length of 94 cm, and a weight of 1.70 kg. British Rod-caught Record: 1.630 kg (1994, Cornwall). Irish Rod-caught Record: 1.651 kg (2007, Cork Harbour).

Ecology

A surface-living mainly offshore species which comes into the shallow waters of northern Europe in late spring and can be found close inshore throughout summer and autumn. North of the British Isles it is a rare

straggler. Its food comprises most small surface-living fishes, especially the young of the herring and cod families, as well as sandeels. It also eats small squids and crustaceans. It spawns in coastal waters in May-June, the eggs having numerous long threads at the surface which tangle in algae, flotsam, and, when fresh, anything they touch. The young fish have short jaws on hatching; the lower jaw elongates first and stays longer than the upper until the fish reaches 9 cm in length. The Garfish is not commercially exploited although its flesh is of good quality. It is a fine sporting fish on light tackle, often leaping out of the water and skittering along the surface when hooked. Mediterranean and Black Sea Garfish are related subspecies *B. b. gracilis* and *B. b. euxini* respectively.

Short-beaked Garfish *Belone svetovidovi*



Characteristics

Lighter and more compressed with somewhat shorter beak, the teeth being comparatively small and closely spaced (13-21 in a distance equal to the eye diameter on the middle of the upper jaw). The upper jaw may be significantly shorter than the lower. 38-52 gill rakers. Previously confused with *Belone belone*, from which it was only separated in 1970.

Colour

Greeny-blue back and upper flanks, the sides and belly gleaming silver with yellowish patches.

Size

Can reach 57 cm. British Rod-caught Record: 393 g (1990, Cornwall). Irish Rod-caught Record: 504 g (1994, Courtmacsherry).

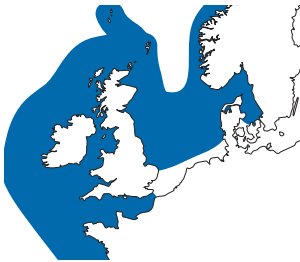
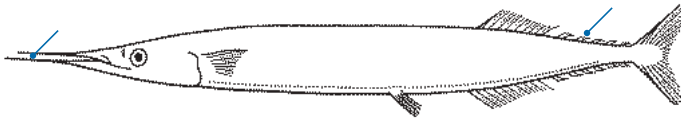
Ecology

Found mainly in temperate waters in the eastern Atlantic, including southern Ireland, Spain and Portugal, with some records from the Mediterranean. Feeds mainly on small surface-living fishes, especially the young of the herring and cod families, as well as sandeels. It also eats small squids and crustaceans. Oviparous – eggs attached by tendrils to drifting objects in the water. Highly fecund.

Family: Sauries *Scomberesocidae*

The Scomberesocidae are surface-living predatory fish with a long, slender body and elongate jaws. They are few in number (two genera and four species are recognised) and live in the open ocean, mostly in temperate zones, where they play an important role as predators on surface plankton and as prey for larger oceanic fishes and seabirds.

Skipper *Scomberesox saurus*



Colour

A beautiful clear green above, shading suddenly to bright silver with a yellowish tinge on the lower sides and belly.

Size

Attains a maximum length of ca. 50 cm. British Rod-caught Record: 148 g (1994, Seaham Beach).

Characteristics

Long and slender-bodied, with slender jaws, but relatively small teeth. Beak shorter than Garfish. The body is compressed and deeper than wide. Dorsal and anal fins rather small, both followed by a series of small finlets. The lateral line runs along the ventral surface from head to tail.

Ecology

A surface-living fish of the open ocean which occasionally penetrates north-eastwards up the northern European coast and into the North Sea. It is found in shoals in coastal waters in late autumn and early winter. It feeds on small shrimp-like euphausiids and other crustaceans, and on small near-surface fishes and fish eggs. The Skipper spawns in the open sea; the eggs have numerous rather short threads

on their surface. The newly-hatched fish has jaws of equal length; the lower jaw protrudes and is longer until the fish is 15 cm in length; beyond that length the upper jaw grows longer. The Skipper is a widespread species and common in warm temperate and tropical seas. It is an important food for many larger fishes and seabirds, and is being fished for increasingly for human food. It occasionally strands itself in large numbers on the North Sea coasts.

Order:

Beryciformes

Squirrelfishes

These are all deep-water oceanic fishes found along the lower continental shelf, occasionally in large quantities, but in general little known. Three of the species included here belong to two families, Trachichthyidae and Berycidae, but other members of the former family also occur in the deep sea near Europe. Members of the Beryciformes are worldwide in their distribution and are marine, mostly deep sea, fishes. Worldwide, there are seven families with 29 genera and 144 species.

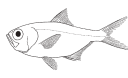
In this order:



Roughfish



Alfonsino



Lowe's Beryx

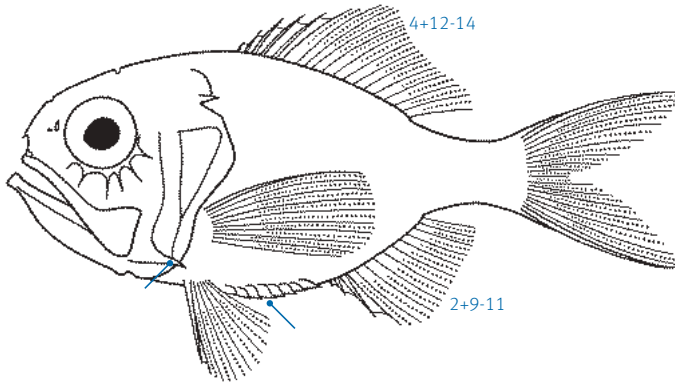


Squirrelfish

Family: Roughies *Trachichthyidae*

All members of this family have a distinct spine at the angle of the preopercular bone. There are seven genera with some 39 species, only one of which has been recorded around Britain and Ireland.

Roughfish *Hoplostethus mediterraneus*



Characteristics

Deep-bodied with a large head which is heavily spined and distinctive because of the deep cavities covered by transparent skin. A series of strong spines along the belly from pelvics to vent. Branched rays in dorsal fin: 12-14; in anal fin: 9-10; eye medium.

Colour

Rose-red on the back and fins, pale pink on sides and belly; dull black of body cavity shows through the skin. Inside mouth and gill cavity deep mulberry black.

Size

Attains a length of at least 30 cm, more usually around 20 cm.

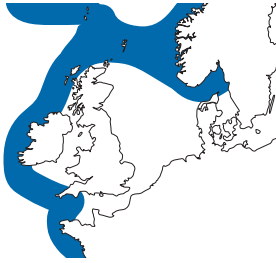
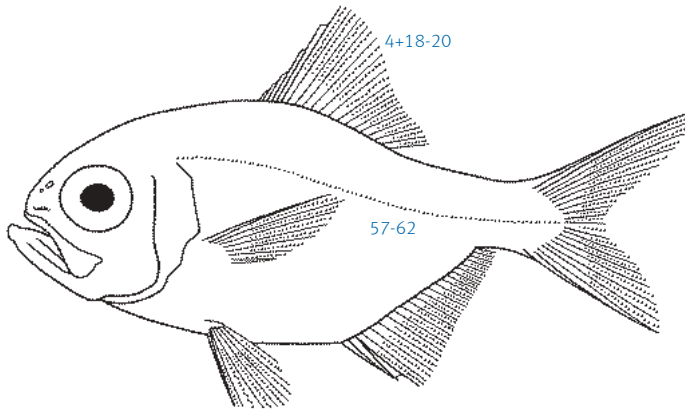
Ecology

This species lives in deep water at depths of 200-500 m, but not on the sea bed, probably keeping about 50 m above it. It is extremely common at appropriate depths to the west of Britain and Ireland. It is not commercially targeted but numbers are caught in deepwater trawls and mostly discarded. It is also found in the Indian Ocean.

Family: *Alfonsinos Berycidae*

This small family has only two genera and nine species worldwide. Two have been recorded in northern European waters.

Alfonsino *Beryx decadactylus*



Characteristics

A deep-bodied fish with a deep head and large eyes. The pelvic fins each have a single strong spine and 10-13 branched rays. 57-62 scales on the lateral line; belly not sharply scaled. Dorsal fin with 4 strong spines and 18-20 branched rays.

Colour

Deep orange-red on the back and upper sides, clear orange elsewhere with a purple sheen over the body cavity.

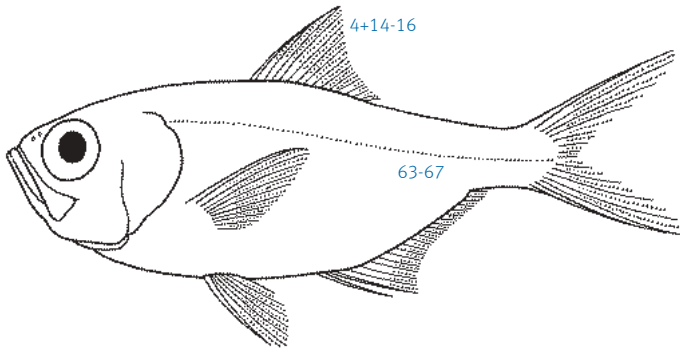
Size

Attains a length of 61 cm and 2.5 kg.

Ecology

This is the most common member of the family in European seas and is captured at depths of 200-550 m. It probably lives close to the bottom on the continental slope, but not actually on the sea floor, and the young live in mid-water. The young have conspicuously heavy spines on the head which are lost with increasing age. Its food is composed mainly of deep-water prawns, with fishes and squids taken occasionally. In northern European waters this fish is not exploited by fishermen, although sometimes large hauls are made and landed. Its flesh is extremely well flavoured and palatable; in southern European waters (where it lives in shallower depths) it is regularly marketed in small quantities. A cosmopolitan species.

Lowe's Beryx *Beryx splendens*



Characteristics

Less deep-bodied (body depth more than 2.5 times in body length), the head is relatively deep but the eyes are comparably smaller than in the commoner Alfonsino. Dorsal fin with 4 spines and 14-16 branched rays. Scales smaller, 63-67 along the lateral line. Origin of anal fin at about end of dorsal fin base.

Colour

Clear rose-red with orange tints ventrally, inside the mouth and gill cavity bright red.

Size

Attains a maximum length of 46 cm usually around 34 cm, can weigh 1.5 kg.

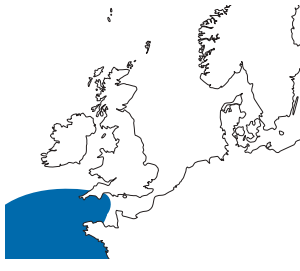
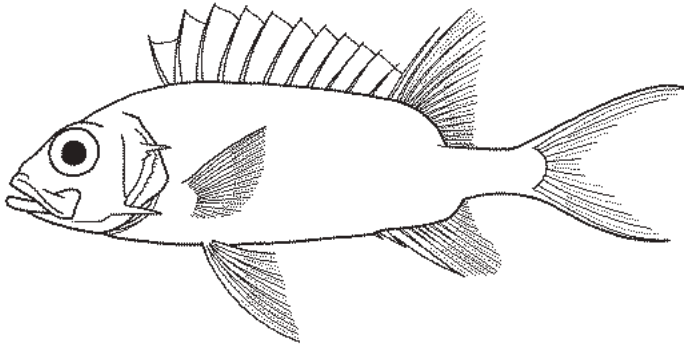
Ecology

A rare fish in northern European waters, but relatively common in the warmer seas to the south. It is marketed in small quantities in southern Europe and in other warm temperate regions. It lives in depths of 100-1300 m and worldwide in warm temperate seas. North east Atlantic distribution only is shown on the map.

Family: Squirrelfishes *Holocentridae*

As with other members of this order, Squirrelfishes have a strong spine at the angle of the preopercular bone – in some species this is venomous. There are eight genera with some 78 species, but only one is known from northern Europe.

Squirrelfish *Holocentrus adscensionis*



Characteristics

Dorsal fin with spines and soft rays almost separate but connected by a membrane; 15-16 soft rays the anterior ones quite long. Anal fin with four spines and 9-10 soft rays. Posterior margin of upper jaw reaching posterior margin of pupil. Large preopercular spine and smaller opercular spine.

Colour

Dullish red or pink; sometimes with blotches. Longitudinal stripes. Lower jaw white. Membrane edges of dorsal fin spines reddish or translucent (not whitish).

Size

Attains a length of 61 cm, more generally to 35 cm.

Ecology

Found mainly in subtropical waters of both west and east Atlantic. Inhabits shallow coral reefs as well as deeper offshore waters (0-180 m). Nocturnal, hiding in crevices or under coral ledges during the day. At night it moves into the open over sand, weed or seagrass beds, eating mainly crabs and other small crustaceans. Can produce sounds. A minor commercial species. One caught in a crab pot off Portland Bill, Dorset in 1983.

Order:

Zeiformes

Dories

This order of generally thin, deep-bodied fish with protrusible jaws, has six families with some 16 genera and about 32 species. However, the Parazenidae and Zeidae are the only representatives in shallow seas in north west Europe.

In this order:



Red Dory



Sailfin Dory

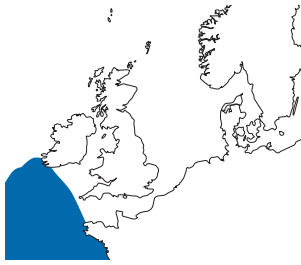
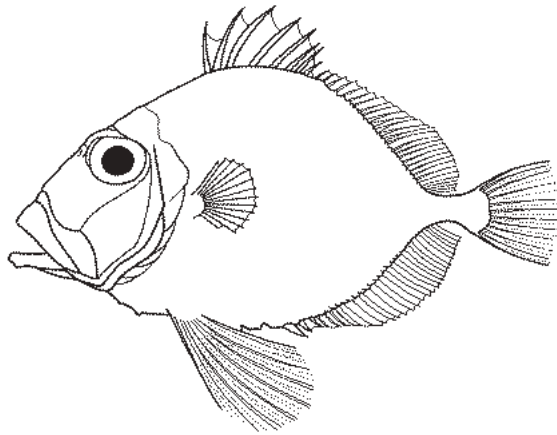


John Dory

Family: Smooth Dorids *Parazenidae*

Dorsal and anal fins without enlarged scales at their bases; pelvic fin 7-9 soft rays but no spines. Three genera and four species in the family, one species in the north east Atlantic.

Red Dory *Cyttopsis roseus*



Characteristics

Deep, laterally compressed body and large eye. Upper rim of orbit with small spines. Mouth large and oblique; highly protrusible. Dorsal fin with 7-8 spines and 28-30 soft rays; anal fin with 1-2 spines and 29-30 soft rays. Pelvic fin soft rays long.

Colour

Rosy pink and silvery; pelvic fins reddish with black membranes.

Size

Attains a maximum of 80 cm.

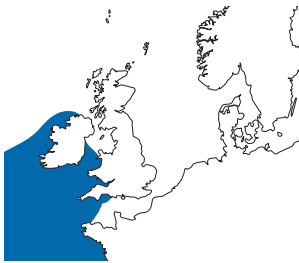
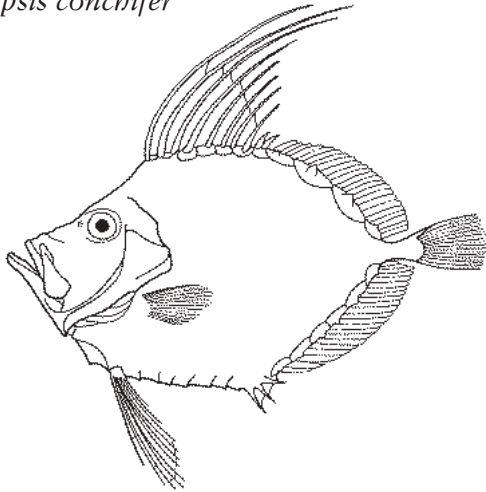
Ecology

A widespread species in the Atlantic, Indian and western Pacific Oceans. A deep water species, ranging from 150-730 m. Swims in large schools. Feeds on other fish and swimming decapod crustaceans. There are some commercial fisheries.

Family: Dorids *Zeidae*

Members of the Zeidae are worldwide in temperate and warm-temperate seas, mostly in shallow water, although some are found in the deep sea. There are only two genera with six species. All have deep compressed bodies with a large head and a highly protrusible large mouth. Enlarged scutes along the keel and large buckler scales along the bases of the dorsal and anal fins. They all have strong spines in their dorsal, anal, and pelvic fins.

Sailfin Dory *Zenopsis conchifer*



Characteristics

Deep, laterally compressed body, with a concave head profile. Eye small. Dorsal fin with 9-10 long spines and 24-26 soft rays membrane of spiny portion with filaments as long as the spines. Anal fin with 3 spines and 24-26 soft rays.

Colour

Body silvery with a dusky mid-lateral spot. Juveniles with black spots. Fin membranes blackish.

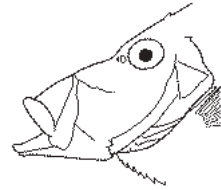
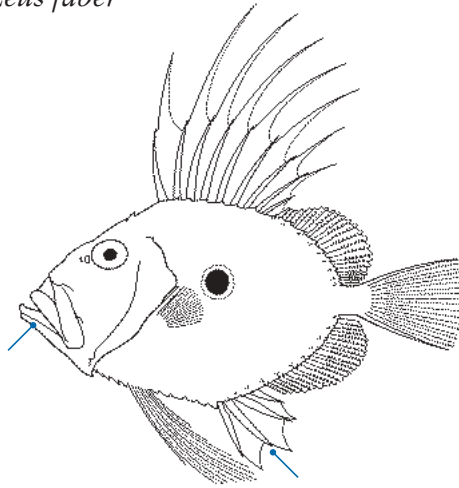
Size

Can attain a length of 80 cm, and a maximum weight of 3.2 kg.

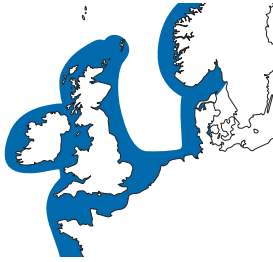
Ecology

Occurs in the Atlantic and Indian Oceans. Common in coastal waters but more normally in 50-600 m. Usually found near the bottom or in midwater over muddy substrates. Swims in small schools. Feeds on fish. Some commercial fisheries. Individual fish turn up occasionally off Ireland and the south west of England.

John Dory *Zeus faber*



Protrusible mouth



Characteristics

Deep laterally compressed body, massive head with large, highly protrusible jaws. Strong spines in the first dorsal fin with trailing filaments, 3-4 similar spines in front of the anal fin. A double series of large spiny scales running around the outline of the belly and back. Also known as St Peter's Fish.

Colour

Dark yellowish-brown on the back, often with lighter yellow lines meandering along the sides; silvery-grey ventrally. A conspicuous black blotch surrounded by a yellow ring on the sides. Anal and pelvic fin membranes black.

Size

Usually up to 40 cm and a weight of 2.5 kg; exceptional specimens, always females, attain 90 cm and 8 kg. British Rod-caught Record: 5.386 kg (1977, Sussex). Irish Rod-caught Record: 3.402 kg (1984, Killala Bay).

Ecology

The John Dory is an inshore fish living mainly in 10-50 m, although exceptionally it is reported close to the surface and as deep as 200 m. It usually lives a solitary life or is in a small school. It feeds on a wide range of fishes which are individually sighted and stalked in a head-on posture until they are close enough to be engulfed by the sudden protrusion of the jaws, often being swept in with the inflow of water. It breeds in summer in the English Channel, but probably does not spawn further north. Its flesh is extremely well flavoured and flaky, with a good texture. It is the subject of a small fishery in British and Irish waters, and always commands a high price. To the south of the Channel it is fished more extensively but its habits are such that large landings are rare.

Order:

Gasterosteiformes

Sticklebacks

Members of this order have small mouths, and often a body armour of dermal plates. There are 11 families with some 71 genera and 278 species worldwide.

In this order:



Three-spined Stickleback



Nine-spined Stickleback



Fifteen-spined Stickleback



Snake Pipefish



Spiny Seahorse



Short-snouted Seahorse



Worm Pipefish



Straight-nosed Pipefish



Greater Pipefish



Lesser Pipefish



Deep-snouted Pipefish

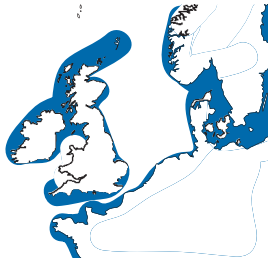
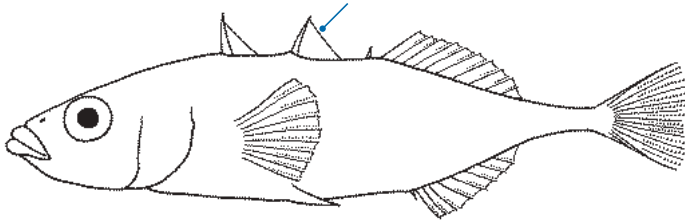


Snipefish

Family: Sticklebacks *Gasterosteidae*

Sticklebacks are well-known and often common fishes across the temperate regions of the northern hemisphere. Some species live in fully marine conditions, others are confined to fresh water, but the majority can thrive in salt or fresh water and are often abundant in slightly saline conditions. Most sticklebacks are small, with scaleless, torpedo-shaped bodies, and a series of sharp spines along the back and a strong spine in each pelvic fin. In all species the males build a nest and guard the eggs and young fish. Only eight species in five genera of the family Gasterosteidae are recognized; three occur in Britain and Ireland.

Three-spined Stickleback *Gasterosteus aculeatus*



Characteristics

Small fishes with three (exceptionally two or four) large isolated spines on the back - the third lying close to the second dorsal fin. Anal fin rather small. Pelvic fin spine long and strong; only a single small soft ray. The spindle-shaped body is naked or with up to 37 bony plates along the sides.

Colour

Variable; usually dark brown-green on the back and silvery on the sides. Males in the breeding season have brilliant red throats and blue eyes. Marine specimens are bluish above and clear silver on the sides.

Size

Mostly 4-8 cm, exceptionally up to 11 cm. British Rod-caught Record: 7 g (1998, High Flyer Lake).

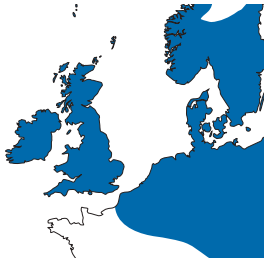
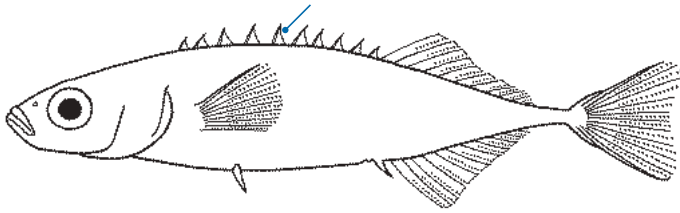
Ecology

A very widely-distributed and often abundant fish in lakes, rivers and coastal waters of northern Europe. In fresh water its normal habitat is in shallows of 0-1 m usually in open areas but with cover near by. In

estuaries it usually lives close to the river bank, and in the sea it is common in coastal waters in tidal pools, but usually among marine algae. It is only common in fully marine habitats from Scotland northwards. This stickleback breeds in spring and early summer, the male constructing a nest of plant fibres in a hollow on the bottom (whether in fresh or salt water habitats). Within the nest the eggs are laid; the male aerates them and removes infertile eggs. The nest is central to the male's territory, which is strongly defended by the brightly-coloured fish. Growth varies with local conditions. In environments poor in food even 3-year-old fish may be only 5 cm in length, but in

large rivers and even more in the sea this may be this length at the end of the first year. Few sticklebacks survive for more than three years. Its diet is very varied but is necessarily confined to small organisms. Crustaceans and small larval insects are important, but worms, molluscs, young fishes, and a small quantity of plant material are also included. The Three-spined Stickleback is preyed upon by a wide variety of fishes, birds, and mammals. Sticklebacks with bony plates on the sides, from pectoral fin to tail fin, occur mainly in the sea in Europe and North America. Those without such plates are usually found in inland fresh waters. Many sticklebacks in Britain and Ireland at least have a few such plates along the side, behind the pectoral fin.

Nine-spined Stickleback *Pungitius pungitius*



Characteristics

Rather slender body, with 7-12, usually 9, short isolated spines along the back. Second dorsal and anal fins of virtually equal length and shape. The caudal peduncle long and narrow, with a keel along each side.

Colour

Dark olive green to brown on the back, lighter ventrally, sometimes even silvery. In the breeding season males have a black throat and white or pale blue pelvic fin spines.

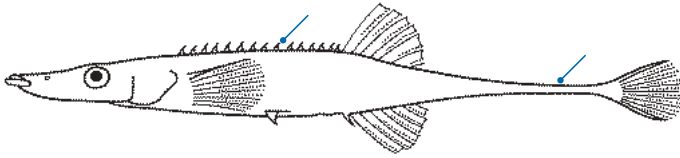
Size

Attains a maximum length of 9 cm, but usually less than 5 cm.

Ecology

Widely distributed but rather local. Widespread in the whole of northern Europe, although it appears to be absent from large areas. It is found in fresh or at the most slightly brackish water, not in the sea, and is most common in densely vegetated situations. Ponds or rivers that in summer appear to be choked with vegetation are a typical habitat. The male builds a nest in aquatic plants usually at least 7 cm above the bottom; in the nest the females (often more than one) lay their eggs. The male protects the eggs and later the young fish. This stickleback grows to about 3.5 cm in the first year of life, at the end of which it is sexually mature. Its maximum life span is three years. The Nine-spined Stickleback feeds mainly on small crustaceans, insects and their larvae, and occasionally young fish.

Fifteen-spined Stickleback *Spinachia spinachia*



Characteristics

Very long slender body with an elongate, pointed snout and extremely long and slim caudal peduncle. A series of 14-17 (mostly 15) short, isolated spines runs along the back. Second dorsal and anal fins short-based and almost triangular in shape. Pelvic fin spine minute.

Colour

Brownish or greenish-brown on the back and upper sides with irregular dark bars. On the underside yellowish. Dorsal and anal fins with a brown blotch on the anterior fin rays and membrane.

Size

Exceptionally attaining a length of 20 cm, usually around 15 cm. British Rod-caught Record: 10 g (1997, Ayr).

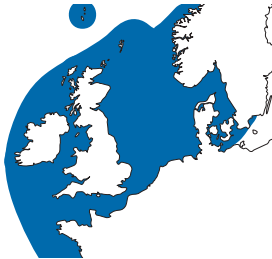
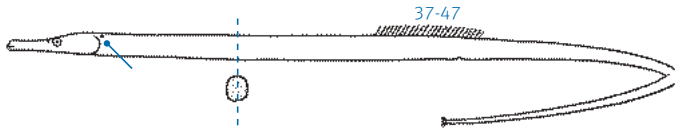
Ecology

A wholly marine stickleback which is found in lower estuaries and shallow coastal waters down to depths of ca 10 m. It is particularly abundant amongst marine algae and eel-grass, and is occasionally found in tidal pools. It spawns in spring and summer; the male builds a fist-sized nest in seaweed well clear of the bottom at half-tide level or below. Most adults die at the end of their first breeding season. Up to 200 eggs are laid in the nest, each about 2 mm in diameter; they hatch in 18-21 days. Its food consists mainly of crustaceans, chiefly copepods and small amphipods.

Family: Pipefishes *Syngnathidae*

The pipefishes are a well-known family of mainly marine, shallow-water fishes, which also includes the seahorses. The family is widely distributed in tropical and warm-temperate seas, and in the tropics in fresh water, and while most are inhabitants of shallow, coastal waters, some species are pelagic and live in the open sea. Structurally they are generally similar, their bodies being encased in a segmented, usually hard armour, the fins being reduced (except for the dorsal fin, which is the main means of propulsion), and the snout being prolonged with a small mouth at the tip. Members of the family have additional interest in that it is the males which incubate the developing eggs, either in a shallow groove on the underside of the tail, or protected by folds of soft skin, or, as in the case of the seahorses, within a brood pouch. Worldwide, there are 52 genera with some 232 species. Eight species occur in northern European waters; several others are known from the Mediterranean.

Snake Pipefish *Entelurus aequoreus*



Characteristics

Very long and slender-bodied with the body rings smooth and the body rounded in cross-section. Pectoral and anal fins absent, tail fin minute - the rays only slightly developed. Dorsal fin with 37-47 rays, mostly in advance of the vertical from the vent.

Colour

Pale brown or yellowish-brown, each body ring picked out with a pale blue band with faintly darker edges.

Size

Females grow to 61 cm, males to 40 cm. British Rod-caught Record: 28 g (1987, Anglesey).

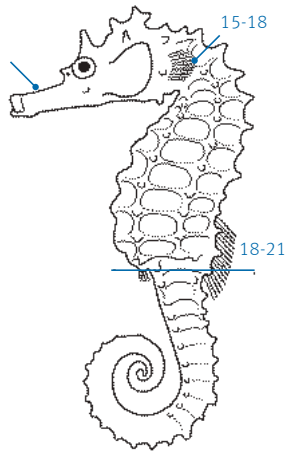
Ecology

An open sea species which is found in deeper water than most pipefishes. It is commonest between 10 and 100 m, among kelps and other large, deep-water seaweeds. Large and young specimens are found well offshore in the surface of the sea, and the species must be to some extent oceanic. For many years the Snake Pipefish has been regularly found among weed on or close to the shore in South Wales and South West

Continued: Snake Pipefish *Entelurus aequoreus*

England. Since 2003 this species has undergone a population explosion and become abundant in the Channel and especially the North Sea. This has caused problems for breeding seabirds, which have tried feeding it to their young, but these have been unable to digest it and suffered starvation as a result. Males carrying around 100 eggs on a sticky brood patch on the underside are found in June-July. The fry are ca 11 mm long on hatching and are planktonic for a short while.

Spiny Seahorse *Hippocampus guttulatus*



Characteristics

Unmistakable seahorse body form and prehensile tail, which lacks a tail fin. The snout is long, more than one-third of the head length, its dorsal profile straight. Small slender eye spine, often supporting a filament. Body rings with pointed spines on the angles. Dorsal fin with 18-21 rays; pectoral fin 15-18 rays. Skin appendages in the form of long filaments often present.

Colour

Variable often a greenish yellow, but may be orange or brown, usually with small white spots.

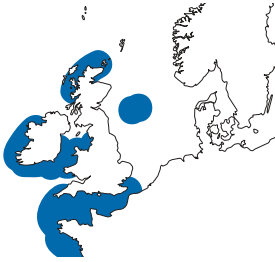
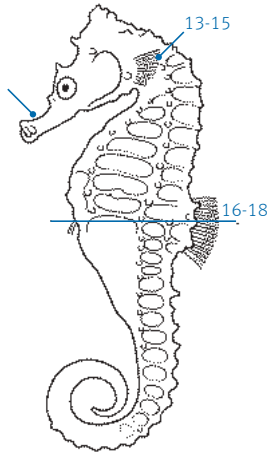
Size

Attains a maximum length, from crown of head to tip of tail, of 23 cm.

Ecology

Occurs mostly in shallow inshore waters down to at least 100 m among eelgrass (*Zostera* or *Posidonia*), algae and sessile organisms, but has also been captured floating in the open sea near the surface, and occurs in littoral lagoons. Their range extends from North Africa to the Shetland Isles; in the British Isles it tends to be more western in its distribution than the Short-snouted Seahorse. Has been proven to be breeding on the south coast of England. Males with eggs in the brood-pouch are found from May to August, and occasionally young fish have been caught in the English Channel from late summer to December. Seahorses feed almost entirely on small crustaceans, principally mysids. Seahorses and their habitats are vulnerable to disturbance and international trade is monitored through a licensing system (CITES II).

Short-snouted Seahorse *Hippocampus hippocampus*



Characteristics

Characteristic shape, with head set at an angle to the rather stout body; but with a short snout, its length not more than one-third of the head length, and with a high crown and concave head profile. Diameter of eye more than half the snout length and with a prominent eye spine. Body rings with rounded spines on the angles. Dorsal fin with 16-19 rays, pectoral fin with 13-15 rays.

Colour

Generally warm brown overall, except that the inner surface of the tail is paler. May be covered with small white dots.

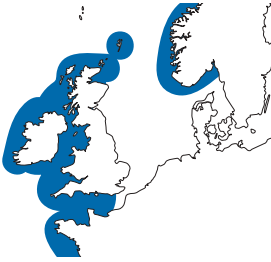
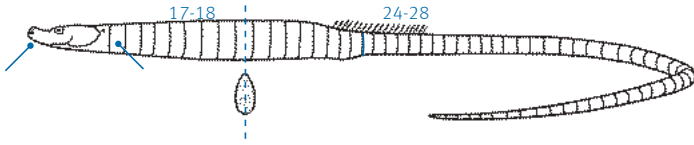
Size

Grows to a length of 15 cm.

Ecology

A southern species of seahorse that reaches its northern limit in the North Sea, found from the Dogger Bank and Netherlands coast to the Mediterranean and West Africa. During the summer months they are seen in inshore areas of eelgrass, algal turf and often in more open areas. This species appears to be less dependent on vegetated areas than the Spiny Seahorse. The Short-snouted Seahorse has been proved to be breeding in the Thames Estuary and south coast of England. There, it breeds from April to October, and newly-born young have been found in September and October. Seahorses and their habitats are vulnerable to disturbance and international trade is monitored through a licensing system (CITES II).

Worm Pipefish *Nerophis lumbriciformis*



Characteristics

Body rounded in cross-section, the rings without angles; pectoral, anal, and tail fins absent. The snout is short and strongly concave in outline, the mouth and tip of the snout being tilted upwards. Dorsal fin rays 24-28; body rings 17-18.

Colour

Dark overall except under the throat and anterior belly which have lighter markings. The basic colour is dark green or brown to match the algae in which it lives.

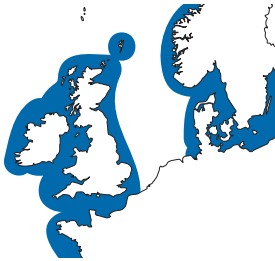
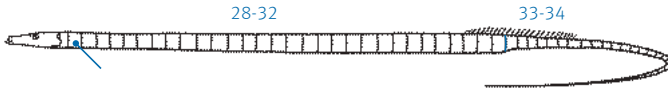
Size

Attains a length of 15 cm; males are usually smaller.

Ecology

Relatively common in shallow water, but confined to rocky areas where marine algae are abundant. It is frequently found under stones or in rock pools at low tide, where it closely resembles, both in colour and body-form, the intertidal algae *Ascophyllum*, *Bifurcaria*, and others. It is largely confined to the tidal zone but has been found down to 30 m. The males carry the eggs on a brood patch in a shallow groove on the belly, and are found with eggs from June to August. On hatching, the young are about 10 mm and live in the plankton for a short while, but can be found on the shore in September and October at 3-4 cm in length; presumably then a few months old.

Straight-nosed Pipefish *Nerophis ophidion*



Characteristics

Body rounded in cross-section, the rings without angles and visible only as segments. Dorsal fin present, 33-34 rays; no tail, anal, or pectoral fins. Snout moderately long, equal to half length of head; profile straight and not noticeably concave. Abdominal rings 28-32.

Colour

Greeny-brown on the back, light green on the sides often with pale wavy streaks; sometimes red; large females have long bluish lines along the belly.

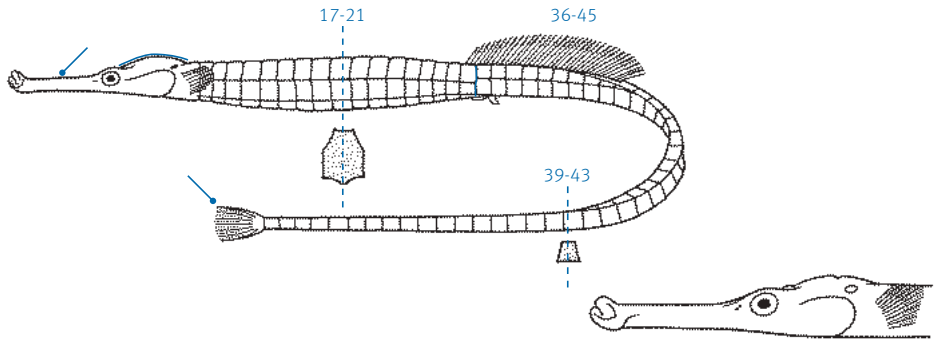
Size

Females attain a length of 30 cm; males grow to 25 cm.

Ecology

This distinctive pipefish is widely distributed in European waters, usually at depths of 5-25 m, although occasionally found shallower than this. It is particularly associated with the long-stranded, greenish-brown algae of the sublittoral zone, and with eel-grass. It is also common in low salinity areas such as the northern Baltic Sea. Males carry the eggs attached to the concave belly; they are not enveloped within skin flaps. Males with eggs are most abundant from May to August; the young hatch and are free-swimming, while still relatively undeveloped, at ca 9 mm in length. Both young and adults feed on crustacean larvae.

Greater Pipefish *Syngnathus acus*



Syngnathus acus heads



Characteristics

A pipefish with pronounced body rings, those of the tail being distinctly four-sided. Pectoral and tail fins well developed. The snout is rounded in cross-section, and long (more than half the head length); head profile rises over the eye and has a conspicuous hump in the mid-line of the nape. Abdominal rings 17-21; tail rings 39-43; dorsal fin rays 36-45.

Colour

Light brown above, often with a greenish tinge, and dusky bars along the body. Creamy-yellow under the abdomen, darker towards the tail.

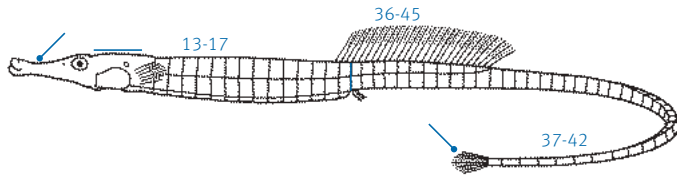
Size

Attains a length of 50 cm – one of the largest of the European pipefish. Males mature at ca 30 cm. British Rod-caught Record: 113 g (1981, Portsmouth).

Ecology

A moderately common species in shallow water over muddy or sandy bottoms. It is confined to coastal waters down to depths of 20 m, occasionally deeper, and is also found in outer estuaries. Its food consists of small planktonic organisms, particularly small crustaceans and post-larval fishes. They are stalked visually and snapped up by a rapid movement of the head, with the mouth opened wide and the tubular snout expanded at the same instant to create a suction. Males brooding eggs are found mostly in June and July, but can occur a month either side of this period. The brood-pouch is a double fold of skin arising from the sides of the anterior tail and meeting in the mid-line. The young are released from the pouch at lengths of 22-35 mm.

Lesser Pipefish *Syngnathus rostellatus*



Syngnathus rostellatus heads



Characteristics

A common pipefish with distinct body and tail rings and well-developed pectoral and tail fins. The snout is rounded in cross-section and relatively short, less than half the head length; the head profile rises over the eye, but there is no conspicuous ridge along the nape. Abdominal rings 13-17; tail rings 37-42; dorsal fin rays 36-45.

Colour

A warm brown on the back with darker mottling to form cross-bars; ventrally it is creamy with silvery reflections.

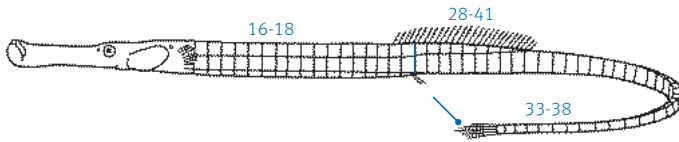
Size

Attains a maximum of 17 cm; males mature at 10 cm.

Ecology

The most abundant pipefish on sandy bottoms in northern Europe. It lives in shallow water of 1-10 m, exceptionally down to 18 m on sand or mud, and among floating algae or eel-grass usually just above the sea bed. It is particularly abundant in estuaries. Like other pipefishes its food is composed almost entirely of small, planktonic crustaceans, although other larvae are also eaten. The males carry the eggs in a pouch under the tail. 'Pregnant' males can be found most commonly from June to August; the young fish are free-swimming from a length of ca 14 mm. This is the pipefish most frequently captured in shrimping nets, especially push-nets on the shore.

Deep-snouted Pipefish *Syngnathus typhle*



Characteristics

A pipefish with distinct body and tail rings, and pectoral and tail fins well developed. The snout is laterally flattened, not round in cross-section, and is relatively deep and the mouth is pointed upwards. The head profile is smooth, not arched above or behind the eye. Abdominal rings 16-18; tail rings 33-38; dorsal fin rays 28-41.

Colour

Usually light greeny-brown, sometimes plain brown; the ventral surface is pale brown.

Size

Size Reaches a maximum length of 35 cm; males are mature at 12 cm.

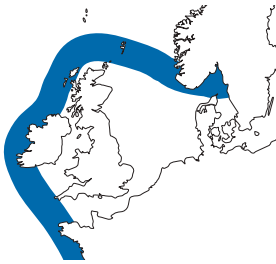
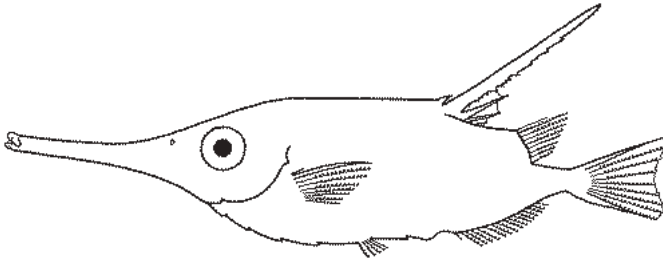
Ecology

A moderately common and widespread pipefish which is abundant only locally. Typically it lives among eelgrass on sandy shores, and around thongweed on rocky shores. It is confined to coastal waters between 4 and 20 m. The food of this species is mainly small, planktonic crustaceans, but it eats a larger proportion of young fishes than the other pipefishes. Males may be captured carrying eggs in their pouch from June to August; incubation lasts for about four weeks and the young are 25 mm when they are first free-swimming.

Family: Snipefishes *Macroramphosidae*

The snipefishes are a small family of marine fish found mostly in temperate and tropical seas worldwide. They are usually encountered at moderate depths. Snipefish are long-snouted, with a rather compressed, deep, body, and small fins except for the massive dorsal fin spine midway along the back. There are three genera with 11 species worldwide, but only one species occurs in northern European seas.

Snipefish *Macroramphosus scolopax*



Characteristics

Relatively small, deep-bodied and compressed, with a long snout terminating in a small mouth. The large dorsal fin spine is massive, serrated on its rear edge, and when laid back extends beyond the level of the tail fin origin. Scales rough-edged.

Colour

Rose-red on back and sides, silvery over the body cavity. The colour fades soon after death.

Size

Attains a length of 20 cm; rarely longer than 12 cm.

Ecology

A relatively rare fish in northern European waters, the Snipefish is known here as an occasional wanderer from the south. It is most abundant in depths of 100-250 m, exceptionally as shallow as 25 m and as deep as 600 m; found in schools in mid-water over the outer shelf or upper continental slope. Juveniles form pelagic shoals. Its food is composed almost entirely of small planktonic crustaceans, but its biology is in general little known.

Order:

Scorpaeniformes

Mail-cheeked Fishes

The common name of this order refers to the fact that all of them have a bony strut which runs under the eye across the cheek to the preopercular bone. Many species have spines attached to this bone which protect the eye. This is a large order, with 26 families, 279 genera and some 1,477 species worldwide.

In this order:



Flying Gurnard



Bluemouth



Small-scaled Scorpionfish



Red Scorpionfish



Redfish



Norway Haddock



Red Gurnard



Streaked Gurnard



Tub Gurnard



Long-finned Gurnard



Grey Gurnard



Piper



Armed Gurnard



Atlantic Hookear Sculpin



Bullhead



Two-horn Sculpin



Four-horn Sculpin



Bull Rout



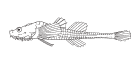
Long-spined Sea Scorpion



Norway Bullhead



Moustache Sculpin



Hooknose



Atlantic Poacher



Lumpsucker



Common Seasnail

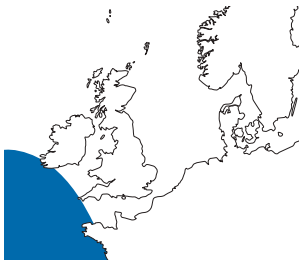
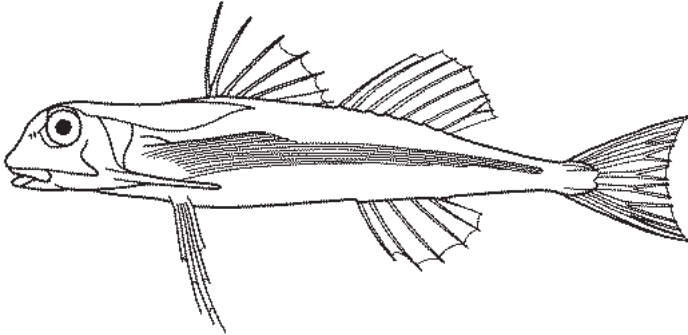


Montagu's Seasnail

Family: Flying Gurnards *Dactylopteridae*

These fish are only distantly related to the gurnards. They are immediately recognisable by their enormous pectoral fins which they can spread like wings. Despite their common name flying gurnards do not fly or even glide in the air; the large pectoral fins are used to glide over the sea bed and, probably, to startle potential predators, and even prey. The first few pectoral rays are free and are used to walk along the bottom. There are two genera with seven species, only one of which occurs on northern European seas.

Flying Gurnard *Dactylopterus volitans*



Characteristics

The large head is blunt and encased in bones to form a helmet, with a long, flatten, keeled spine extending from the nape to the middle of the first dorsal fin. There is a long serrated preopercle spine and another long spine extends below the base of the pectoral. Dorsal fin with 7 spines (the first two without a membrane) and 8 soft rays. Anal fin with no spines and 6 soft rays. Pectoral fins extremely large and fan-shaped, with six anterior rays separated into small lobe which is used for 'walking'.

Colour

Back and large pectoral fins dark with numerous large white spots. The pectorals may show brilliant blue markings.

Size

Can reach a length of 50 cm and a maximum weight of 1.8 kg.

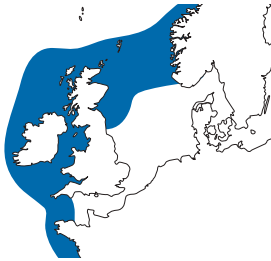
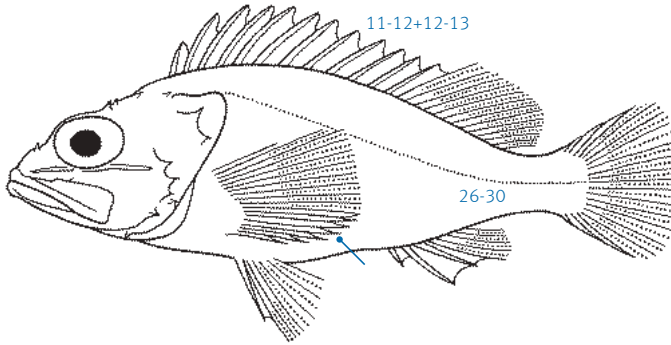
Ecology

Found at depths of 1-100 m in brackish and in sea water in both the western and eastern Atlantic Ocean. Usually occurs in association with reefs over sandy or muddy substrates, exploring the bottom with the pectoral fin lobes. Feeds on benthic crustaceans, especially crabs, as well as clams and small fish. Occasional specimens are found in the western Channel and Irish inshore waters.

Family: Scorpionfishes *Scorpaenidae*

The scorpionfishes are a family of marine fishes which are distributed worldwide except for the Antarctic seas. In temperate seas they are well represented by the red-fishes, which are present as numerous species in the North Pacific with only a few Atlantic representatives. In the tropics and in warm temperate seas there are numerous scorpionfishes, some of them with venomous spines in their fins. There are some 56 genera with 418 species. The five northern European members of the family have strong spines in the dorsal and anal fins, are fully scaled, and all have a bony ridge across the cheek below the eye.

Bluemouth *Helicolenus dactylopterus*



lateral line; the bony ridge beneath the eye not massive.

Colour

Predominantly red overall often a mottled pattern, lightening to rose pink ventrally. Inside the mouth and gill cavity a dark blue, showing through the gill covers as blue-black.

Size

Attains 46 cm in length and 1.5 kg in weight. British Rod-caught Record: 1.431 kg (1976, Stornoway). Irish Rod-caught Record: 1.32 kg (2008, Caherciveen).

Ecology

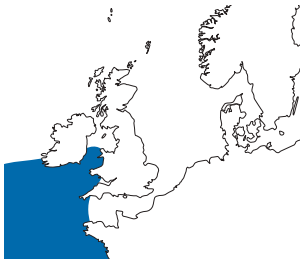
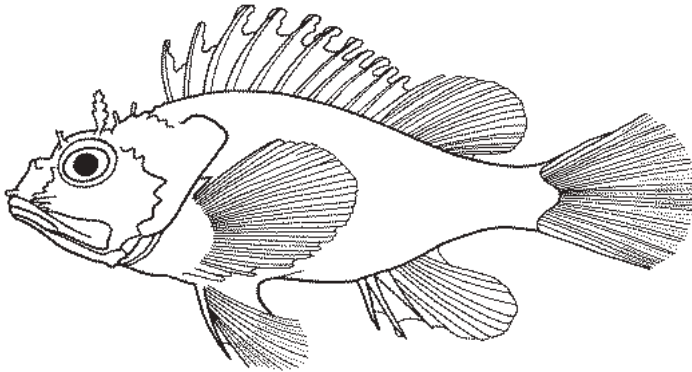
A common fish on the lower continental shelf to the west of Britain and Ireland, but

becoming less common off the western Norwegian coast. It lives on mud and sandy mud in depths of 200-800 m; exceptionally, specimens are taken in shallower water. It feeds on crustaceans, mainly shrimps, and fishes - especially lantern fishes, but also eats cephalopods and other near-bottom invertebrates. It hunts close to, but not on, the sea bed. The Bluemouth is of little commercial importance as a food fish although locally, as in Portugal and the western Mediterranean, it is marketed. Surprisingly, since 1991 a population has become established in the North Sea, and a specimen has even been caught in the Severn Estuary.

Characteristics

A relatively narrow-bodied fish with 11-12 strong dorsal fin spines, scales between the eyes and on the gill covers and cheeks. The lower nine pectoral fin rays have the outer third of their length free of the fin membrane. Head moderately large and spiny; scales on body large, 26-30 in the lateral line. No fleshy flaps on head or

Small-scaled Scorpionfish *Scorpaena porcus*



Characteristics

Head short with a spiny cheek ridge. Fleshy flaps on the cheek and snout but none on the lower jaw; a branching leaf-like tentacle above eye almost equal to eye diameter. Scales small; lateral line with 65-70 scales (at least seven scales from end of dorsal fin to the lateral line). Spines of the dorsal fin medium.

Colour

Variable, brownish orange to deep red with dark blotches over much of the body and fins.

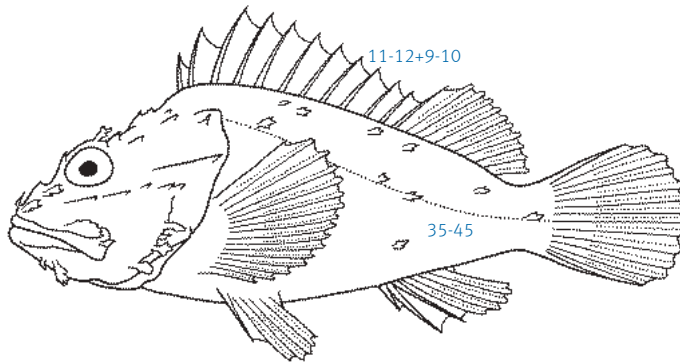
Size

Can reach a length of 37 cm and a weight of 870 g.

Ecology

Found in the eastern Atlantic and the Mediterranean and Black Seas. Recent specimens have been reported from off North Wales and the Eddystone Reef. Bottom-living among rocks and algae at depths of 0-800 m. A solitary and sedentary species, feeding on small fish (mainly gobies and blennies) as well as crustaceans and other invertebrates. Breeds from July to September.

Red Scorpionfish *Scorpaena scrofa*



Characteristics

A stout-bodied scorpion-fish with 11-12 strong dorsal fin spines, the third to fifth spines being larger than the rest. A scaleless head and pectoral fin base, and the membrane coming close to the tips of the pectoral fin rays. Head large and spiny; scales on body large, 35-45 along lateral line (five scales in a row from end of dorsal fin to the lateral line). Row of fleshy flaps along the lower jaw, numerous small skin flaps on head and body, but not conspicuously large above the orbit.

Colour

Pink to dark reddish-brown with dusky mottlings or even beige, very variable and usually related to the immediate surroundings. Usually has a large clear black spot on the membrane of the dorsal fin between spines 7 and 9.

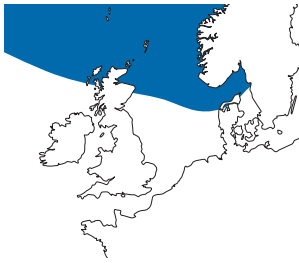
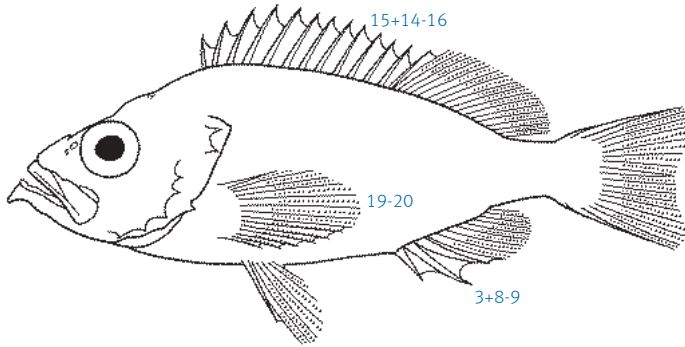
Size

Attains a length of 51 cm.

Ecology

The Red Scorpionfish is uncommon but regular in the waters to the south west of Britain, in any month of the year. In the western Mediterranean it is common on sandy or stony grounds in depths of 20-100 m, and the only records of its occurrence in the English Channel have been of fish caught in similar depths. It feeds mainly on prawns and other crustaceans, and fishes.

Redfish *Sebastes marinus*



Characteristics

A thickset, heavy-headed fish with a protuberant chin. The dorsal fin has 15 strong spines and 14-16 soft rays; the anal fin has 3 spines and 8-9 soft rays; the membrane of the pectoral fins extends almost to the tips of the rays, which number 19-20. Spines on the preoperculum are flattened, the ventral spines downward pointing.

Colour

Bright red except for the belly which has a pink or rose flush, and the gill cover which is dusky.

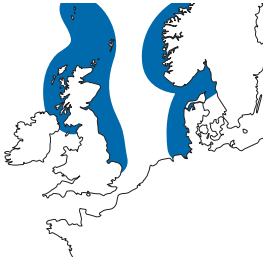
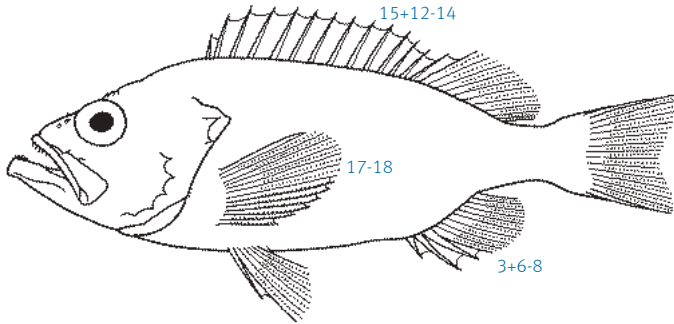
Size

Attains 1 m in length and 15 kg in weight, at a considerable age. Few specimens today live long enough to exceed 50 cm.

Ecology

A common fish in the colder regions of the North Atlantic, the Redfish is most abundant on the continental shelf in depths of 100-400 m, less commonly down to 500 m. Below that depth it is largely replaced by *Sebastes mentella*, which extends to 1,000 m. Both species are viviparous. The Redfish mates in northern waters (the European stocks in the Barents Sea) in late summer, and the females migrate southwards to the neighbourhood of the Lofoten Islands to liberate their larvae in May and June. Other North Atlantic stocks are presumed to make similar breeding migrations. Adult Redfish eat large quantities of fishes, particularly Herring, Capelin, and members of the cod family. The early young are plankton-feeders, and later eat large quantities of crustaceans. Redfish are eaten by sperm whales. They are also caught in large numbers by vessels from northern Europe, and to a lesser extent from North America.

Norway Haddock *Sebastes viviparus*



Characteristics

A rather heavy-bodied redfish with a large head and slightly protuberant chin. Head spiny and scaled forward to the eyes. The dorsal fin has 15 strong spines and 12-14 soft rays; the anal fin has 3 spines and 6-8 soft rays; 17-18 rays in the pectoral fin, the membrane of which continues to the tips of the rays. Spines on the preoperculum flattened, all pointing towards the tail except for the last weak one which may point downwards.

Colour

Rosy-red on the back and sides, pink ventrally. A dusky patch on the gill cover and three or four dark bands across the back. Inside of mouth is pink.

Size

Attains a length of 30 cm; usually up to 25 cm. British Rod-caught Record: 836 g (1975, Southend-on-Sea).

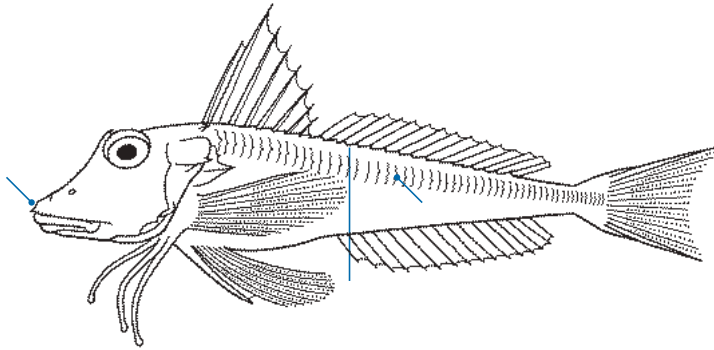
Ecology

The Norway Haddock is found in inshore waters of 10-100 m and only occasionally occurs in deeper water. It is also the most southerly-ranging member of its genus in European waters. It tends to prefer rocky sea beds, although it occasionally occurs on sand or even mud. It feeds on a wide range of smaller fishes and crustaceans. The young are born as well-developed larvae at a length of 4-5 mm, and up to 30,000 young may be produced by a single fish. It has little commercial importance although small numbers may be caught on occasions; it is sometimes caught by anglers.

Family: Gurnards *Triglidae*

The Triglidae is a family of marine fishes known as gurnards or gurnets, and in North America called sea robins. The family is of worldwide distribution in tropical and temperate seas, usually in shallow water. The head is covered with a bony armour, often with strong spines on the gill covers and elsewhere. The lower three rays of the pectoral fins are separate, thickened, and well supplied with sense organs. They are used to locate food items buried in the sea bed, and are extended forward and bent like fingers, while the fish creeps slowly along the bottom. Gurnards also make audible noises by special muscles attached to the swim-bladder. No doubt this helps in keeping schools in contact especially at spawning time. There are 10 genera with some 105 species. Six species are known in northern European waters.

Red Gurnard *Aspitrigla cuculus*



Colour

Deep red overall, except that ventrally it is pinkish-silver. The ventral fins are pale but darken towards their tips.

Size

Attains a length of 50 cm and a weight of over 1.5 kg. British Rod-caught Record: 1.325 kg (2005, Porthleven). Irish Rod-caught Record: 1.63 kg (1968, Belmullet).

Ecology

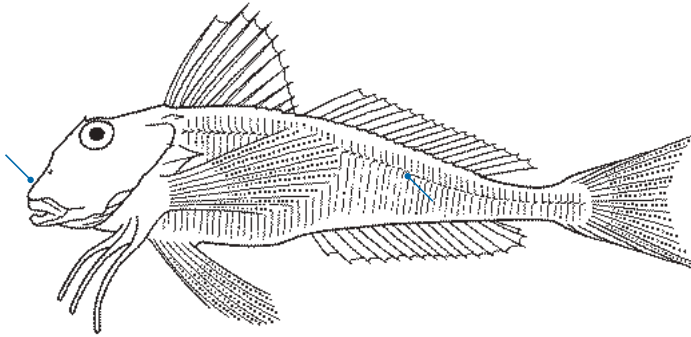
A shallow-water species found mostly on the Atlantic coast in depths of 20-250 m. It is a relatively uncommon fish, except locally. It is found on a variety of different sea beds,

usually on sand, or sand and gravel, but also on mud, or even rocks. It spawns in summer. Its food consists principally of crustaceans, especially shrimps and swimming crabs, but it also eats fishes and bottom-living invertebrates. Its diet suggests that it is a more active fish than most species of gurnard. It is captured in some numbers by trawlers to the south of Britain and Ireland; it is also occasionally caught by anglers.

Characteristics

A rather stout-bodied gurnard with moderately large scales. The lateral line has no spines and each pore is covered by a large, laterally expanded scale. The snout ends in three short spines on each side, and is slightly concave in profile. Pectoral fins only just reach the vent.

Streaked Gurnard *Chelidonichthys lastoviza*



Characteristics

A stout, heavy-bodied gurnard with a blunt snout and near vertical profile to the head. The lateral line scales have very slight spines, and the body is crossed by distinct ridges of skin originating at the lateral line.

Colour

Dull red, even reddish-brown above, with darker patches; ventrally creamy coloured. The pectoral fins are greyish with a red tinge and rows of large blue spots.

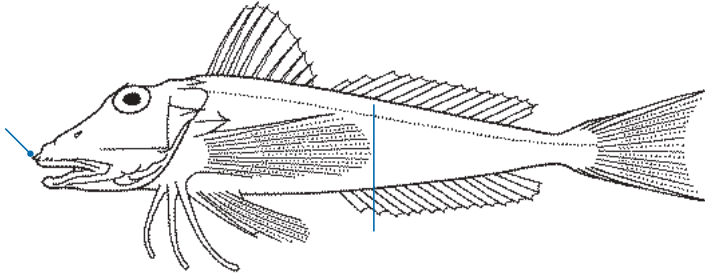
Size

Grows usually to ca 36 cm, and a maximum of 40 cm. British Rod-caught Record: 637 g (1971, Loch Goil).

Ecology

A rare fish north of the English Channel, and not common even there, the Streaked Gurnard is mainly an occasional late summer migrant from the south to most of northern Europe. It lives in moderately deep water, 40-100 m, and is thus not often caught close inshore. It seems to inhabit sand and muddy grounds especially where they are interspersed with rocky patches. It feeds exclusively on crustaceans, especially swimming crabs. Also known as *Trigloporus lastoviza*.

Tub Gurnard *Chelidonichthys lucernus*



Characteristics

The snout is produced to form two lobes bearing small spines on the front edge; it is pointed in profile. The eye is small, about 1.5 times the depth of the cheek. Lateral line scales are not enlarged or spiny; the body scales are small. The large pectoral fins reach well past the vent.

Colour

The back and upper sides range from bright red to pink; the underside is orange or white. Pectoral fins are a brilliant peacock blue, with red at the edge, and green spotted.

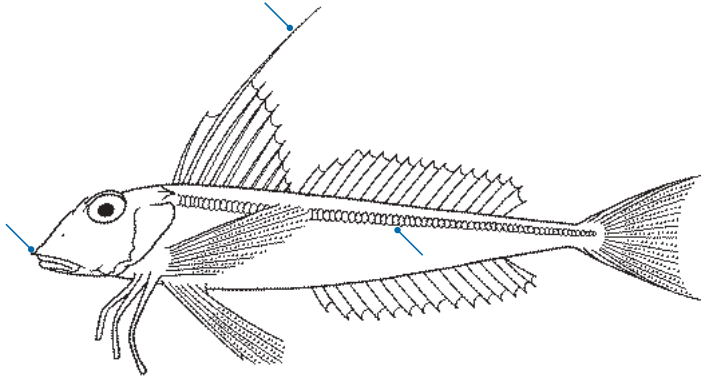
Size

Attains a maximum length of 75 cm, usually between 50-60 cm, and a maximum weight of 6 kg. The largest European gurnard. British Rod-caught Record: 5.528 kg (1976, Langlan Bay). Irish Rod-caught Record: 5.542 kg (1973, Achill).

Ecology

A relatively abundant gurnard in inshore waters of 20-150 m, extending in decreasing numbers to 200 m. Small specimens are frequent in shallow water from 2-20 m. It lives occasionally solitarily, more often in small schools, on mud and muddy-sand bottoms. It feeds on a wide range of crustaceans and bottom-living fishes. It probably eats more fish than other gurnard species; sandeels, small flatfishes, gobies, and dragonets are all eaten in numbers. Swimming crabs and brown shrimps are also important food. A moderately important food fish, especially in continental Europe; its flesh is white and tasty. Also caught in numbers by anglers.

Long-finned Gurnard *Chelidonichthys obscurus*



Characteristics

Relatively slender-bodied with a pointed snout, convex or straight profile, and a single small spine on each side of the mid-line at the tip of the snout. The second dorsal fin spine is greatly elongate, thickened at the base and twice as long as the remaining spines. The lateral line is covered by large flexible scales.

Colour

Reddish on back and sides shading to pinkish on the underside; the lateral line is pearly-pink in colour. Pectoral fins dark blue.

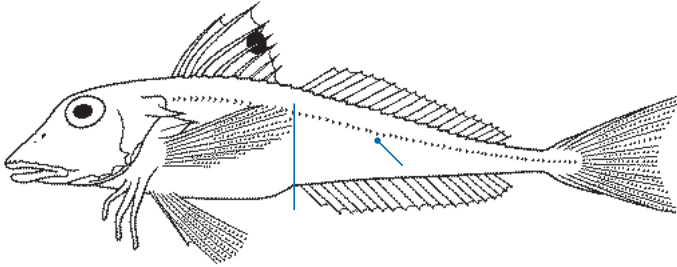
Size

A small gurnard, it attains a maximum length of 36 cm.

Ecology

An extremely rare fish in northern European waters. It appears to live in inshore waters in 10-170 m depth, mainly on soft bottoms or rough rocky grounds. It feeds on crustaceans, principally shrimps and mysids, and also eats some molluscs. Its biology is virtually unknown.

Grey Gurnard *Eutrigla gurnardus*



Characteristics

A relatively slender-bodied gurnard with a sharply-pointed snout; the head profile is straight. The eyes are large, their diameter is as great as the depth of the cheek, except in very large fish. No spines at base of dorsal fin. The pectoral fins are short and do not reach the vent. The lateral line has sharply-pointed, bony scutes, but in the largest specimens these spines are less noticeable.

Colour

The back and upper sides grey, or greyish-brown with small white or creamy spots; lateral line white, ventrally a clear separation to the dull white belly. A dusky blotch on the first dorsal fin and tail dark. Some specimens are reddish, showing an identical pattern, but reddish instead of grey with red tail and blotch on dorsal.

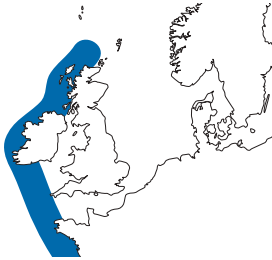
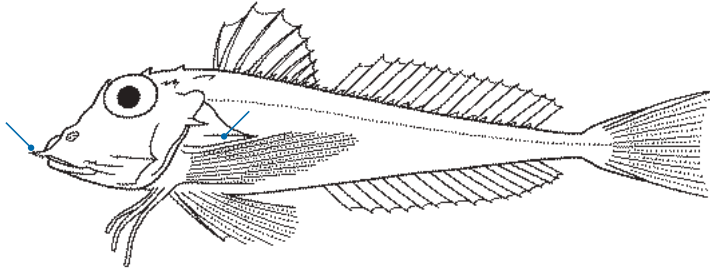
Size

Attains a maximum length of 45 cm; usually around 30 cm. Maximum weight ca 1.4 kg. British Rod-caught Record: 1.105 kg (1976, Mull). Irish Rod-caught Record: 1.389 kg (1967, Rosslare Bay).

Ecology

In general, this is an inshore gurnard, although it is occasionally caught in very shallow water. Usually it lives at depths of 20-50 m, exceptionally from 10-150 m. It is most common on sandy bottoms but also occurs, with decreasing frequency, on mud, shell, and rocky bottoms. It eats bottom-living crustaceans, for example brown and pink shrimps, and small crabs, and fishes such as gobies, dragonets, small flatfishes, and sandeels. It spawns from April to August in moderately deep water. Its maximum life span rarely exceeds six years, and it attains sexual maturity at between two and three years. The Grey Gurnard is not deliberately exploited as a food fish in northern Europe, although a considerable quantity is captured incidentally in trawling. It is marketed in small quantities mainly for crab bait.

Piper *Trigla lyra*



Characteristics

The snout is produced to form two flattened plates, one on each side, with distinct forward-pointing teeth. A massive spine immediately above the pectoral fin; other head spines well developed. Fine, rough-edged scales on the body; lateral line smooth, but dorsal profile with sharp spines.

Colour

Bright red, the sides rosy fading to pinkish-silver on the abdomen.

Size

Attains a length of 60 cm.

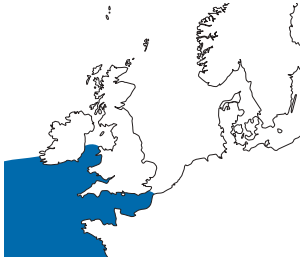
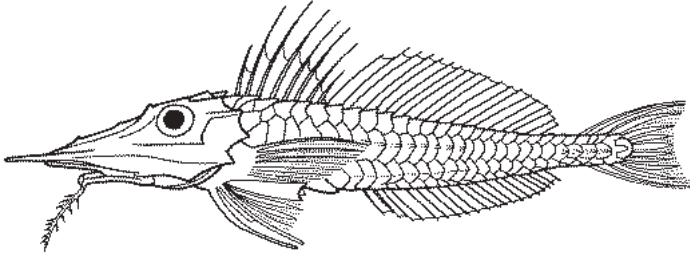
Ecology

The Piper lives on the upper continental slope in deep water of 300-700 m; it is the only gurnard to be found in such deep water in northern Europe. It lives on the sea bed on muddy bottoms. Its biology is little known.

Family: Armoured Gurnards *Peristediidae*

In this family the body is enclosed within four rows of thick spine-bearing plates on each side. Worldwide there are four genera with some 36 species but only one of these has been recorded around Britain and Ireland..

Armed Gurnard *Peristedion cataphractum*



Characteristics

Body enclosed in spiny plates, of which there are 17-21 along the lateral line. Elongate bony projections on snout; lower jaw with two long fringed barbels.

Colour

Mainly pinkish or reddish, paler below.

Size

Reaches a maximum length of 40 cm.

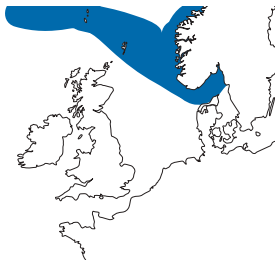
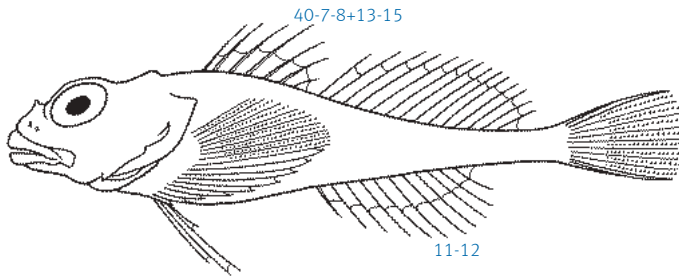
Ecology

Occurs in the eastern Atlantic and the Mediterranean on muddy and rocky bottoms on the continental shelf at depths of 50-850 m. Records of this species in Britain are all from the western English Channel during the 19th Century. Walks on the bottom using its free pectoral rays. Feeds on invertebrates by digging in the mud using its rostrum. The young are pelagic, the juveniles living in coastal waters initially before migrating to deeper waters. Of some importance to subsistence fisheries.

Family: Bullheads *Cottidae*

Fishes of the family Cottidae are exceptionally abundant and well distributed in the colder shallow seas of the northern hemisphere, particularly in the North Pacific from which they have spread to the Atlantic. A few species are found in fresh water. They have rather stout bodies, and broad spiny heads. They are scaleless, but some species have small spines in the skin, or bony plates running along the sides. In most, probably all, species the sexes are distinguished by colour and the presence of a long urinogenital papilla in males. There are 70 genera with some 275 species worldwide; only a few of these occur in northern European waters.

Atlantic Hookear Sculpin *Artediellus atlanticus*



Characteristics

A small northerly species with a smooth head and two dorsal fins. The head has a number of raised bumps, but no spines except for one on the edge of the preoperculum which is large and curved to point upwards. Lateral line without large scales; no ridges in the skin on the lower body.

Colour

Greeny-brown with dark spots on body forming prominent bands in adult males. Fins with dark and light bands.

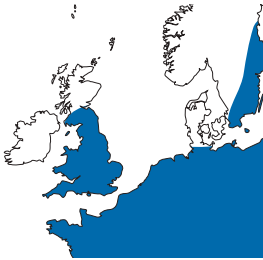
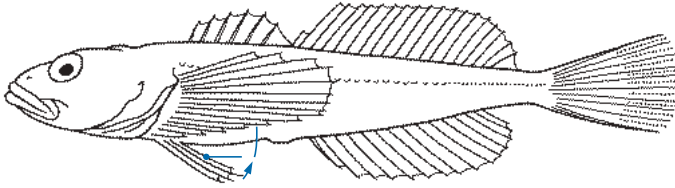
Size

Attains a maximum length of 13 cm, usually around 10-11 cm; the largest specimens are males.

Ecology

Ecology An Arctic fish found only in the extreme north of northern Europe. It inhabits muddy bottoms in 35-410 m, but in the shallower of these depths only in the far north. It feeds on polychaete worms and molluscs. The European subspecies, *A. atlanticus europaeus*, is distinguished from the western North Atlantic form, *A. atlanticus atlanticus* – which is said also to occur near Iceland and the Faroes.

Bullhead *Cottus gobio*



Characteristics

A small freshwater fish with a broad, flattened head and a relatively short spine on each preoperculum. The lateral line continues to the tail fin, although the pores are not visible beyond the second dorsal fin. Pelvic fins pale coloured, the outer ray as long as, or longer than the inner ray; neither reaches the vent.

Colour

Variable with habitat; usually brown or greenish-brown, variously mottled. Paler ventrally.

Size

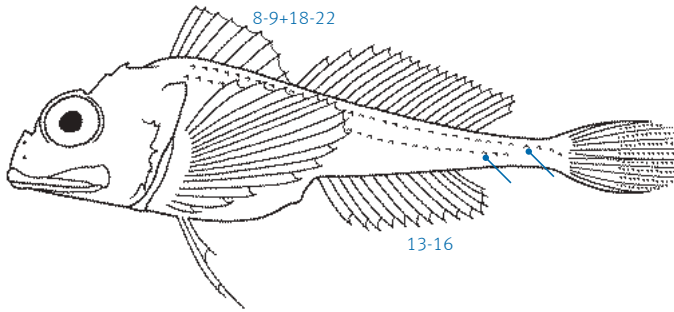
Usually not more than 10 cm; exceptionally in the north of Europe up to 17 cm. British Rod-caught Record: 28 g (1983, Guildford).

Ecology

The Bullhead is abundant in streams, small rivers, and larger lakes, especially those with stony beds. It can be found in water up to 9 m in depth, although it is most abundant in the shallows. In daytime it hides under rocks and stones, or in dense plant beds, but becomes active at night and then makes forays over the river bed. It feeds mainly on crustaceans, especially gammarids (freshwater shrimps), and bottom-living insect larvae. It is frequently accused of eating salmon and trout eggs on the grounds that it can be found in their redds: its effect as a predator is very slight. It spawns in March-May in a cavity excavated beneath a large stone. The eggs are attached to the underside of the stone and are guarded by

the male for 3-4 weeks, until they hatch. The fry scatter on hatching and shelter in the crevices among stones. They become sexually mature in their second year and live for five years at most. The Bullhead is eaten by some fishes such as Chub and Burbot, occasionally by Trout, and by aquatic birds such as the Heron and the Kingfisher. It is sensitive to pollution and low oxygen levels so its presence indicates good water quality.

Two-horn Sculpin *Icelus bicornis*



Characteristics

A small sculpin with a roughly spiny head and two well-separated dorsal fins. Large spines on preoperculum, the lower two forward-pointing and short, the third long, branched at the tip and pointing backwards. Two lateral lines both with large scales bearing spines on their posterior ends. Anal fin base shorter than dorsal.

Colour

Yellowish with brown spots most numerous on the back.

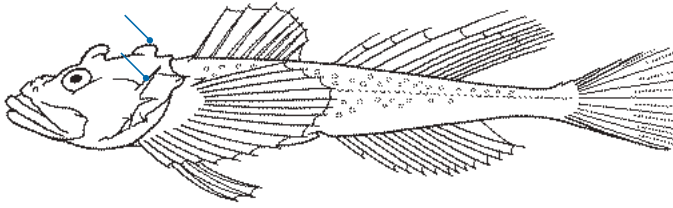
Size

Attains a length of 15 cm.

Ecology

A northern sculpin which lives on the sea bed on mud, or mud and stones, mainly between 40-180 m, exceptionally shallower than this, and also down to 560 m. Young fish are, however, found in coastal waters even in the Laminaria zone, just below low tide mark. Mainly a north West Atlantic species which is also found in the northern East Atlantic down to Norway; may occur in the extreme north east of the area.

Four-horn Sculpin *Trigloopsis quadricornis*



Characteristics

A broad-headed sculpin with three strong spines on the preoperculum, one on the gill cover and another just above it. Membrane from the gill covers free, forming a flap across the throat. Adults have rounded spongy knobs on the head, and bony tubercles along the chain-like lateral line.

Colour

Grey-brown above, yellowish or cream ventrally. Knobs on head yellowish-grey.

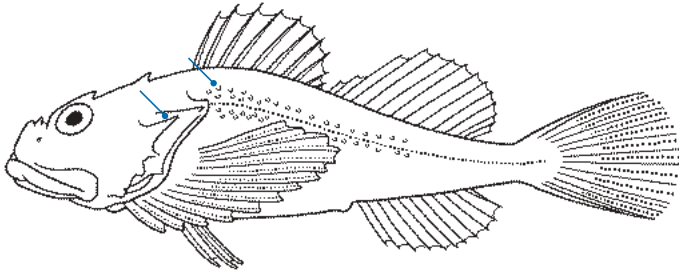
Size

Females can attain a length of 36 cm; males grow to 23 cm.

Ecology

In Europe this fish is known only in the Baltic Sea, and the Barents and White Seas in the extreme north. However, freshwater populations are found in the lakes of Sweden, Finland, and other Baltic countries. These are relicts of populations which lived in the region when the Baltic was a fully marine sea, soon after the last Ice Age. In the sea it lives in the coastal zone, as deep as 15-20 m. It feeds on isopod crustaceans and fishes, especially Smelt, Arctic cods, and Capelin. It spawns in early winter and the fry hatch in spring. It has no commercial value to fisheries.

Bull Rout *Myoxocephalus scorpius*



Characteristics

A large, broad-headed sculpin with only two relatively short spines on the preoperculum and another on the gill cover. Membrane from the gill covers forms a flap under the throat. The sides on either side of the lateral line have numerous small spines in the skin.

Colour

Greeny-brown above often blotched with a darker colour. Ventrally cherry red (breeding males) to orange (females) with conspicuous round white spots. Rounded spots extend onto the sides.

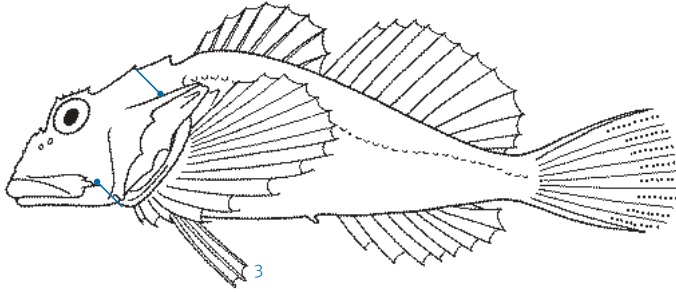
Size

Generally females grow to 30 cm, males to 25 cm; in Arctic seas this species may attain 60 cm. British Rod-caught Record: 1.119 kg (1982, Whitley Bay).

Ecology

Widely distributed in shallow water of 4-60 m along most sea coasts of northern Europe. Only in the extreme north of its range is it found between tide marks. It inhabits a wide range of sea bottoms from sand and mud to rocks; it is commonly caught near harbour walls. It spawns from December to March, the clumps of eggs being deposited between rocks on the bottom; they are guarded by the male. They hatch in 5-12 weeks, depending on the sea temperature. The Bull Rout feeds on a wide range of bottom-living fishes and crustaceans, including commercial species, but makes little difference to their numbers, for it is only locally abundant.

Long-spined Sea Scorpion *Taurulus bubalis*



Characteristics

A relatively small sculpin which has a very long, strong spine on the preoperculum (longer than the eye diameter). The membrane running from the gill covers ventrally is joined to the throat and does not form a flap. Always a small white barbel at the angle of the mouth on the upper jawbone. Lateral line spiny, but no spines on the skin either side of it. Three distinct rays in each pelvic fin.

Colour

Variable with type of habitat: usually greeny-brown with yellowish underside, often with irregular dark bands on back and sides. Occasionally deep red.

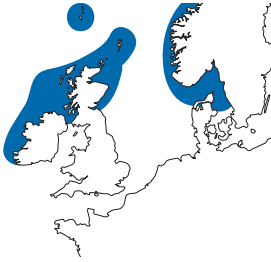
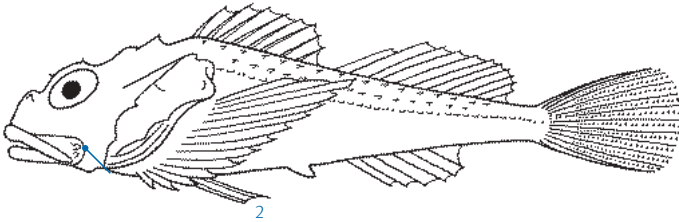
Size

Attains a length of 17.5 cm; males are generally smaller. British Rod-caught Record: 283 g (1992, Dorset).

Ecology

A common fish on rocky shores and in the immediate sublittoral zone, but apparently always in association with rocks and algae. Found down to 30 m. Its food consists almost entirely of fishes and crustaceans, mainly those species which are found in the same habitats, e.g. blennies, gobies, amphipods, prawns, and shore crabs. It breeds in early spring, the eggs being deposited in clumps amongst algae. The young are pelagic shortly after hatching, but return to the sea bed at a length of 13-14 mm.

Norway Bullhead *Taurulus lilljeborgi*



Characteristics

Similar to the Long-spined Sea Scorpion and, like it, has a long upper preopercular spine (but equal to the eye diameter in length). Membrane from the gill covers joined to, not forming a flap across, the throat. A small barbel at the corner of the mouth. Lateral line spiny, distinct spines in the skin above the lateral line and on the back. Pelvic fins with two soft rays only.

Colour

Reddish-olive overall with four dark bands on the back and upper sides. Distinct black spot on the first dorsal fin. Breeding males have a band of red across the head and red patches on the sides.

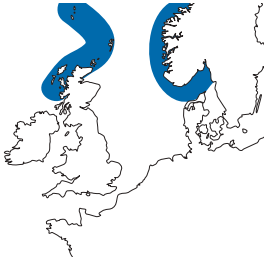
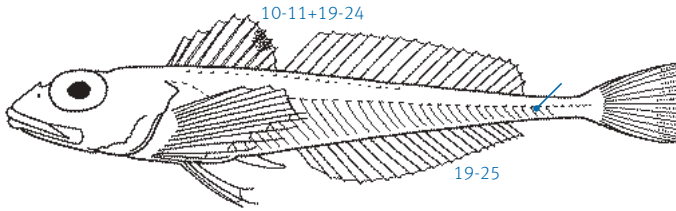
Size

Size Attains a maximum length of 7.5 cm, but usually grows to only 5-5.5 cm.

Ecology

Lives in close association with rocks and algae, and in the south of its range is mostly captured in depths of 2-90 m. However, it has been caught on the shore near low-tide mark, especially in pools with dense Corallina growths. It breeds in spring in deep water, the eggs being laid in clumps on the sea bed. Probably they are guarded by the male. The larvae are planktonic at first but return to the bottom at 13-14 mm long.

Moustache Sculpin *Triglops murrayi*



Characteristics

A moderately small northern fish with two well-spaced dorsal fins, and the head with numerous fine spinules and a few spines. The lower half of the body has many diagonal rough-edged ridges, which begin at the lower lateral line. Two lateral lines with spiny scales, the lower curved downwards above the pectoral fin. Anal fin base shorter than second dorsal fin.

Colour

Brownish above with dark cross-bars which break into speckles on the sides. Black spot on the first dorsal fin.

Size

Attains a maximum length of 17 cm, usually up to 14 cm. Males are smaller than females.

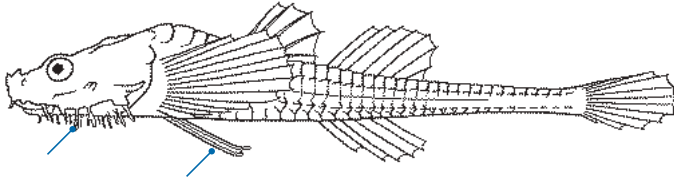
Ecology

Found in moderately deep water usually between 50-250 m, exceptionally to 300 m, and in shallower water in the north. Mostly it is captured on sandy bottoms. It feeds mainly on polychaete worms and small crustaceans. It is frequently found in cod stomachs in northern waters.

Family: Poachers *Agonidae*

The poachers are an interesting family of mainly Arctic marine fishes, with 22 genera and some 47 species, but represented by two species only in the European Atlantic. The North Pacific contains a greater number of species. All have a body armour of several rows of overlapping plates, small fins, and rather small mouths. All live in shallow seas.

Hooknose *Agonus cataphractus*



Characteristics

Head broad and body encased in hard bony plates (31-34 dorsal plates); body flexible to a limited degree. A strong spine on each gill cover and a pair of strong hooks on the snout. Many short unbranched barbels on the underside of the head. Pectoral and pelvic fins short. Also known as Pogge.

Colour

Dull brown on the back with four or five darker saddles; ventrally creamy-white. Pectoral fins tinted orange in breeding season.

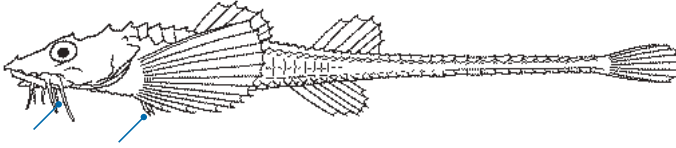
Size

Exceptionally attains 21 cm, usually only 10-15 cm. British Rod-caught Record: 46 g (1985, Anglesey).

Ecology

A common fish in inshore waters especially on sandy or muddy shores. Found at depths of 20-270 m; young specimens live in even shallower water of 2 m on offshore banks. The Hooknose is commonly captured in shrimp and sprat trawls, but has no economic value. It breeds from February to May, when the female deposits clumps of eggs between the branching holdfasts of kelp and other brown seaweeds. The eggs may take as long as 12 months to hatch. The larvae are planktonic at first, but at a length of 20 mm begin to live on the bottom. The Hooknose feeds primarily on small crustaceans, with brittlestars, polychaete worms, and small molluscs being eaten on occasions.

Atlantic Poacher *Leptagonus decagonus*



Characteristics

Head narrow and body encased in 41-45 hard bony plates, each plate with a spine; tail very elongate. A few long barbels under the head, one branched in the middle of the lower jaw and four straight ones at each corner of the mouth. Pectoral fins long.

Colour

Body brownish-grey with several darker cross-bands; lighter ventrally.

Size

Maximum attained 21 cm; usually up to 20 cm.

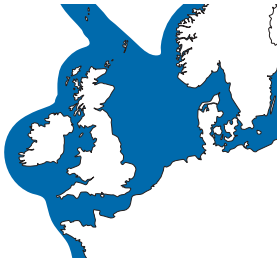
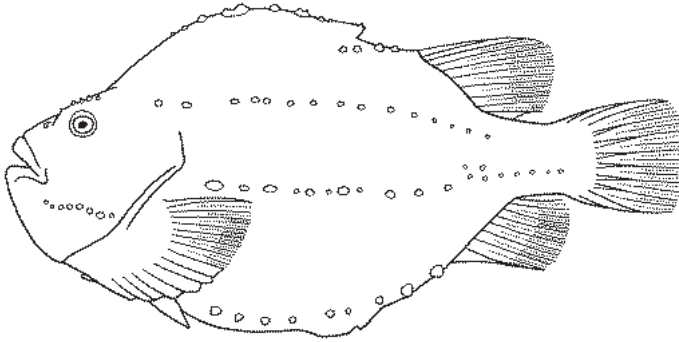
Ecology

An Arctic species which is confined to the extreme northern parts of Europe. It has been found mainly in depths of 75-500 m, exceptionally on muddy or muddy-sandy bottoms, often among stones. Its food consists mainly of benthic crustaceans although some pelagic species are also eaten.

Family: Lumpfishes *Cyclopteridae*

Members of the Cyclopteridae are marine fishes found mainly in cool temperate and polar seas, and in the deep sea. They are stout-bodied, some like the Lumpsucker having two short dorsal fins and large bony plates in the skin, while others have a single dorsal fin, loose skin, either smooth or with fine prickles in it. All except some deep-sea species have a well-developed sucker-disc on the thorax. There are six genera with 28 species. One species only is found on the continental shelf in northern European waters; others live in deep water further offshore.

Lumpsucker *Cyclopterus lumpus*



Characteristics

Unmistakable in that the globose body is rounded with rows of large, coarsely-spined plates on the sides. The pelvic fins form a large powerful sucker disc on the belly; second dorsal and anal fins short-based and about equal in length. First dorsal fin reduced in adults; in the young it forms a high crest. Young with large sucker and closely covered in bony tubercles.

Colour

Variable; greyish or greenish-brown on the back, paler ventrally. Males show orange or reddish tints, or bright red, on the belly in the breeding season.

Size

Females are usually 30-40 cm long with a maximum of 60 cm, and weight of 10 kg; males attain 50 cm, but are usually 25-30 cm in length. British Rod-caught Record: 9.347 kg (1987, Weymouth).

Ecology

A common fish in the seas north of the English Channel. Primarily a bottom-living species living among rocks from low-water mark on the shore down to 200 m, but the larvae and young are planktonic, and many of the non-breeding adults live bathypelagically. The young are often attached to floating algae or other flotsam; adults are frequently caught in mid-water trawls. The Lumpsucker makes an inshore migration to spawn

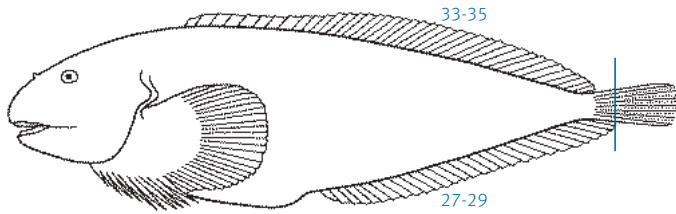
Continued: Lump sucker *Cyclopterus lumpus*

at, and below, low-tide mark on rocky shores. The eggs are laid in loose clumps between seaweeds and rocks from February to May, and as late as July and August to the north. The male guards the eggs and keeps water flowing through the egg mass. It feeds mainly on small crustaceans, polychaete worms, jellyfishes and fishes. During spawning migrations it does not feed. In its turn, the Lump sucker is eaten by the Angler Fish, Halibut, Greenland Shark, and frequently by Sperm Whales. Males guarding egg clumps are also vulnerable to seabirds at low tide. It is fished for in a small way, mostly for the sake of the roe which, salted and dyed, is offered for sale as a substitute caviar.

Family: Snailfishes *Liparidae*

The Snailfishes have no scales and a jelly-like skin. In many species the pelvic fins are modified to form a sucker disc. There are some 29 genera and 334 species worldwide, but only two of these occur around Britain and Ireland.

Common Seasnail *Liparis liparis*



Characteristics

A small, round-bodied, tadpole-like fish with a long-based dorsal fin (33-35 rays). Anal fin also long-based but shorter (26-29 rays); both fins joined to the tail fin, the anal more noticeably. Skin loose and flabby, covered with minute prickles. No scales. Sucker disc on belly well developed.

Colour

Usually dull brown above, lighter below; variably patterned with stripes, patches, and bars of darker brown.

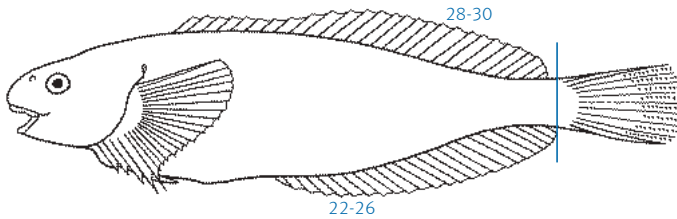
Size

Exceptionally grows to 18 cm in the far north; usually attains a length of 10-12 cm.

Ecology

A relatively common fish in shallow inshore waters of 5-150 m, but rarely, if ever, found in intertidal habitats. In the North and Irish Seas it is common on mud and muddy-sand; elsewhere it is reported to live on rocky grounds. It breeds in winter (January to March), the eggs being laid in hazelnut-sized clumps among hydroids, short algae or bryozoans. The eggs hatch in 6-8 weeks and the larvae are pelagic. The Common Seasnail feeds mainly on crustaceans, especially shrimps, and worms and small fish.

Montagu's Seasnail *Liparis montagui*



Characteristics

A small, round-bodied plump fish with loose, gelatinous skin covered with minute prickles. A rounded, well-developed sucking disc on the belly. Dorsal fin long-based, low anteriorly, with 28-30 rays; anal with 22-26 rays. Neither fin is joined to the tail fin, but the anal comes close to the base of the tail fin rays.

Colour

Variable with habitat; often brownish, sometimes pink, reddish, or even green.

Size

Exceptionally to a length of 10 cm; rarely longer than 6 cm.

Ecology

A shallow water seasnail most frequently captured in intertidal pools or under seaweed on rocky shores; it is probably confined to the shore. It spawns in winter or early spring to the north of Britain. The eggs are laid in small clumps on red algae, or on the hydroids on the holdfasts of brown seaweed. The early young are pelagic, but at ca 1.2 cm they begin to live on the sea bed. Both young and adults cling by their sucker disc to the underside of a rock, with their tail curled around to the snout. They feed exclusively on small crustaceans.

Order:

Perciformes

Perches

The members of this order, the largest order of vertebrates, are very varied in form, and often the dominant fish found in many habitats worldwide. There are some 160 families with about 1,539 genera and over 10,000 species.

In this order:



Sea Bass



Wreckfish



Dusky Perch



Comber



Rock Bass



Pumpkinseed



Largemouth Bass



Ruffe



Perch



Zander



Bullseye



Bluefish



Common Dolphinfish



Remora



Vadigo



Blue Runner



Pilot Fish



Guinean Amberjack



Greater Amberjack



Almaco Jack



Derbio



Scad



Ray's Bream



Silver Pomfret



Rough Pomfret



Long-finned Bream



Bogue



Dentex



Zebra Sea Bream



White Sea Bream

Continued: Perciformes *Perches*



Saddled Bream



Spanish Sea Bream



Red Sea Bream



Pandora



Couch's Sea Bream



Saupe



Gilthead



Black Sea Bream



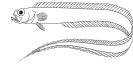
Meagre



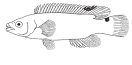
Plain Red Mullet



Striped Red Mullet



Red Bandfish



Scale-rayed Wrasse



Rock Cook



Rainbow Wrasse



Baillon's Wrasse



Corkwing Wrasse



Goldsinny



Ballan Wrasse



Cuckoo Wrasse



Sars's Eelpout



Esmark's Eelpout



Vahl's Eelpout



Viviparous Blenny



Butterfish



Jelly Cat



Wolffish



Spotted Catfish



Raitt's Sandeel



Lesser Sandeel



Smooth Sandeel



Corbin's Sandeel



Greater Sandeel



Lesser Weever



Greater Weever



Yarrell's Blenny



Spotted Snake Blenny



Snake Blenny



Black-faced Blenny



Butterfly Blenny



Montagu's Blenny



Shanny



Tompot Blenny



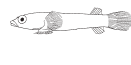
Variable Blenny



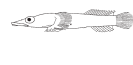
Red Tompot Blenny



Small-headed Clingfish



Two-spotted Clingfish



Connemara Clingfish



Shore Clingfish



Common Dragonet



Spotted Dragonet



Reticulated Dragonet



Transparent Goby



Jeffreys's Goby

Continued: Perciformes *Perches*



Crystal Goby



Giant Goby



Couch's Goby



Red-mouthed Goby



Steven's Goby



Black Goby



Rock Goby



Two-spotted Goby



Guillet's Goby



Diminutive Goby



Fries's Goby



Lozano's Goby



Marbled Goby



Common Goby



Sand Goby



Norway Goby



Painted Goby



Leopard-spotted Goby



Louvar



Yellowmouth Barracuda



Johnson's Scabbardfish



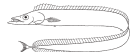
Oilfish



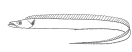
Black Scabbardfish



Frostfish



Silver Scabbardfish



Hairtail



Bullet Mackerel



Frigate Mackerel



Little Tunny



Skipjack Tuna



Plain Bonito



Bonito



Atlantic Chub Mackerel



Mackerel



Albacore



Yellowfin Tuna



Bigeye Tuna



Atlantic Bluefin Tuna



Swordfish



Atlantic Sailfish



Blue Marlin



White Marlin



Blackfish



Barrelfish



Cornish Blackfish



Imperial Blackfish



Longfin Cigarfish

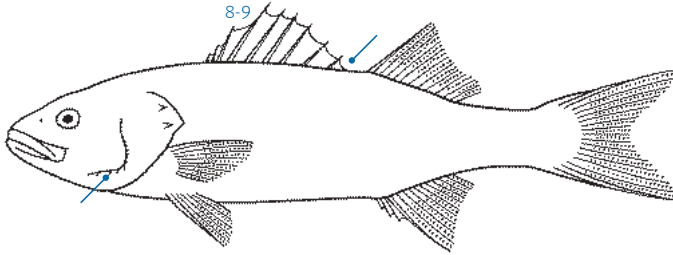


Boarfish

Family: Sea Basses *Moronidae*

The Sea Basses are a family of spiny-finned fishes found worldwide in both tropical and temperate fresh waters, and in the sea. In many ways these fish are similar to the sea perches, with which family they were associated for many years. There are only three genera, with eight species. The family includes the well-known North American Striped Bass, *Morone saxatilis*, and its freshwater relatives, but in European waters the only representative is the Sea Bass.

Sea Bass *Dicentrarchus labrax*



Characteristics

Two dorsal fins separated by a short space; the first fin is strongly spiny; 8-9 spines. Body streamlined, relatively shallow with large scales. Forward-pointing spines on the lower edge of the preoperculum; no heavy ridge across gill cover, two flat opercular spines present. 66-74 scales along the lateral line.

Colour

Greeny-grey on the back with brilliantly silver sides, and silvery-white belly. A dusky patch on the gill cover. Small fish (up to 10 cm) are faintly dark spotted.

Size

Attains a length of 1 m, usually around 60 cm, and a maximum weight of ca 12 kg. British Rod-caught Record: 8.876 kg (1987, Kent). Irish Rod-caught Record: 8.08 kg (2000, Doughmore Strand).

Ecology

A relatively common fish in the sea around England, Wales, Ireland and the southern North Sea coasts; it becomes much rarer to the north. It is an active swimming, schooling fish in inshore waters, commonly

entering estuaries and penetrating upstream into fresh water; a habitat of the young especially. It may be captured in offshore waters, although it is usually found in close proximity to reefs. It is to some extent a migratory fish, the North Sea populations, in particular, being summer migrants from the south or south-west. The Sea Bass feeds on a wide range of fishes, especially members of the herring family, sandeels, and other small schooling fishes. It also eats considerable quantities of squids and various crustaceans. The young mainly eat small crustaceans, but soon graduate on to a fish diet. The Sea Bass breeds from March to mid-June, mostly in May, in inshore waters. The eggs and early larvae are pelagic. It is a long-lived fish (large specimens

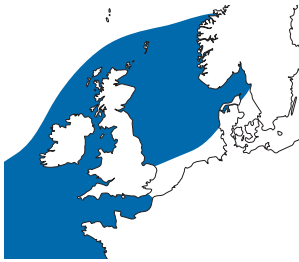
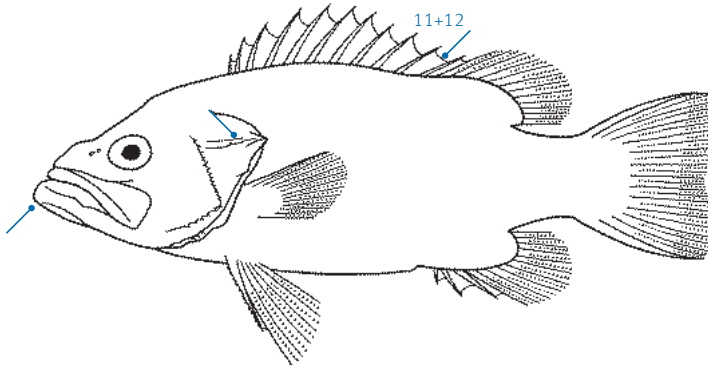
Continued: Sea Bass *Dicentrarchus labrax*

may exceed 20 years of age), and its breeding success at the northern extremities of its range is limited; hence heavy exploitation, whether by anglers or by commercial fishermen, can lead quickly to decreased catches. The Sea Bass is an extremely valuable fish commercially and is very popular with anglers. It is caught in the western Channel by midwater pair trawlers, and it is now farmed in the Mediterranean.

Family: Wreckfishes *Polyprionidae*

This small family has only two genera with five species, only one of which is found around Britain and Ireland.

Wreckfish *Polyprion americanus*



Characteristics

A heavy-bodied fish with a rather pointed head and protruding lower jaw. The dorsal fins are united into a single fin, although the first 11 fin elements are strong spines. Scales small, 90-100 in the lateral line, the vertical fins with high scaly sheaths. Cheeks scaly, the lower preopercular edge spiny, a heavy ridge running across the gill cover. Also known as Stone Bass.

Colour

The back and upper sides are bluish grey, shading to pale grey on the sides and ventrally with a silvery sheen. Often blotchy on the back. Juveniles have black blotches on head and body

Size

Attains a length of 2 m and a weight of 48 kg. British Rod-caught Record: 5.407 kg (2001, Poole). Irish Rod-caught Record: 5.315 kg (2005, Baltimore).

Ecology

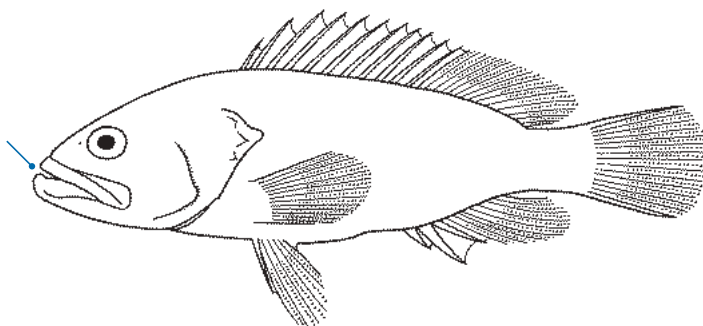
The Wreckfish is an uncommon fish in northern European waters, but one which occurs fairly regularly. The habit of juveniles up to 60 cm of accompanying drifting wreckage, often in schools, is possibly the reason for its occurrence here, as it follows flotsam blown from the southwest into northern latitudes. Consequently, those found in

this region are mostly young fish; the large adults live solitarily in deeper water close to the bottom. Most Wreckfish are caught, or seen, near the surface; larger fish live at depths of 100-200 m, occasionally deeper. They are marketed in southern Europe as food fish. Found also in the western Atlantic and the Indian Ocean; the map shows European distribution.

Family: Sea Perches *Serranidae*

The Serranidae is a large family of marine fishes, including the groupers and lyretails or basslets, with 64 genera and 475 species, which are most abundant in tropical and warm-temperate seas, with only two representatives in northern Europe. In general, they are large predatory fishes with big heads and wide mouths, fully scaled bodies, three opercular spines, two dorsal fins (the first with strong spines), but often joined to form a single fin, and an anal fin with three strong spines in front. Many sea perches are hermaphrodite, in some species developing both male and female gonads simultaneously. Others are functional males early in life, changing sex to female later. The Comber exhibits this latter form of hermaphroditism.

Dusky Perch *Epinephelus marginatus*



Characteristics

First dorsal fin strongly spiny and joined to the second fin. Preoperculum with a toothed edge; gill cover with three flat spines, but with no strong ridge across it. Mouth large with thick lips. Strong, sharp teeth in the front of the jaws, all depressible (not firmly fixed). Scales very small, extending across the head and lower jaw. Tail rounded.

Colour

Deep brown with irregular light blotches on the back and freckles on the sides; yellowish under chin and belly. Dorsal fin with an orange edge, the others with a light edge.

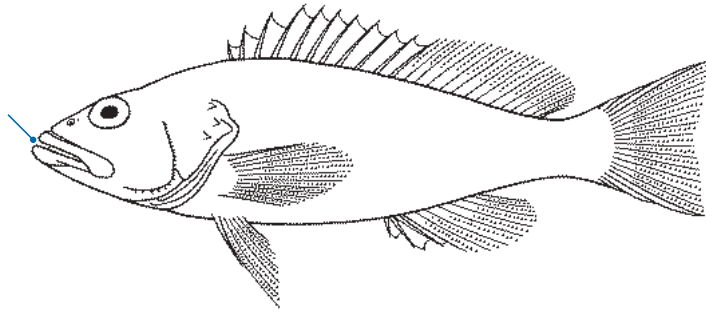
Size

Attains a maximum length of 1.5 m, and a weight of ca 60 kg. British Rod-caught Record: 12.700 kg (1973, Dorset).

Ecology

This is a rare fish in northern European waters, and it has been recorded only on rare occasions as far north as Ireland. It used to be common in the Mediterranean, living at 8-200 m among rocks where there are caves or crevices big enough to hide in; it is usually solitary, but large caves may be inhabited by more than one fish. It feeds mainly on fishes and crustaceans. It is listed by the IUCN as an Endangered species.

Comber *Serranus cabrilla*



Characteristics

Strong spines in the first dorsal fin which is joined to the second, soft-rayed, dorsal. Preoperculum with fine teeth on its edge. Gill cover with three flat spines but no heavy ridge running across it. A pair of canines in the upper jaw, all other teeth small, densely packed and not depressible.

Colour

Back and sides brownish-yellow with 7-9 darker vertical bars; head with pale blue or greenish stripes along the lower side, often continuing along the sides. Tones vary with depth and sexual development.

Size

Grows to a length of 40 cm and a weight of ca 1 kg. British Rod-caught Record: 822 g (1977, Cornwall).

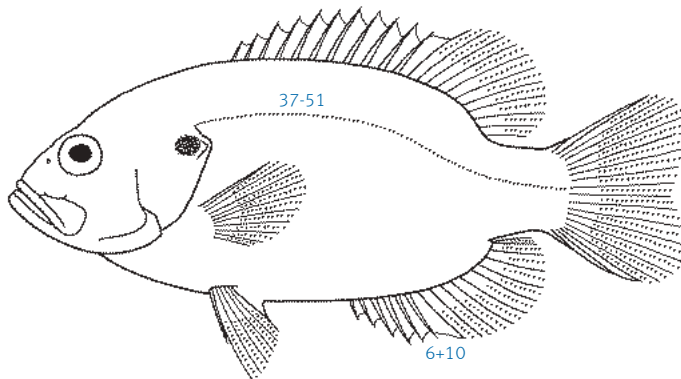
Ecology

A relatively uncommon fish in northern waters. It is found from 20-85 m and to the south of Biscay in deeper water. In the Mediterranean it is caught in small quantities in trawls, and can be seen over seagrass beds, as well as around rocks and on clear patches. In northern Europe it is mainly captured by anglers on the edges of rocky patches. It feeds on a wide range of smaller fishes, squids, and crustaceans. It breeds from July to August in the English Channel, but most of the fish in this area are probably recruited by migration from the south.

Family: American Sunfishes *Centrarchidae*

The Centrarchidae is a family of freshwater fishes originally confined to North America, but now widespread in temperate fresh waters in Europe, Africa, and elsewhere. Most of the sunfishes, as they are known in North America, are deep-bodied, rather thickset fishes with a dorsal fin composed of strong spines continuous with the branch-rayed fin. The body is fully scaled and the lateral line is complete. The larger species are popular fishes with anglers, while the smaller ones, being fairly colourful, are often kept in coldwater aquaria. There are eight genera with 31 species. Three species are found in Britain (none in Ireland), resulting from stocking for angling purposes and the release of pet fish.

Rock Bass *Ambloplites rupestris*



Colour

Back and upper sides golden brown to olive, ventrally silvery to white; each scale below the lateral line with a dusky spot, forming faint lengthwise stripes. Eye usually bright red to orange; a dark spot on the edge of the gill cover.

Size

Attains 43 cm in length; 1.36 kg in weight.

Ecology

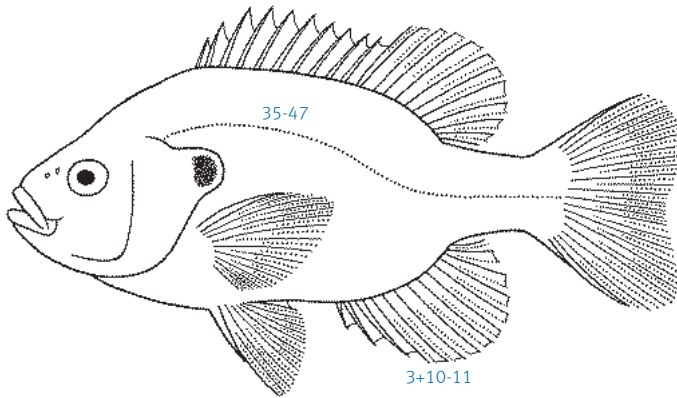
Native to eastern central North America; in Europe found only in a single lake in southern England. This population thrived for at least 20 years but there is evidence that it has declined recently. In North America the

Rock Bass inhabits rocky bottomed areas in shallow lakes, and the lower reaches of streams. Its food is largely composed of aquatic insects, crayfish, and small fishes. Like other members of the family the male digs a shallow nest, up to 60 cm in diameter, in the bottom of which the eggs are laid; the male guards the eggs and later the young for a short while.

Characteristics

A deep-bodied freshwater fish with a continuous dorsal fin containing 10-12 stout spines. Anal fin with 5-7 (usually 6) short, strong spines. The anal fin base is more than half the length of the dorsal fin base. Scales large, 39-40 along lateral line.

Pumpkinseed *Lepomis gibbosus*



Characteristics

A very deep-bodied, laterally compressed fish, its head length much less than its body depth. Dorsal fins continuous, the first with usually 10, sometimes 11 strong spines: anal fin short, its base distinctly less than half the dorsal fin base, with 3 strong spines only. Scales large, 35-47 along lateral line.

Colour

Back and upper sides golden brown to olive, lower sides golden with irregular wavy blue-green lines. Ventrally bronze to orange-red. Dusky bars on the sides. The gill cover with a wide black spot near the edge with a narrow border of yellow and a small, half-moon shaped red spot on the extreme edge.

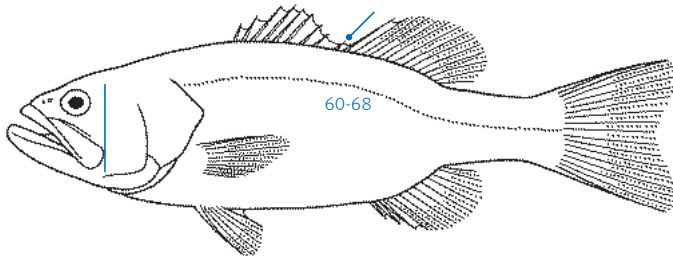
Size

Size Grows to 40 cm and attains 630 g in weight. British Rod-caught Record: 400 g (2003, Sussex).

Ecology

The Pumpkinseed is native to the fresh waters of eastern North America, but has been widely redistributed by man even in that continent. In Europe, it was introduced in the early 1900s and is now widespread north of the Pyrenees and Alps, its range extending as far east as the Black Sea and north to the Baltic. In England, it is established in several lakes in Somerset, Sussex, London and Essex. In North America it lives in small lakes, the shallow weedy bays of larger lakes, and the quiet, slow-moving waters of streams. It is often seen in schools at the surface exposed to the sun. It feeds on insects and aquatic invertebrates. Its bright colouring makes it a good fish for the aquarium. In a few parts of Canada it is an important commercial food fish.

Largemouth Bass *Micropterus salmoides*



Characteristics

A rather slender-bodied fish with the head length greater than the depth of the body. Scales small, 60-68 along the lateral line. Dorsal fin continuous but deeply notched, the first section low with 10 short, stout spines. Anal fin with 3 strong, but short spines and 10-12 soft rays. Pelvics not joined together, but conspicuously joined to the body by a membrane. Upper jaw extends back to beyond the eye level.

Colour

Back and top of head deep green to olive, sides fading to golden green, white on the belly. A solid broad, black lateral stripe from eye to tail, most conspicuous in the young, becoming broken or inconspicuous with age.

Size

Attains a maximum length of 83 cm and a weight of 11 kg; usually up to 53 cm and 2.27 kg.

Ecology

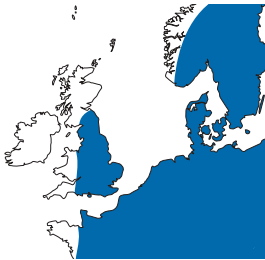
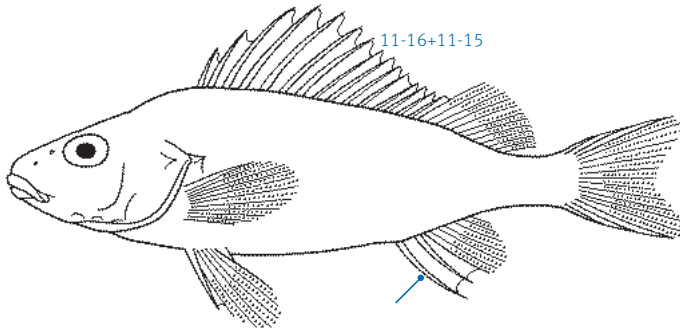
The native range of this species included the lower Great Lakes of North America and the Mississippi River system, but because of its great popularity as a sporting fish it has been introduced to many parts of North America as well as Europe, South America, and South Africa. In Europe, it is now widespread west of the Danube basin, and its range includes most of western Europe. Introduction from France in 1934 resulted in the establishment of a population in Dorset which survived until

recently. The effect of the introduction in Europe has been severe, as this species is predatory on young native fish and competes very successfully with native predatory species. In Britain, at least two North American fish parasites have been introduced with it. In America, it is most common near the surface of small shallow lakes, the shallow bays of larger lakes, and less often in rivers. It rarely lives below 6 m depth, and prefers well-vegetated regions. Large bass eat fishes mainly, but the smaller specimens eat a wide range of insects and crustaceans as well.

Family: Perches *Percidae*

The Percidae are freshwater fishes originally confined to the temperate waters of the northern hemisphere, but representatives have been introduced to Australia, New Zealand, and South Africa. The family is best represented in North America, where numerous small species (the darters) live. All members of the family have two dorsal fins, the first composed of sharp spines, the second with mainly branched rays. In most species the fins are separate. The anal fin has two sharp spines in front of the branched rays. The body is covered with rough-edged scales. There are 10 genera with some 200 species. Three species are found in Britain but only one of these occurs in Ireland.

Ruffe *Gymnocephalus cernuus*



Colour

Back and sides greenish-brown, liberally spotted with darker colour, the lower sides yellow, ventrally white. The ventral fins are yellowish; dorsal and tail fins dark spotted.

Size

Exceptionally up to 30 cm and a weight of 500 g usually around 15-18 cm. Females tend to be larger than males. British Rod-caught Record: 148 g (1980, West View Farm).

Ecology

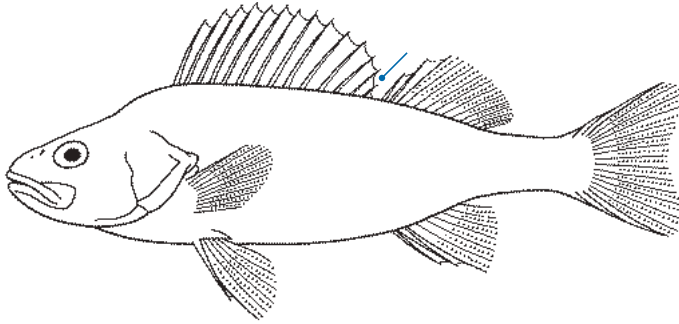
The Ruffe is essentially a fish of lowland rivers and lakes. It is able to tolerate the slight salinity of much of the Baltic. It lives close to the bottom in small schools, feeding during

daylight on bottom-living insect larvae (chiefly bloodworms), crustaceans and fish eggs. Spawning takes place in March to May; the eggs are adhesive and stick to vegetation or stones on the bottom. Growth is fast at first, but slows down with sexual maturity at about two years; their life span seldom exceeds five years. At one time ruffe fishing was important in eastern Europe; today this fish is not exploited as food, nor is it regarded as a sporting fish. It has, however been used in live-baiting and has been introduced in this way to Loch Lomond, with disastrous results for the native Powan.

Characteristics

Body moderately deep, head short, snout blunt and rounded. Teeth small, no large canines in jaws. Dorsal fins united, the first fin spiny, the fin outline notched at its junction with the soft dorsal. 11-16 spines in the first dorsal fin; 11-15 rays in the second. Head scaleless, with large cavities beneath the skin.

Perch *Perca fluviatilis*



Characteristics

Body moderately deep, head short, snout rounded and blunt. Dorsal fins separate, although joined at the base by a membrane. Teeth small but very numerous; no large canines. Pelvic fins set close together, the space between them less than two-thirds the width of the base.

Colour

Back greeny-brown becoming golden green on the sides, and cream to white on the belly. Dark vertical bars across the upper sides, a black spot at the end of the first dorsal fin. Pectoral fins yellow, pelvic, anal and tail fins red.

Size

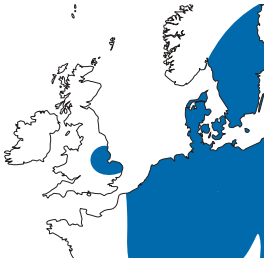
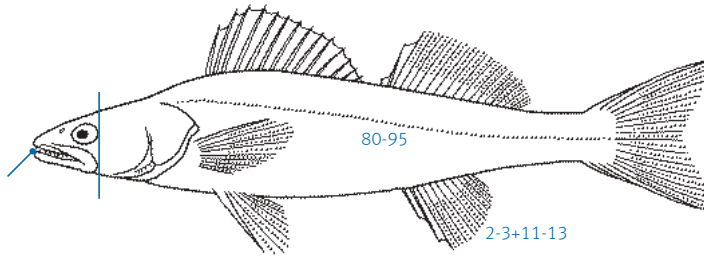
Attains a maximum length of 51 cm and a weight of 4.75 kg; more usually ca 35 cm and 1.20 kg. British Rod-caught Record: 2.699 g (2006, Crowborough); Irish Rod-caught Record: 2.495 kg (1946, Lough Erne).

Ecology

The Perch is a common fish in lowland lakes and ponds, and rivers where the current is slow. It also occurs in the brackish Baltic Sea. In general it is not found at high altitudes, although introduced populations exist in lakes up to 1,000 m in Europe. Typically, it is a fish found in small schools when young, lying among submerged tree roots or close to bridges, landing-stages, and weed beds; its barred markings allow it to merge with such backgrounds. Occasionally huge schools of large fish may be seen in clear lakes outside the breeding season. It spawns in April and May, usually in shallow areas. The eggs are moderately large (2.0-2.5 mm) and are shed

in white ribbons, up to 1 m long, wound among plants, tree roots, and any obstruction in the water. In deep barren lakes the eggs may be shed over stones, but still in the form of long lacy ribbons. The eggs hatch in 8 days at 13°C, and the young measure 4-6.5 mm at hatching. Once the egg yolk has been absorbed, the fry feed on minute plankton, later graduating to larger organisms. From a length of ca 15 cm they feed to an increasing extent on fishes (mainly sticklebacks, smaller Perch, Roach, and other small cyprinids). In many food-poor lakes they grow extremely slowly and form stunted populations in which the largest individuals rarely attain 15 cm in length. The Perch is well-known as an angler's fish. In Europe it is fished for and marketed as a food fish; its flesh is very good eating. These inland fisheries are operated by means of hooks, traps, and to some extent by netting.

Zander *Sander lucioperca*



Characteristics

Body elongate, the snout pointed, head length greater than depth of body or equal to it. Upper jaw extends past eye level, small teeth in jaws and several large fangs in front also. Two dorsal fins, the first spiny and separated by a narrow interspace from the second. Pelvic fins widely spaced, the distance between them almost as great as the base of one fin. 84-95 scales along the lateral line. Also known as Pikeperch.

Colour

Greenish-grey or brown on the back and sides becoming lighter on the lower sides and white on the belly. Young fish have 8-10 indistinct dusky bars on the sides; these are faint in the adult. Dorsal and tail fins dark spotted.

Size

Attains a maximum length of 130 cm and a weight of 18 kg; usually about 60 cm. British Rod-caught Record: 9.667 kg (2007, River Severn).

Ecology

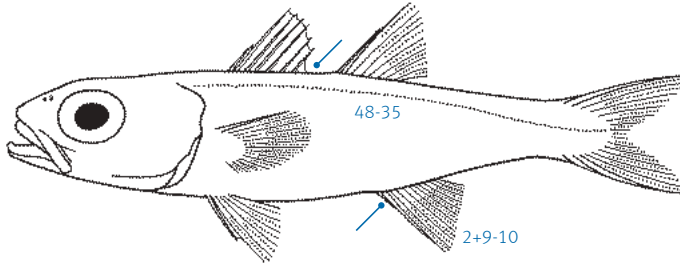
The Zander is native to eastern Europe, but has been introduced to the Rhine catchment and to England. It is now widespread in France and western Europe, and is rapidly extending its range in eastern and central England. It is a predatory species most abundant in large lakes and lowland rivers, preferring cloudy water and avoiding weed-beds. It hunts most actively at dawn and dusk, remaining inactive at other times, usually close to the bottom. When young, it keeps

in small schools, but becomes solitary when larger. Its food comprises fishes of all kinds which inhabit the same water: small Bream, Bleak, Roach, Perch, and, on the continent, whitefish. The young feed on aquatic insects and crustaceans. The adults spawn from April to June over sandy or stony bottoms, or among the roots of larger aquatic plants. Spawning grounds are in shallow water and are used year after year. The Zander is a valuable sporting fish, and, in inland Europe, an important food fish; here considerable effort is made to increase the stock in fish farms. Its introduction to England and release in open waterways was made by fishery interests without consideration for the wider issues involved.

Family: Deepwater Cardinalfishes *Epigonidae*

Only one member of the family Epigonidae occurs in northern European waters but there are six genera and some 25 species worldwide. The family is largely bathypelagic and found worldwide. The Bullseye is the largest and lives in deep water in the cold temperate and temperate zone of the Atlantic.

Bullseye *Epigonus telescopus*



Characteristics

Slender-bodied but rounded and even thick-set anteriorly. Eye very large and reflects with a pale greenish yellow light when freshly caught. Two dorsal fins, well separated; the first with slender, rather fragile spines; anal fin with two slender spines in front of 9-10 branched rays. 48-53 scales along the lateral line.

Colour

Deep brown-violet in colour, lighter ventrally; when captured in nets the scales are frequently dislodged and it appears light brown.

Size

Attains 76 cm in length; most caught are less than 38 cm.

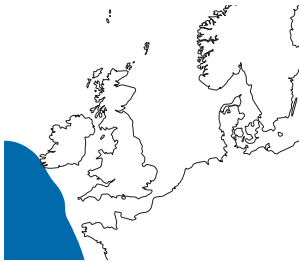
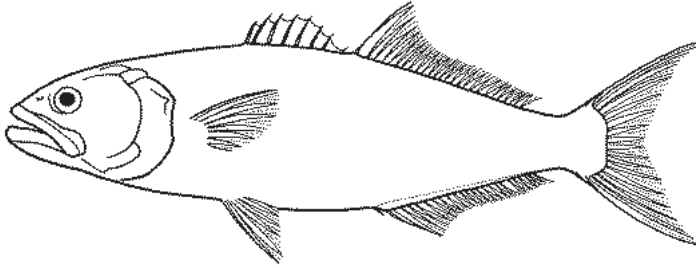
Ecology

A deepwater fish found in mid-water, not on the sea bed. It lives at depths of 180-900 m. It has never been reported to occur close inshore. Its food has been little studied, but it is thought to feed on fishes such as lantern-fish, and deep-water crustaceans. It is caught comparatively rarely (although recent deep trawling off the western Irish coast has shown that it is relatively common there).

Family: Bluefishes *Pomatomidae*

There is only one species in this family.

Bluefish *Pomatomus saltatrix*



Characteristics

Teeth prominent and sharp, compressed into a single series. First dorsal fin with 7-8 short spines and second with one spine and 23-28 soft rays; anal fin long with 2 or 3 spines and 23-27 soft rays.

Colour

Greenish on back, sides and belly silvery.

Size

Can reach a length of 1.3 m and a maximum weight of 14.4 kg.

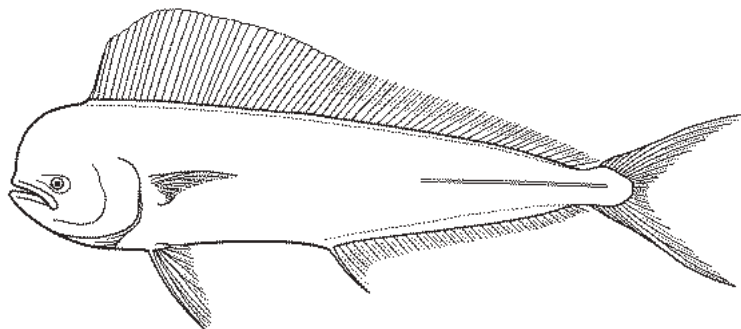
Ecology

Found in all warm oceans except the eastern Pacific, in both coastal and oceanic waters from 0-200 m. Common along surf beaches and rocky headlands; adults sometimes occur in estuaries and brackish waters. Moves in schools, chasing and attacking smaller fish, feeding on them and on crustaceans and cephalopods. An aggressive and voracious species, sometimes killing more than it can eat. Lives to at least nine years. An important commercial and game fish. One specimen collected at Ballycotton, Co. Cork, in 1973.

Family: Dolphinfishes *Coryphaenidae*

The dolphinfishes are unmistakable, with a long dorsal fin originating on the head and running back almost to the tail. There is only one genus with two species, one of which has been recorded in northern European waters.

Common Dolphinfish *Coryphaena hippurus*



Characteristics

A compressed elongate fish with rounded head profile. Single dorsal fin with 58-66 rays extending from above eye almost to caudal fin. Anal fin with 25-31 soft rays extending from anus almost to caudal fin. Pectoral fin more than half the head length. Small oval tooth patch on tongue. Mature males have a prominent bony crest in front of head.

Colour

Green back with golden hues, yellow sides to white belly. Quickly fades to metallic blue with silvery flanks after death. Young have pronounced vertical bars along the sides.

Size

Can reach a length of 2.1 m. Maximum weight is 40 kg.

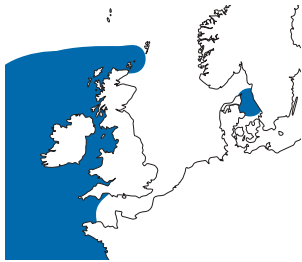
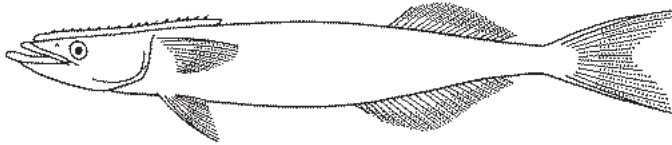
Ecology

A pelagic species found in tropical and subtropical waters in all the oceans of the world. Occurs in open waters but also near the coast at depths from 0-85 m. In 1993, two specimens were caught in offshore waters off the southwest coast of Ireland. Forms schools and feeds on other fish and invertebrates in open water, including crustaceans and squid. Spawns in the open sea where young may reach maturity in 4-5 months. Short-lived – perhaps only 4 years. An important commercial and sport fish.

Family: Sharksuckers *Echeneidae*

The Echeneidae are marine fishes of most distinctive appearance and habits. They are all rather slender fishes with protruding lower jaws and a unique sucker disc on top of the head which is formed from a modified spiny dorsal fin. The fish uses this disc to adhere to larger fishes, sharks, whales, and turtles. Most sharksuckers are tropical fishes, and some are adapted to a certain type of host. Several of those which are always found with the same species of host are known to clean their host of parasites; others feed on free-living food. There are four genera with eight species worldwide. Only one of these is known from northern European waters.

Remora *Remora remora*



Colour

Uniformly dark greyish-brown, the pectoral fins light at their tips.

Size

Can attain a length of 62 cm. Those found in northern European waters are rarely more than 15 cm.

Ecology

A rare fish in the eastern North Atlantic and occurring only because of the northerly migrations of the Blue Shark, and possibly other sharks from the sub-tropical Atlantic. The specimens reported have been caught attached to Blue Sharks, Porbeagle (once), Basking Sharks, Swordfish and Leatherback Turtles; also occasional sightings

close to sailing ships. This species is known to feed on its host's skin parasites, but will also leave the host to make quick forays to pick up small fishes or crustaceans. It does not feed on the scraps from the shark's meals. It does not spawn near Britain or Ireland. Worldwide in tropical oceans; the map shows European distribution.

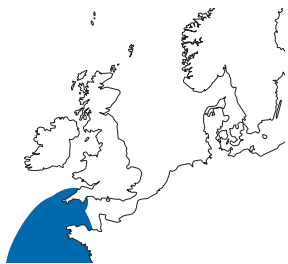
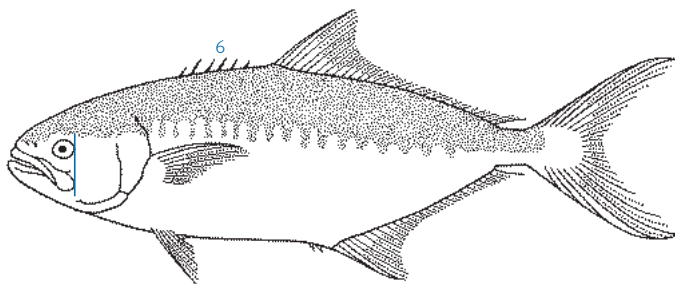
Characteristics

Immediately recognizable because of the sucker disc on the top of the head (looks like a venetian blind with a central bar); 16-20 pairs of laminae in the disc which does not extend past the pelvic fin tips. 28-37 long slender gill rakers on the first gill arch.

Family: Jacks & Scads *Carangidae*

The Carangidae is a large and important family of marine fishes, known as jacks, trevallies, pompanos, and horse mackerels. The members of the family have different body shapes; some are narrow-bodied, others deep-bodied, while the pompanos (mostly tropical species) are almost plate-like in shape. Many of these fishes have a line of heavy scutes running along the side of the body; most have two dorsal fins, and two separate spines in front of the anal fin. Some 32 genera and 140 species are recognized in the family; most are found in tropical and warm temperate seas. They include many valuable food and sporting species. Only one species (the Scad) is at all common in northern European seas; seven others are rare visitors.

Vadigo *Campogramma glaycos*



Characteristics

Torpedo-shaped body with long-based second dorsal and anal fins, each with a high lobe in front; tail fin lobes long, fin deeply forked; first dorsal fin with six short separate spines; pectoral fins relatively long. Mouth large, jaw extends past eye, a single row of large widely spaced teeth in each jaw.

Colour

Greeny-grey above extending to the lateral line in a striking series of zigzag lobes; ventrally white with a rose flush on flanks. Fins greyish.

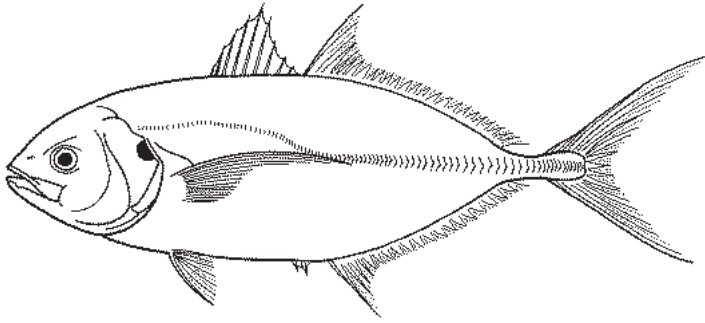
Size

Certainly attains a length of 65 cm, possibly 1 m.

Ecology

A near-surface inhabitant found in coastal waters but not close inshore. It feeds heavily on fishes (especially Scad), and squids. It is a warm-water fish, most commonly found in the Mediterranean and the tropical eastern Atlantic; most abundant off Morocco. It is a very rare vagrant north of Spain, and the only British records (Isle of Skye and Cornwall) are from the nineteenth century.

Blue Runner *Caranx chrysos*



Characteristics

Streamlined laterally compressed body with posterior lateral scales expanded, forming 45-46 scutes. Dorsal fin with 9 spines and 23 soft rays; anal fin with 3 spines and 19 soft rays. Maxilla ends below middle of eye.

Colour

Brownish to olive green on back and sides grading to silvery below, with an overall golden sheen. Dark spot on rear of operculum. Juveniles have about seven dark bars.

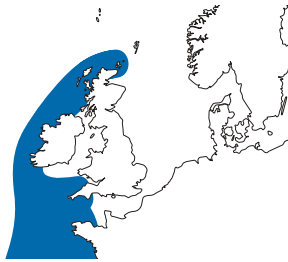
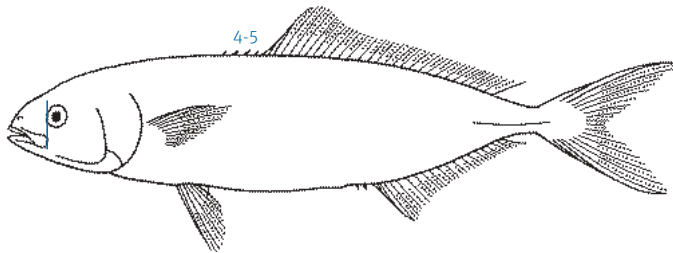
Size

Can reach a length of 70 cm and a weight of over 5 kg. British Rod-caught Record: 567 g (2007, Lynmouth).

Ecology

Associated with reefs in subtropical parts of the Atlantic, including the western Mediterranean. Forms schools in coastal waters at depths of 0-100 m. Feeds on fish, crustaceans and other invertebrates. Spawns offshore from January to August; fecund with ca 41,000 eggs per female. Young fish often found associated with floating Sargassum weed. Can live for up to 11 years. A minor commercial and sport species.

Pilot Fish *Naucrates ductor*



Characteristics

Torpedo-shaped body, rather rounded in cross-section, with a fleshy keel on either side of the caudal peduncle. Anal fin rather short-based (about equal to head length), two short spines anterior to the fin; 4-5 short, unconnected spines in front of dorsal fin.

Colour

Dark grey-blue on back and top of head continuing as 5-7 broad bands down sides and on to belly. Tail fin with a dark bar and white tips.

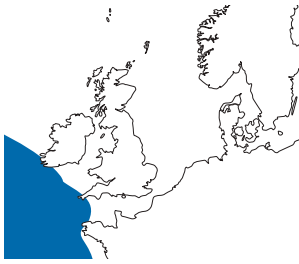
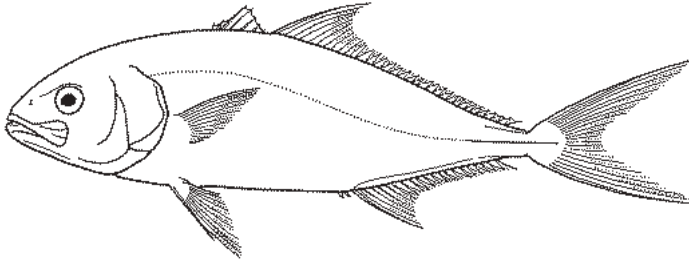
Size

Very rarely exceeds 35 cm in length at which it weighs ca. 0.5 kg, but has been reported to grow to 70 cm. British Rod-caught Record: 298 g (1997, Towy Estuary).

Ecology

An open sea fish which is well known for the juveniles' habit of accompanying larger animals (sharks and turtles mainly), sailing boats, and even driftwood. This is a habit common to many members of the family (see Scad). They often swim in small schools, keeping a loose formation close to the shark's head. Large pilot fish are solitary. When young they eat pelagic crustaceans, but the adults eat fishes and squids. It is a rare wanderer in northern European waters, its occurrence there is presumably the result of having accompanied some larger animal or vessel from the south or south-west. Most recent records from the south and west of Britain are of Pilot Fish accompanying turtles.

Guinean Amberjack *Seriola carpenteri*



Characteristics

A streamlined somewhat laterally compressed fish. Long dorsal fin with 8-9 spines and 28-33 soft rays. The 5-7 spines of the first dorsal fin are united by a membrane. Anal fin with 17-21 soft rays. Anterior lobe of the second dorsal fin is moderately raised, being equal to or slightly longer than the length of the pectoral fin (15-18% of the fork length). Gill rakers on first branchial arch 19-23. Internally the anterior margin of the first pterygiophore of the anal fin is distinctly concave. Medium sized specimens of this species are very difficult to separate from similar sized Almaco Jacks, and it may be that this can only be done conclusively by an x-ray or dissection of the pterygiophore.

Colour

Silvery possibly with a reddish tinge and pale belly, amber stripe along midside of body. Dark nuchal stripe from upper lip through the eye to the origin of the dorsal fin. Juveniles with five irregular dark body bars.

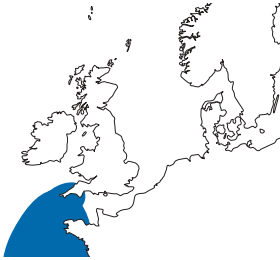
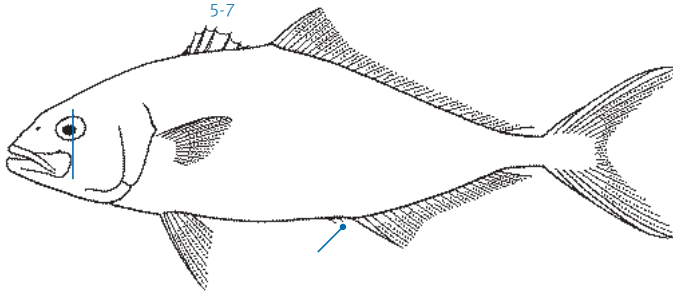
Size

Can reach a length of 73 cm. British Rod-caught Record: 641 g (2000, Hern).

Ecology

Occurs in subtropical waters of the eastern Atlantic at depths of 0-200 m, mostly in coastal waters over the continental shelf. Feeds mainly on fish and squid. An important commercial and sport fish. A few specimens have been caught around the Channel Islands, and Devon and Cornwall, but identification of this species is problematic.

Greater Amberjack *Seriola dumerili*



Characteristics

A rather torpedo-shaped fish with a curved head profile and deeply forked tail. The anal fin is shorter than the second dorsal fin; both have slightly higher rays in the front part of the fin. Pectoral fin short; dorsal fin lobe relatively short being equal to, or shorter than, the length of the pectoral fin (13-15% of the fork length). Gill rakers on first branchial arch 11-19 in adults, 18-24 in fish less than 20 cm. Anterior margin of the first pterygiophore of the anal fin is distinctly concave.

Colour

Back and upper sides silvery with reddish or violet tints, amber stripe along midside of body, belly pale. Dark nuchal stripe from upper lip through the eye to the origin of the dorsal fin. Fins dusky sometimes with pale tips. Juveniles with irregular dark body bars.

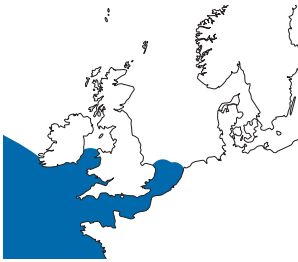
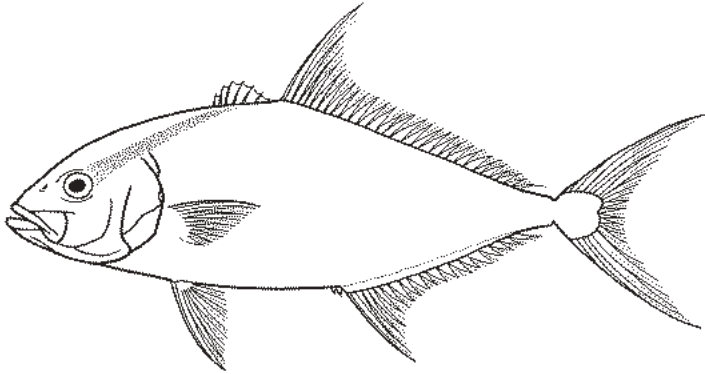
Size

Grows to 1.9 m in length and a weight of ca 80 kg. British specimens usually 35-55 cm.

Ecology

A surface-living fish found in small schools often in the strong currents off rocky outcrops and islands. It is a powerful swimmer which makes considerable annual migrations. Very large specimens are predatory and often solitary; the young are frequently found accompanying jellyfishes. It is of wide distribution in the tropical and warm temperate Atlantic and is found worldwide. It is rare in northern European waters.

Almaco Jack *Seriola rivoliana*



Characteristics

Body elongated and quite deep. Lateral line forming a dermal keel on the caudal peduncle, which like others of this genus has dorsal and ventral grooves. Dorsal fins with a total of 8 spines and 27-33 soft rays. Anal fin with 3 spines and 18-22 soft rays. Anterior lobe of the second dorsal fin is high, being 1.3-1.6 times the length of the pectoral fin (18-22% of the fork length). Gill rakers on first branchial arch 22-26. Anterior margin of the first pterygiophore of the anal fin is straight. Medium sized specimens of this species may show overlap in the dorsal fin height and number of gill rakers with the Guinea Amberjack, in which case they can only be identified conclusively by examination of the pterygiophore by x-ray or dissection.

Colour

Variable - back brown, olive, or blue green usually with a violet or bronze tint; flanks with amber stripe and belly paler. Dark nuchal stripe from upper lip

through the eye to the origin of the dorsal fin. Fins dark, except pelvic fins which are white ventrally. Juveniles with irregular dark body bars.

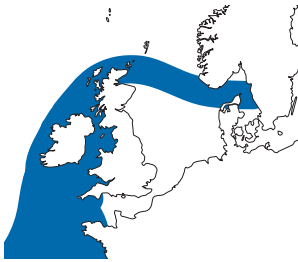
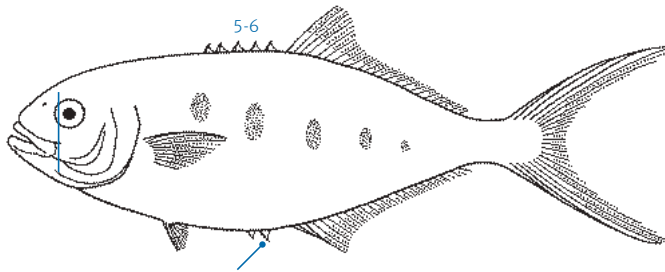
Size

Can reach a length of 1.6 m and a weight of 60 kg. Most British specimens 30-48 cm. British Rod-caught Record: 673 g (2007, Guernsey).

Ecology

A circumglobal subtropical species associated with outer reef slopes and offshore banks from 5-160 m. Usually found in small groups. Feeds mainly on other fish but also on invertebrates. Young fish are often found around floating objects. A useful commercial and sport species. This species and the Greater Amberjack, while still rare, have become commoner in British and Irish waters since the late 1990s. They have been found from Sussex to west Wales.

Derbio *Trachinotus ovatus*



Characteristics

A deep-bodied very compressed fish with a small head and strongly forked tail. The mouth is small and does not extend beyond the front of the eye. A series of 5-6 short, separate spines in front of the dorsal fin (a forward-pointing spine is sometimes also present). Pectoral fin short and rounded. Wavy lateral line arched upwards above the pectoral fin. 32-41 gill rakers.

Colour

May be greenish on the back otherwise silvery. Large black spots on the tips of the dorsal and anal fins; The outside edges of the tail fin with black stripes. A series of three to five dusky blotches along the sides.

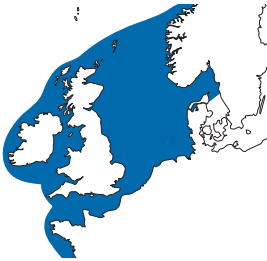
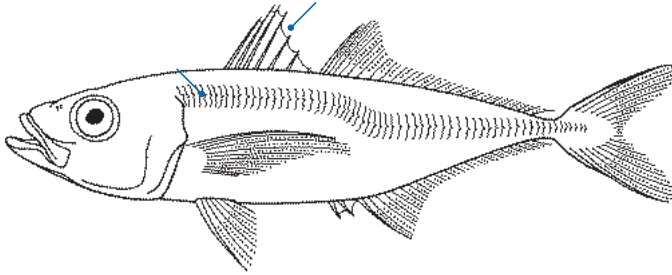
Size

Usually about 30 cm in length; exceptionally up to 70 cm and 2.8 kg.

Ecology

A rare fish in northern European waters, but one which is common enough to the south and in the Mediterranean. It is a surface-living species which occasionally comes into coastal waters in the course of its migrations. It feeds on small fishes, especially schooling ones such as the members of the herring and cod families.

Scad *Trachurus trachurus*



Characteristics

Slender-bodied and elongate, but with a heavy, rather long head. A series of wide bony scales along the entire length of the lateral line, flexible in front, becoming sharp-edged and hard towards the tail. First dorsal fin with long spines all united by a membrane, separate from second dorsal fin. Two spines in front of anal fin, joined together by membranes, but free of the anal fin. Also known as Horse Mackerel.

Colour

The back is dark grey-blue with greenish tints, the sides silvery with a golden flush, white ventrally; a dusky spot on the edge of the gill cover.

Size

Attains 70 cm in length and ca. 2 kg in weight; most are about 25 cm long. British Rod-caught Record: 1.507 kg (1978, Devon). Irish Rod-caught Record: 894 g (1986, Clonakilty).

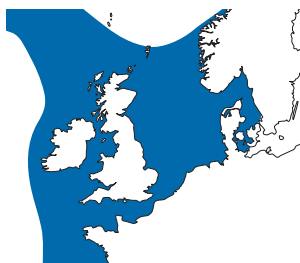
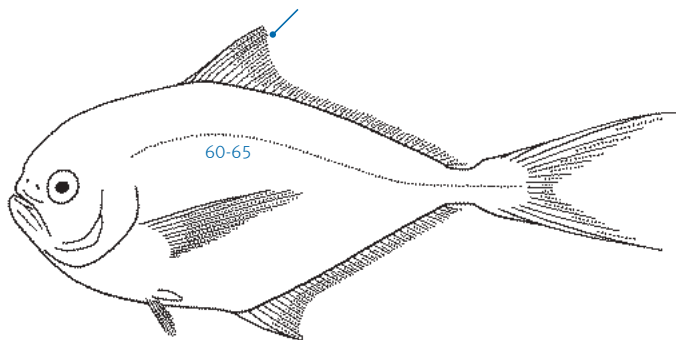
Ecology

A pelagic, schooling fish of wide distribution and great abundance. It can be taken close inshore (young ones in particular) but is more typical offshore, near the surface; it rarely swims deeper than 100 m. Young fish in their first year are commonly found swimming in small clusters beneath large jellyfishes. Young Scad feed on planktonic invertebrates. As they grow larger their diet changes to include fishes, but larger crustaceans are eaten in quantity. Fully grown, they feed on schooling fishes and small squids. Spawning takes place in summer in the North Sea, and earlier to the south of Biscay. The Scad is not a prime food fish, although in Biscay and the Mediterranean it is fished for commercially and canned in oil in large quantities, as well as being sold fresh or smoked. In northern European waters it is fished mainly for reduction to fish meal. The Scad is an important food for several other fishes and seabirds, particularly gulls.

Family: Pomfrets *Bramidae*

The Bramidae are moderate to large marine fishes found worldwide except in polar seas. Most live in the surface to middle layers of the ocean, often in the open ocean, although Ray's Bream (the most abundant European species) lives on the edge of the continental shelf. All are deep-bodied fishes with well-developed fins, but no sharp spines in them. As a group they show striking changes in body form, and fin and scale shape from juvenile stages to adult, which has in the past meant that young fish and adults were regarded as separate species. There are seven genera with some 22 species worldwide. Four species have been recognized in northern European seas; only one is at all common.

Ray's Bream *Brama brama*



Characteristics

Deep-bodied, but narrow towards the tail; profile of head steep. Pelvic fins placed beneath the pectorals. Dorsal and anal fins densely scaled and rigid, moderately long and low, except that the front rays are elongate to form a lobe. Pectoral and tail fin lobes long. Body scales smooth and relatively small, more than 60 scales along the lateral line.

Colour

When alive or freshly dead, dark graphite on the back with silvery reflections on the sides and ventrally. The silver dulls after death and the fish looks plain brown.

Size

Attains a maximum length of 66 cm; more usual at lengths of 40-55 cm. Weight attained is ca 6 kg. British Rod-caught Record: 3.621 kg (1967, Hartlepool). Irish Rod-caught Record: 2.842 kg (1979, Valentia).

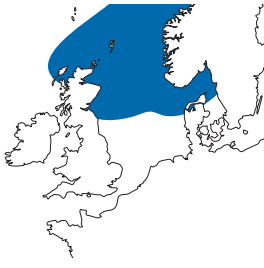
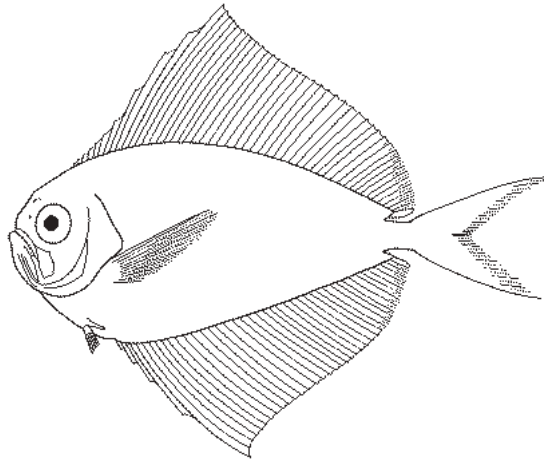
Ecology

Ray's Bream is a common, if irregular visitor to the seas of northern Europe, but it is abundant enough to support an important commercial fishery on the Atlantic coast of Spain and Portugal. It lives in the open sea in mid-water, probably as shallow as 73-91 m, but deeper further north. Its range is subject to the temperature of water masses, and it migrates northwards from the Iberian

Continued: Ray's Bream *Brama brama*

peninsula; in some years by midsummer it is caught off Ireland, and by autumn it is found west of Scotland and Norway. In the winter months it returns southwards, but frequently great numbers become trapped in the too shallow, too cool North Sea, and are stranded on the coast. The causes of these abundant years are not clearly understood. Ray's Bream feeds on a wide range of crustaceans and fishes, but seems to be unselective in that it eats what is most abundant. Its flesh is frequently infested with the cestode worm, *Gymnorhynchus gigas*, which spoils it (at least aesthetically and possibly as an allergen) as food. It is otherwise a good food fish.

Silver Pomfret *Pterycombus brama*



Characteristics

A rather slender-bodied but compressed fish. Pelvic fins small, placed in front of the level of the pectoral fins. Large fan-like dorsal and anal fins, the origin of the dorsal above the rear edge of the eye, and of the anal below the pectoral fin base; both enlarged fins are scaleless and completely fold into a sheath formed of enlarged scales along bases of the fins. Scales large (45-49 along lateral line), thin and papery, but with weak hooks on them.

Colour

Dark brown above, lighter ventrally with silvery reflections.

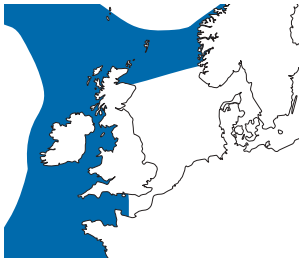
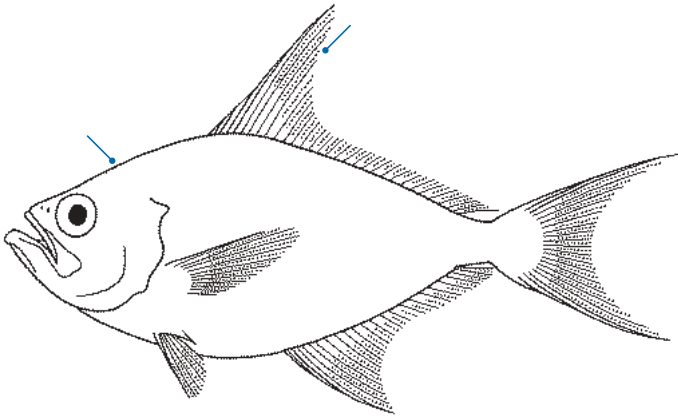
Size

Attains 46 cm in length.

Ecology

An inhabitant of the open Atlantic Ocean living in the upper layers of the sea. It is occasionally caught by line fishermen off Spain and Portugal at depths of around 128 m; it is not a deep-sea fish. Numerous adult specimens have been stranded or caught alive on the Norwegian coast; they are presumed to have migrated from the south-west. The species spawns in the Gulf Stream waters off Florida and the Caribbean. Little is known of its biology. A rare fish in coastal waters; it has been recorded from Norway, Ireland, Scotland and England.

Rough Pomfret *Taractes asper*



Characteristics

Body relatively shallow, but with the head profile sloping gently upwards to dorsal origin. Pelvic fin beneath pectorals. Anterior rays in both dorsal and anal fins high, remaining rays short (in fish longer than 10 cm). Dorsal and anal fins scaled and semi-rigid. Scales large, 41-45 along lateral line; scales near the tail have sharp hooks; young fish have hooks on all the scales.

Colour

Dark brown on back, yellowish on sides; probably with silvery reflections when alive.

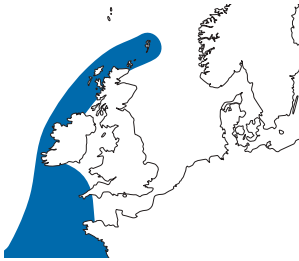
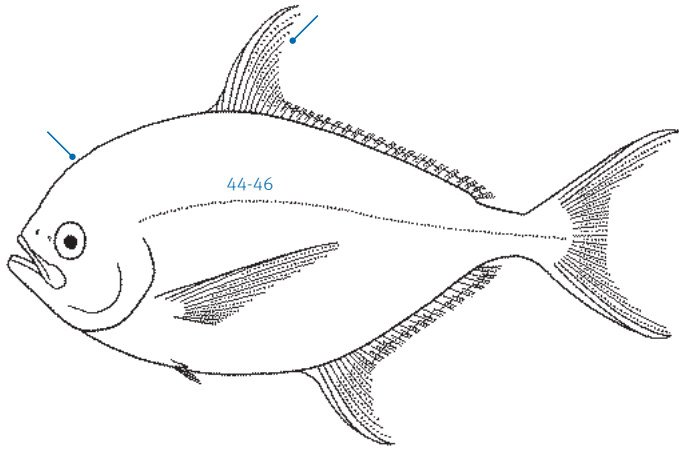
Size

Size Attains at least 50 cm in length.

Ecology

A relatively uncommon bramid which is probably distributed worldwide in the middle layers of the oceans. Off Spain and Portugal it is caught occasionally on lines set for Ray's Bream at about 80 m. In northern European waters large adults are captured rarely, although to the south young and old can be caught, which suggests that the northern specimens are not part of the breeding stock. Large specimens were originally thought to be a distinct species, *Taractes raschi*.

Long-finned Bream *Taractichthys longipinnis*



Characteristics

Body very deep, with a steep, rounded profile to both head and breast region. Pelvic fins small, situated beneath the bases of the pectoral fin. Dorsal and anal fins long-based, the anterior rays in both prolonged into very high lobes. These fins are fully scaled. Body scales large, 44-46 in a series down the side; young fish have a spine on each scale towards the tail.

Colour

Dark brown dorsally, silvery on sides and belly; pectoral fins light, dorsal lobe dark. Tail fin dark with white rear margin.

Size

Attains 1 m in length and a weight of over 45 kg; most specimens are less than half these dimensions.

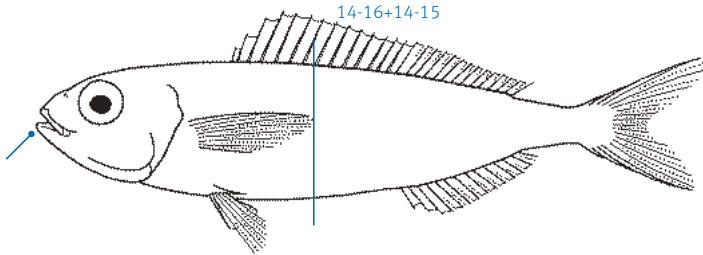
Ecology

A large oceanic fish which probably swims in small schools in the upper layers of the sea. Despite its wide distribution in the tropical and warm temperate Atlantic Ocean, it is extremely rare in northern European waters, the most known specimens having been stranded. A related species occurs in the Pacific Ocean.

Family: Sea Breams *Sparidae*

The Sea Breams are marine fishes found around the world in tropical and temperate seas. Most are deep-bodied, fully-scaled fishes, except that the snout is scaleless. Their teeth show many adaptations to their varied diet, from the flattened molars of shellfish eaters, through the conical teeth of general predators, to the sharp-edged incisors of plant browsers. Sea breams, which are elsewhere also known as porgies and snappers, include many important game and food fishes. Worldwide, there are 33 genera with some 115 species. Twelve species have been reported in northern European seas, but only two are at all common.

Bogue *Boops boops*



Characteristics

A slender-bodied sea bream, its body only slightly oval in cross-section; the eyes are moderately large but the mouth is small. Pectoral fins short. Teeth compressed, incisor-like, those in upper jaw each with several rounded cusps. 13-16 spines and 14-15 rays in the dorsal fin.

Colour

Green on back, paler on the sides with a yellowish tinge. Lateral line dark with faint dusky lines parallel to it on the lower side. A small dusky spot at the base of the pectoral fin.

Size

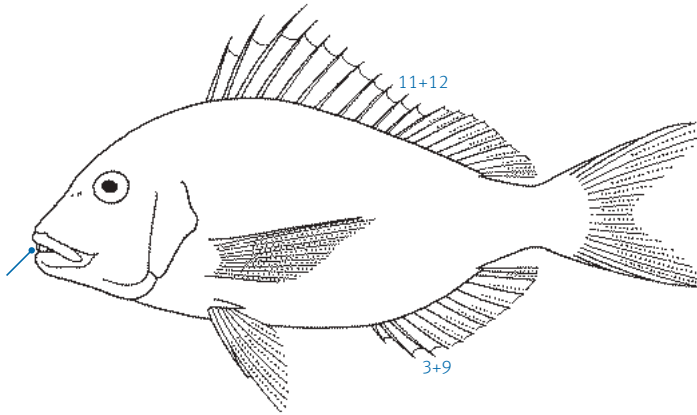
Attains a maximum length of 38 cm, but usually about 25 cm. British Rod-caught Record: 885 g (1978, Guernsey).

Ecology

An uncommon sea bream in northern European waters but to the south, and in the Mediterranean, it is extremely common. Here it lives in schools, often containing 100 or more fish, from close inshore (ca. 2 m) down to

depths of 150 m, on sandy bottoms - especially on sea-grass beds and close to rocks. It is said by some authors to eat planktonic organisms, especially copepods and young fish, but its teeth seem to be clearly adapted to browse on algae, sea-grass, and encrusting growths. In Britain shoals occur in southern sandy bays, most often caught in the winter months. In northern waters its diet has not been studied; elsewhere it is a valuable food fish.

Dentex *Dentex dentex*



Characteristics

A moderately deep-bodied sea bream with a large head. The upper profile is steep (large males have a conspicuous hump on the forehead); the eyes are relatively small and set high on the head; the snout is long. Mouth large, 4-6 large, curved teeth in the front of the jaws, smaller but strong teeth behind. Dorsal fin with 11 spines and 11-12 rays, the 4th or 5th spines being the longest.

Colour

Bluish-silver above, paler on the sides, but with small blue spots (which quickly fade on death); pectoral and ventral fins pink. May go more rosy with age.

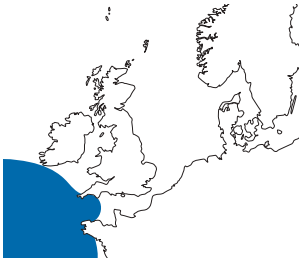
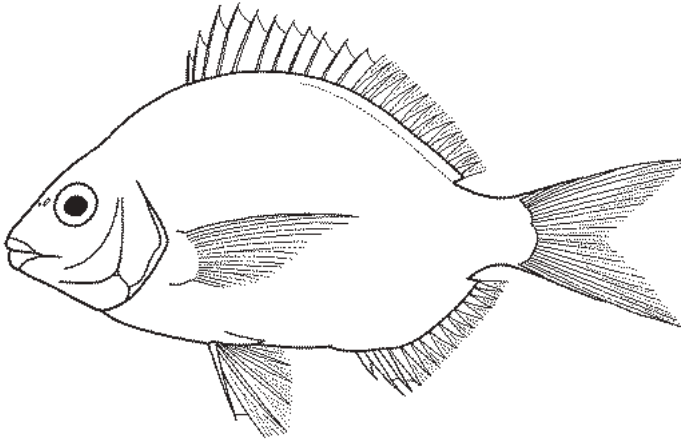
Size

Attains 1.2 m and ca 12 kg.

Ecology

A rare fish in northern European waters, owing its status there to occasional migration of large fish from the south. It usually lives in small schools on rocky grounds down to around 200 m, but comes into shallower water in spring. It is entirely predatory on fishes and cephalopods. In southern Europe it is a valued but rather uncommon food fish.

Zebra Sea Bream *Diplodus cervinus*



Characteristics

Oval, laterally compressed deep body with a rather pointed snout. Mouth small with 10-12 incisors on upper jaw and 8 on the lower jaw, followed by small molars. Dorsal fin with 11-12 spines and 11-14 soft rays.

Colour

Silvery gold with broad dark vertical bars down sides. Dark transverse bar across eyes.

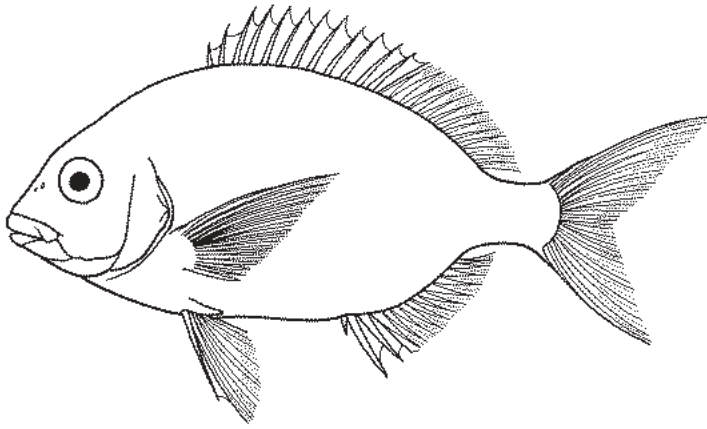
Size

Can reach a length of 55 cm and a maximum weight of 2.75 kg

Ecology

Occurs in the warmer waters of the eastern Atlantic and the Mediterranean in depths of 30-300 m. In 2000 a single specimen was caught off Portland, Dorset. Often associated with reefs or rocky bottoms on the continental shelf (30-80 m), but may also be found in much deeper water over mud. Forms small schools and feeds on small invertebrates and seaweeds. Of minor importance to commercial and sport fisheries.

White Sea Bream *Diplodus sargus*



Characteristics

Oval, laterally compressed, deep body. Snout longer than eye diameter. Dorsal fin with 11-12 spines and 12-15 soft rays. Anal fin with 3 spines and 11-14 soft rays. 58-67 scales along lateral line. 8-10 incisor teeth in the upper jaw and 8 in the lower, with large molars behind them.

Colour

Body silvery grey with 5-11 (usually 9) vertical bands alternating light and dark, and a dark saddle on the caudal peduncle.

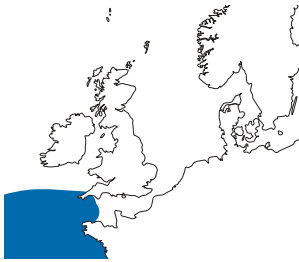
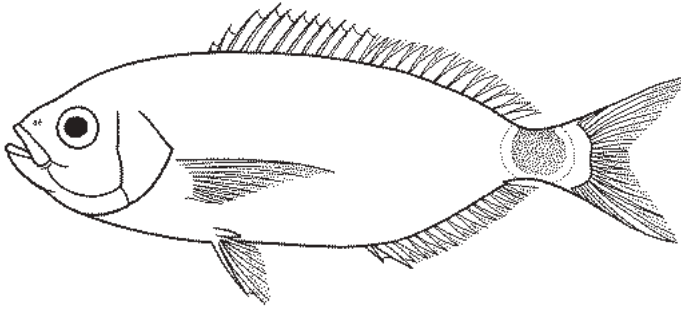
Size

Can grow to a length of 45 cm and a maximum weight of 2 kg. British Rod-caught Record: 661 g (2003, Jersey).

Ecology

Occurs in the warmer waters of the eastern Atlantic and the Mediterranean at depths of 0-50 m. Adult and young fish have been seen in the Channel Islands since 1999. Lives mainly over coastal rocky reef areas and *Zostera* beds. An active fish frequenting the surf zone especially at dawn, feeding on shellfish and other benthic invertebrates. Can live to 10 years. Of minor importance as a commercial and sport fish. There are two subspecies in Europe: *D. sargus cadenati* in the Atlantic and *D. sargus sargus* in the Mediterranean and Black Seas.

Saddled Bream *Oblada melanura*



Characteristics

Elongate oval laterally compressed body. Long fairly low dorsal fin. Snout short; jaws with an outer row of 8-10 incisors and smaller incurved lateral teeth. Dorsal fin with 11 spines and 14-18 soft rays. Lateral line with 64-67 scales.

Colour

Dark silvery on back and sides; lighter below; dark stripes along scale rows near tail. Caudal peduncle with a white-edged black saddle.

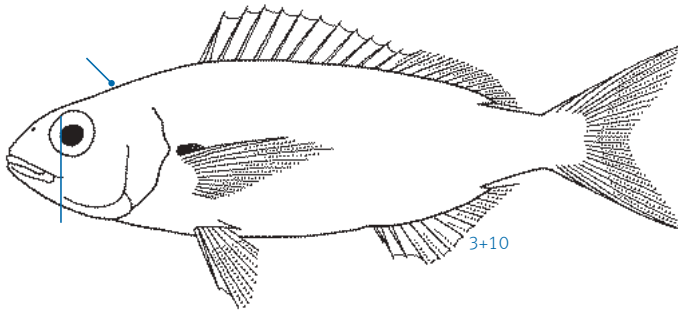
Size

Can grow to a length of 34 cm. British Rod-caught Record: 439 g (2000, Cornwall).

Ecology

Occurs in the subtropical waters of the eastern Atlantic and Mediterranean at depths of 0-30 m. In 2000 a single specimen was caught off Black Head, Cornwall. A gregarious species found in numbers over rocky bottoms or seaweed beds. Feeds mainly on small invertebrates. An important commercial and sport species.

Spanish Sea Bream *Pagellus acarne*



Characteristics

Body distinctly slender, its dorsal profile smoothly convex, but with a rather blunt snout. The mouth is large and extends back to the level of the eye; eye diameter moderate, roughly equal to the snout length, cheek narrow. Scales extend on the top of the head to the rear of the eyes. Teeth in front of jaw relatively small, sharp and curved; inside there are small rounded molars. Anal fin with 3 spines and 9-10 soft rays. Also known as Axillary Sea Bream.

Colour

Pale rose-coloured above, sides and belly silvery, fins reddish; mouth is golden or orange internally. Dusky spot at pectoral base.

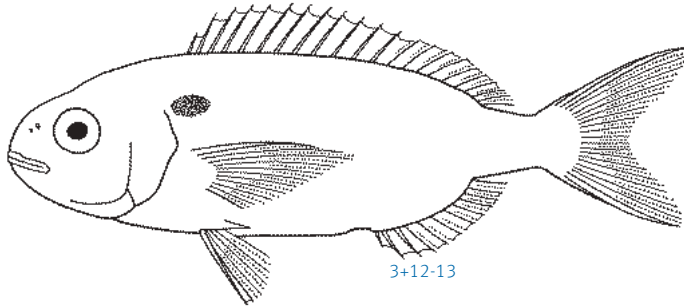
Size

Grows to a maximum length of 36 cm, but usually around 25 cm. British Rod-caught Record: 236 g (1995, Guernsey).

Ecology

An inshore sea bream which lives close to the bottom in depths of 20-100 m on sand or sand and mud. Young specimens live closer inshore in shallower water than adults. This fish feeds mainly on crustaceans, but other invertebrates are eaten. In northern European waters it is extremely rare and the few records are mainly of adults in late summer, presumably the result of a northerly migration.

Red Sea Bream *Pagellus bogaraveo*



Characteristics

A typical sea bream shape, relatively deep-bodied with a short rounded head. This species has a large eye, its diameter greater than the snout length; the cheek depth is less than eye diameter. The scales on the top of the head extend forward only to the middle of the eye. The pectoral fin is long. The mouth extends back to the level of the eye margin; the teeth in front of the jaws are curved, sharp but not elongate; inside the jaws there are 2-3 rows of rounded, rather small molars. Anal fin with 3 spines and 11-12 soft rays.

Colour

Large fish are rose or reddish-grey, the sides silvery with a pink flush and the fins greyish-red; there is an elongated dusky blotch at the origin of the lateral line. Young fish are paler and may lack this blotch.

Size

Attains a maximum of 70 cm, more often around 35 cm in length; and a weight of *ca* 4.5 kg. British Rod-caught Record: 4.330 kg (1974, Cornwall). Irish Rod-caught Record: 2.892 kg (1963, Valentia).

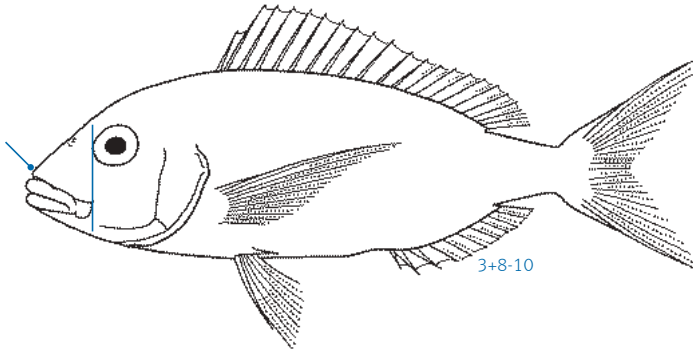
Ecology

Relatively common in the seas to the south and west of Britain and Ireland, but less so further north, although occurring fairly regularly. It is a schooling species, the young in particular forming large schools, while the adults are encountered in smaller groups. The young come into inshore waters, usually over or close to rocks and rough ground or wrecks, where it may be as shallow as 35 m, while the larger fish live

as deep as 100-200 m.

Most of the fish in northern seas are summer migrants from the south. The Red Sea bream's food is mainly fish, although large ones also eat decapod crustaceans and occasionally squid. It breeds in late summer and autumn (to the south-west of Britain), earlier to the south. It probably grows very slowly, lives to 15 years. It is a very good food fish, but not caught in sufficient numbers to be commercially important, except in Biscay. It is also occasionally caught by anglers. The Red Sea Bream became rare in south west Britain after the 1980s, but catches started to increase again in the present century.

Pandora Pagellus erythrinus



Characteristics

Moderately slender-bodied with a relatively small head and a rather pointed snout. The mouth is anterior to the eyes. Teeth in front of jaw sharp, curved, but not very long; inside the jaws are small rounded molars.

Colour

Orange-red on the back and upper sides, pinkish below fading to silver. Lateral line picked out in pale blue, blue also present on the back and the base of the dorsal fin. Eye and pectoral fin yellow. Edge of the gill cover red; inside of the mouth pale or grey.

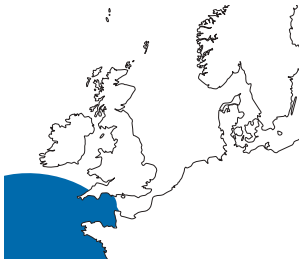
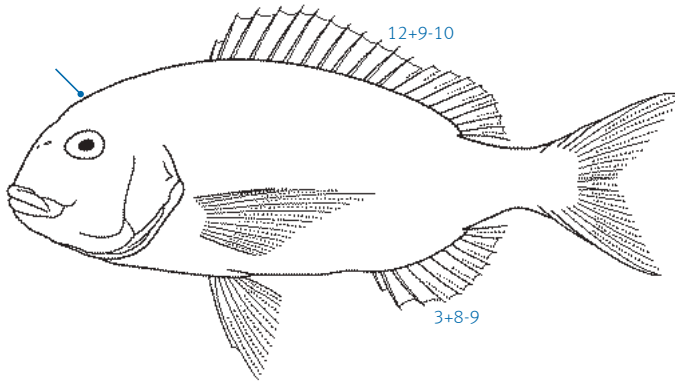
Size

Most usual lengths are 15-25 cm, exceptionally to 60 cm. British Rod-caught Record: 1.552 kg (1997, Cornwall).

Ecology

A very rare fish in northern European seas, this species is occasionally caught off the southwest coasts and the Channel Islands. Common in the Mediterranean and southern Biscay from whence the northern fish migrate in the summer months. Young specimens form schools in shallow water over sandy bottoms. The adults live on sand or mud, particularly near rocky outcrops between 15 and 120 m. The Pandora eats small fishes and bottom-living invertebrates, particularly crustaceans and small molluscs.

Couch's Sea Bream *Pagrus pagrus*



Characteristics

A deep-bodied sea bream with a high, convex dorsal profile to the head, the eye is relatively small and the cheek deep. In front of the jaws 4-6 very strong teeth with sharp, curved teeth behind and at the sides; at the back of the jaws there are two rows of flattened crushing teeth, the inner row being larger.

Colour

Rosy in general, darker on the back, silvery sides. Fine blue spots on upper scales and blue band between the eyes, most noticeable in young fish. Fins pinkish; tail fin tips white with a fine dark margin in central section of fin.

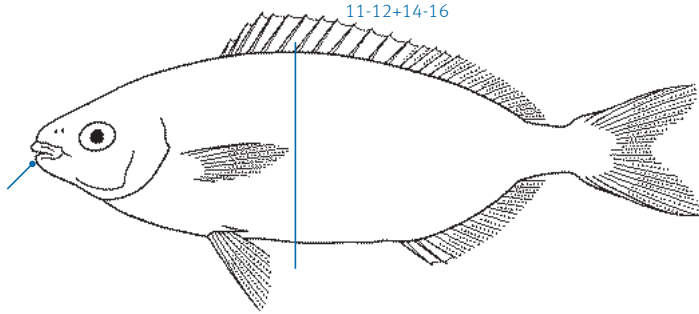
Size

Very occasionally reaches 91 cm in length; frequently up to 50 cm. British Rod-caught Record: 2.968 kg (2007, Guernsey).

Ecology

Formerly an extremely rare wanderer to the seas of northern Europe, this species has become increasingly common off south west coasts and the Channel Islands. To the south of Biscay, and in the Mediterranean, it becomes more common although it is nowhere abundant. It lives over sand, or muddy bottoms where algae coat the surface, and in seagrass beds at 20 m and below; the young fish are found in shallower water. A general offshore migration into deeper water occurs in winter. It feeds heavily on molluscs and crustaceans.

Saupe *Sarpa salpa*



Characteristics

Body moderately deep, profile smoothly rounded making the body oval. Mouth small, not reaching eye level; teeth flattened incisors, in a single row in both jaws, notched at the edge in the upper jaw, triangular and serrated in the lower jaw. Pectoral fin short. 11-12 rather stout spines in the dorsal fin. Also known as Salema.

Colour

Greyish-blue on the back fading to silvery on the sides, with 10-12 lengthwise golden yellow stripes which extend on to the operculum and a yellow eye. A dusky spot at the pectoral fin base.

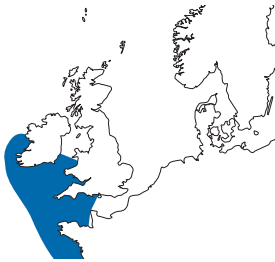
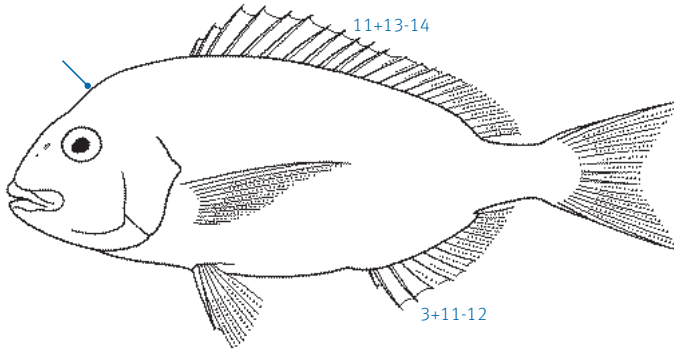
Size

Adults are usually about 30 cm in length; exceptionally they attain 45 cm.

Ecology

An extremely rare fish in northern European waters which has been recorded only a few times. Two British records (Cornwall 1995 and Swansea 2008). To the south, in the warm temperate and tropical Atlantic, and in the Mediterranean, it is common. It is a shallow water species, rarely found below 15 m and can be seen swimming in characteristically tight, compact schools sometimes with very many fish together. It feeds by grazing on the fronds of algae and sea-grass, eating mainly the growths on the surface of the plant.

Gilthead *Sparus aurata*



Characteristics

A deep-bodied sea bream with a strongly arched back, relatively small eye (diameter less than snout length) placed high on the side of the head, and deep checks. The teeth in front of the jaws are strong, curved and pointed – much larger than those lying behind them – while inside the jaws there are large, flattened, rounded crushing teeth.

Colour

Back dark grey-blue, the lower sides and belly silvery, with a dusky blotch at the origin of the lateral line. The edge of the gill cover is scarlet, and a bright golden stripe runs across the forehead between the eyes; both fade on death. Black rear edge to tail.

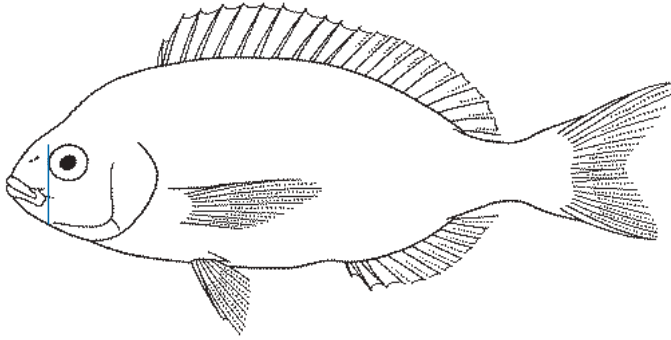
Size

Attains a maximum length of 70 cm. Weights of over 5 kg have been reported. British Rod-caught Record: 4.692 kg (1995, Devon).

Ecology

A shallow water species which lives in schools over sand or mud in depths of 30 m. The young fish live in shallower water still. In the Mediterranean it comes closer inshore in spring, often entering river mouths and lagoons, and thriving in the low salinity water. It migrates offshore to breed in deeper water in winter. In northern European waters it was formerly a rare fish, the biology of which has been little studied. However, in recent years it has become increasing common off the southwest coast, juveniles are found in numbers in some estuaries in south west England and South Wales. Its food is heavily biased in favour of molluscs, especially mussels and oysters, and crustaceans. It is an important food fish to the south but, at times, a pest to shellfish culture. They are now farmed in the Mediterranean.

Black Sea Bream *Spondyliosoma cantharus*



Characteristics

A rather deep-bodied sea bream with a relatively small head, and jaws which extend at most to the front of the eye. The teeth are sharply pointed, slightly curved and not markedly large; teeth in front and sides of jaws similar in shape, slightly larger in front, 3-5 rows of fine teeth behind the first row. Bases of the soft portions of the dorsal and anal fins in scaly sheaths.

Colour

Adult a lead grey when alive, except breeding males which are black with a broad white vertical band. Brown stripes along the rows of scales, more conspicuous after death. Juveniles dark grey with broken golden brown stripes along the flanks.

Size

Exceptionally it attains a length of 60 cm; mostly it is about 35 cm. Attains a weight of ca 3 kg. British Rod-caught Record: 3.125 kg (1977, South Devon).

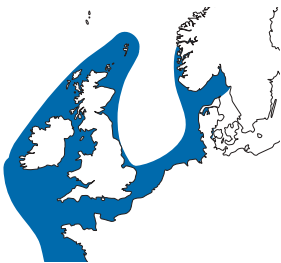
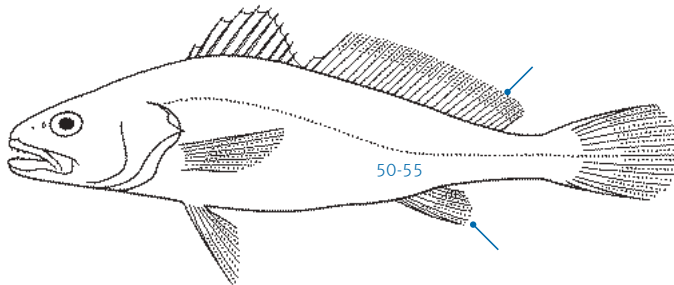
Ecology

A relatively common sea bream in northern European waters, although north of the English Channel it is probably a summer migrant. It is particularly common around wrecks, or rocky outcrops, although in the Mediterranean it is found typically over sand and sea-grass beds. It is one of the few nest-building sea breams; the male digs a depression in the sandy sea bed in which the female sheds her eggs. Here they are guarded by the male until they hatch; the young tend to form a loose school around the nest for several weeks after hatching. The Black Sea Bream spawns in April and May in the eastern English Channel. In some areas it is a popular fish with anglers, and is also caught by commercial fishermen.

Family: Drums *Sciaenidae*

The drums are a large family of mainly marine fishes found worldwide in tropical and temperate seas. There are some 70 genera with about 270 species worldwide. Many of them are valuable food fishes locally. They are distinguished by possessing two dorsal fins, the first short with weak spines, the second very long-based with numerous branched rays; the anal fin is generally short-based. The tail is emarginate, rounded or pointed but never forked; the lateral line scales extend to the tip of the tail. Their most striking attribute is their marked ability to make sounds, the large swim-bladder acting as a resonating chamber amplifying the noises produced by adjacent muscles. Many drums (they are also known as shade-fishes, weakfish or croakers) live in estuaries or other murky waters and their ability to locate one another by sounds (for they can hear acutely) is clearly an advantage. Only one species occurs in northern European waters; four others occur in the Mediterranean and off southern Europe.

Meagre *Argyrosomus regius*



Mouth large, extending to eye; no barbel under chin.

Colour

Silver or silvery-brown on the back, paler on the sides with golden tints especially on the lateral line; inside the mouth is golden yellow.

Size

Attains a length of 2 m and a weight of ca 65 kg.

Ecology

A rare fish in northern European waters which is a result, presumably, of stray fish wandering from the south.

In the Mediterranean it lives in shallow water over sandy bottoms, and the young especially can be found in estuaries and low-salinity lagoons. It feeds on smaller, schooling fishes, especially sardines and grey mullets, and other mid-water fishes. The deep rumbling sounds that it produces can be heard at a distance of 30 m or so in water. It is an extremely good food fish, and a splendid fighting fish for the angler, but large specimens are now very rare in European seas.

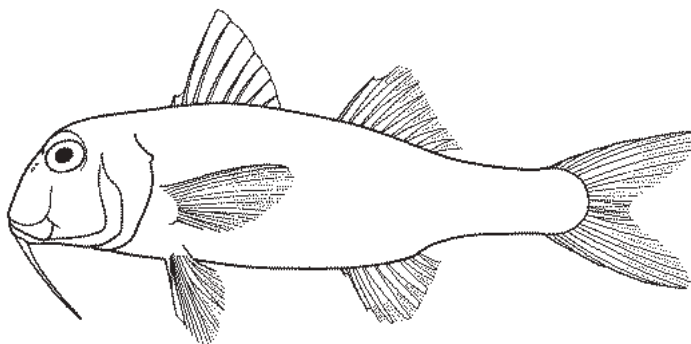
Characteristics

A long-bodied fish and heavily scaled, the scales extending on to the head and tail fin, and obliquely inserted into scale pockets. Second dorsal fin long-based; anal fin conspicuously short-based.

Family: Red Mulletts *Mullidae*

The red mulletts are a family of fishes of worldwide distribution in tropical and warm temperate seas, where they are generally called goatfishes. Around 60 species are known and all are moderately slender with blunt snouts and rounded heads. Characteristically they have two dorsal fins (the first spiny), large scales, and a pair of conspicuous barbels on the chin. These barbels are the reason for their alternative name - goat fishes. Most of them are reddish with yellow tints. They live mainly in shallow inshore waters close to the sandy or muddy sea bed in which they detect buried invertebrates by means of their barbels. There are six genera with some 62 species. Two species occur in northern European waters; three others are found in the waters of southern Europe (two of which are Red Sea immigrants into the Mediterranean through the Suez Canal).

Plain Red Mullet *Mullus barbatus*



Characteristics

Elongate body with steep forehead and two long mobile barbels. Snout short, nearly vertical. No teeth on upper jaw. Three suborbital scales. Two dorsal fins, the first with 7-8 spines, the second with 1 spine and 7-8 soft rays. Scales large and fragile, 31-35 along lateral line.

Colour

Reddish, with no spots or stripes on body or fins; may have a rather blotchy appearance.

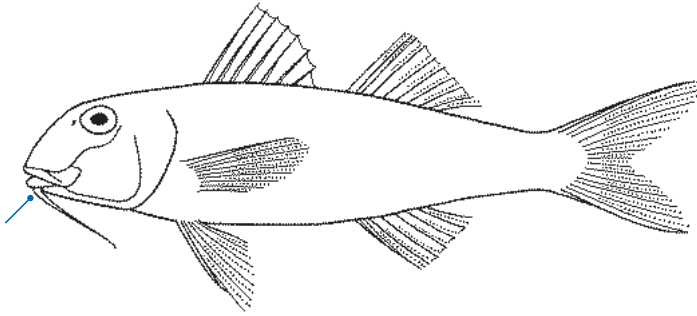
Size

Can grow to a length of 30 cm.

Ecology

Occurs in subtropical areas of the eastern Atlantic and the Mediterranean and Black Seas in water depths of 10-328 m. Found over the continental shelf on gravel, sand and mud substrates. Feeds on small benthic invertebrates, especially worms, molluscs and crustaceans. Of some importance to commercial and sport fisheries. The range of these species probably extends to northern Biscay; its presence in British waters has not yet been shown.

Striped Red Mullet *Mullus surmuletus*



Characteristics

Body slender and rather flattened, with a steeply arched head profile. Snout longer and less deep than in *M. barbatus*. Only two suborbital scales; scales are large and fragile, 33-37 along lateral line. Two long barbels on the lower jaw, their length greater than that of the pectoral fin.

Colour

In daytime, reddish-brown with 4-5 lengthwise yellow stripes and a darker stripe from eye to tail; at night, these stripes break up into an indistinct marbled pattern. First dorsal fin with dark markings. Below a depth of ca 15 m they are deep red.

Size

Attains a maximum length of 40 cm and a weight of ca 1.8 kg. British Rod-caught Record: 1.786 kg (1996, Alderney). Irish Rod-caught Record: 572 g (2005, Kilmore Quay).

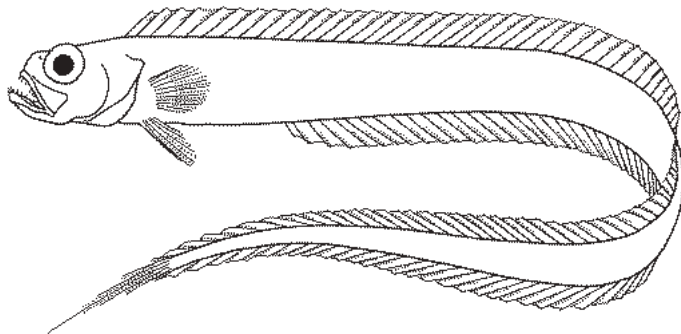
Ecology

Through most of northern Europe's seas the Striped Red Mullet is a scarce fish but in the English Channel, and at times in the southern North Sea, it is moderately common with fish of all sizes being caught. It lives in small schools on sandy or muddy bottoms in 3-90 m, although it also occurs on rocky grounds. These fish probe the soft bottom with their long barbels which are covered with sensory pores, in search of food and may vigorously excavate a pit to seize their prey. The school is sometimes followed by smaller fishes such as wrasses, which snap up small food items that are uncovered. In the Mediterranean the Striped Red Mullet spawns in summer, when the female sheds her eggs on the bottom in 10-55 m. The early young are blue-backed and silvery-sided planktonic creatures which live at the surface of the sea. This is a valued food fish, and regular landings are made on the Channel coasts.

Family: Bandfishes *Cepolidae*

The bandfishes are a small family of marine fishes found in the Indo-Pacific and the eastern North Atlantic. They are all very similar in body form - long and slender with long dorsal and anal fins, continuous with the tail fin. Many are reddish in colour. Worldwide, there are four genera with some 19 species. One species only is found in European waters.

Red Bandfish *Cepola macrophthalmma*



Characteristics

Long slender body with long dorsal fin, originating above the gill cover. Eye large, mouth strongly oblique with well-spaced, relatively large, curved teeth in the jaws.

Colour

Back and sides red or orange-red, ventrally orange to yellowish. The dorsal and anal fins are yellowish with a blue margin in the male and pink in females, except that the anterior part of the dorsal fin is red.

Size

Attains a maximum length of 80 cm, but usually around 60 cm. British Rod-caught Record: 200 g (2001, Inverkip).

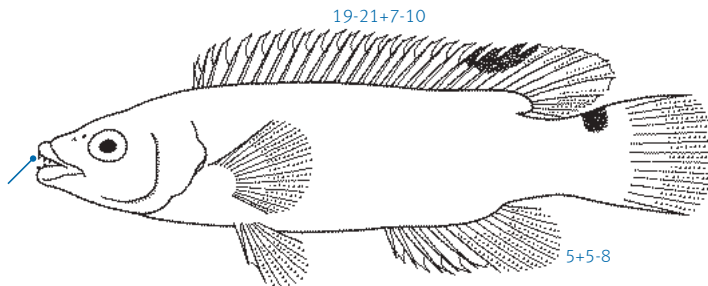
Ecology

Moderately common around Ireland, on the southern and western coasts of Britain, and also off the French coast; rare in the North Sea. It lives in vertical burrows, about 6-8 cm wide in stiff mud at depths of 17-200 m. It emerges from the burrow at times to feed on planktonic crustaceans, chiefly copepods, although it may take some prey by partly protruding the body from the burrow. It is occasionally eaten by other fishes, including the mid-water feeding Whiting. After storms, it is sometimes stranded on shore or captured by sprat nets, presumably because the burrows have been destroyed by the sea's action. More often caught by anglers than by commercial fisheries. Widely referred to as *Cepola rubescens*.

Family: Wrasses *Labridae*

The wrasses are a large family with some 68 genera and 453 species distributed in tropical, warm temperate, and temperate seas. Wrasses are fully scaled, have a long-based dorsal fin, the anterior rays of which are spiny, usually have stout teeth, and have well-developed pharyngeal bones with flattened teeth. Most are relatively small, shorter than 30 cm. In general, they are colourful fishes, the sexes having different colouring or markings. Some species (probably most) change sex with age from female to male, with accompanying colour changes. Wrasses are also well known for their habit of sleeping at night, sometimes buried in sand, at other times hidden between rocks or in algae. Some also are well known as 'cleaner fish' which pick parasites off larger fishes, although this behaviour has been proven in only a few European species. In general, they have little food value although they are locally marketed; the largest species have some appeal to anglers, but they are not sporting fishes.

Scale-rayed Wrasse *Acantholabrus palloni*



Characteristics

A slender-bodied wrasse with moderately large scales which extend up the rays of the fins and over most of the head. Five sharp spines in the anal fin, 19-21 in the dorsal fin. Mouth large, almost reaching the level of the eye; teeth in front, especially in the lower jaw, sharp and protruding.

Colour

Basically greeny-brown on the back and upper sides, lighter ventrally, may have 5-7 pale blotches above the lateral line; dusky blotches at the end of the spiny dorsal fin and on the upper edge of the tail fin base.

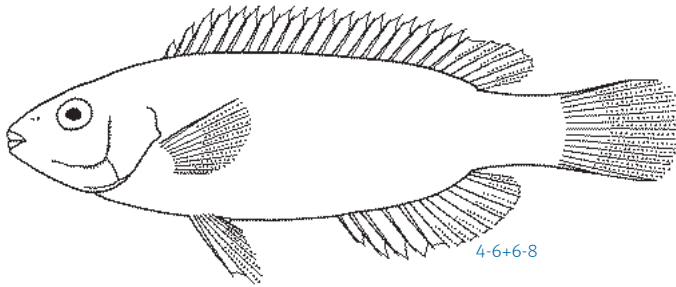
Size

Grows to a length of 30 cm. British Rod-caught Record: 419 g (1992, Eddystone Reef).

Ecology

In northern European waters this wrasse is rare, but even to the south it seems uncommon. It lives in deeper water than most wrasses, among rocks mostly between 50 and 270 m, exceptionally as shallow as 18 m. Its diet has been little studied, but one specimen examined contained mollusc, crab, and fish remains.

Rock Cook *Centrolabrus exoletus*



Characteristics

A rather deep-bodied but small wrasse. Its mouth is small, although the thick lips accentuate its size; the corner is less than halfway to the eye. Teeth are small and in a single row. Anal fin with 4-6 (usually 5) stout spines. Preoperculum serrated. It is also known as the Small-mouth Wrasse.

Colour

Greeny-brown or reddish with a purple tinge on the back and blue lines across the cheeks; lighter on the sides and yellowish on the belly. Males have conspicuous blue spots on the vertical fins. No black spots. The tail has two dark vertical bars giving a pale crescent between them and a light edge to the fin.

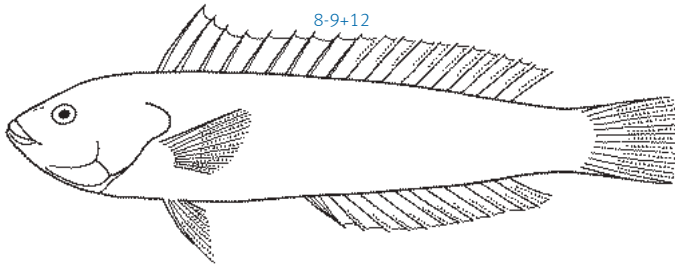
Size

Attains a length of 15 cm, usually up to about 12 cm. British Rod-caught Record: 109 g (2001, Newquay).

Ecology

A little-known wrasse which is local in its distribution. It lives in shallow water from 2-25 m amongst algae-covered rocks and in eel-grass beds. The young are found in the shallower depths, and may very rarely be caught near extreme low-tide level. It is said to eat small crustaceans, and from the frequency with which it is taken in prawn traps it may scavenge on the bait, although it could as easily be attracted by the amphipods which swarm round pot baits. It is also known to act as a cleaner-fish, picking parasites off larger fishes, and is one of the very few temperate fishes to show this behaviour.

Rainbow Wrasse *Coris julis*



Characteristics

A long, slender-bodied wrasse with very small scales (more than 60 along the lateral line) which do not extend on to the head. Dorsal spines thin and flexible, 8-9 in number. Teeth protrude forwards from the mouth.

Colour

Variable with sex and age, also with the depth at which it lives. Females and young males orange-brown above with a yellow-white stripe on sides; adult males greenish above with a zigzag blue-edged orange band on sides. Both have a bright blue spot on the edge of the gill cover.

Size

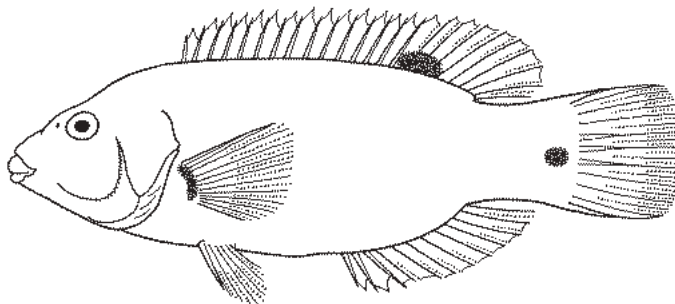
Males grow to 30 cm, females to ca 16 cm.

Ecology

Excessively rare in British and Irish seas; there were four reports in the 19th Century and few since, and records of eggs identified as belonging to this species may be doubted.

In the Mediterranean and on the warmer Atlantic coasts it is very common, living in shallow water of 3-120 m close to rocks and among seagrass beds. Active during the daytime, and probably buries itself in sand at night. This wrasse changes sex, from female to male, and often lives in small, loosely organized, male-dominated communities.

Baillon's Wrasse *Crenilabrus bailloni*



Characteristics

Relatively deep-bodied, with large to moderate scales, 33-38 in the lateral line, and four scales between it and the dorsal fin ray bases. Two or three rows of scales on the cheek. Edge of preoperculum is lightly serrated on rear and lower faces.

Colour

Dull greeny-brown with dusky spots on the dorsal fin membrane on the base of the first soft rays and on the base of the last rays. There may be a spot on the tail in front of the tail fin and below the lateral line, though these are not always evident. A blue arc on the base of the pectoral fin. In breeding males the snout and fins are usually pinkish.

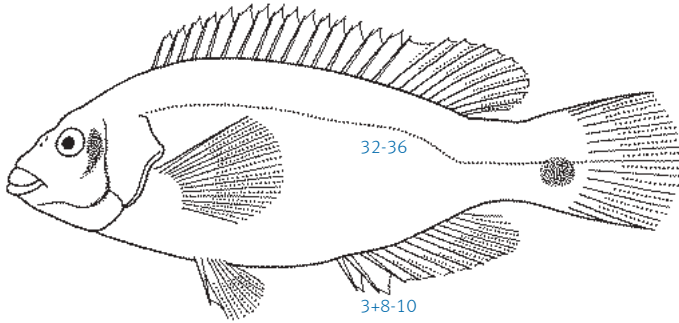
Size

Attains a length of 20 cm. British Rod-caught Record: 226 g (2004, Weymouth).

Ecology

An excessively rare wrasse in northern European seas which formerly was recorded on very few occasions. However, since 1990 it has become more common on southern coasts. It is believed to live near rocks covered with algae and in eel-grass beds, where it builds domed nests in the open. Its biology is virtually unknown. Sometimes called *Symphodus bailloni*.

Corkwing Wrasse *Crenilabrus melops*



Characteristics

A deep-bodied wrasse with large scales (31-37 along the lateral line) extending on to the head and cheeks, where there are several rows. It has three anal spines, 8-10 branched rays. Preoperculum edge heavily serrated on rear and lower edges. Pelvic fins are long and reach almost to anus. Teeth in a single series except in large specimens.

Colour

Variable with habitat; usually green or greeny-brown, sometimes reddish. The males have bluish lines on the lower sides of the head and belly. Dark, comma-shaped spot behind the eye, and a pupil-sized spot on the tail base on, or below, the lateral line. Dorsal fin without bold marks. Blue edges to dorsal and anal fins.

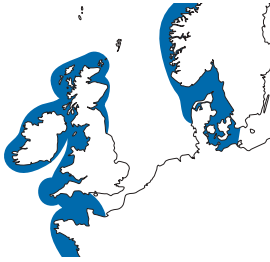
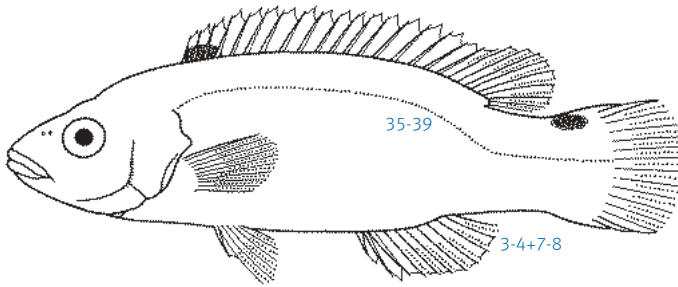
Size

Exceptionally reaches a length of 28 cm, usually around 15 cm; may attain a weight of 450 g. British Rod-caught Record: 360 g (2005, Portland).

Ecology

This is the most common of the smaller wrasses in northern European seas. It is particularly abundant among rocks, both between tide marks, where it is a common inhabitant of heavily weedy rock pools, and below tide level down to 30 m; it is also found in eel-grass beds, especially when young. In winter it moves into deeper water. Its food is mainly molluscs and small crustaceans, but the young fish have been observed to act as cleaners. It builds a nest among algae in early summer, usually between rocks, guarded by the male. After hatching, however, the fry are planktonic and by the autumn have drifted inshore. Sometimes called *Symphodus melops*.

Goldsinny *Ctenolabrus rupestris*



Characteristics

Relatively slender-bodied with a pointed head and small mouth. The scales are large, 35-39 in the lateral line; the preoperculum finely serrated on its rear edge but not ventrally; anal fin with only 7 or 8 branched rays. Teeth in front of jaw curved and large; in two rows.

Colour

Brown or reddish-orange with dusky spots on the dorsal fin membrane between the first and fifth spines, and dark spot on the top of the tail just in front of the fin.

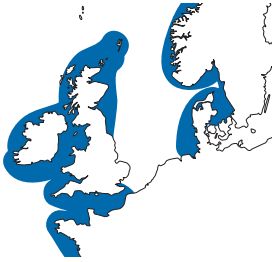
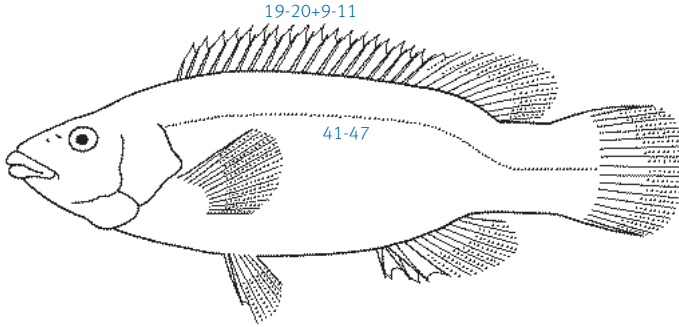
Size

Attains a maximum length of 18 cm, usually around 12 cm. British Rod-caught Record: 102 g (2005, Portland).

Ecology

The Goldsinny is one of the more common small wrasses in northern European seas although it is only abundant locally, despite its wide distribution. It is a very active fish that lives close to algal-covered rocks in 11-30 m, and among eelgrass beds, and in extreme low-water tidal pools on rocky shores which may be no more than 1 m deep. It is usually found in proximity to deep water, and may migrate offshore. Its bold markings resemble those of other wrasses known to act as cleaner fish, and this behaviour gained it some recognition during the 1980s, when trials were held to determine if it could control outbreaks of sea lice in salmon cages. Unfortunately, these were not successful.

Ballan Wrasse *Labrus bergylta*



Characteristics

The largest species in Europe, the Ballan Wrasse has a rather deep body, pointed but not elongate snout, and a small mouth which does not reach to eye level. Scales moderately small, 41-47 scales on the lateral line, all about pupil sized. Rear edge of the preoperculum smooth. Dorsal fin with 19-20 spines.

Colour

Very variable with sex and age, generally basically greenish or greeny-brown, sometimes reddish and others completely green; the undersides and the fins are spotted with white and the scale edges are dark.

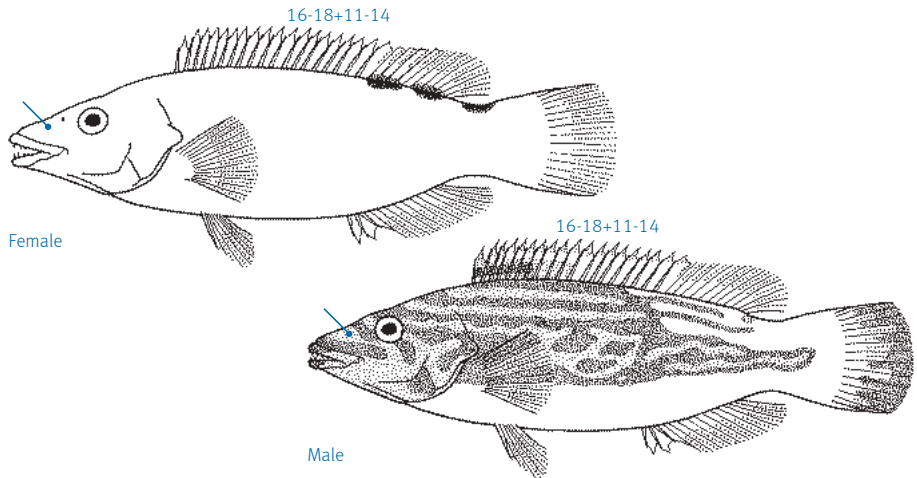
Size

Attains a maximum length of 66 cm and a weight of ca 4.5 kg. British Rod-caught Record: 4.302 kg (1999, Jersey). Irish Rod-caught Record: 4.3 kg (1993, Clogher Head).

Ecology

Probably the most abundant large wrasse in the eastern North Atlantic. It is common close to rocks and around reefs from 2-3 m to about 20 m, while the young are often found in shore pools provided there is abundant algae and rock. The adults are usually solitary or form small schools. It feeds heavily on molluscs (mainly mussels), but also eats large numbers of crustaceans, especially the smaller crabs. Like several other wrasses it builds a nest of fine algae, wedged into a crevice, in which the eggs are laid in summer. After hatching, the larvae are pelagic for a short while and drift into shallow inshore waters. The Ballan Wrasse in northern Europe suffers in very severe winters, when many may be killed by the cold.

Cuckoo Wrasse *Labrus mixtus*



Characteristics

A rather slender-looking wrasse with notably elongate head and pointed snout; mouth large, reaches almost to eye level. Scales rather small, not much bigger than the pupil, 45-48 along lateral line. Rear edge of preoperculum smooth. 16-18 spines in the dorsal fin.

Colour

Females and immature males yellow, reddish-orange, or red, paler on the belly, with three dusky blotches with white patches between them on the back at the rear of the dorsal fin and on the caudal peduncle. Males have a brilliant blue head, the blue continuing on the sides as streaks across the yellow or orange background. When spawning, the male has a white patch on top of the head.

Size

Attains a length of 35 cm and a weight of over 1 kg. British Rod-caught Record: 1.126 kg (1998, Dungeness). Irish Rod-caught Record: 1.106 kg (1998, Causeway Coast).

Ecology

A moderately uncommon wrasse in northern European waters in general, although it may be common locally especially close to rocks in 35-180 m. In summer it moves inshore and may be found in water as shallow as 10 m, while small specimens occur in the low tidal fringe. An offshore migration into deeper water takes place in early winter. The male selects a nest, usually a cleared hollow in the sea bed, and displays around it, attracting females towards the nest and driving rival males away. An elaborate courtship ensues on nest building. Growth is slow and in northern waters at least, Cuckoo Wrasse live for a considerable span (up to 17 years). Their diet has been little studied, but is believed to comprise crustaceans, molluscs, and other bottom-living organisms.

Family: Eelpouts *Zoarcidae*

The eelpouts are found in cool temperate to polar seas both in the Arctic and the Antarctic. In the northern hemisphere they are represented by numerous species which live from the shoreline down to 1,000 m and more. Several of these are found in the Barents Sea region, but only four are at all common in shallow water south of the Arctic Circle. Worldwide there are 46 genera with 230 species. Eelpouts all have rather elongate bodies, the dorsal and anal fins fusing with the tail fins, large fan-like pectoral fins and short stumpy pelvic fins on the throat. They also have rather broad, large heads and protuberant lips.

Sars's Eelpout *Lycenchelys sarsii*



Characteristics

Very slender-bodied, with only a moderately large head on which large pits open to the surface around the jaws. The dorsal and anal fins are long, low and continuous. The body is scaly all over, although the scales are small and embedded. The dorsal fin origin is over the end of the pectoral fins. Pectoral fin with 15-16 rays.

Colour

Back and upper sides reddish-brown sharply divided from the light ventral surface. Back usually with rounded blotches.

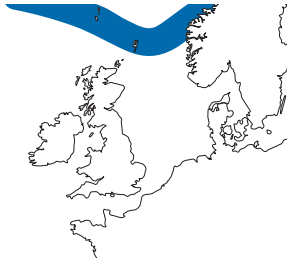
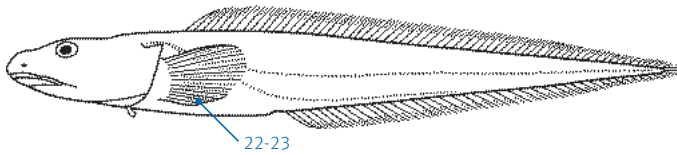
Size

Maximum length 30 cm, usually around 15 cm.

Ecology

Widely distributed along the Scandinavian coast on muddy bottoms at depths of 150-600 m, but most common between 200 and 350 m. A common fish in the deep Norwegian fjords. It eats worms, crustaceans, and small molluscs.

Esmark's Eelpout *Lycodes esmarkii*



Characteristics

Long-bodied with a large heavy head, thick fleshy lips. Dorsal fin long and of uniform height, continuous with the tail and anal fins. Lateral line double, running along the sides and along the belly, which is covered with embedded scales. Pectoral fin with 22-23 rays - its base scaleless.

Colour

Body dark greenish-brown, ventrally yellow-white; the back and upper sides with 7 or 8 double yellowish cross-bands each forming an inverted Y-shape.

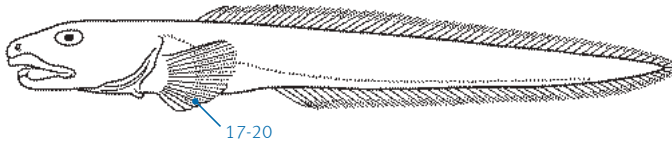
Size

Attains a maximum length of 75 cm, but mostly 50-65 cm.

Ecology

Lives on muddy bottoms in deep water from 200-550 m, in the deeper depths at the south of its range. It does not live in the near polar temperature water of the far north or at great depths, preferring temperatures of 2-5°C. It spawns in autumn, producing relatively more eggs than other eelpouts (about 1,200 per female), but they are similarly large (6 mm). It feeds mostly on small echinoderms such as brittlestars and sea-urchins. It is of no fishery value but is occasionally captured in trawls.

Vahl's Eelpout *Lycodes vahlii*



Characteristics

Slender-bodied but with a broad head; lips thick and fleshy. Dorsal fin long, of uniform height, continuous with the tail and anal fins. Lateral line on lower side of body, belly covered with embedded scales. Pectoral fin with 17-20 rays; its base covered with scales.

Colour

Brownish, lighter ventrally, with 8-13 dark cross-bands when young, these fading and breaking up in adults; always a dark spot or up to three spots at front of dorsal fin. Internal lining of body cavity black.

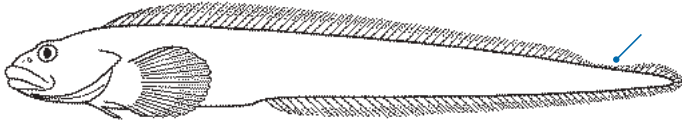
Size

Attains a length of 52 cm; European specimens are rarely more than 35 cm.

Ecology

Found in deep water from 17-365 m, most abundantly in 20-300 m on muddy bottoms at low temperatures of 2-3°C and full salinity. It feeds on small crustaceans, molluscs, worms, and brittlestars. Spawns in summer, producing few (less than 100) large eggs. The European populations are regarded as the subspecies *L. vahlii gracilis*; *L. vahlii vahlii* occurs off West Greenland and North America.

Viviparous Blenny *Zoarces viviparus*



Characteristics

Long-bodied but rather stout at the abdomen, the head broad and lips thick. Dorsal fin long but with a low section of short spines close to the tail; the anal fin is also long and the fin continues around the tail. Skin slimy with deeply embedded small scales.

Colour

Usually dull but very variable with the nature of the habitat. Often greyish-brown above, may have pale band across the back of the head from one eye to the other, yellowish below with a series of dusky bars along the body and dorsal fin. Frequently deep brown above.

Size

Attains a maximum length of 50 cm, usually growing to ca. 30 cm. British Rod-caught Record: 368 g (1982, Redcar Shore).

Ecology

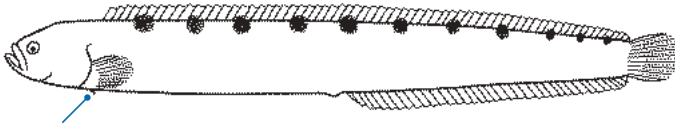
This is the most common member of the family, and the most southerly in distribution in European seas, reaching the Scottish coasts, the North Sea and the Irish Sea. It is common on the shore between tide marks and down to 40 m at the most. It is found on rocky shores under stones, amongst algae and in pools; in deeper water it occurs on muddy and sandy bottoms. It also occurs in estuaries, in the north in low

salinities. It is well known as a viviparous fish. Mating takes place from August-September, the eggs develop within the female for 3-4 weeks before hatching, and then continue to grow, nourished by special tissues of the ovary. The young are born fully formed from December-February and at a length of about 4 cm. The Viviparous Blenny feeds mainly on small crustaceans, occasional fish and molluscs. In the Baltic countries it is fished commercially with traps and seines; its flesh is tasty with considerable fat content. It is eaten fresh or smoked.

Family: Butterfishes *Pholidae*

The Butterfishes are found in the cooler seas of the northern hemisphere, and like Arctic blennies, resemble blennies in certain features. The family is a small one with only three genera and 15 species. Its members are long-bodied slender fishes with long-based, wholly spiny dorsal fins, and pelvic fins which are often reduced to small stumps, sometimes are moderately long, and at others are absent. Most species are inshore or shallow sea inhabitants.

Butterfish *Pholis gunnellus*



Colour

Usually a warm brown, sometimes greenish, with indistinct vertical bars on sides, a dark stripe through the eye to the corner of the mouth. A row of white-ringed black spots along the base of the dorsal fin, 9-15 (usually about 12) in number.

Size

Attains 25 cm in length. British Rod-caught Record: 32 g (1978, Gourock).

Ecology

A common fish on the seashore and below tide marks to ca 100 m. It is found mainly on rocky shores from mid-tide level downwards and occurs in intertidal pools, under stones, and amongst algae. In deeper water it is common

among rocks and on rough ground, but can be caught in trawls on mud and sand (presumably where loose stones and shells provide shelter).

It spawns from January-February on the British and Irish coasts, earlier further north, the eggs being laid in clumps between stones or inside shells on the shore and guarded by an adult, usually the female.

The postlarvae are pelagic. The Butterfish feeds on worms, small crustaceans, and molluscs.

Because it is so abundant in littoral waters, it must play a large part in the food-chains of the area, but few observations are available on its predators.

It is a frequent intermediate host of the seabird parasitic worm *Cryptocotyle sp.*, which encysts to form black blisters in the skin.

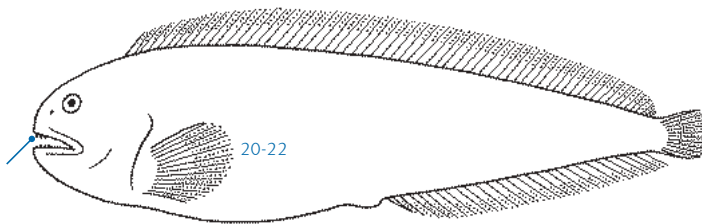
Characteristics

Long slender body, strongly flattened from side to side; head short and narrow, the lips fleshy. Dorsal fin long, running from the back of the head to the tail fin; anal fin about half the length of the dorsal; pelvic fins minute and spiny. The scales are minute and embedded in the skin, which is exceptionally slimy, giving rise to the common name.

Family: Wolffishes *Anarhichadidae*

The Anarhichadidae, or sea catfishes, is a small family of marine fishes related to the blennies (and not to the true catfishes). They are confined to the temperate and boreal waters of the northern hemisphere. They are long-bodied, rather large fish which lack pelvic fins and have huge dog-like teeth in the front of the jaws and rounded crushing teeth in the sides and on the palate. They mostly live close to the sea bed in moderately deep water on the lower continental shelf. Some species are fished for commercially and occasionally are caught by sport fishermen, but they are not much exploited for either purpose. Worldwide there are only two genera with five species, three of which occur in northern European seas.

Jelly Cat *Anarhichas denticulatus*



Characteristics

Typically catfish-like, but the body deeper and more gross than the other species, the head pointed, and the tissues soft and watery (feels jelly-like when handled). The pectoral fin is small, its length four or more times in snout to vent length; 20-22 pectoral rays. Length of the tail fin rays less than two

times in the depth of the caudal peduncle. Teeth in row in centre of palate rounded or pointed, the length of the row less than the length of the rows of palatine teeth on either side.

Colour

Dark greyish-brown or chocolate with faint, blurred markings forming obscure bars on sides.

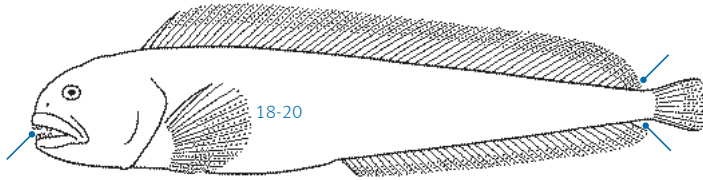
Size

Grows to a length of 140 cm and a weight of 20 kg; usually around 90 cm and up to 15 kg.

Ecology

An Arctic form which is moderately common in the Norwegian Sea northwards, and is known from such areas as the Skaggeak and northern North Sea only from single occurrences. In 1986 and 1992 single specimens were caught off the Irish coast. It lives mainly on soft bottoms of silty mud in depths of 60-970 m, and feeds on crustaceans, sea urchins, and brittlestars. Its watery flesh means that it has little value as a food fish, although it is caught in considerable quantities.

Wolffish *Anarhichas lupus*



Characteristics

Typical of the family, with long dorsal and anal fins (free of the tail fin in this species), huge head with strong teeth in the jaws. The length of the tail fin is twice the depth of the caudal peduncle. The pectoral fin is moderately large, its length about 3.5 times into the snout to vent distance; pectoral fin has 18-20 rays. Teeth on the vomer (central row in the roof of the mouth) large, the length of the row considerably longer than that of the palatine teeth (either side of it also in the roof of the mouth).

Colour

Body is brownish or bluish-grey with 9-12 darker cross-bars extending onto the dorsal fin.

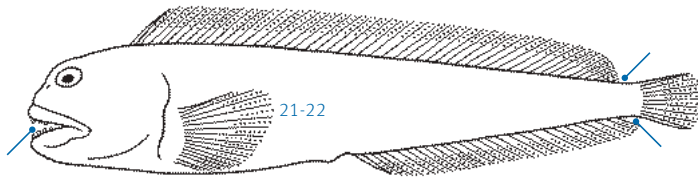
Size

Grows to a maximum of 1.5 m and a weight of ca 24 kg; the majority of specimens caught today are less than 1 m. British Rod-caught Record: 11.906 kg (1989, Whitby).

Ecology

In the seas off Iceland, the Faeroes, and Norway this fish is found in abundance and in relatively shallow water from 2-30 m down to 300 m, and young ones even in immediately subtidal situations. To the south, round Britain and Ireland, it lives from 60-300 m. It is found mostly on hard bottoms, sometimes on mud, and spawns in the winter, the eggs being deposited as a ball-like clump on the sea bed. The larvae stay on the bottom until their yolk reserves are used up, then briefly are found in the mid o surface layers, but by late autumn are bottom-living. The adults feed on crabs, sea urchins, mussels, whelks, and scallops. It is a slow-growing fish which is quickly affected by heavy fishing. Its flesh is well flavoured and firm, but it is not caught in great quantities. Its skin can be prepared as leather. This species is the sea catfish most frequently caught by anglers.

Spotted Catfish *Anarhichas minor*



Characteristics

Similar in the general build with the tail fin long (twice the depth of the body before the fin) and pectoral fin length about three times into the snout to vent distance. In this species the dorsal fin ends in a series of low rays which continue up to the tail fin rays. Anal fin just connects with tail fin. Pectoral fin rays 21-22. Teeth on vomer (centre of the roof of mouth) rather arched or pointed, the row equal in length to the rows of palatine teeth on either side of it.

Colour

Yellowish-brown with numerous, distinct rounded spots on dorsal fin, back, and sides. Juveniles up to 10 cm have faint bars which break into spots with growth.

Size

Attains a maximum size of ca. 135 cm, but is rarely longer than 144 cm; maximum weight up to 24 kg.

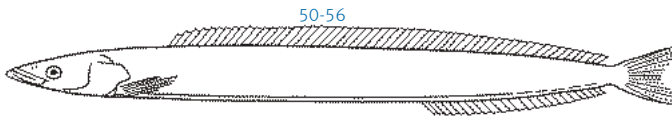
Ecology

This is an Arctic species which is found mainly in the cold deep water of the Norwegian Sea and the Barents Sea, and to some extent replaces the more southerly sea catfish. It has been recorded only once in British or Irish waters. It lives at depths of 20 m in the northern parts of its range, down to 500 m; it is most common between 100-200 m. It feeds on sea urchins, brittlestars, crabs, and molluscs. Its breeding habits are similar to the preceding species except that the eggs are laid in deeper water, 110-250 m. This is the most important of the sea catfishes to the fishing industries of Russia and other northern countries; its flesh is of good quality and the skin can be used for leather. It is, however, slow-growing and stocks can quickly become exhausted.

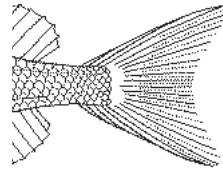
Family: Sandeels *Ammodytidae*

The sandeels are a family of rather small marine fishes, found mainly in the northern hemisphere and most abundantly in the North Atlantic. There are eight genera and 23 species, six of which occur in European waters - one is confined to the Mediterranean. They are superficially similar, being slender-bodied with a sharply protuberant lower jaw, long dorsal and anal fins. They burrow in clean sand and shell grounds, but also swim actively in huge schools in mid-water. At all times of their lives they are preyed upon by other fishes and seabirds, and as a group they play an important role in the food-webs of the shallow sea.

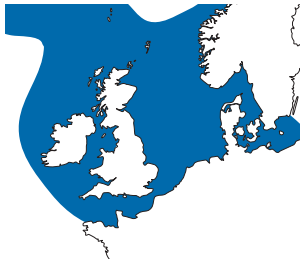
Raitt's Sandeel *Ammodytes marinus*



Head of *Ammodytes*



Tail of *A. marinus*



Colour

Greeny-blue on the back, the sides bluish fading to silver which continues on to the belly.

Size

Grows to a length of 25 cm.

Ecology

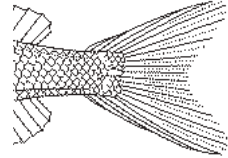
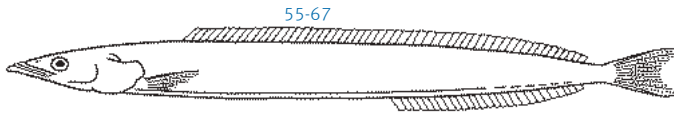
An extremely abundant offshore species which usually lives at depths of 30-150 m. It is also occasionally found in inshore waters, even in river mouths. It burrows in sand and fine gravel, and also swims in large schools in mid-water. Its food consists mainly of planktonic crustaceans, fish larvae, and worms; in turn it is eaten by other fishes and is a major component in the diet of seabirds. It lives for

up to five years, and spawns in winter (November to March) in the English Channel, later further north. Widely used for anglers' bait, and the basis of an industrial fishery for fishmeal and oil. Raitt's Sandeel makes up 90% of the catches in northern European waters, but the landings have declined drastically from their peak of almost one million tonnes per year in the late 1990s.

Characteristics

Virtually identical to the Lesser Sandeel, having a freely protrusible upper jaw which can be swung forwards to form an extended tube; no large teeth in the roof of the mouth. It differs in having the belly scales in irregular rows and having no scaly patches on the base of the tail fin lobes. Dorsal rays number 55-67; vertebrae 66-72.

Lesser Sandeel *Ammodytes tobianus*



Tail of *A.tobianus*



Characteristics

A typical sandeel with long, slender body, long dorsal fin which slots into a groove, a rather shorter anal fin, small pectoral fins, a forked tail fin, and no pelvic fins. The upper jaw is fully protrusible and there are no 'teeth' in the roof of the mouth. Lateral line pores open along the canal, not on branch canals. Scales present on body, forming a chevron pattern along the belly, and patches on the base of each tail fin lobe. 49-58 rays in the dorsal fin; 60-66 vertebrae.

Colour

Yellowish-green on the back, the sides are yellow, the belly silvery.

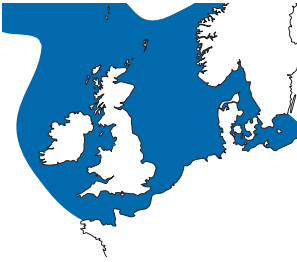
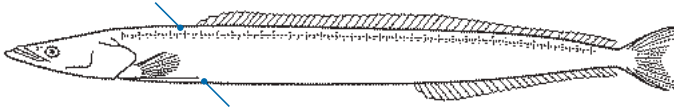
Size

Grows to a maximum length of 20 cm.

Ecology

An extremely common inshore fish in northern European seas, living in sandy bays and on beaches from about mid-tide level to depths of ca 30 m. It is always found close to clean, rather fine sand, in which it burrows with great rapidity, or swimming over the sand often in a head-down posture. Two spawning races are recognized, spring spawners and autumn spawners, which are locally dominant in any one place, but have been found in several parts of their range. Both races deposit their eggs in the sand and these stick to the sand grains. It is an extremely important food fish to a wide variety of other fishes, e.g. Mackerel, Herring, gadoid fishes in general, and Sea Bass, and seabirds. It is a popular bait-fish for anglers. Large quantities are also captured for reduction to fish meal.

Smooth Sandeel *Gymnammodytes semisquamatus*



Characteristics

Closely similar to the preceding species with a protrusible upper jaw, and no 'teeth' in the palate. The lateral line has short canals branching above and below the main canal (typically two above and for every three below). The anterior half of the body is scaleless. A short groove below the pectoral fin is only a little longer than that fin. Dorsal and anal fins have wavy margins, dorsal rays number 56-59; anal rays 28-32; vertebrae 65-70.

Colour

Greenish-brown above, even golden on the back, the sides yellowish, and the belly silvery.

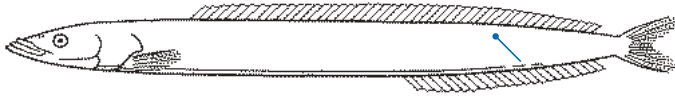
Size

Attains a length of 28 cm.

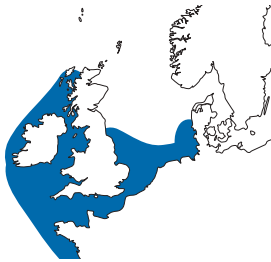
Ecology

This is one of the less well-known sandeels of northern Europe and is also more southerly in its distribution. It usually lives in offshore areas in depths of 20-200 m, over coarse sand or shell gravel. Its distribution is rather local on account of this preference. It spawns in summer in the English Channel and from March-August in the North Sea, the eggs being laid among the shell gravel. It feeds in mid-water on copepods, planktonic crustaceans, and fishes. It lives for up to five years.

Corbin's Sandeel *Hyperoplus immaculatus*



Head of *Hyperoplus*



Characteristics

A large sandeel closely similar to the Greater Sandeel and sharing its feature of a non-protrusible upper jaw. The large tooth on the palate appears as two almost separate teeth with low cusps. A shallow fold of skin along the lower sides of the belly is interrupted, but runs to the tail fin. Dorsal fin rays number 59-61; anal fin rays 31-34; vertebrae 70-74.

Colour

Back and sides dark grey-brown, the belly yellowish. The snout is uniformly dark with no pronounced dark spot, but dark area at the tip of the lower jaw.

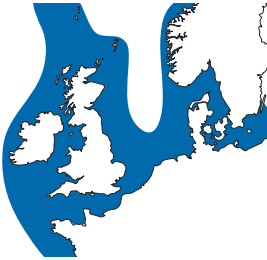
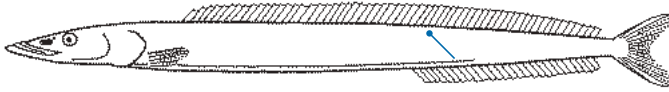
Size

Attains a length of 35 cm. British Rod-caught Record: 128 g (1978, Jersey).

Ecology

An offshore large sandeel which lives on coarse sand or shell-gravel bottoms. Its depth range is from ca 50-300 m, although young specimens are occasionally captured in much shallower water. It spawns in winter and spring, and the larvae and postlarvae are found in the plankton mainly in May off western Scotland and from January to March in the English Channel. The biology of this fish is relatively little known.

Greater Sandeel *Hyperoplus lanceolatus*



Characteristics

Elongate and slender-bodied like all the sandeels, but this species does not have a protrusible upper jaw, and in the roof of the mouth there is a single large bifid (two points) tooth. Scales present over the body but not on the head; lateral line not branched.

A shallow fold of skin on each side of the belly reaches back to the first third of the anal fin. Dorsal fin with 52-61 rays; anal 28-33 rays; vertebrae 65-69.

Colour

Greenish, back and upper sides bluish-green, the belly silvery-white; a distinct black blotch on the side of the snout.

Size

Grows to 40 cm. British Rod-caught Record: 239 g (1979, Guernsey).

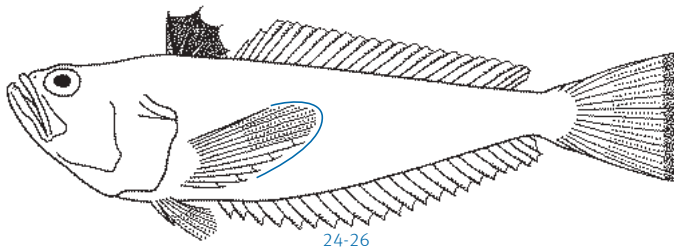
Ecology

An inshore sandeel which is found from low-tide level (young specimens) down to ca. 150 m, on sandy bottoms. It breeds during spring and summer at depths of 20-100 m, the eggs being shed in sand, although the larvae and postlarvae are pelagic. It feeds on a wide range of planktonic crustaceans, fish eggs and larvae, but as it grows it eats larger crustaceans and fishes, including the other sandeel species. This is the largest species of sandeel known, and although it is not as abundant as the smaller species it is quite common. Like the others, it is preyed upon by numbers of larger fishes, seabirds and even small cetaceans.

Family: Weevers *Trachinidae*

The weevers are small family of marine fishes confined to the inshore waters of the eastern Atlantic from Norway to West Africa. Most species are small with a rather elongate body, a deep, compressed head and anterior body. The mouth is oblique, the eyes placed on top of the head, and the body scales lie in oblique rows. The habit of weevers is to bury themselves in sandy bottoms with only the eyes exposed. The first dorsal fin and the gill cover have venom glands at the bases of the spines, wounds from which are very painful and may be serious (due mainly to shock and secondary infections); they are not directly fatal. Worldwide there are only two genera with eight species. Four species are known in European seas; only two occur around Britain and Ireland.

Lesser Weever *Echiichthys vipera*



Characteristics

A short-bodied weever, the head and anterior body deep (depth more than a quarter of the length without tail fin). The mouth is strongly oblique. No spines close to eyes or above upper lip; no scales on cheek. Outline of pectoral fin smoothly rounded. Second dorsal fin with 21-24 rays; anal fin with 24-26 rays.

Colour

Yellow-brown on back (usually matches the sand it is living in), the sides and particularly the head with darker blotches; lighter ventrally. First dorsal fin mostly black, tail yellow with dark band on the rear margin.

Size

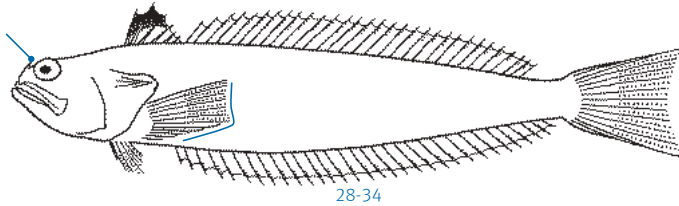
Attains 15 cm in length. British Rod-caught Record: 96 g (2001, Weymouth).

Ecology

The Lesser Weever occurs in shallow water on clean sandy bottoms from low-tide mark to 50 m. It also occurs between tide marks, moving on to the beach with the advancing tide and retreating as the tide ebbs, and occasionally becoming stranded in pools of water on the shore. It burrows in the sand, using its pelvic and pectoral fins which move the sand out from underneath, assisted by the water forced out of the gill chamber as the fish respire. When disturbed it tends to

bury itself deeper, but also erects its dorsal fin spines which have venom-producing tissue along their underside. If trodden upon by a bather or paddler, the wound is at once extremely painful, with local swelling of the affected limb. Many Lesser Weevers are caught in shrimp trawls, and stings from the gill cover and dorsal spines are a constant hazard when sorting the catch. The most widely recommended treatment is to soak the area of the wound in hot water as soon as possible after the injury, as heat destroys the toxic quality of the venom. The Lesser Weever's food consists mainly of small bottom-living organisms, especially crustaceans such as amphipods and young brown shrimps, and fishes such as sandeels and gobies, and worms. It spawns in summer. It has no value to fishermen or anglers, and its chief impact on man is in being one of very few dangerous fishes in European seas. It is locally abundant in some sandy areas, but by no means common elsewhere.

Greater Weever *Trachinus draco*



Characteristics

A compressed and elongate species with a relatively narrow head. Short spines in front of and above each eye, and pointing downwards above the front of the upper lip. A strong venomous spine on the gill cover. Scales in oblique rows on body; small scales on cheek. Pectoral fin outline notched at upper edge. Second dorsal fin rays number 29-32; anal rays 28-34.

Colour

Yellowish-brown above, lighter on the sides and belly with characteristic diagonal streaks of blue and yellow on sides following scale rows. First dorsal fin partly heavily pigmented.

Size

Attains 41 cm in length.
British Rod-caught Record:
976 g (1999, Cornwall).

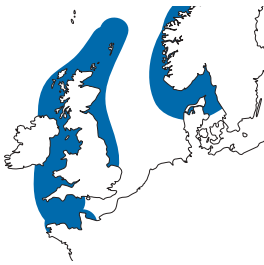
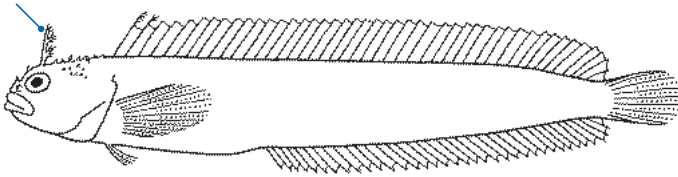
Ecology

Like all members of the family, it is a bottom-living fish which lies buried in the sandy sea bed during daylight and emerges to forage at night. It lives in relatively deep water of 30-100 m, but may be taken on occasions as shallow as 8 m. Because of its burrowing and preference for deep water, it is not often caught in trawls and has been regarded as rare, whereas it is probably fairly common, at least locally. It feeds almost entirely on bottom-living animals, particularly crustaceans and fishes, the latter comprising sandeels, dragonets and gobies especially. It is landed and marketed as a food fish on the continent of Europe, and its flesh is rather well flavoured.

Family: Arctic Blennies *Stichaeidae*

The Arctic blennies are a family of fishes found in the cooler seas of the northern hemisphere, and resemble blennies in certain features. Sometimes called pricklebacks; altogether there are 37 genera with some 76 species. They are particularly well represented in the North Pacific. Their members are long-bodied slender fishes with long-based, wholly spiny dorsal fins, and pelvic fins which are often reduced to small stumps. Most species are inshore or shallow sea inhabitants.

Yarrell's Blenny *Chirolophis ascanii*



Characteristics

Long slender body, but rather deep anteriorly. The dorsal fin is composed entirely of fairly long spines; the pelvic fins are small and flap-like, nearly as long as a dorsal spine. A large fringed tentacle above each eye, smaller tentacles on the top of the head, and on the first dorsal fin spines.

Colour

Colour Yellowish-brown with darker transverse bands forming double bars across the back; a dark ring around the eye continues across the cheek as a stripe.

Size

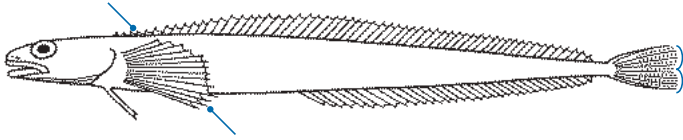
Grows to a length of ca 25 cm. British Rod-caught Record: 86 g (1996, Anglesey).

Ecology

A bottom-living species which is found in shallow water, usually on rocky grounds within the seaweed zone, or below, to about 175 m. It lives at depths as shallow as 20 m, but rarely occurs on the shoreline. It inhabits crevices in rocks and, in British and Irish waters at least, is more often caught in crab-pots and traps than in

any other way. Its eggs are laid on the sea bed (probably in crevices guarded by an adult - but this is not certain); the postlarvae are found in the plankton in May and June off Iceland, and from January-April in the western Channel. Its food consists of benthic molluscs and worms, but has been little studied. Owing to its habitat preferences and geographical range it is common only locally south of Scandinavia. Rare in southern Britain, but has been found in the Channel Islands.

Spotted Snake Blenny *Leptoclinus maculatus*



Characteristics

Body moderately long but rather stouter than the Snake Blenny. Dorsal fin entirely spiny, the spines in front distinctly low; pelvic fins long and slender, longer than the dorsal spines; pectoral fins long, the lower rays long with their tips free of the fin membrane; tail fin square cut or rounded. Snout to anal fin distance equal to anal fin base.

Colour

Yellowish-brown with numerous brown spots; five darker large blotches on the back and upper sides.

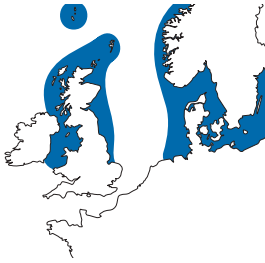
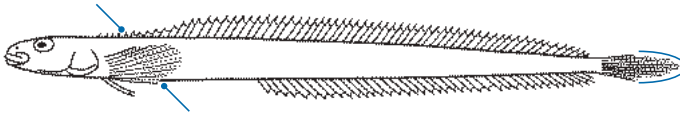
Size

Attains a maximum length of 20 cm, more usually up to 17 cm.

Ecology

A northern species which is found on mud and stone bottoms, or gravelly ground in depths of 15-250 m. The eggs are shed on the bottom in shallow water in winter; the postlarvae are pelagic and are found in June. This blenny is said to feed on worms and small crustaceans, and creep along the sea bed using the free lower pectoral rays. This fish has not been recorded around Britain or Ireland, but may turn up in the extreme north east of the area.

Snake Blenny *Lumpenus lampretaeformis*



Characteristics

Very long slender body, almost eel-like, and with the tail fin long and pointed. The dorsal fin is long-based, the elements all spiny, those in front and at the end low. Pelvic fins longer than dorsal spines; pectoral fins rounded, all the rays enclosed in the fin membrane. Body in front of the anal fin shorter than the anal fin base.

Colour

Pale brown shading to blue on the sides, ventrally greenish-yellow; a series of brown patches along sides.

Size

Grows to 49 cm in length; rarely more than 25 cm in European waters.

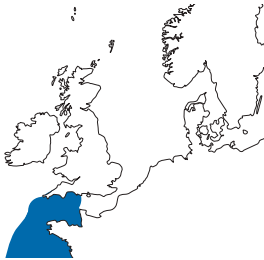
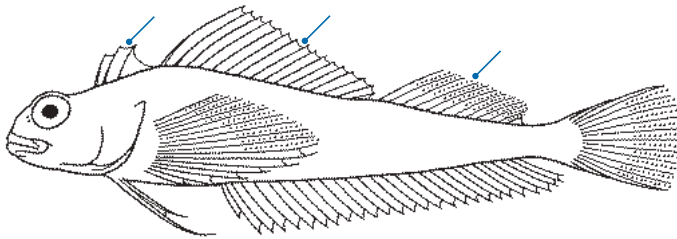
Ecology

A bottom-living fish found on muddy grounds from 30-200 m, but most common between 40-100 m. The Snake Blenny lives in Y-shaped burrows in the mud. Occasionally, as in late spring (in British waters) it has been caught in large numbers, but usually it is captured in small numbers only. It spawns in December and January on the bottom; postlarvae are pelagic and found mainly from February to April. Its food consists of small crustaceans, molluscs, brittlestars, and worms; it is eaten by both Cod and Halibut.

Family: Triplefin Blennies *Tripterygiidae*

The Tripterygiidae is a large family found mostly in tropical and warm temperate seas. Most are small fishes living close to the sea bed in shallow water, usually among rocks and coral. They differ from blennies by possessing scales, from gobies by having two-rayed pelvic fins, and from both by having three separate dorsal fins; all these groups occur in similar habitats. Worldwide, there are 23 genera with some 150 species. Four species are found on the coasts of southern Europe, but only one is known from northern Europe.

Black-faced Blenny *Tripterygion delaisi*



Colour

Eyes red, pale brown with five oblique darker stripes across the back and body, head with dusky patches, yellowish ventrally. In the breeding season males are black anteriorly, this extending back to include the pelvic fins, the pectoral fin base, and the first dorsal fin; the remainder of the body is deep yellow or orange with dusky bars.

Size

Grows to a length of 9 cm.

Ecology

This species was described only as recently as 1970 and was first found in the English Channel in 1972. It lives on the low shore among stones on fine gravel with algal covering,

and occurs as deep as ca 20 m. Its secretive nature and habit of hiding in crevices on rock faces and on wrecks are probably the reasons why it was not discovered earlier; it has been seen by divers on a number of occasions in various locations along the southern English coast.

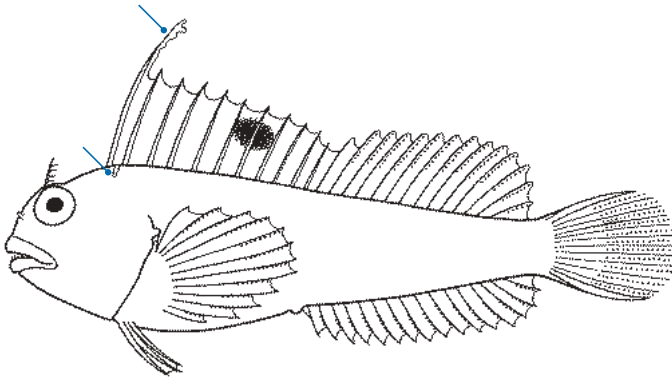
Characteristics

Distinctive among northern European fishes because it has two-rayed pelvic fins, a body covered with rough-edged scales, and three dorsal fins, the first two spiny and the third soft. The head is broad almost triangular; anal rays number 26-27; second dorsal rays 16-18; third dorsal rays 12-14.

Family: Blennies *Blenniidae*

The blennies are a very large family of mainly small fishes found worldwide in temperate and tropical seas, with a few species living in fresh water. Many live in intertidal pools or under rocks on the shore; others are found in the shallow sea. Their life style is low-key, relying on obliterative colouring among algae and rocks; many breed in crevices in such situations. Their abundance, and the numerous species recognised illustrate their importance as members of the shallow water community. Blennies all have scaleless skins, numerous close-packed small teeth in the jaws, and two long rays in each pelvic fin, placed well forward on the throat. Many species have small lappets of skin on the head. Worldwide, there are 56 genera with 360 species. About 20 species are recognized in European seas, only six of which occur around Britain and Ireland.

Butterfly Blenny *Blennius ocellaris*



Colour

Greenish-brown, or warm brown with 5-7 darker bars running across back and sides; a conspicuous eye-spot on the dorsal fin, black with a pale blue to white encircling ring.

Size

Attains a maximum length of 20 cm. British Rod-caught Record: 32 g (1990, Portland Harbour).

Ecology

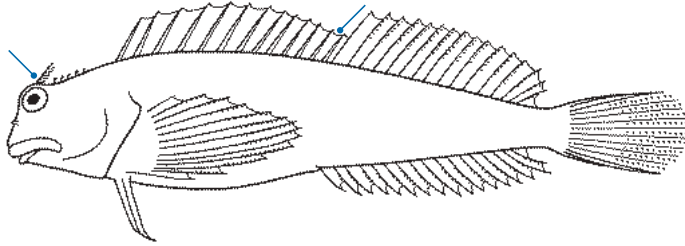
The Butterfly Blenny is the only blenny to be found at any depth in European seas. It inhabits depths from 10-100 m, usually on shell bottoms or where the encrusting alga *Lithothamnion* is abundant. It also lives on

sandy bottoms where it seeks shelter in empty mollusc shells and human debris such as broken pottery, crockery, cans and hollow marrow bones. It breeds in spring and summer, the eggs being deposited in such hollow receptacles, or in rocky crevices, and are guarded by the male. The newly hatched young are planktonic for a short while. The Butterfly Blenny feeds on small crustaceans, worms, and small fishes, but its diet has not been closely studied.

Characteristics

A rather stout-bodied blenny with a large eye. A flattened, bushy tentacle on the head above each eye; small fleshy flaps at the base of the first dorsal fin ray, and the upper edge of the pectoral fin. Dorsal fin rays very high, especially the first part; this fin deeply notched.

Montagu's Blenny *Coryphoblennius galerita*



Characteristics

A small blenny with a characteristic fleshy flap across the forehead between the eyes; the free edge is fringed and a line of small fine tentacles runs along the centre line of the nape. A conspicuous notch between the unbranched and branched rays of the dorsal fin.

Colour

Greeny-brown in background colour with darker markings and small blue-white spots on head and body. Adult males are strongly marked with these spots and have a yellow fringe to the crest on the head; the lip at the mouth corner is orange.

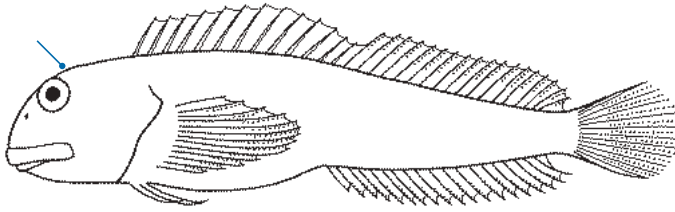
Size

Grows to a length of 8.5 cm.

Ecology

On the Atlantic coasts of Europe this blenny is found on rocky shores in pools at around mid-tide level. It is particularly common in pools with little cover other than the coralline alga, Corallina, and the encrusting species, Lithothamnion. In the Mediterranean it is found in extremely shallow water, again close to rock faces. It feeds mainly on the encrusting barnacles which live on nearby rocks, and bites off their appendages when they are extruded from their shell; it also eats small copepod crustaceans. It lays its eggs in crevices in the rock, usually on the ceiling, and they are guarded by the male. It spawns in July in British and Irish waters.

Shanny *Lipophrys pholis*



Characteristics

The only European blenny to lack a tentacle on top of the head; the forehead is smoothly rounded except that in large fish a fleshy ridge develops in the mid-line. Dorsal fin uniform in height with unbranched and branched rays separated by a shallow notch.

Colour

Variable with habitat, usually dull brown, dark green, or greeny-grey, blotched indistinctly with darker colours; a dark spot between the first and second dorsal fin rays. Breeding males often dark brown with white upper lip.

Size

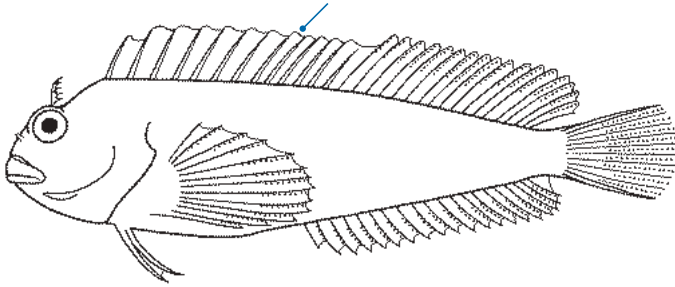
Size Attains a length of 16 cm.
British Rod-caught Record:
112 g (1995, Cornwall).

Ecology

An extremely common shore fish which is very adaptable. It is most abundant on rocky coasts, although it will colonize sandy and muddy pools provided they contain stones, or wood or metal pilings which allow green algae to grow. On rocky shores it can be found in pools or under stones from high-water neap-tide level down to extreme low water; it is most abundant from mid-tide level down. It occurs down to a depth of 30 m. Can be found on the shore under weed when the tide is out. It feeds on a wide range

of smaller animals, most notably barnacles, molluscs, small crabs and other crustaceans. The young fish specialise in nipping off the limbs of barnacles when they are protruded in feeding movements, but also eat small amphipods and copepods. It spawns throughout spring and summer, and the eggs are laid on the underside of a large stone or the roof of a crevice. They are guarded and aerated (by fanning with the pectoral fins) by the male. Exceptionally, the Shanny may live for as long as 10 years.

Tompot Blenny *Parablennius gattorugine*



Characteristics

A stoutly-built blenny with a uniformly high dorsal fin, the anterior rays of which are stiff and spiny, and separated from the soft-rayed dorsal by a shallow notch. Dorsal spines 13-14. Pectoral fin rays 14. A bushy branched tentacle above each eye. No canine teeth in the upper jaw.

Colour

Yellowish-brown to medium brown with seven or more dark brown bars running across the sides. The eye is reddish-brown. May have an eye spot between the third and fifth dorsal spines.

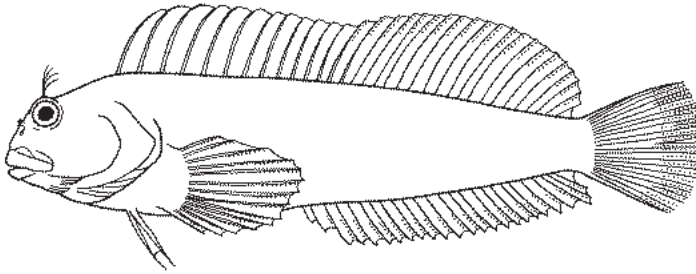
Size

Attains a length of 30 cm; rarely exceeds 20 cm. British Rod-caught Record: 156 g (1989, Cornwall).

Ecology

The Tompot Blenny is a common species in the immediate sub-tidal region of European seas. Small specimens are found occasionally in the lowest shore pools on rocky shores amongst kelp, but the adults are most common from 1-12 m below low-tide level, but may go deeper. This fish favours rocky areas where it conceals itself on ledges or between stones. It spawns from mid-March to April, the eggs being deposited in a crevice and guarded by the male. Its food is composed principally of small crustaceans, but its diet has not been fully studied. An inquisitive fish that may approach divers. It is occasionally caught in crab pots on the south and west coasts of Britain and Ireland.

Variable Blenny *Parablennius pilicornis*



Characteristics

A medium sized blenny, the paired tentacles above the eyes consisting of a short stalk with a crown of 4-6 fine radiating thread-like filaments. Slight dip between spiny and soft dorsal fin. Dorsal fin with 11-12 spines. Pectoral fin rays 14. Canine teeth in both jaws.

Colour

Very variable; often blotched all over with two dark bands on the underside of the head; can be uniform yellow or orange; or with broad dark band from forehead through the eye to the tail on each side and a dark stripe along the back. Most have a honeycomb pattern of marking on the cheeks which may extend on to the body.

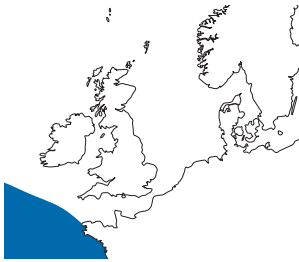
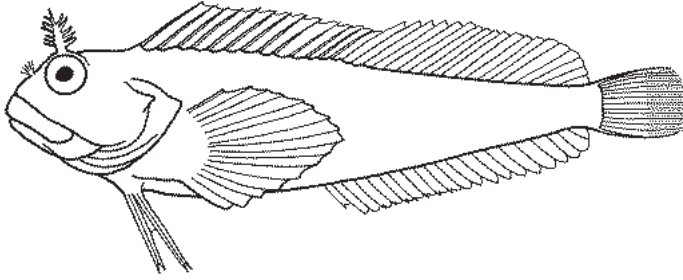
Size

Attains a length of 13 cm.

Ecology

A benthic species which can be found from rocky shores down to 25 m. Often occurring on steep wall in surf-exposed sites, but also found of flat stony bottom areas, especially when there is a cover of sponges and other sessile animals. Known from southern Biscay to southern Africa and the western Mediterranean, also south west Atlantic and western Indian Ocean; specimens have been photographed twice in the Plymouth area. An inquisitive fish that feeds on invertebrates including polychaetes. The eggs are adhesive and adults are thought to guard them in a crevice.

Red Tompot Blenny *Parablennius ruber*



Characteristics

Paired tentacles above eyes, wider and in a single plane, not as bushy as in the Tompot Blenny. Tentacle on nostril. Lateral line branched posteriorly. Dorsal spines 13-14. Pectoral fin rays 14. No canine teeth in upper jaw.

Colour

Colour Bright red to reddish with brown mottling, and several vertical dark bars along sides. Dorsal, pectoral and tail fins with thin white stripes across them. Blue eye spot on first and second spines of dorsal. Two white eye rays, one extending on to the lip to give a white patch.

Size

Can reach a length of 14 cm.

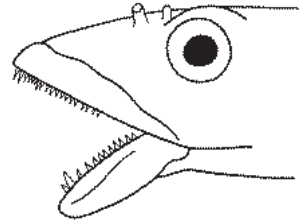
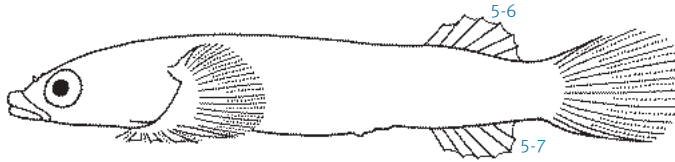
Ecology

Occurs in the eastern Atlantic (Atlantic islands, Portugal and Brittany) and has recently been found around the west of Britain and Ireland – there is some uncertainty concerning its status due to previous confusion with the Tompot Blenny and it may be more widespread in northern Europe. Inhabits mainly rocky shores with lots of water movement at depths of 10-40 m. Usually found singly or in small groups. Oviparous; eggs are demersal and adhesive and laid in crevices.

Family: Clingfishes *Gobiesocidae*

A group of small fishes, mostly marine, found in tropical and temperate seas and some tropical freshwaters, and worldwide in distribution. They have a powerful sucking disc on the underside, formed partly from the pelvic fins, by means of which they cling to the underside of rocks. They are rather flattened fishes with almost triangular heads, and upward directed eyes; their bodies are scaleless, the fins generally small and without spines. Members of this family (*Gobiesocidae*) are often hard to find and are frequently overlooked. Worldwide, there are 36 genera with about 140 species, only four of which are found in northern European waters.

Small-headed Clingfish *Apletodon dentatus*



Clingfish teeth



Characteristics

A small clingfish with a short head, a quarter of the length of the body. Dorsal and anal fins short-based (dorsal 5-6 rays; anal 5-7 rays), neither joined to the tail fin. Teeth in jaws small in front, with 1-3 larger curved canines each side.

Colour

Variable, usually reddish-brown on the back with lighter patches, sometimes greenish, can have white spots on the back. Males have a dark spot on the dorsal and anal fins, and a purple patch on the throat, females may have a pale throat patch.

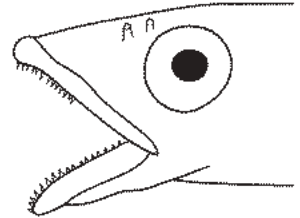
Size

Attains 4 cm in length.

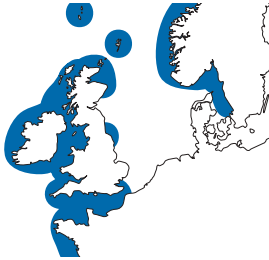
Ecology

This clingfish lives on the lower shore and in inshore waters down to a depth of 25 m. It is little recorded, but has been found widely and at times comparatively commonly; it is probably much more common than present records suggest. It breeds in spring and early summer, the eggs being laid in a hollow within the holdfast of the kelp and other marine algae. After a short planktonic stage following hatching, the young fish of 15 mm can be found among algae in autumn. Its biology is largely unknown.

Two-spotted Clingfish *Diplecogaster bimaculata*



Clingfish teeth



Characteristics

A small clingfish with a fairly small head although it is more than one quarter of the body length. Dorsal and anal fins short-based (dorsal, 5-7 rays; anal, 4-6 rays), neither joined to the tail fin. Teeth in jaws uniformly small, not enlarged at sides.

Colour

Very variable, but often bright red or reddish with blue or brown spots, yellowish ventrally. Males have a purple spot circled with yellow on each side behind the pectoral fin.

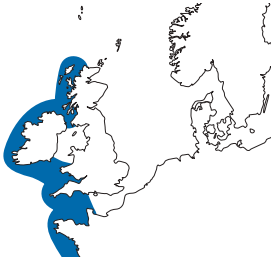
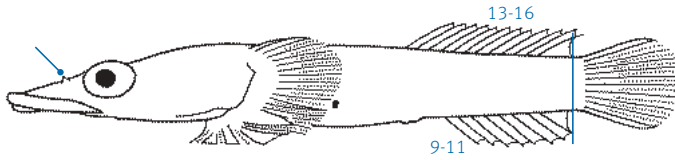
Size

Attains 6 cm in length, but most are around 4 cm.

Ecology

A moderately common species which lives on the lower shore and in inshore waters to a depth of 55 m. It is most abundant on stony grounds, but is also found on soft ground often clinging to a mollusc shell. It spawns in spring and early summer, the eggs being laid on the inside of a shell or under stones, and are guarded by an adult. The eggs are golden yellow and 1.6 mm in diameter. The larvae and postlarvae are pelagic during summer. The food of the adult consists of small crustaceans.

Connemara Clingfish *Lepadogaster candolii*



Characteristics

A moderately large species with a long, rather flattened snout. A very small skin flap at the edge of the anterior nostril. Dorsal and anal fins long-based (dorsal, 13-16 rays; anal, 9-11 rays), but neither is joined to the tail fin.

Colour

Males are usually reddish on the back with deeper toned spots on the head. Females are mostly yellowish-green.

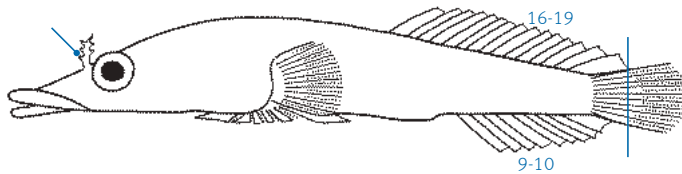
Size

Attains a length of 7.5 cm.

Ecology

This clingfish is usually found on rocky shores at extreme low-water mark and in pools, as well as below tide level amongst the holdfasts of kelp and thongweed. It is usually found clinging to the underside of stones or amongst the algae holdfasts. It lays its eggs on the underside of stones; they are guarded by one of the parents. The breeding season extends from April to July, and the larvae and postlarvae live for a short while in the plankton. It is rarely found and little is known of its biology.

Shore Clingfish *Lepadogaster lepadogaster*



Characteristics

A moderately large species with a long snout and 'duck-billed' appearance, and a fringed flap at the edge of the front nostril. Dorsal and anal fins long-based (dorsal, 16-19 rays; anal, 9-11 rays) and joined to the tail fin.

Colour

Background colour varies from pink through rose to deep red, with yellow-rimmed blue eyespots on the top of the head.

Size

Attains a length of 6.5 cm.

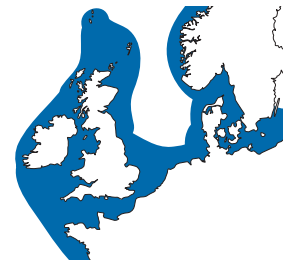
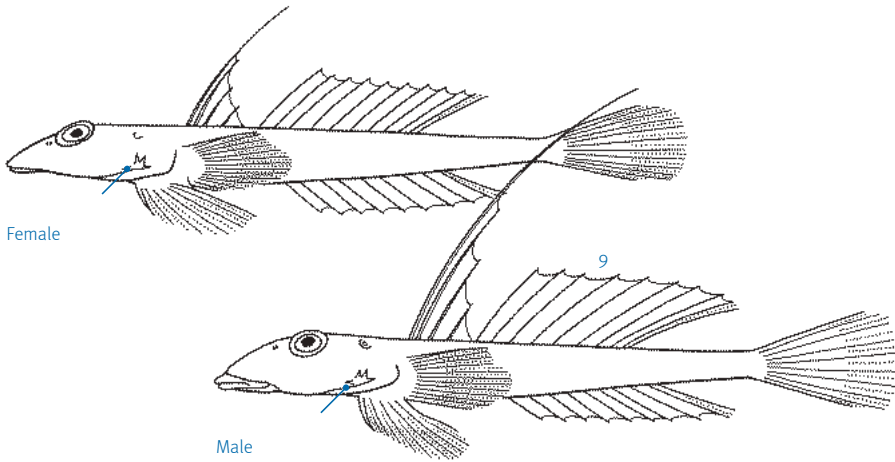
Ecology

This is the most frequently encountered of the clingfishes in intertidal habitats in northern European waters. In places it is locally abundant on boulder shores at mid-tide level and below, especially where the shore is partly sheltered. It is always found clinging to the underside of the stones, or amongst kelp growing on rocks low down the shore. It breeds in summer, the golden eggs being laid in clusters on the underside of a boulder and guarded by a parent. The larvae and later fry are planktonic for a short period. This is the Atlantic subspecies *Lepadogaster l. purpurea*, Mediterranean stock is recognized as a distinct subspecies *Lepadogaster l. lepadogaster*.

Family: Dragonets *Callionymidae*

The dragonets are a family of small marine fishes found mostly in shallow inshore waters, although a few are found on the lower continental shelf. All are rather flattened from above, their heads being almost triangular, with broad expanded pelvic fins, and a restricted gill opening on the top of the head. This is associated with the life style of many of them, as they lie buried in the sea bed with just the top of the head and back exposed. Dragonet males are brilliantly coloured, especially in the breeding season, and spawning is accompanied with quite elaborate courtship displays. Dragonets are widely distributed in tropical and warm temperate seas, but are fewer in cool temperate waters. Worldwide, there are 10 genera and some 182 species, with other species yet to be described. Six species occur in European seas, but only three live around Britain and Ireland.

Common Dragonet *Callionymus lyra*



Characteristics

The largest, most abundant dragonet. The body is flattened above and below; head large, the snout long. Four sharp spines on the preoperculum, the first one pointing forwards, the other three pointing backwards or upwards. Second dorsal fin with 8-10 rays. Males have

enormously long rays in the first dorsal fin and a long tail fin.

Colour

Females and immature males pale brown above with a series of six brown blotches on the sides and three conspicuous saddles across the back. The males are highly coloured, with blue and yellow stripes on the 3 dorsal fins. The head and body are yellowish to brown with numerous blue stripes and blotches, the tail fin membrane is yellow with greeny-blue stripes.

Size

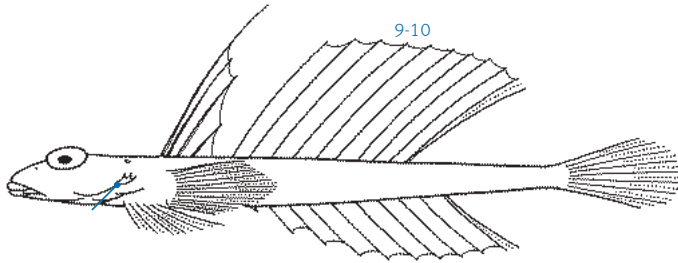
Males attain 30 cm, females 20 cm in length. British Rod-caught

Record: 180 g (1992, Devon).

Ecology

The Common Dragonet is extremely abundant in certain areas, particularly over sandy or muddy bottoms and in depths of 20-100 m, extending downwards as far as 200 m. Its food consists of polychaete worms, small crustaceans and molluscs. Spawning takes place from February to March, continuing on the west coast of Ireland into June, and is preceded by an elaborate display of its colourful fins by the male. The eggs and postlarvae are pelagic. Males live for up to five years, females a little longer.

Spotted Dragonet *Callionymus maculatus*



Characteristics

A small dragonet with a relatively short snout. Its body is compressed anteriorly, rounded in cross-section at the tail. The preopercular bone has four sharp points, the lower being rather small and pointing forwards, the other three all pointing upwards. The second dorsal fin with 9 (rarely 10) rays.

Colour

Females and young males are brownish-yellow on the back with two rows of conspicuous brown spots on the sides and scattered smaller blue spots. Four dark brown saddles across the back are distinct but with irregular margins, dorsal fins with two horizontal rows of dark blotches. Males are similarly coloured but have a very high dorsal fin and a longer tail fin; the former has four rows of conspicuous dark-centred spots interspersed with pale, blue-white spots.

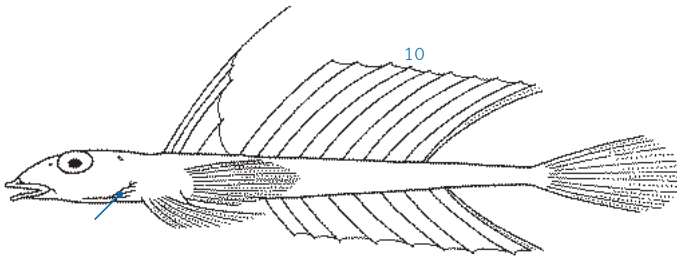
Size

Males attain 14 cm, females 11 cm in length.

Ecology

A deeper water species than the Common Dragonet, it is most abundant from 70-300 m, usually on sandy grounds. It is an inhabitant of the offshore banks rather than close inshore. It breeds from April to June; the eggs and larvae are pelagic, but are found over deeper water than those of Common Dragonet. Its biology is virtually unknown.

Reticulated Dragonet *Callionymus reticulatus*



Characteristics

Similar to other members of the family, but has only three spines on the preoperculum, all pointing back and upwards; no spine at the base. Second dorsal fin with 10 rays.

Colour

Females and young males are orange-brown on the back, creamy-white below. Males are the same colour but have dark-centred rounded spots and dark-margined, blue-white wavy lines and spots on the dorsal fins in vertical or oblique lines. Both sexes have pale blue spots on the sides and four sharply defined dark-edged red-brown saddles across the back.

Size

Males grow to ca 10 cm in length, females to 8 cm.

Ecology

Locally distributed and relatively uncommon in northern waters, and living on clean sandy bottoms from the low shore to ca 40 m. It is believed to spawn between April and September in the English Channel. The postlarvae occur there in the plankton from May to September. Its biology is virtually unknown, but in the North Sea considerable numbers are eaten by the Tub Gurnard.

Family: Gobies *Gobiidae*

The gobies represent one of the most successful families of bony fishes in terms of number of species known. Worldwide there are some 210 genera and over 1,950 species. They are abundant in temperate and tropical seas in inshore waters, and many species are found in estuarine conditions and in fresh water. They are typically small fishes (the largest European goby grows to a length of 27 cm), rather elongate, but with a broad head and cylindrical front part of the body; the cheeks and lips are swollen and the eyes large and close together. They have two dorsal fins (the first with six spines in most species), a single anal fin, and a rounded, large tail fin; the pectoral fins are large, and the pelvic fins fused to form a broad palm-like disc which has a weak adhesive power and enables the fish to cling to the substrata in still or slow-moving water. They have scales with toothed edges on the body. They do not possess a lateral line on the body; instead they have sensory papillae in characteristic rows on the head. Gobies are difficult to identify, especially as there are 20 species known from northern European waters. Their identification is simplified by knowledge of their habitat and life style, and for convenience in the key below they are divided into several groups under habitat headings and size attained.

Large gobies – 12 cm or more in length:

living on rocky shores

Gobius cobitis, *Gobius paganellus*

living in inshore waters

– on mud or sand

Gobius niger

– on rocks

Gobius cruentatus, *Thorogobius ephippiatus*

Medium gobies – 7-11 cm in length:

living inshore, on stony shores

Gobius couchi

living offshore, below 15 m

Gobius gasteveni, *Buenia jeffreysii*,
Lesuerigobius friesii

Small gobies – less than 8 cm in length:

pelagic

Aphia minuta, *Crystallogobius linearis*

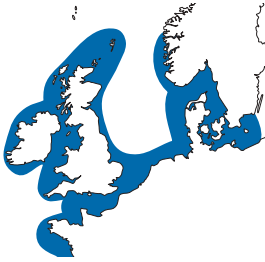
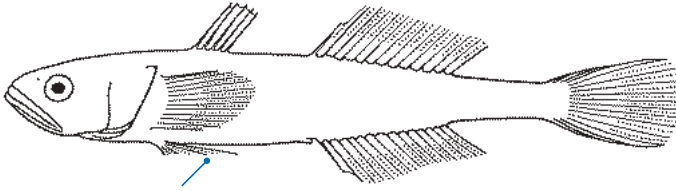
living on or close to shore

Gobiusculus flavescens, *Pomatoschistus microps*,
Pomatoschistus pictus, *Pomatoschistus minutus*
Pomatoschistus lozanoi, *Pomatoschistus*
marmoratus

living offshore in ca 30 m

Pomatoschistus norvegicus, *Lebetus guilleti*,
Lebetus scorpioides

Transparent Goby *Aphia minuta*



Characteristics

Slender-bodied, and compressed from side to side; eyes lateral. First dorsal fin with five spines. Pelvic fin disc well developed with anterior membrane; pectoral fins with no free rays at top. Mouth large and oblique, males possess large canines. Scales large, 24-25 in row on side, but very fragile and easily lost. Body completely transparent except for pigmented eyes, silvery swim-bladder and gut. Males have larger, higher fins and larger teeth than females.

Colour

Colourless; minute speckles of pigment on head, dorsal and anal fins.

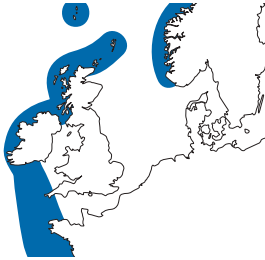
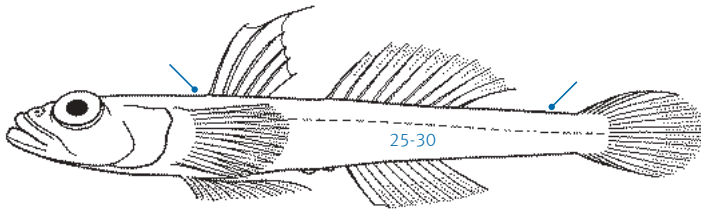
Size

Males grow to a length of 6 cm; females to 5 cm.

Ecology

This little fish is pelagic in inshore waters from the surface down to a depth of ca 60 m. It lives in huge schools, but on occasions may be found in groups of 30-50. It occurs over a variety of sea beds, sand, mud, and also in estuaries. Its food consists of small planktonic organisms, especially the larvae of crustaceans and molluscs. Despite its normally near-surface life style, it breeds on the sea bed from May to August when each female lays up to 2,000 eggs in an empty bivalve shell. Adults die soon after spawning, at an age of one year plus. The Transparent Goby is common in most of northern Europe's seas, but owing to its small size and pelagic life is not often captured.

Jeffreys's Goby *Buenia jeffreysii*



Characteristics

A rather slender-bodied goby with a narrow caudal peduncle, its length (last dorsal ray to tail fin rays) almost equal to head length. Pelvic fin has an anterior membrane with no lateral lobes; upper pectoral fin rays not free of membrane or much branched. Scales large, 25-30 in series from pectoral fin base to tail fin origin, none on nape. Eyes large and close, almost touching. Snout rather pointed anterior nostril with a raised rim but no lobe. Cheeks without vertical rows of sensory papillae. Second spine of dorsal fin longest and with its tip free of the membrane.

Colour

Variable, pale brownish-grey or reddish with coarse reticulation flecked with rusty brown dots, paler saddles across back opposite dusky spots on sides. Dorsal fins with dusky spots. Membrane between first and second spines of dorsal brilliant ice blue.

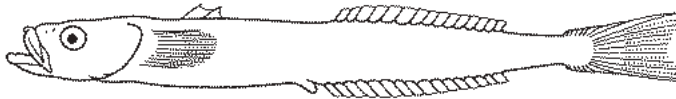
Size

Attains at least 6 cm in length.

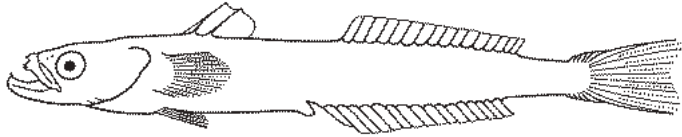
Ecology

A little-known offshore goby which has been captured in isolated areas on the Atlantic coasts of northern Europe in 10-330 m - on sand, mud, shell-gravel, and gravelly bottoms where it can find shells and stones to shelter under. It breeds from March to August. The eggs have been found in mollusc shells and are guarded by the male.

Crystal Goby *Crystallogobius linearis*



Female



Male



Characteristics

Body slender and compressed; eyes lateral; pectoral fin normal with no free tips to the upper rays; pelvic fin a deep funnel in males, rudimentary or absent in females. Mouth strongly oblique; male with larger jaws and canines in lower jaw, female with smaller mouth and teeth. Scales absent. Males have two rays in the first dorsal fin; females usually lack a first dorsal fin.

Colour

Totally transparent except for the eye and a few dark points on chin, and the bases of the fins.

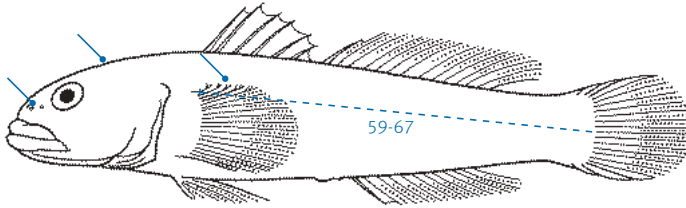
Size

Males attain 5 cm in length; females grow to 4 cm.

Ecology

A surface-living fish in offshore waters over depths of between 20-80 m, exceptionally as shallow as 5 m and as deep as 400 m. On the Atlantic coasts of northern Europe it is seasonally extremely abundant; literally thousands can be taken in a single short haul of a fine-meshed net. It feeds on plankton. It breeds from May to August on the sea bed, the eggs being laid in the empty tubes of large worms such as *Chaetopterus* in ca 30 m. The males guard the developing eggs, but the larvae live in the plankton soon after hatching. Its total life span only just exceeds one year.

Giant Goby *Gobius cobitis*



Characteristics

A large goby with a large head and deep caudal peduncle. Eyes relatively small and well spaced. The space between the end of the dorsal fin and beginning of tail fin about two-thirds the head length. Pelvic fin with distinct lobes at the edges of the membrane; pectoral fin with free upper rays; scales between pectoral fin base and tail fin 59-67; nape scaly but scales do not extend to eye edge. Anterior nostril with several finger-like processes. First dorsal fin rounded.

Colour

Brownish-olive, or greyish, with 'pepper and salt' speckling and rounded blotches on sides; ventrally cream; narrow light edges to the dorsal, anal, and tail fins, which are covered in rows of brown spots.

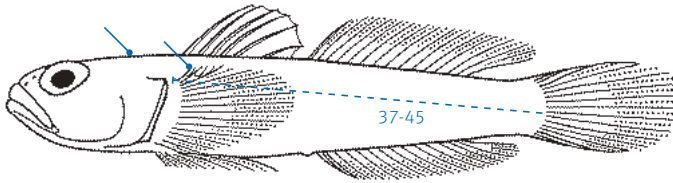
Size

Grows to a length of 27 cm. British Rod-caught Record: 262 g (1994, Guernsey).

Ecology

This is the largest goby in European seas, but its distribution is very restricted in northern seas. Around the Channel it is found in rocky shore pools from extreme high-water level down to mid-tide level, often in pools where salinity is low owing to freshwater run-off. It prefers pools with bare rock bottoms, or those where loose rocks are exposed on the bottom and which contain green filamentous algae. It feeds extensively on these algae, but also eats crustaceans, particularly gammarids and shore crabs.

Couch's Goby *Gobius couchi*



Characteristics

A moderately elongate goby with a deep caudal peduncle, the length of which is about two-thirds of the head; head large, eyes prominent, cheeks and lips protuberant. Scales large, 35-45 in line from pectoral fin base to tail; scales on nape and on upper edge of gill cover but not on cheek. Uppermost pectoral rays free at tips for up to one-quarter of their length; pelvic fins with well-developed anterior membrane, but not lobed at sides. Anterior nostril with a triangular flap of skin.

Colour

Fawn-brown or grey with coarse reticulations on the back; paler on sides with yellow or gold flecks and 7-9 dark brown blotches on the sides; a dark brown or black comma spot at the upper rays of the pectoral fin near the base, with a pale rear border.

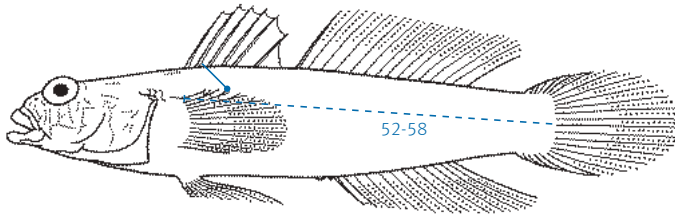
Size

Probably attains a length of ca 8 cm.

Ecology

A recently described species (1974) which is so far known only from a few localities, all in sheltered areas, including Helford, Cornwall, and Lough Ine, Co. Cork. At Helford it lives in small pools of water beneath flat stones or among green and red seaweeds growing on pebbles on the low shore at extreme low-tide level. It is presumed to live in deeper water below low-water mark also. Its food is composed of polychaete worms, small crustaceans, molluscs, and algae. This fish is estimated to live for up to six years, but much of its life history is, as yet, unknown.

Red-mouthed Goby *Gobius cruentatus*



Characteristics

A stout-bodied goby with a deep caudal peduncle, the length of which (last dorsal ray to the origin of the tail fin) is about two-thirds of the head length. Anterior membrane of pelvic fin well developed but without lobes at the sides, rear margin of the pelvic disc slightly concave; upper rays of pectoral fin free. Scales 52-58 in series between pectoral fin base and tail fin; scales present on nape, upper part of gill cover, and rear part of cheek. Anterior nostril with a simple tentacle.

Colour

Warm brown, almost reddish with darker blotches on sides; lips and cheeks with vivid red markings. Lines of black papillae on head. Spines and rays of fins banded black and white.

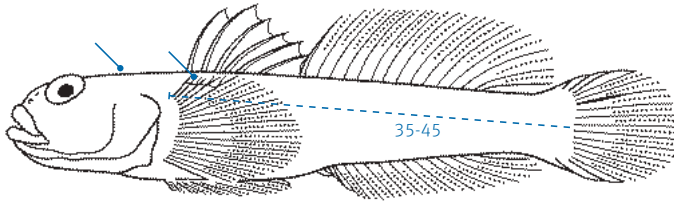
Size

Attains 18 cm in total length.

Ecology

An exceedingly rare goby in northern waters which was first discovered in 1968 among museum specimens collected in the 1930s. A third specimen was collected in 1960, and another, probably this species, was seen more recently. All were caught in southwest Ireland, in shallow inshore water. In the Mediterranean, this fish lives on stones and sandy ground amongst eel-grass. All reports, photographs or captures of further Atlantic specimens would be of the greatest interest.

Steven's Goby *Gobius gasteveni*



Characteristics

Rather elongate, but caudal peduncle compressed and deep, shorter (last dorsal fin ray base to tail fin ray base) than two-thirds of head length. Scales large, 37-45 in a row between the base of the pectoral fin and the tail; scales extend onto nape and a few on the upper edge of the gill cover; cheeks are naked. The two top rays in the pectoral fin divided and free at their tips for about a quarter of their length; pelvic fin disc with an anterior margin, but with no lateral lobes, posterior edge rounded or concave. Anterior nostril with a thin, finger-like lobe.

Colour

Pale grey above, white below with a series of lateral reddish-brown blotches, white spots on cheek and gill cover, on the latter set in orange. Brown stripe from snout through eye to above the pectoral base. A conspicuous dark, triangular spot, which is longer than it is deep, on the pectoral fin at the bases of the upper rays.

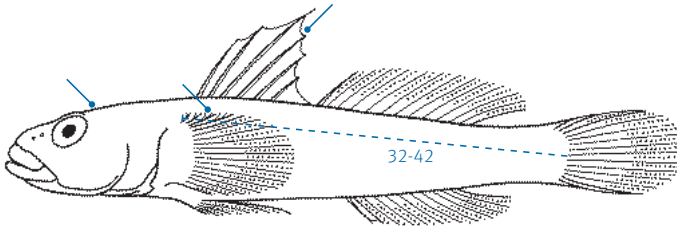
Size

Attains 12 cm in length, but rarely exceeds 10 cm.

Ecology

An offshore goby which has been found in the English Channel at about 25-74 m. It is known only from the Channel and off Madeira, but may be expected to occur both between these localities in suitable depths, and possibly in the Mediterranean also. It has been captured on bottoms described as muddy sand, and shell and small stones. It was formerly confused with the Mediterranean species *Gobius auratus*.

Black Goby *Gobius niger*



Characteristics

A stout-bodied goby with the tail in front of the fin deep and the caudal peduncle short (less than two-thirds head length). Scales large, 32-42 in a series between pectoral fin and tail. Anterior membrane of pelvic fin well developed but with no lobes on either side; upper pectoral fin with short, free rays. Nape scaly. Anterior nostril with a simple flap on the rim. First dorsal fin rays elongate in adults, particularly so in males.

Colour

Variable with habitat and maturity; usually medium to dark brown with darker blotches on back and sides. Underside of head dark. Black blotch on front of first, and often the second, dorsal fin.

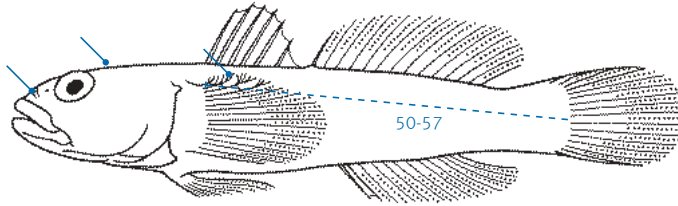
Size

Size Attains a maximum length of 18 cm. British Rod-caught Record: 63 g (1980, Inveraray).

Ecology

Widely distributed, living on muddy and sandy bottoms, especially in eel-grass beds from 2-70 m. The Black Goby is particularly common in estuaries and low salinity areas such as the Baltic Sea and coastal lagoons. It feeds primarily on small crustaceans, including small shore crabs, small molluscs, worms, and some small fishes. It spawns from May to August, the eggs being laid inside a cavity, such as under loose rocks, roofing tiles, tyres or the shells of the larger molluscs. As with other gobies the eggs are elongate and laid in a dense patch in a single layer; they are guarded by the male.

Rock Goby *Gobius paganellus*



Characteristics

Moderately large with body deep in front of the tail fin and caudal peduncle (end of second dorsal to tail fin distance) about half head length. Anterior membrane of pelvic fin well developed, no lateral lobes or at most weak lobes; pectoral fin with the upper rays free, much divided, and reaching back nearly to the level of the dorsal origin. Scales between pectoral fin base and tail fin number 50-57. Nape scaly, scales extending forward to the edge of the eyes. Anterior nostril with five or six finger-like branches.

Colour

Brown with darker mottling and lateral blotches; upper part of first dorsal fin with pale edge. Adult males deep purple-brown, first dorsal fin with conspicuous orange band.

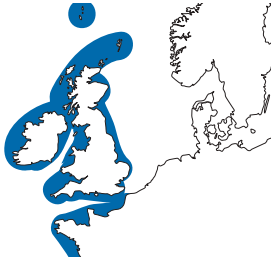
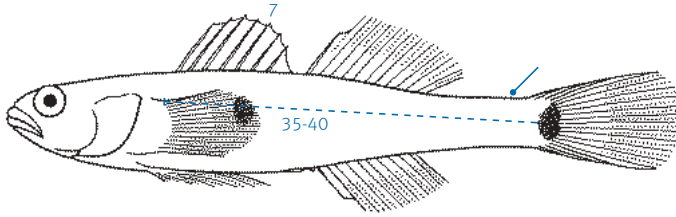
Size

Grows to a length of 12 cm.
British Rod-caught Record:
35 g (1993, Caernarfon).

Ecology

Confined to rocky habitats and best known on rocky shores, where it lives in pools or under stones with dense algal cover, mainly from mid-tide level and below, and continuing downwards to 15 m. Like other gobies it spawns in crevices or under loose rocks, the eggs being attached to the roof in a close-packed, single layer. Breeding takes place from April to June in northern European waters. It feeds on a wide range of smaller animals, particularly small crustaceans, young fishes, and a little algae. It may live for up to 10 years.

Two-spotted Goby *Gobiusculus flavescens*



Characteristics

A rather slender-bodied goby, compressed from side to side; eyes lateral and widely spaced. Pelvic fin with an anterior membrane, pectoral fins without branched upper rays. The caudal peduncle, between the end of the dorsal rays and the tail fin, is long and slender, almost as long as the head. Seven rays in the first dorsal fin. Scales number 35-40 in lateral series.

Colour

Colourful, body reddish-brown with darker reticulations and a series of pale saddles along the nape and back, the sides with alternate black and pale blue marks. A highly characteristic large black spot with a pale edge at the tail fin base; males have a similar spot on the side, beneath the first dorsal fin.

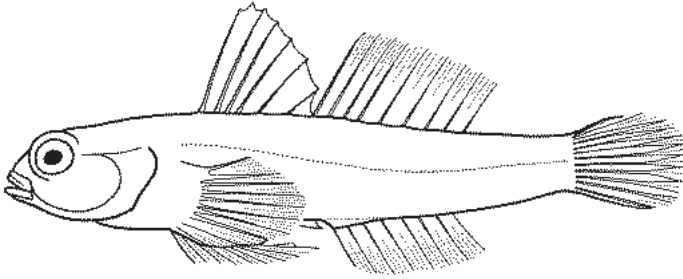
Size

Attains a length of 6 cm.

Ecology

An active, inshore goby which swims at an angle and lives in small schools adjacent to algae from near the surface down to depths of 15 m. It is relatively common in rock pools on the shore where larger brown algae grow. It also lives amongst eel-grass. It is semi-pelagic in its life style, except when breeding from May to July, when males are guarding the eggs laid in the hollow holdfasts of the brown algae. It feeds on planktonic organisms, especially crustacean and mollusc larvae and copepods.

Guillet's Goby *Lebetus guilleti*



Characteristics

Closely similar to Diminutive Goby, but distinguished by having 7-9 full-length rays in the second dorsal fin and 5-6 rays in the anal fin. It also has 25-26 vertebrae.

Colour

Fawn with two or three broad brown bands around the body. The adult male colouring has not yet been described.

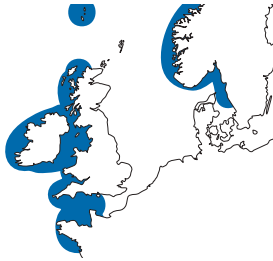
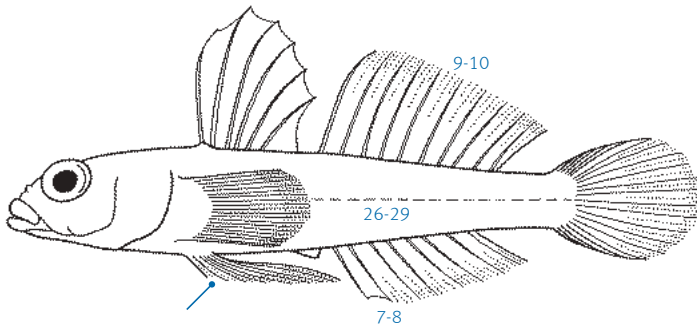
Size

Possibly up to 30 mm, the maximum observed size is 24 mm. This is probably the smallest species of fish in European seas.

Ecology

The biology of this species is virtually unknown. It was described as long ago as 1913 but it is only since 1971 when two forms of postlarvae of *Lebetus* were recognized in the English Channel that it has been accepted as an inhabitant of the European coastline. There is one record from Ireland. It is believed to live in shallower water than its relative, probably from 2-30 m, mainly on the Lithothamnion alga-encrusted stones and shell ground of well-lit water. Postlarvae have been recorded from June to September, which must reflect the breeding season closely.

Diminutive Goby *Lebetus scorpioides*



Characteristics

A very small but relatively stout-bodied goby which is set apart by the pelvic fin disc lacking an anterior margin, while the posterior end is concave. The dorsal fins are high, but short-based, second dorsal fin with 9-10 full length rays; anal fin with 7-8 full length rays. Scales large, 26-29 in a lateral series from pectoral fin base to tail fin base; no scales on nape. It has 27-29 vertebrae.

Colour

Males yellowish to dusky-grey, underside reddish-orange; sides with vertical bars and a sharp-edged pale band across tail. First dorsal fin yellowish with a white edge, second dorsal with a jet black edge and oblique yellow and white bands. Female pale brown with deep brown cross-bars, the first dorsal fin with oblique yellow to orange-red bands with a dark spot at the rear end; the second dorsal fin has a narrow dark edge and thin oblique orange-red bands.

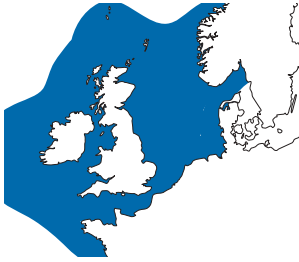
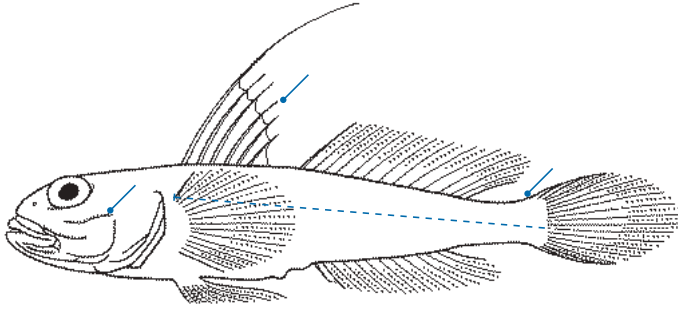
Size

Attains a length of 3.9 cm.

Ecology

This minute goby is widely distributed in the eastern North Atlantic but in isolated areas. Recorded at several places on the west coast of Ireland. This is probably due more to the difficulty of catching so tiny a fish in the depths it inhabits than to true scarcity of the species. It lives in depths of ca 30-375 m on coarse grounds, mainly sand and gravel, sometimes on muddy sand, and often where calcareous algae encrust stones and shells. It spawns between February and September (in the Channel, postlarvae are captured in the plankton between February and October). Its food consists of small crustaceans and worms.

Fries's Goby *Lesuerigobius friesii*



Characteristics

A stout-bodied goby with a moderately slender but short caudal peduncle. The first dorsal fin rays are elongate, the tail fin is pointed; no free pectoral fin rays; pelvic fins form a disc with an anterior membrane but without lateral lobes. Scales large, 24-29 in a series from the pectoral fin base to the tail fin; nape covered with scales. Papillae on head large and conspicuous.

Colour

Pale fawn or grey with conspicuous golden yellow blotches on head, body, dorsal, and tail fins.

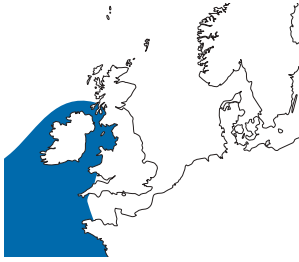
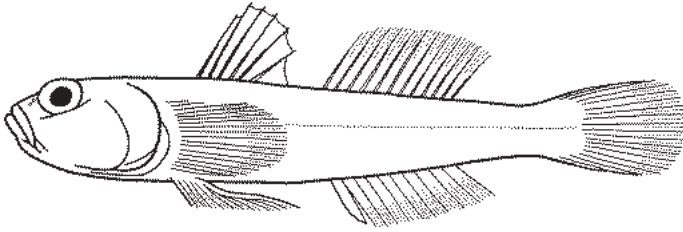
Size

Grows to a length of 13 cm.

Ecology

A bottom-living goby found in moderately deep water of 20-350 m, although possibly most abundant between 40-150 m. Burrows in soft muddy sediment and sits in the entrance to the burrow. In places this goby has been observed to live in association with the Norway Lobster, *Nephrops norvegicus*, in whose burrows the goby conceals itself. As the fish has been captured elsewhere where the crustacean is common, it is probable that the association is widespread. The goby appears to act as a watchdog for the crustacean, but the precise relationship and much of the fish's biology, is not known.

Lozano's Goby *Pomatoschistus lozanoi*



Characteristics

Pectoral fins with 18-21 rays; 30-33 vertebrae. Anterior membrane of pelvic disc with finger-like rear edge. 57-65 scales along the lateral line, and scales over the head and nape.

Colour

Body with dark red speckling. Male has dark longitudinal bands and a small black spot in the first dorsal fin.

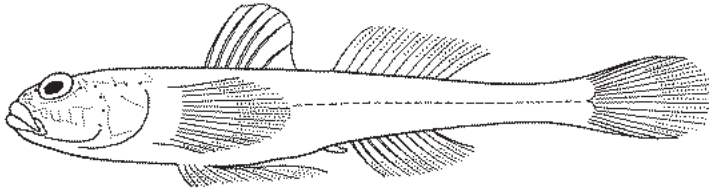
Size

Up to 8 cm in length.

Ecology

Found in brackish and marine waters in the eastern Atlantic at depths of 0-8 m. Feeds on bottom invertebrates including crustaceans and nematodes. Eggs are laid under empty bivalve shells; sexually mature after one year and life span only two years. Both morphologically and in depth distribution it falls between the Norway Goby and the Sand Goby. Its certain identification can be established only by study of the sensory papillae on the cheeks.

Marbled Goby *Pomatoschistus marmoratus*



Characteristics

A small slender goby, the anterior membrane of pelvic disc has tiny finger-like projections on the rear edge. 37-48 (usually 40-46) scales along the lateral line; the nape and head are naked, but the breast or at least the rear of it is usually scaled. 31-34 (usually 33) vertebrae.

Colour

Sandy with dark spots along the flanks. Breast maybe dusky, and is always dark in the males which also have four distinct vertical dark bars and dark spot at the rear of the first dorsal fin. The female has a dark blotch on the chin.

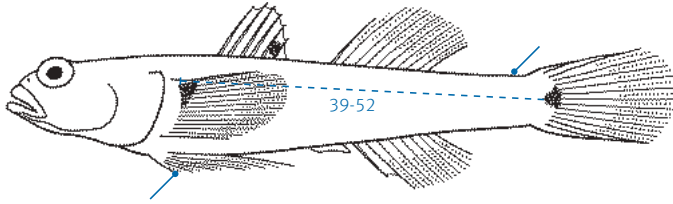
Size

Attains a maximum length of 8 cm.

Ecology

A common goby of shallow sandy areas, down to 20 m. It is regularly found in estuaries and lagoons; both brackish and hypersaline. Ranging from the Mediterranean up the Iberian coast to southern Biscay, some fish thought to be of this species have been collected with Sand Gobies in the Camel estuary, Cornwall. It feeds on small invertebrates, especially crustaceans and insect larvae. It matures after one year, and in the summer the female lays the eggs under a shell where the male guards them.

Common Goby *Pomatoschistus microps*



Characteristics

A moderately stout, small goby with a rather long caudal peduncle (last dorsal ray to tail fin distance nearly equals head). Pelvic fin with an anterior membrane with a scalloped edge, without minute projections. Six rays in the first dorsal fin. Scales moderate in size, 39-52 in a lateral series; no scales present on head, nape, or breast. 30-32 (usually 31) vertebrae.

Colour

Light grey to sandy fawn with reticulations of fine dots and faint pale saddles across the back. Dusky marks on sides which, near the tail fin base, are conspicuous, as is the triangular mark on the pectoral base. Males have a dark spot on the rear of the first dorsal fin membrane, dark thin bars across the sides and an orange dusky throat.

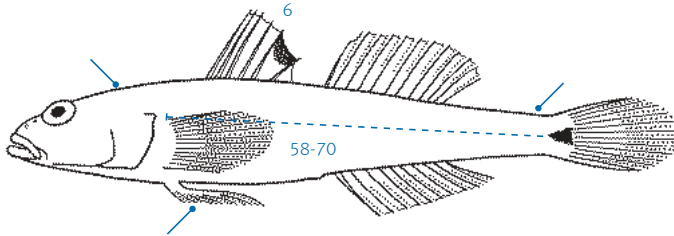
Size

Attains a length of 6.4 cm. British Rod-caught Record: 1 g (2006, Blackwater Canal).

Ecology

An abundant small goby which is found close inshore in intertidal pools, in estuaries, and slightly brackish drainage ditches and rivers. It is particularly common on muddy, marshy shores, but is also found in high shore pools on sand. In winter most migrate into deeper water. It spawns from April to August, the eggs being laid on the hollow surface of an overturned bivalve shell such as a cockle or a clam. Several broods of eggs are produced by each female, each guarded within the shell by the male. By the end of the breeding season sheltered saltings pools will contain thousands of small gobies. It feeds mainly on small crustaceans and their larvae. By its very abundance it must be an important link in the food-chains of the muddy and sandy littoral zone, but there is little information available on its predators.

Sand Goby *Pomatoschistus minutus*



Characteristics

A relatively slender goby with a long caudal peduncle, nearly as long as the head. The pectoral fins are rounded, their upper rays not free of the fin membrane, 18-21 fin rays. The pelvic disc and anterior membrane is complete; the latter is edged with small villi (short finger-like projections). First dorsal fin usually with six rays. Scales small, 58-70 in a lateral series (pectoral base to tail), scales present on the nape and on the breast.

Colour

A light sandy-brown with a fine network of dark dots and faint saddles across the back, pale breast. Males have a conspicuous dark blue to black, white-rimmed spot on the posterior edge of the first dorsal fin and four narrow dark cross-bars.

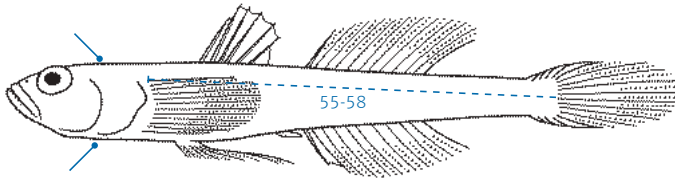
Size

Attains a length of 9.5 cm, usually only around 6 cm. British Rod-caught Record: 3 g (2005, Herne Bay).

Ecology

An extremely common goby on inshore sandy grounds from about mid-tide level to 20 m. It is possibly most common in depths of 30 cm below low-tide level down to 10 m, and is caught in great quantity by shrimp nets and trawls. It enters the mouths of estuaries, but is rarely found in low salinity water. It moves into deeper water in winter. It breeds from March to July, the female laying her eggs in empty bivalve shells where they are guarded by the male. After hatching, the young are pelagic until they reach a length of ca 17 mm. Few specimens live longer than one year. Its food is composed mainly of small crustaceans, particularly copepods, amphipods, and young brown shrimps. It is preyed upon by a number of bottom-living fishes, especially the Bull Rout, Codling, Pouting, and even Sea Bass. It is also taken by terns.

Norway Goby *Pomatoschistus norvegicus*



Characteristics

Similar to the preceding species, but lives in deeper water. Scales small, 55-58 in a lateral series, no scales on the nape or the throat. Second dorsal fin with 8-10 branched rays; anal fin with 8-10 branched rays. Pectoral fins with 16-18 rays.

Colour

Pale sandy-brown with fine reticulation of dark dots and dusky spots on sides. Males have 5-6 very narrow dark vertical bars on the sides and dark spot at rear of first dorsal.

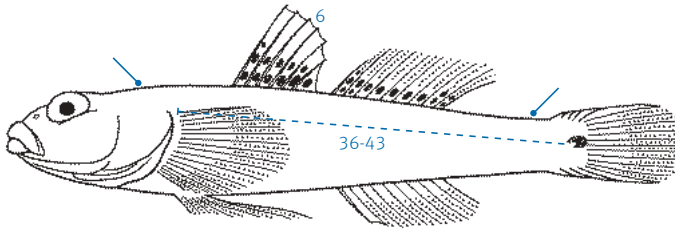
Size

Attains a maximum length of 6.5 cm.

Ecology

The Norway Goby has often been confused with the Sand Goby which it closely resembles. It lives in deeper water, however, from 30-280 m, being most abundant in northern European waters between 50-120 m. It is usually found on coarse sand and muddy bottoms, less often on shell. Its biology has been little studied.

Painted Goby *Pomatoschistus pictus*



Characteristics

A relatively stout-bodied small goby with a moderately long caudal peduncle, nearly as long as the head. Pelvic disc well developed with an anterior membrane which is smooth edged. Six rays in the first dorsal fin. Scales large, 34-43 in a lateral series, none on head or nape.

Colour

Warm brown to fawn with a network of darker spots on the scale edges, a line of four double dark spots along the sides and large paler saddles on the back reaching down the sides. Dorsal fins with a row of black spots with orange banding across the fin membranes. Males are more brightly coloured.

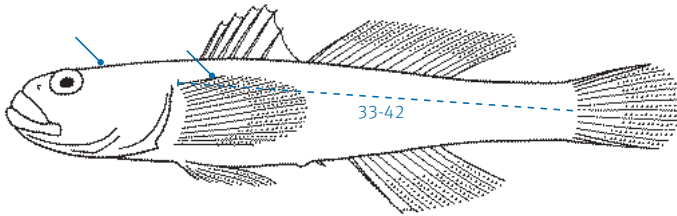
Size

Attains a length of 9.5 cm, usually only around 6 cm.

Ecology

A moderately common goby in northern European seas, which is rather restricted by its choice of habitat. It is found in inshore waters from around low-tide mark down to a depth of 50 m, but mainly on gravel, shell, or coarse sand mixed with shells and stones. It occurs also on sand in close proximity to rocks, and in eel-grass beds. Occasionally found in intertidal pools with stony bottoms. It does not enter estuaries. It breeds from April to July, the eggs being laid in a bivalve mollusc shell and guarded by the male. Newly-hatched larvae are ca 3 mm long and are pelagic until they reach a length of ca 12 mm.

Leopard-spotted Goby *Thorogobius ephippiatus*



Characteristics

A relatively slender goby with a rather deep but long caudal peduncle (distance between last ray of second dorsal and tail fin equals head). Anterior membrane of pelvic fins well developed but with no lateral lobes; no free rays on upper edge of pectoral fin. Scales number 33-42 in a series from pectoral base to tail fin; no scales on head, nape, or anterior to dorsal fin. Anterior nostril with a raised rim but no flap or tentacle.

Colour

Pale fawn with conspicuous orange to brick-red blotches on head and body, and a black spot near the edge of the first dorsal fin. Breeding males are dark with a conspicuous light edge to the second dorsal fin.

Size

Attains a maximum length of 13 cm. British Rod-caught Record: 39 g (1995, Anglesey).

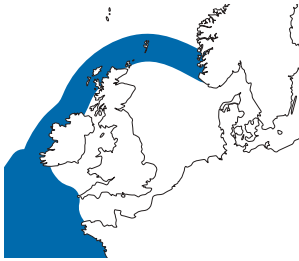
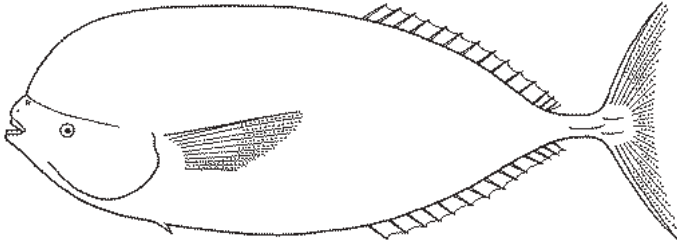
Ecology

This species has a wide distribution but was very difficult to capture before the diving and underwater photography became widespread. It lives from 6-40 m, in vertical rock faces, often upside down, hiding in crevices in the rock. Very rarely it is found in deep rock pools near low-water level. It spawns from May to July in the Channel. Its food comprises mainly amphipod crustaceans and polychaete worms. This species was formerly known as *Gobius forsteri*.

Family: Louvars *Luvaridae*

A most striking fish which has some resemblances to the members of the tunny family, especially in the tail fin which is high and the keel on either side of the tail itself. It is worldwide in distribution in warm temperate seas, although it has not been reported in tropical waters on either side of the equator. The adult is totally different from the young fish which goes through several characteristic stages of development. This has led to several of these stages being recognized at some time as distinct species, and even genera, of fishes. However, there is only one species in the family. Only adults have occurred in northern European waters.

Louvar *Luvarus imperialis*



Characteristics

Deep-bodied with a high, almost vertical profile; mouth small; teeth present in juveniles but lost by adulthood. Tail fin strong with high lobes, a small keel at the base of each and a large fleshy keel on the side of the tail. Dorsal and anal rays low but strong, few in number.

Colour

Brilliant, body pale pink, deep blue above; the fins are scarlet except that the tail fin is deep blue with reddish tinges.

Size

Grows to 1.88 m in length and a weight of 140 kg.

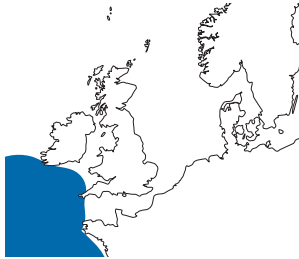
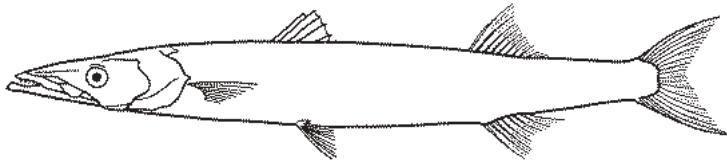
Ecology

A rare vagrant in northern European seas, where it is best known as a stranded fish, or is caught in shallow water on coasts close to the open sea. These are exceptional circumstances, however, as it is a mesopelagic inhabitant of the ocean. It lives from the surface down to about 1,000 m and feeds on salps, medusae, and ctenophores (all pelagic animals which might be classed as jellyfishes). It is known to breed in the Mediterranean, where many of the highly variable young stages have been captured, but many details of its life history are as yet unknown.

Family: Barracudas *Sphyraenidae*

All members of this small family have a very characteristic elongate body and a large mouth with numerous large sharp teeth. Some have been known to attack humans. Worldwide there is only one genus with some 21 species. Only one species has been recorded around Britain and Ireland.

Yellowmouth Barracuda *Sphyraena viridensis*



Characteristics

Body cylindrical and very streamlined with a conical snout. Mouth superior and long with two rows of long canine teeth. No scales on rear edge of preoperculum.

Colour

Dark above, silvery below. Numerous broad vertical dark bars extending from upper body to just below the lateral line in the anterior flanks. Interior of mouth yellowish.

Size

Size Can reach a length of 1.8 m and a weight of 8.2 kg.

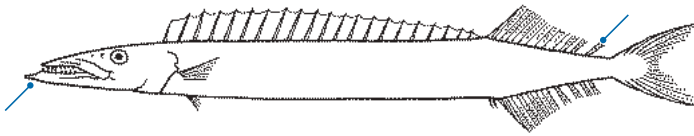
Ecology

Found in the eastern Atlantic Ocean and probably other waters, but its distribution is uncertain because of previous confusion with the European Barracuda *Sphyraena sphyraena*. In 2001 one specimen was caught off The Lizard, Cornwall. Occurs inshore and in the open sea, feeding on fish, crustaceans and cephalopods. Of importance to some commercial fisheries.

Family: Snake Mackerels *Gempylidae*

The snake mackerels are a small family of moderate to large marine fishes which are widely distributed in the tropical and warm temperate oceans of the world. Altogether there are 16 genera with 24 species. They are fast-swimming, predatory fishes found near the surface of the sea and in mid-water. Generally they are slender-bodied and streamlined (superficially like elongate tunnies), possessing large teeth in the jaws, but lacking lateral keels on the sides of the tail. Several species are exploited as food in the warmer oceans, but in northern European waters only two species occur as rare visitors.

Johnson's Scabbardfish *Nesiarchus nasutus*



Characteristics

Moderately long, compressed body with a long pointed snout and a strongly protuberant lower jaw ending in a fleshy tip. Teeth large and fang-like. Two small finlets behind the dorsal and anal fins.

Colour

Dark brown or black on the back with violet tints on the sides; fins and inside mouth black. Lateral line white.

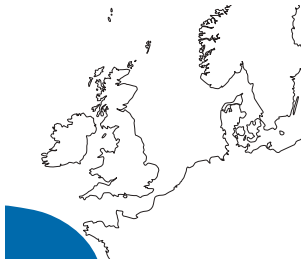
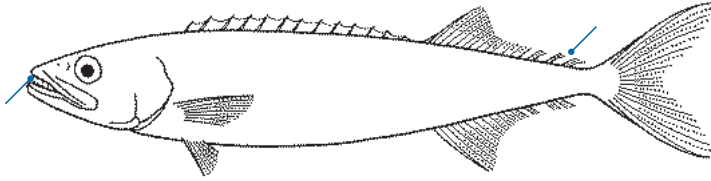
Size

Attains a length of 130 cm.

Ecology

An active predatory fish which lives from the surface down to a depth of ca 1,000 m, always in the open sea. Lives on the continental slope and seamounts travelling into middle depths at night to feed on a wide range of mesopelagic fishes and squids, while the young mainly eat crustaceans and young fishes. Young fish live nearer to the surface, and are much more frequently captured than the fast-swimming adults. They have been caught in all the warmer oceans and this fish is assumed to be circumtropical in its range. It is a rare vagrant in the eastern North Atlantic. Only Atlantic distribution is shown on the map.

Oilfish *Ruvettus pretiosus*



Characteristics

Somewhat elongate body but rounded in cross-section, the head is smoothly rounded, the lower jaw prominent but not pointed; teeth moderate in size, sharp and strong. First dorsal fin composed of short spines; two small finlets behind the dorsal and anal fins. Body covered with sharp spiny scales giving the body a rough surface. Ventral keel from pelvic fins to vent.

Colour

Dark purplish-brown, lighter on the sides and ventrally (fades to dull brown after death). Inside of mouth brown.

Size

Attains a length of 2 m, and weight of ca 45 kg.

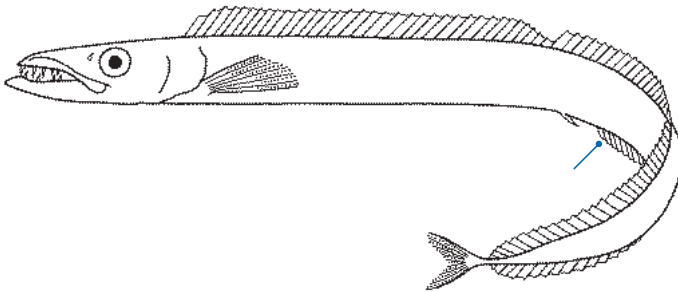
Ecology

An active predatory fish found worldwide in tropical and warm temperate seas, and which usually lives in mid-water in depths of 180-750 m. It is found only in open oceans, never coming into inshore waters. In the eastern North Atlantic it is very rare. It feeds on a wide range of mid-water fishes and squids, but its biology has been little studied. Its flesh is very oily; the oil has a purgative effect. The map shows its range in the Atlantic Ocean.

Family: Scabbardfishes *Trichiuridae*

The scabbardfishes are a moderately small family of marine fishes of worldwide distribution in tropical and temperate seas. Most live near the surface or in the middle depths of the open ocean down to ca 1,000 m. They are all long-bodied fishes with elongate heads and jaws with formidable teeth. The dorsal fin runs the whole length of the body; the tail fin is absent in some species but small in the remainder. Most have no pelvic fins. Altogether, 10 genera and 39 species are known, although only four occur in the eastern North Atlantic, and only one of these is at all common. Several species grow to ca 1.5 m in length and are valuable food fishes locally.

Black Scabbardfish *Aphanopus carbo*



Characteristics

Slender and long-bodied with a small but well-developed tail fin, and dorsal fin composed of 38-40 slender spines, distinguished by a dip from the second dorsal fin of 53-56 rays. Anal fin well developed with a dagger-like spine in front. Pelvic fins absent in the adult.

Colour

When freshly caught, dark with dull coppery iridescence on the sides; when dead, jet black, the skin tending to slough off leaving white flesh exposed.

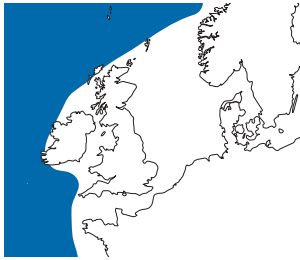
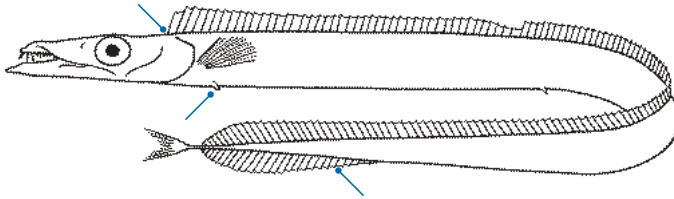
Size

Grows to a length of 110 cm.

Ecology

The most common of the scabbardfishes in the eastern North Atlantic, although it is not often captured. Off southern Europe it lives in mid-water at depths of 200-700 m, coming closer to the surface at night, although in northern waters it tends to live deeper than this at ca 300-900 m. It feeds on a wide range of smaller fishes, shrimps, and squids. Off Madeira, and to a lesser extent Portugal, it is an important food fish and is captured in large quantities on special deep-water lines. To the west of Britain and Ireland it is caught occasionally, but it can be captured in numbers in rather deeper water than is usually trawled.

Frostfish *Benthodesmus elongatus*



Characteristics

Extremely slender and long-bodied, with a long-based dorsal fin and a short anal fin. Pelvic fins minute in adults, small in young, tail fin small but deeply forked. Dorsal fin with 45-46 slender spines confluent with 102-109 rays.

Colour

Silvery but with dusky shading on back and fins. Jaws are dark and the inside of mouth and gill cavity is black.

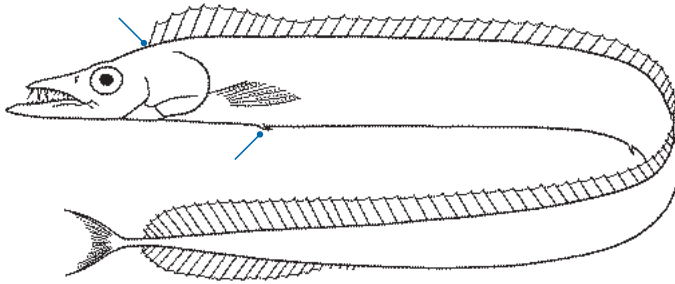
Size

Attains 100 cm in length.

Ecology

A rare deep-water fish which lives over the continental slope in 200-400 m. Off the Portuguese coast and in the tropical Atlantic it is more common, but nowhere has it been found abundantly. Its biology is little known. It is known also in the Pacific and Indian Oceans, each possessing a distinct subspecies; the Atlantic subspecies is formally known as *Benthodesmus elongatus simonyi*.

Silver Scabbardfish *Lepidopus caudatus*



Characteristics

Long and slender-bodied, with a pointed snout and a dorsal profile which is smoothly rounded, then steeply curved at the nape. No scales. Dorsal fins well developed and continuous, tail fin small but conspicuous, anal fin low and very short, pelvic fins small. A small flattened spine just behind the vent.

Colour

Entirely silvery, dusky on the edges of the fins and on the head.

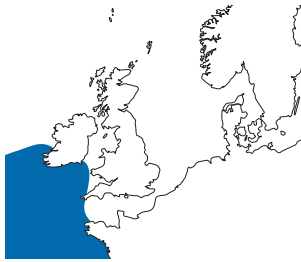
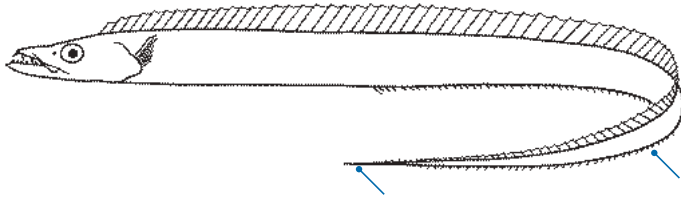
Size

Attains a length of 205 cm and a weight of 8 kg.

Ecology

An uncommon fish in the eastern North Atlantic, although relatively common off the Portuguese coast where it is fished commercially on sandy bottoms at depths of 100-250 m. Further north it tends to live deeper, down to 400 m. It is occasionally stranded on shore in large numbers, presumably as a result of upwelling deep water carrying schools into shallower water, but this rarely happens in Europe. Its food consists mainly of fishes, but shrimps are eaten as well. It is widely distributed in the tropical and warm-temperate Atlantic, Indian, and south Pacific Oceans.

Hairtail *Trichiurus lepturus*



Characteristics

Long and slender-bodied extremely compressed, with a pointed head and moderately long teeth in the jaws, supplemented with huge fangs. Dorsal fin long, its origin in front of the operculum and continuing to the tail tip. Pectoral fin points upwards at a steep angle. No tail fin. Anal fin barely noticeable comprising a single long spine and a series of hair-like rays. Head profile steep behind eye.

Colour

Bright silvery overall; tip of the jaw and dorsal fin edge dusky.

Size

Grows to a length of 1.5 m and weights of 5 kg.

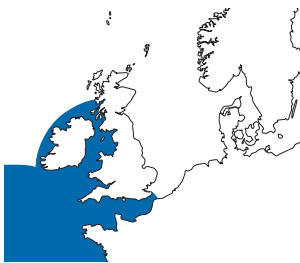
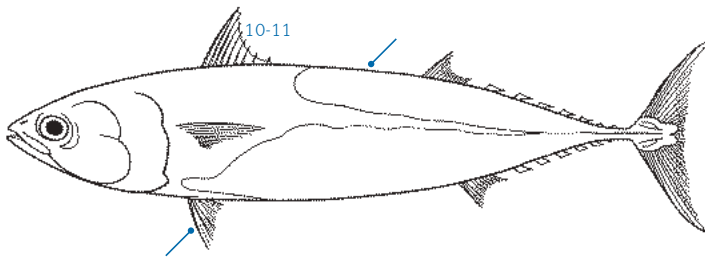
Ecology

A rare fish in the seas of northern Europe, occasionally caught as far north as the south west of Britain or Ireland. Usually it lives from the near surface down to 350 m over the outer continental shelf, but occasionally comes closer inshore, as off West Africa. It feeds actively on smaller fishes and squids. Off the Portuguese coast and southwards it is a frequently captured, and locally important, food fish. It is worldwide in distribution in tropical and subtropical seas, seasonally entering cool temperate zones. The map shows Atlantic distribution only.

Family: Mackerels & Tunnies *Scombridae*

The Scombridae is a large family of marine fishes found in tropical and warm temperate seas around the world, with relatively few species moving seasonally into cool temperate seas, such as those of northern Europe. These fish are often large and predatory, and live in the surface waters of the sea, making considerable migrations which in some cases involve crossing ocean basins. They are spindle-shaped with a pointed snout, round-bodied in cross-section, with a tapering tail. The dorsal fin is composed of stout rays (which slot completely into a groove on the back in the larger species); the second dorsal and anal fins are well developed and stout, ending in a series of separate finlets; the tail fin is high and deeply forked (or lunate). The whole body plan is that of a fast and powerful fish, streamlined to attain the maximum efficiency from its swimming movements. Tunas are among the few fishes to have a body temperature higher than the surrounding water. This can be seen as another contribution to their swimming efficiency. Tunas are heavily exploited as food fish. Fisheries in the Mediterranean are known to have been in existence for more than 2,000 years, although it is only in the second half of the twentieth century that oceanic exploitation has become so heavy that some stocks have become severely depleted. Most of the large tunas and several of the smaller species have now been overfished. Worldwide, some 15 genera and 51 species are recognised, but of these only one occurs commonly in the seas of northern Europe, and all but two are rather rare stragglers here.

Bullet Mackerel *Auxis rochei*



Characteristics

A sleek and spindle-shaped small tunny. Two small fleshy keels at the bases of the tail fin lobes and a larger one on each side of the tail. The first dorsal fin is high, strongly concave, and widely separated from the second dorsal fin; the space between them at least equal to the length of the first dorsal fin base. Second dorsal and anal fins small and followed by 8 and 7 finlets respectively. A single

long triangular flap of skin between the pelvic fin bases (interpelvic process). Thick medium sized scales forming a corselet over the area behind the head, around the pectoral fins and back along the lateral line, the rest of the body naked. The corselet below the origin of the second dorsal fin 6-15 (usually >10) scales deep. Pectoral fin short, not reaching a vertical line from the front of the scaleless area above

Continued: Bullet Mackerel *Auxis rochei*

the corselet. Teeth slender and conical. 40-47 (mode 45) gill rakers on the first branchial arch.

Colour

Blue-green or dark blue on the back, silvery on the sides and belly; 15 or more broad, dark bars run up the back almost vertically from the lateral line.

Size

Grows to 50 cm, common to 35 cm, and a weight of ca 3 kg.

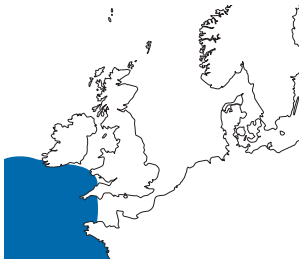
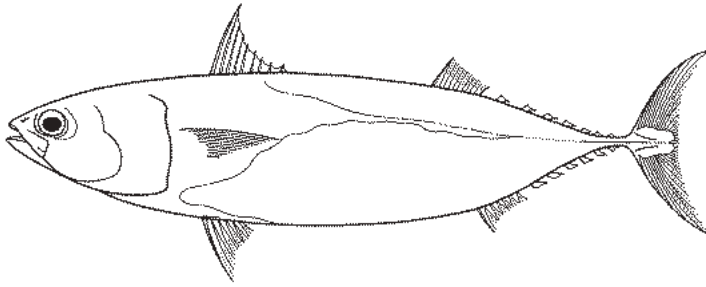
Ecology

The Bullet Mackerel is a pelagic, schooling fish of the shelf seas in tropical and warm temperate waters, which comes close inshore in warm seasons. In northern European waters it is rarely caught, although southwards, in Biscay, it is caught in some numbers. It feeds on smaller schooling fishes, especially Pilchard, Anchovy, and Scad, small squids and crustaceans. It is preyed on by sharks, barracudas, billfish and larger tunas.

Note

Until recently the literature available did not readily distinguish *Auxis rochei* from *A. thazard* and frigate mackerels were recorded as either, and were subsequently treated as a single cosmopolitan species *Auxis thazard*. A review by Collette and Aadland in 1996 clearly separated the two species; however, their study found few proven occurrences of *A. thazard* in the mediterranean or East Atlantic. Consequently, most prior records of *Auxis thazard* from this region, and the majority of subsequent ones have been treated as synonymous to *Auxis rochei*.

Frigate Mackerel *Auxis thazard*



Characteristics

A small tunny, similar to a Bullet Mackerel but deeper bodied. Small fleshy keels at the bases of the tail fin lobes and a larger one on each side of the tail. The first dorsal fin is high, strongly concave, and widely separated from the second dorsal fin; the space between them at least equal to the length of the first dorsal fin base. Second dorsal and anal fins small and followed by 8 and 7 finlets respectively. A single long triangular flap of skin between the pelvic fin bases (interpelvic process). Thick medium sized scales forming a corselet over the area behind the head, around the pectoral fins and back along the lateral line, the rest of the body

naked. The corselet below the origin of the second dorsal fin is narrow only 1-5 scales deep. Pectoral fin medium, reaching to or beyond a vertical line from the front of the scaleless area above the corselet. Teeth slender and conical. 37-43 (mode 40) gill rakers on the first branchial arch.

Colour

Blue-green or dark blue on the back, silvery on the sides and belly; 15 or more narrow, rather wavy, dusky lines run across the back obliquely from the lateral line upwards.

Size

Grows to 61 cm.

Ecology

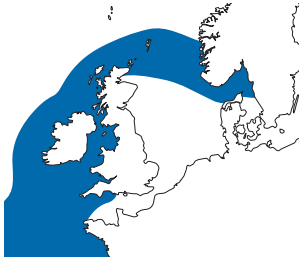
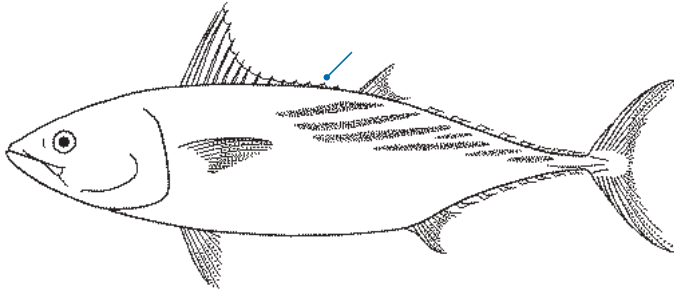
The Frigate Mackerel is a pelagic, schooling fish of the shelf seas in tropical and warm temperate waters, which comes close inshore in warm seasons. It is very fecund, spawning in batches and producing from 200 000 to over a million eggs. Because of the confusion between this species and the

Bullet Mackerel not a great deal is known specifically about this fish and it is assumed that their biology and ecology are similar. It is rarer than the Bullet Mackerel in the East Atlantic but known to occur off Liberia, and recently specimens have been caught off Cornwall and South Wales.

Note

In view of these occurrences all frigate mackerels need to be reported and examined carefully.

Little Tunny *Euthynnus alletteratus*



Characteristics

Typically tunny-shaped with the first dorsal fin high in front, then each spine successively shorter to give a concave edge. Second dorsal fin relatively small. Scales on front part of the body form a distinct corselet which is very conspicuous. Anal fin origin beneath the first dorsal finlet.

Colour

Steel blue above, with wavy and curved black lines on the posterior back. Creamy-silver on the lower sides and ventrally, an iridescent stripe in front. Several (5-7) dusky spots behind and below the pectoral fins.

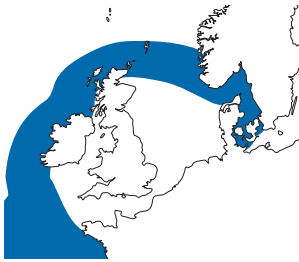
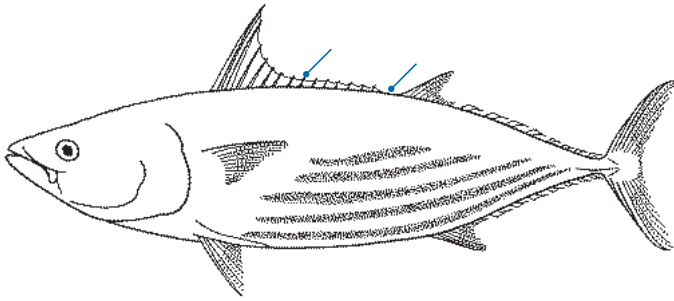
Size

Attains a length of 91 cm, and a weight of 16 kg.

Ecology

An extremely rare tunny in northern European waters which has been recorded five or six times only. To the south, however, it is very common; in tropical and warm temperate parts of the Atlantic it is the most common tunny in inshore waters. It forms tight compact schools near the surface, and feeds on all kinds of smaller fishes, squids, and crustaceans - often attracting flocks of seabirds to the scene by the frenzy of their feeding. It is commercially exploited despite its small size, for its flesh is firm and tasty. It is also highly favoured by anglers.

Skipjack Tuna *Katsuwonus pelamis*



Characteristics

Typically tuna-shaped, with a high first dorsal fin and each succeeding ray shorter, giving the edge a concave outline, and almost extending to the second dorsal fin. Moderate-sized scales are present anteriorly, but the posterior body is scaleless. Gill rakers numerous 53-63 on first gill arch. Distance between snout and first dorsal fin origin greater than distance between second dorsal fin origin and the last finlet. Also known as the Oceanic Bonito.

Colour

The back is plain deep blue above shading to green on the side; the sides and belly are shining silver white. The belly has 4-6 long broad stripes running from the scaly corselet to the tail.

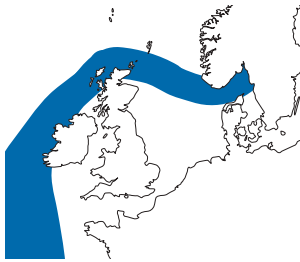
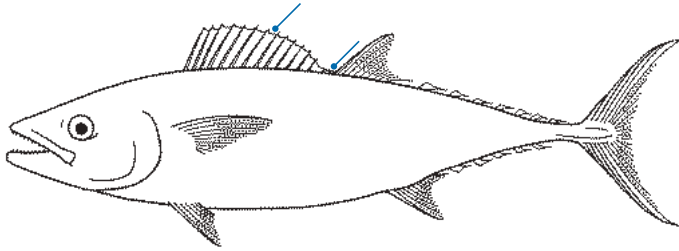
Size

Attains 1 m in length and a weight of ca 35 kg.

Ecology

In northern European waters the Skipjack Tuna is uncommon, but because of its wide range and habit of making migrations it occurs more frequently than the other rare tunnies. It lives in both small and large schools worldwide in tropical seas and seasonally in temperate ones, usually offshore and on open ocean coasts. This tunny can be captured in mid-ocean. It feeds on a wide range of planktonic crustaceans, squids, and smaller fishes, especially smaller scombroids, lantern fishes, and young Pilchards and Anchovies, and their relatives. It is a very important food fish, exploited throughout the world but most notably in the Pacific. Most of the catch is canned.

Plain Bonito *Orcynopsis unicolor*



Characteristics

Typically tunny-like in shape with a long-based first dorsal fin which touches the second dorsal at the base. Spines of the first dorsal fin long and slender, the second to sixth rays high and the outline convex. Scales present on the front of the body only. Teeth in jaws large, well spaced and canine-like. Two flaps of skin in the interpelvic process.

Colour

The back is steel blue, the sides blue-green, ventrally silvery-white. No dark spots or bars.

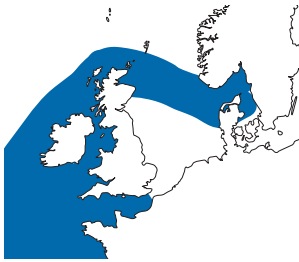
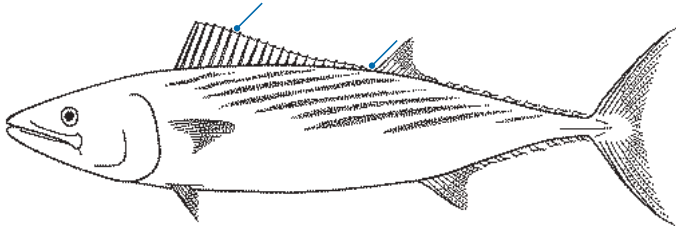
Size

Attains a length of 1.3 m and weight of 13 kg.

Ecology

A little-known tunny which may live in deeper water than most. It is common only locally, as off the North African coast; elsewhere it occurs singly from time to time over a short period, then is not reported again for years. In northern European waters it has been caught only off Scandinavia on three occasions and must be regarded as very rare. It is believed to live in the open sea. It is probably confined to the Atlantic Ocean and Mediterranean, but a similar species (the Dogtooth Tuna) occurs in the Indian and Pacific Oceans.

Bonito *Sarda sarda*



Characteristics

Similar to the other tunnies in build. The first dorsal fin is long-based and almost joins the second dorsal; its outline is straight or slightly concave, the first 10 spines being the longest and of almost uniform height. The pectoral fin is short. The mouth is large and extends back to the rear edge of the eye.

Colour

The back is steel blue to olive green with numerous (ca. 10) oblique black lines running across it; sides silvery-yellow.

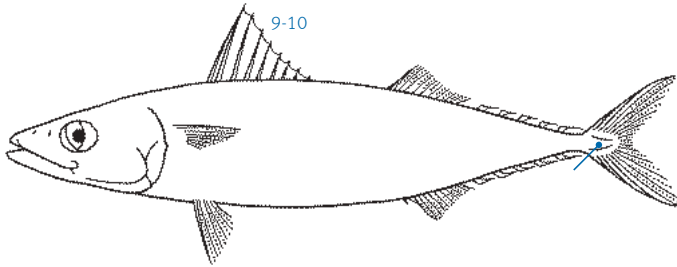
Size

Attains 91 cm in length and a maximum of 8.5 kg in weight, but most caught are less than 4 kg. British Rod-caught Record: 4.004 kg (1969, South Devon).

Ecology

A moderately regular visitor to northern European seas, and very common off southern Europe. It is migratory with the seasons, not living in water below 15°C and preferring temperatures around 22°C. It is a strong, swift, open-ocean predator travelling in tight compact schools and leaping clear from the water when in pursuit of its prey. In European seas the Bonito eats Anchovy, Pilchard, Sprat, Whiting, Mackerel, and Scad, and squids. The schools are usually found offshore, 25-32 km from the coast. It spawns mainly in early spring off the North African coast and in the Mediterranean. After spawning, the schools migrate to richer feeding-grounds, and in the Atlantic it is this migration which brings them into northern European waters. It forms an important part of the European tuna fisheries, and is fished for throughout the tropical Atlantic. It is also a fine sporting fish.

Atlantic Chub Mackerel *Scomber colias*



Characteristics

Closely similar to the Mackerel with the two dorsal fins widely separated and no groove in the mid-line of the back. Small keels at the bases of the tail fin lobes: no lateral keel on the body. First dorsal spines number 8-10; head larger than the Mackerel (3 to 3.5 times in the body length); scales larger round pectoral fin base. It is also called the Spanish Mackerel.

Colour

Back greeny-blue with faint wavy dark lines extending down the sides; lower sides and belly silvery-white with an iridescent flush, and numerous rounded dusky spots on the sides.

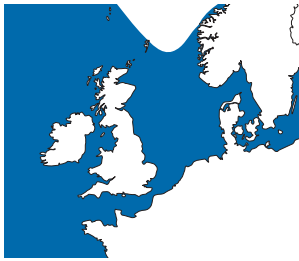
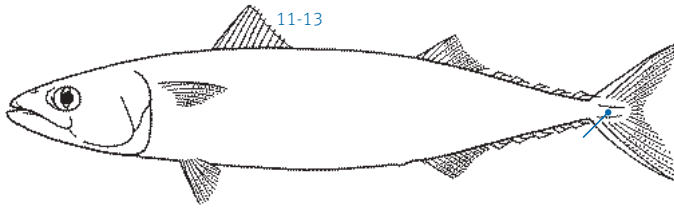
Size

Attains 40 cm in length.
British Rod-caught Record:
0.754 kg (2003, Torquay).

Ecology

Worldwide in tropical and warm temperate seas, the Chub Mackerel is an uncommon visitor in the eastern North Atlantic. In the Mediterranean, however, it is common, as it is off Portugal, and is fished commercially. It is a schooling fish common on the high seas, from the surface to 300 m, and coming into inshore waters in summer. It feeds on pelagic crustaceans and whatever fishes are common locally, and in its turn is preyed upon by larger fishes, small cetaceans, and seabirds. It is heavily fished in the North Pacific (California and Japan). It was formerly known as *Scomber japonicus*, but this species has been separated into three and the Atlantic form is now *S. colias*.

Mackerel *Scomber scombrus*



Colour

Back brilliant blue-green with black irregularly curving lines, which are sometimes broken into spots and curves. The lower sides and belly are white with pinkish and gold reflections without spots or bars. The blues and iridescent colours on the sides fade quickly after death.

Size

Attains a maximum length of 66 cm and weight of 3.4 kg; rarely more than 1.8 kg. The usual length today is *ca* 41 cm and weight *ca* 680 g. British Rod-caught Record: 2.79 kg (1984, Cornwall). Irish Rod-caught Record: 1.971 kg (1979, Ballycotton).

Ecology

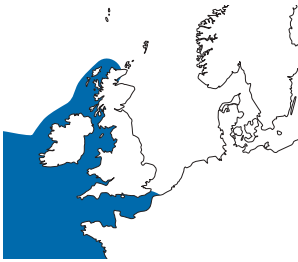
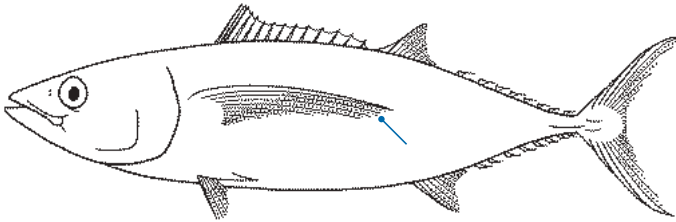
A common North Atlantic fish living near the surface of the sea in huge schools above the continental shelf. It is found seasonally close inshore, as well as over offshore banks, but is highly migratory - making inshore migrations as well as moving north in summer. The

reverse movement occurs as the sea cools in winter. The fish spawns in summer, the season covering most months from May until August; the eggs and postlarvae float at the surface. The food of the Mackerel is varied. Young fishes eat planktonic crustaceans, their larvae, and fish larvae. The adults also eat large quantities of pelagic crustaceans and, in addition, they prey heavily on schools of smaller fishes, especially Sprats, Herring, and sandeels. In winter they fast partially, the Mackerel schools retiring to the deeper water on the edge of the continental shelf, or in localized deeps. With the sparsity of planktonic food organisms, and smaller schooling fish in such places, they tend to lie quiescent near the sea-bed. At all seasons of the year, however, they are preyed upon by larger fishes, especially the more active sharks, and tunnies, and by dolphins and other small cetaceans. The Mackerel is an important food fish. It is

Continued: Mackerel *Scomber scombrus*

captured in different ways, including varied nets and feathered hooks. It is also a fine sporting fish. Because of its poor keeping qualities it was formerly not much marketed, but now large quantities are frozen before transport. It is also canned and smoked, and in these ways has assumed a much greater importance to the fishing industries of northern Europe. However, it is a slow-growing fish (large specimens may be as much as 20 years of age), living at the extremity of its range, and is thus liable to be over-fished quite quickly. The North Sea stock is depleted, and the southern and western ones are regulated by exclusion areas and quotas.

Albacore *Thunnus alalunga*



Characteristics

A small tuna with very long pectoral fins, when depressed they reach beyond the base of the second dorsal fin. The first dorsal fin is high in front, successive spines being slightly shorter so that the fin outline is concave; the first and second dorsal fins are close together. Body completely scaled, with very small scales over most of the body and larger ones on the corselet. 25-31 gill rakers on the first gill arch. It is also known as the Longfin Tunny or Tuna.

Colour

Deep blue above with a bluish iridescent band on the sides, the belly silvery-white. Fins dark, but the tail, second dorsal, anal, and the finlets have light trailing edges.

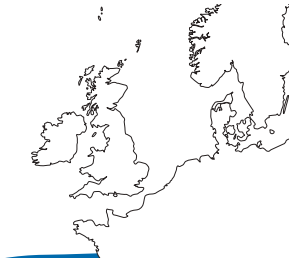
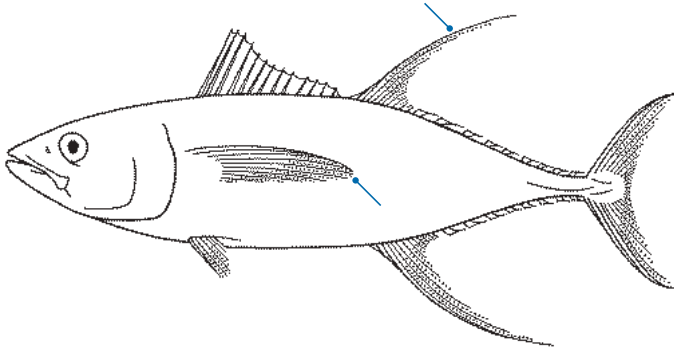
Size

Attains 130 cm in length, and certainly 23 kg, possibly 43 kg in weight. British Rod-caught Record: 2.155 kg (1990, Devon). Irish Rod-caught Record: 16.66 kg (2003, Blasket Islands).

Ecology

The Albacore is worldwide in tropical and warm temperate seas. In northern European waters it is common in Biscay, but northwards is a rare vagrant, found only in warm seasons and usually singly. It is an important food fish in southern Europe. Its food is mainly fish, especially Anchovy, Skipper, lantern fishes, and hatchet-fishes; it also eats squids and planktonic crustaceans. It lives in the surface waters down to a depth of 50 m in large schools, spawns in May and June off the Portuguese and Spanish coasts, and later makes its feeding migration into northern waters.

Yellowfin Tuna *Thunnus albacares*



Characteristics

A large tuna, the first dorsal fin is high anteriorly with a strongly concave edge and almost joins the second dorsal fin. The body is fully scaled. The pectoral fin is moderately long, depressed it reaches beyond the level of the second dorsal fin origin. The lobes of the second dorsal and the anal fins are very long in fish longer than 150 cm, exceptionally so in large fishes. Gill rakers 26-34.

Colour

Bright blue above, yellowish on the sides, silvery-white ventrally. May show four or more broad white bands on the belly, the grey between them with vertical rows of white spots. All the finlets are brilliant clear yellow, the lobes of the second dorsal and anal fins, and the outer edge of the tail are pale yellow. Size Attains a length of 2.4 m and weights of up to 200 kg.

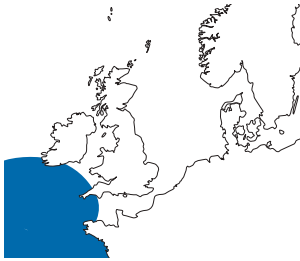
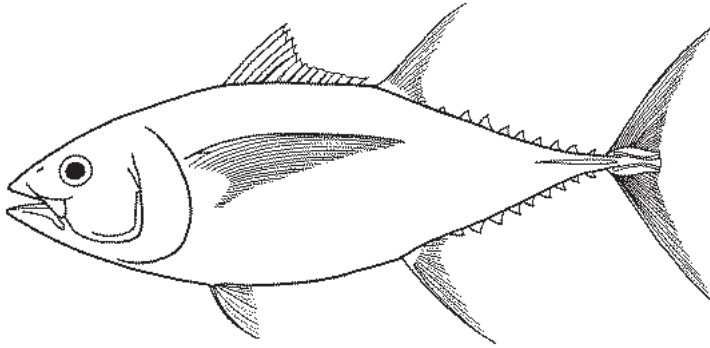
Size

Attains a length of 2.4 m and weights of up to 200 kg.

Ecology

A worldwide species in tropical and warm temperate waters which first occurred in northern European seas on the North Wales coast in 1972 and off Cornwall in 2006. Its status anywhere north of southern Spain is that of an accidental vagrant. It is usually found in surface waters with temperatures of 22-28°C, exceptionally down to 14°C, and like other large tunas is seasonally migratory. It is one of the few tunas to be found in inshore waters. It is an important food fish in tropical seas.

Bigeye Tuna *Thunnus obesus*



Characteristics

Well-proportioned streamlined body, deepest near the middle of the first dorsal fin base. Pectoral fin moderately long, reaches base of second dorsal in young fish relatively shorter in older ones. 13-14 dorsal spines; 14-15 soft dorsal rays. Anal fin with 14 soft rays. Gill rakers 23-31.

Colour

Back a dark bluish-black; a blue band along the sides; lower sides and belly whitish. May show eight or more narrow white bands on the belly the grey between them with vertical rows of small white spots. First dorsal fin deep yellow; second dorsal and anal fins light yellow; finlets bright yellow edged with black.

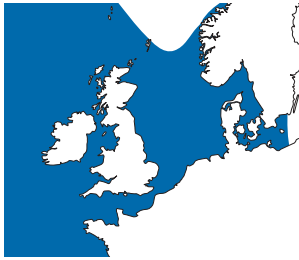
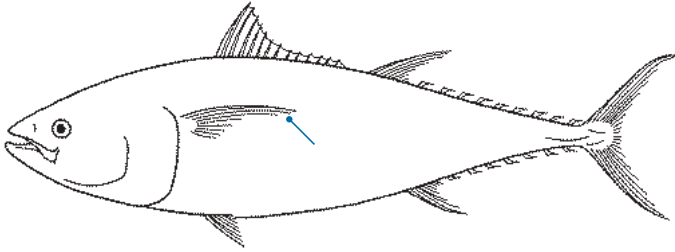
Size

Can reach 2.5 m in length and 210 kg in weight. British Rod-caught Record: 30.276 kg (1985, Cornwall).

Ecology

Occurs worldwide in tropical, semi-tropical and warm temperate oceans. Rare around Britain and Ireland but specimens have been taken in 1985 near Newlyn, Cornwall, in 2004 at Christchurch Bay, Dorset and in 2006 off southwest Ireland and in South Wales. Found in waters of 10-250 m depth – the adults in deeper water, the juveniles mostly at the surface, often associated with floating objects. Eggs and larvae are pelagic. They feed on a wide variety of fish, cephalopods and crustaceans. An important commercial and sport fish. It is listed by the IUCN in the Red Data book as Vulnerable.

Atlantic Bluefin Tuna *Thunnus thynnus*



Characteristics

The only common large tuna in northern European waters. The body form is typical of the family with a series of finlets behind the second dorsal and anal fins. First dorsal fin high in front, the middle spines short and the fin outline concave, 13-15 spines in all; first dorsal fin separated from second by a very small space. Body completely scaled; the scales on the anterior body larger than the rest. Pectoral fin short, about equal to snout length in adults, relatively longer in young not quite reaching origin of second dorsal fin. Gill rakers on first arch number 34-43.

Colour

The back is dark blue, shading to green on the upper sides; the belly is white. The fins are grey-blue, but the second dorsal and anal fins are brown and the finlets are dull yellow.

Size

Attains a length of 4 m and a weight of 680 kg, but now rarely over 2.6 m and 300 kg. British Rod-caught Record: 386 kg (1933, Whitby). Irish Rod-caught Record: 440 kg (2001, Donegal Bay).

Ecology

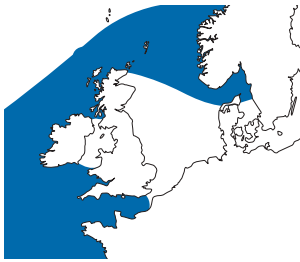
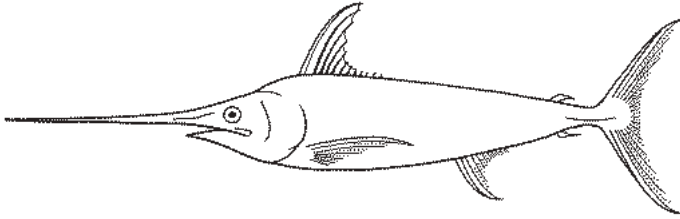
A wide-ranging fish in the Atlantic, with close relatives in the Indian and Pacific Oceans. It is a surface-living, schooling fish, rarely found deeper than 100 m, which lives over the outer continental shelf and makes seasonal migrations. In northern European waters it is mainly a summer visitor, appearing in July and August, and rarely captured or seen later than September. It is very sensitive to water temperature and in cold summers may not

appear. Most of these fishes are migrants from the south, off North Africa or possibly from the Mediterranean, but some make a trans-Atlantic journey. The regularity of their migrations into northern seas has been affected by overfishing both there and to the south. The Bluefin Tuna feeds on planktonic animals, especially crustaceans, but also preys heavily on schools of smaller fishes, in particular Herring, Sprat, Pilchard, Whiting, and sandeels. It also eats large quantities of squids. The young feed on smaller prey but eat many young fish. It breeds in June in the Mediterranean and off Spain, the eggs and larvae being pelagic. Growth rate is fast, 6-year-old fish are *ca* 1.5 m long. The Bluefin Tuna may live for up to 30 years, but very few fish can survive so long today because of heavy fishing pressure. The Mediterranean and Biscay stock is in serious decline.

Family: Swordfishes *Xiphiidae*

The Swordfishes are characterised by the elongate snout, the absence of teeth in adults and a single median keel on either side of the tail. There is only one species.

Swordfish *Xiphias gladius*



Characteristics

Heavy-bodied anteriorly, slender towards the tail, with a long pointed snout produced into a sword-blade (flat top and bottom). A single keel on the sides of the tail. No pelvic fins. The dorsal fin is high in front; in adult fish it is clearly separated from the second dorsal, but in young fishes both first and second dorsal fins, and the two anal fins, are united to form single fins.

Colour

Grey-blue above, paler blue beneath, almost white on the belly; the fins are dark greyish.

Size

Attains a maximum length of 4.9 m, but the average is between 2-3 m with weights of 60-120 kg.

Ecology

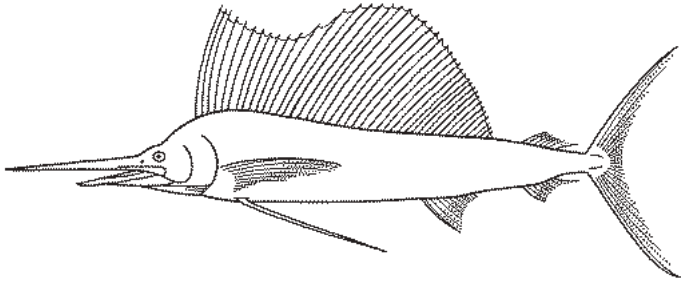
An open ocean migrant which is nowhere abundant in European waters, although distinctly more common off southern Europe than it is in the north. From Biscay northwards the Swordfish was thought to be a rare vagrant, but experimental fishing in the late 20th Century for albacore in oceanic waters off Ireland caught substantial numbers. The adults appear to be solitary, but are occasionally seen in pairs, except when spawning in spring and summer, when large schools form. It is an active, strong swimmer

which attacks schooling fishes, including Mackerel, Herring, Sprat, Pilchard, argentines, and rattails, as well as squids. It lives at the surface and as deep as 610 m, and consequently its diet includes numbers of deep-water fishes. For centuries the Swordfish has been exploited as a food fish in Europe and this may be the reason why it is comparatively scarce today. In North America it became a relatively popular food fish more recently, and heavy catches were made, but the numbers landed have declined in recent years. It is a fine sporting fish for anglers.

Family: Billfishes *Istiophoridae*

The billfish family (Istiophoridae) is closely related to that of the swordfish (Xiphiidae). Both have slender bodies with a pointed head and a long pointed snout forming a bill. The istiophorids have a slender bill, rounded in cross-section, and include the marlins and spearfishes. The billfish family contains three genera with 11 species. Both families are distributed worldwide in tropical and temperate seas, although the istiophorids favour warmer water.

Atlantic Sailfish *Istiophorus albicans*



Characteristics

Rather slender-bodied with a high sail-like first dorsal fin, the middle rays of which are longest, longer than the depth of the body. Pelvic fins long and slender.

Colour

Generally dark blue above, fading to white or silver below; the sides often have dusky vertical bars or spots. Dorsal fin bright cobalt blue with round or oval black spots.

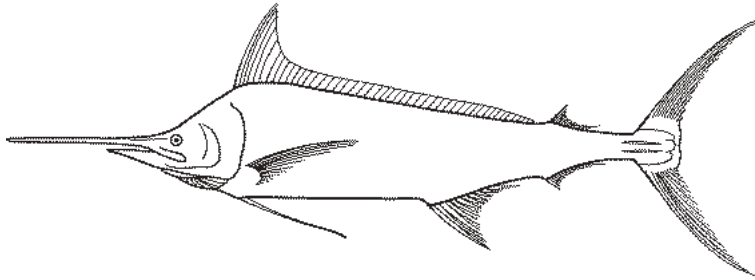
Size

Attains a length of 3.6 m and a maximum weight of ca. 58 kg, but the average is closer to 32 kg.

Ecology

Encountered only rarely in northern European waters (one was stranded on the English Channel coast of Devon in 1928), and rare even in southern European waters. It is found worldwide in tropical oceans at the edge of coastal waters and in the open sea, but is strongly migratory, travelling coastwise with seasonal warming of the water. Its food consists of smaller schooling fishes and squids, which are common in the surface waters of the sea. It is well known as a sporting fish (especially off the North American coast), and has been exploited by high-seas fisheries as a food fish.

Blue Marlin *Makaira nigricans*



Characteristics

A large streamlined fish with the snout elongated into a spear. First dorsal fin with 45-50 soft rays; high for first few rays, then much lower than body depth. Anal fin with 19-23 soft rays. Lateral line a network of interconnecting canals.

Colour

Body blue-black dorsally shading to silvery white below. Sides with about 15 vertical cobalt coloured bands. First dorsal fin blackish or dark blue; other fins brownish black; anal fin bases silvery white.

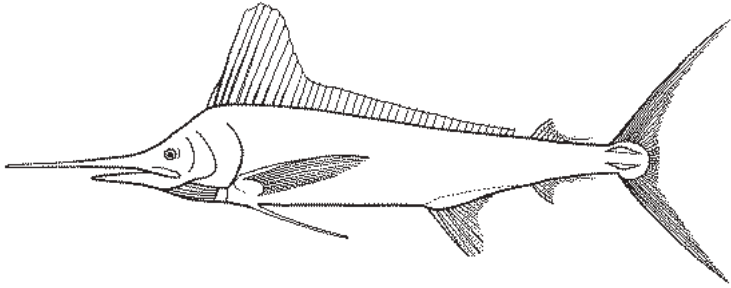
Size

Can reach a length of 5 m and a weight of 820 kg.

Ecology

Occurs in the subtropical waters of the eastern and western Atlantic at depths of 10-200 m. Blue Marlin have been found dead on the Isles of Scilly and in Pembrokeshire. Usually found singly. Feeds during daylight mainly on other fish but also eats squids and octopods. Sexually mature at 50 cm (females) and 80 cm (males). An important commercial and sport species.

White Marlin *Tetrapturus albidus*



Characteristics

Body long and streamlined with some lateral compression. Pectoral fin long. First dorsal fin with 43-52 soft rays and about as high as the body depth. Anal fin with 17-23 soft rays.

Colour

Colour Blue-black dorsally shading to silvery white below; sides with brown blotches and sometimes more than 15 rows of whitish vertical stripes. First dorsal fin dark blue with black dots; second dorsal fin dark blue; pectoral fins brownish-black; pelvic fins blue-black with a black membrane; caudal fin brownish-black.

Size

Can reach a length of 3 m and a weight of 82.5 kg.

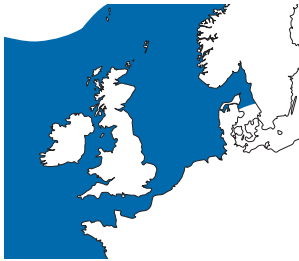
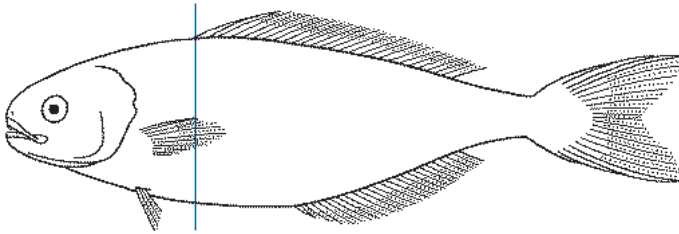
Ecology

Occurs in the warmer parts of the Atlantic Ocean, usually above the thermocline at depths of 10-150 m. Distribution varies seasonally reaching higher latitudes only during summer. Feeds on other fish and squid. One found in North West England. A commercial and sport species.

Family: Blackfishes *Centrolophidae*

The blackfishes or medusafishes are a moderately large family of oceanic fishes found at the surface and in the middle depths of the sea. Most of them occur over the outer edge of the continental shelf and further out to sea, but occasional specimens stray into shallow water. Most are rather compressed with long dorsal and anal fins, but the fin spines are soft as is the skeleton in general, and these fish are usually flabby to handle. Young specimens are usually deeper bodied than adults and many species live in association with medusae (jellyfishes); adults of some species eat medusae. Worldwide there are seven genera with some 28 species. Four species only occur in northern European seas; others live off southern Europe.

Blackfish *Centrolophus niger*



Colour

Deep brown, almost black, on the back, shading on the sides to grey and ventrally with silvery flecks. Young have dark vertical bands. Fins all dark.

Size

Attains a maximum length of 1.5 m; usually about 75 cm in length. British Rod-caught Record: 2.679 kg (1998, East Yorkshire).

Ecology

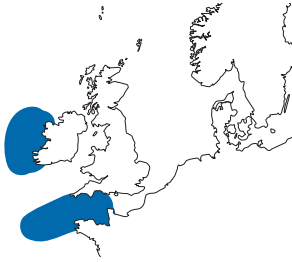
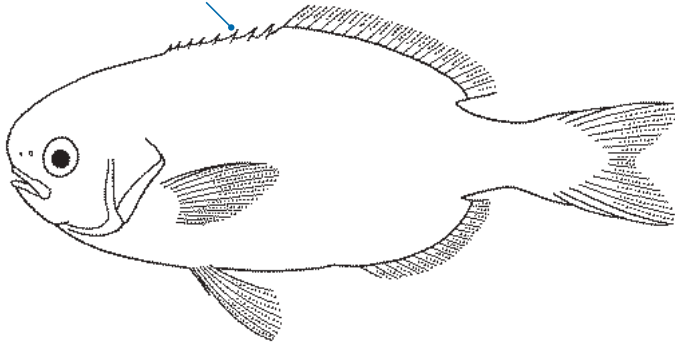
An oceanic fish found on the edge of the continental shelf and probably most abundant between 100 and 600 m, but in mid-water not on the bottom. However, numerous reports of this fish inshore, in shallow

water, suggest that it is likely to occur almost anywhere in the northern European area. Whether this is due to migration by the fishes, or to movement of water masses in which they are living, is not known. It is relatively common off the western coasts of Britain and Ireland at appropriate depths. The adults feed heavily on deep-water jellyfishes, and also eat small fishes and crustaceans. The young live in association with medusae near the surface.

Characteristics

Slender-bodied but oval in cross-section, the snout blunt and profile gently curved. The head is moderately long, equal to the body depth at the anal origin. The dorsal fin origin is well down the back, about level with the end of the pectoral fin.

Barrelfish *Hyperoglyphe perciformis*



Characteristics

Relatively deep-bodied; profile of head and body steep; body depth 2.5 to 3 times in the length; preoperculum with weak teeth. Dorsal fin of 6-8 quite strong, short, separate spines and 20-22 feeble rays.

Colour

Young are dark green above, shading to olive, white ventrally; adults are dark brown or black in colour.

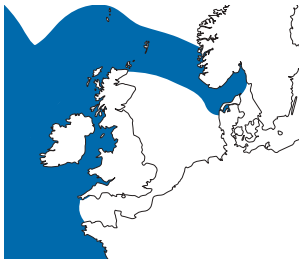
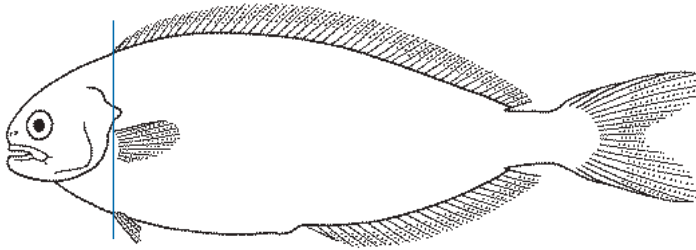
Size

Can attain a length of 91 cm; specimens in European waters usually ca 33 cm.

Ecology

A vagrant from the western Atlantic which owes its occurrence in northern European waters to the habit of the young fish of accompanying floating wreckage, or Sargassum weed, in the tropical Atlantic. Most occurrences have been of small fishes associated with floating boxes or logs, presumably drifted across the Atlantic by winds and currents. Adults are deep-water fish found along the edge of the continental shelf and submarine canyons, and are rarely encountered in European seas.

Cornish Blackfish *Schedophilus medusophagus*



Characteristics

Rather deep-bodied, but elongate and compressed from side to side (body with flattened sides in cross-section); the snout blunt and profile steep. Head short, its length about two-thirds of the body depth at the anal origin. Dorsal fin begins as short rays anteriorly set vertically in front of the pectoral fin base. Body flabby, the bones, even jawbones, flexible and elastic.

Colour

Dull brown above with a violet sheen over the body cavity, and grey-brown ventrally.

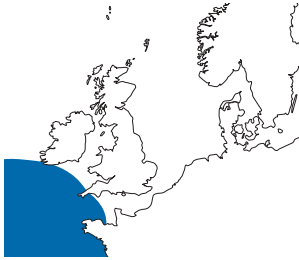
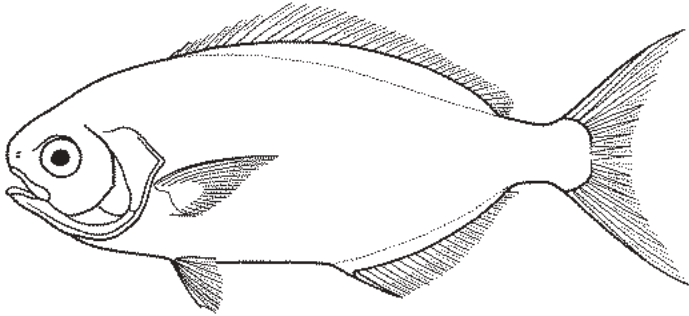
Size

Attains 58 cm in length. British Rod-caught Record: 233 g (1983, Cefn Sidan Beach).

Ecology

Adults are found in the open sea at depths of 300-900 m in mid-water, not on the bottom. They are moderately common to the west of Britain and Ireland and off the Portuguese coast on the edge of the continental shelf, but this species is only rarely found in inshore waters, in contrast to its more abundant relative, the Blackfish. It appears to eat only the large dusky coloured deep-water medusa, *Atolla*. Young fish are deeper-bodied greenish-brown above and lighter below; they are frequently found at the surface of the sea accompanying jellyfishes and flotsam. Very rarely the young are found in northern European seas, as the result of oceanic surface drift.

Imperial Blackfish *Schedophilus ovalis*



Characteristics

Body deep and moderately compressed. Body firm. Dorsal fin long, its origin over pectoral fin base, with 6-8 spines and 31-32 soft rays.

Colour

Dull brownish-black dorsally gradually shading to brownish grey below.

Size

Can reach a maximum length of 80 cm.

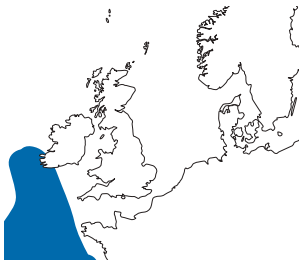
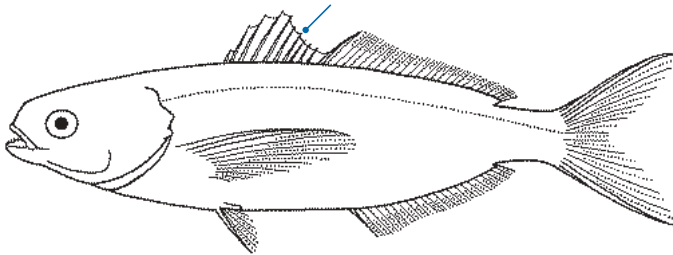
Ecology

Occurs in the eastern Atlantic and the Mediterranean at depths of 70-700 m. In 2001 a single specimen was caught off the Blasket Islands, Ireland; another was caught off Cornwall in 2004. Found mainly in deep water at the edges of continental shelves or around oceanic islands. Adults are usually found near the bottom where they feed on fish and invertebrates. Young are pelagic at first and often associated with floating jellyfish. Important in some commercial fisheries.

Family: Driftfishes *Nomeidae*

The driftfishes are a small family of mainly tropical and warm-temperate oceanic fishes of worldwide distribution. There are three genera with some 16 species. They are closely related to the blackfishes. Like their relatives, they pass through a surface-living stage when young, but the adults are deep-water fishes found in the middle waters over the edge of the continental shelf. Only one member of the family is found in northern European seas, and that very rarely; other members live in the tropical Eastern Atlantic.

Longfin Cigarfish *Cubiceps gracilis*



Characteristics

Slender and cigar-shaped body with a moderately large head and a blunt snout. Lateral line runs parallel to the back in a gentle curve. Pectoral fins long, much longer than the head length. First dorsal fin of 10-12 flexible spines, second fin longer and lower; anal fin similar to second dorsal. Scales large.

Colour

Plain medium brown in colour; slightly lighter ventrally.

Size

Attains 90 cm, but in European seas usually around 25 cm.

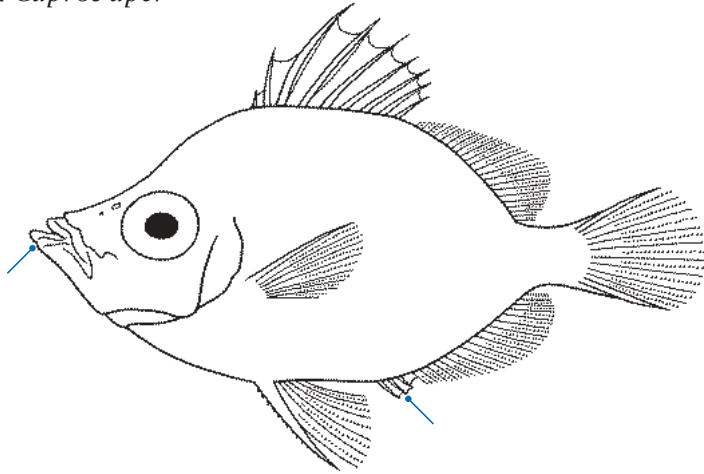
Ecology

Exceptionally rare in northern European seas and then mostly as young fish which, presumably, have been carried north by currents and wind. The young live at the surface often associating with large medusae (jellyfishes), usually in the open sea, but occasionally being drifted close inshore. Adults live on the edge of the continental shelf and are free-living predatory fishes, although little is known of the biology of this species. Closely related, if not identical, species are found in the Pacific and Indian Oceans.

Family: Boarfishes *Caproidae*

The members of the family Caproidae are found in moderate depths in all the oceans; they are deep-bodied but with rather a small but protrusible mouth; mostly they are brick red in colour. They have heavy spines in their dorsal, anal, and pelvic fins. Worldwide there are two genera and some 11 species. Only one of these occurs in northern European waters.

Boarfish *Capros aper*



Characteristics

Rather deep-bodied but with a moderately small head and pointed snout. The mouth is small but the jaws are very protrusible. The dorsal fin spines are long and strong, as is the first pelvic spine, but the anal fin spines are relatively short. The scales are small and finely toothed and the body has a sand-paper like feel to it.

Colour

Usually deep red with yellowish markings; in shallow water, yellow or straw coloured.

Size

Attains a maximum length of 16 cm, but usually about 10 cm. British Rod-caught Record: 85 g (1983, Cornwall).

Ecology

Evidently common locally in deep water on the lower continental shelf in 100-400 m. It is thought to live among the yellow and pink coral growing on the rock faces in these depths. However, it is occasionally captured in large numbers on sandy grounds, and in areas such as the western English Channel it may be fairly common for a period of two or three years and then suddenly disappear. It spawns in summer, the eggs and larvae are planktonic, but spawning takes place only as far north as Britain and Ireland. It feeds entirely on small crustaceans. Regularly found on beaches or in rockpools, usually dead but any live ones seem to survive if returned to the sea.

Order:

Pleuronectiformes

Flatfishes

The flatfishes are one of the most distinctive of fish orders. Worldwide, there are 14 families, with some 134 genera and about 678 species.

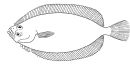
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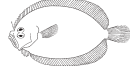
Four-spot Megrim



Megrim



Norwegian Topknot



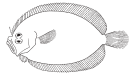
Turbot



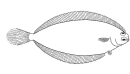
Brill



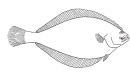
Topknot



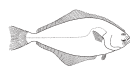
Eckström's Topknot



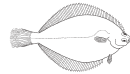
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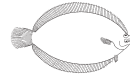
Long Rough Dab



Halibut



Dab



Lemon Sole



Flounder



Plaice



Greenland Halibut



Imperial Scaldfish



Scaldfish



Thor's Scaldfish



Solenette



Bastard Sole



Thickback Sole



Sand Sole

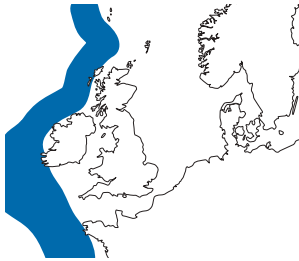
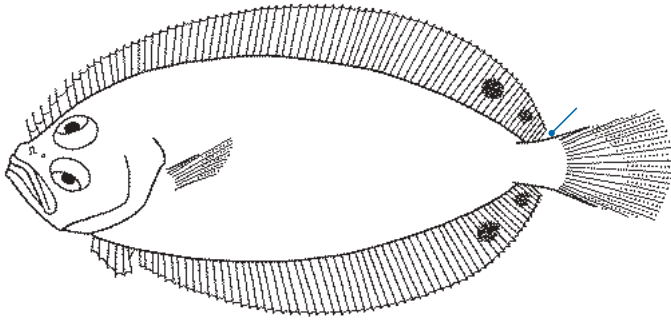


Common Sole

Family: Left-eyed Flatfishes *Scophthalmidae*

The Scophthalmidae is a small family of flatfishes which have both eyes on the left side of the head (reversed specimens are rare). During larval development the right eye moves from the right side of the head and comes to rest close to the left eye. Members of the family are wide-bodied with large heads and well-developed pelvic fins, which are approximately the same size on each side. The family is confined to the Atlantic basin and has four genera and eight species. It includes several valuable food fish such as Turbot and Brill, as well as a number of minor species. Seven species are included here.

Four-spot Megrim *Lepidorhombus boscii*



Characteristics

A narrow-bodied flatfish with large eyes and mouth. The dorsal and anal fins end with the bases of the last two rays on the blind side. Eyes very large, level with one another, their diameter longer than the snout length. Lower jaw slightly prominent. Pelvic fins long-based, equal on both sides. Dorsal fin rays number 75-86; anal rays 65-69.

Colour

Pale yellowish-brown without dusky markings on back except for two rounded black blotches on the end of both the dorsal and anal fins. White on the blind side.

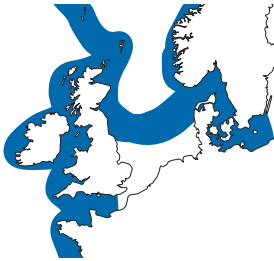
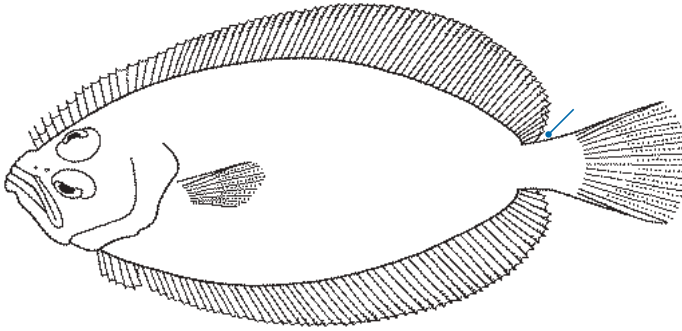
Size

Can attain a length of 40 cm; usually around 32 cm.

Ecology

Lives in deeper water than the Megrim, and is usually captured lower down the continental slope in depths of -1,000m, although in the Mediterranean it is found in shallower water. It is quite common, but confined to muddy grounds. It has only minor importance as a food fish in northern Europe, but off the Spanish coast it is captured in some quantity.

Megrim *Lepidorhombus whiffiagonis*



Characteristics

A rather narrow-bodied flatfish with a moderately large head, large eyes and mouth. The dorsal and anal fins end with the base of the last two rays on the underside. Eyes large, the lower one in front of the upper, their diameter just less than the snout length. Lower jaw distinctly prominent. Pelvic fins long-based, equal on both sides. Dorsal fin rays number 85-94; anal rays 64-74.

Colour

Pale yellowish-brown with dusky patches; ventrally white.

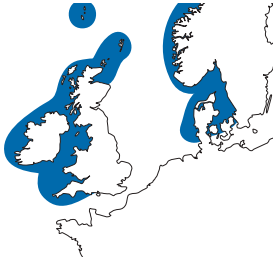
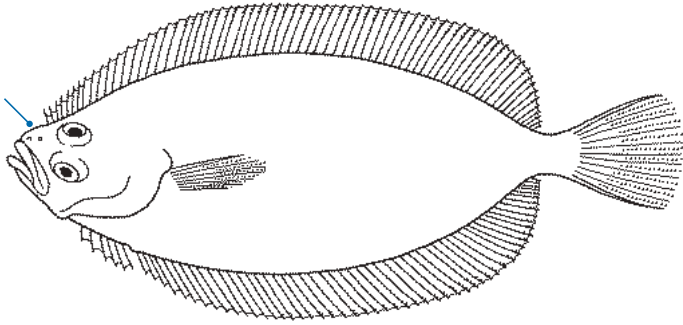
Size

Attains a length of 61 cm; usually between 35 and 45 cm. British Rod-caught Record: 1.715 kg (1973, Gairloch). Irish Record: 1.85 kg (1987, Killala).

Ecology

A common flatfish found on the lower continental shelf at depths of 50-300 m, and most abundant on muddy bottoms, although not confined to that habitat. It spawns in spring in deep water, the eggs being transparent and pelagic. The postlarvae change to a bottom-living life at about 19 mm in length. The Megrim feeds mainly on fishes including scaldfishes, sandeels, dragonets, gobies, and smaller members of the cod family. It also eats crustaceans and squids. It is taken in some quantity by trawling and is of moderate importance to the fishing industry, but its flesh is rather dry.

Norwegian Topknot *Phrynorhombus norvegicus*



Characteristics

Rather slender-bodied with a small head and a smooth profile to the snout. The dorsal and anal fins fairly high, and continue on to the lower side of the body to form distinct lobes; pelvic fins are long-based and equal in size; both are free of the anal fin. Scales are moderately large, on the eyed side having teeth on the edge making the body feel rough; ventrally these teeth are smaller.

Colour

Yellowish-brown with irregular dusky marks, sometimes a mosaic of large colourful patches on the head and back, also on dorsal and anal fins.

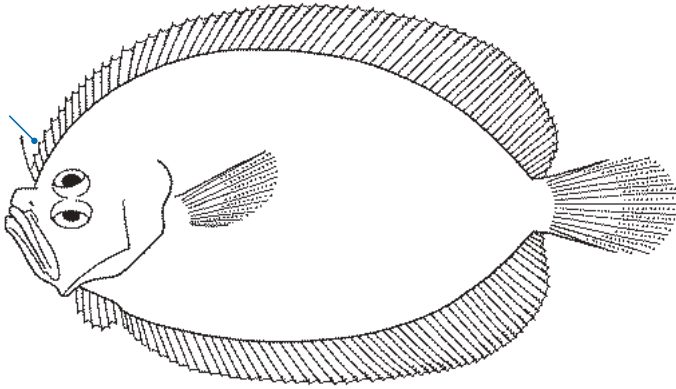
Size

Grows to a length of 12 cm.

Ecology

A moderately common flatfish, but one which is not often captured because of its small size and of its habit of living amongst rocks and on rough grounds. It lives at depths of 20-50 m, but has been caught as shallow as 10 m and as deep as 170 m. Its biology has been little studied. Its food consists of worms, crustaceans and young fishes, and it breeds in late spring and summer. The young fish start to live on the sea bed at a length of 13 mm.

Turbot *Psetta maxima*



Size

Attains a length of 1 m and a weight of 25 kg; more usual lengths are 50-80 cm and weights are ca 5-12 kg. Females are larger than males. British Rod-caught Record: 15.308 kg (1980, Salcombe). Irish Rod-caught Record: 15.422 kg (1982, Cork Harbour).

Characteristics

Body extremely broad and rather thickset; head large; broad-based pelvic fins of virtually equal size; a large mouth. The first rays of the dorsal fin are branched, but only their extreme tips are free from the fin membrane. Body scaleless but with irregularly scattered large bony tubercles in the skin, sometimes present on the blind side only. Dorsal fin rays number 57-71; anal fins 43-52.

Colour

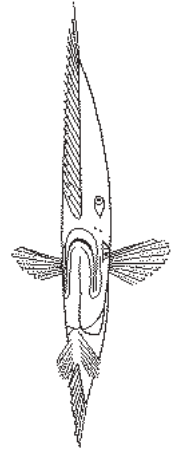
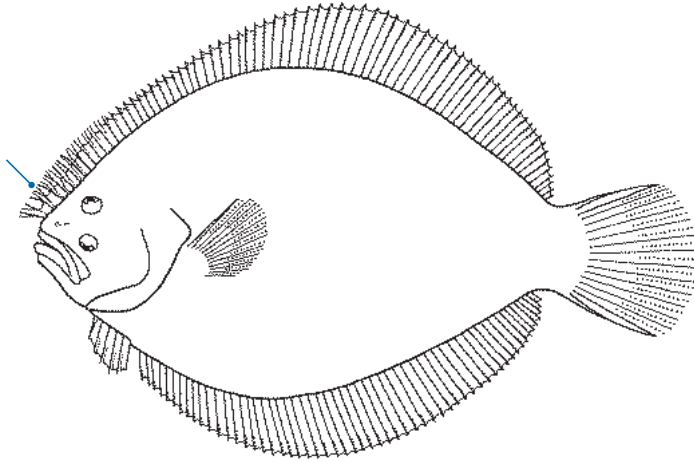
Very variable to match the sea bed; generally it is a dull sandy-brown with darker spots and speckles extending on to the fins, including the tail fin which is heavily spotted.

Ecology

Like the Brill, the Turbot is close to the extremity of its range in northern European waters and rapidly becomes scarce to the north of Britain, although it is common in the southern North Sea, Irish Sea, and the English Channel. The Turbot lives in shallow inshore waters from just below the shoreline to about 80 m on shell-gravel, gravel, and sandy bottoms. Young fish live in shallower water than adults, which are particularly common on offshore banks; the young of less than one year are common in the breakers and tidal pools of sandy shores. The Turbot feeds very heavily on fishes. It is an active predator capturing

large quantities of sandeels, Sprat, Herring, Whiting, Pouting, and less often other flatfish species, dragonets, and gobies. It spawns during spring and summer, the females producing up to 10 million eggs. The eggs and larvae are pelagic, and the postlarvae have a distinct swim-bladder which is lost when the young fish begins to live on the sea bed at 2.5 cm. The extended pelagic life, which may continue for 4-6 months, assists in the dispersal of the young Turbot from the rather restricted spawning grounds. This is one of the most valuable of marine food fish and is ranked by many as the finest flavoured. It is caught in trawls, seines, and by lines, but is never sufficiently abundant to satisfy demand. The North Sea and Irish Sea stocks of Turbot are depleted, and in consequence it is one of the most promising sea fishes for intensive culture; some success has already been achieved here.

Brill *Scophthalmus rhombus*



Front view



Characteristics

A broad-bodied, heavy-headed flatfish, with a large curved mouth, and broad-based pelvic fins. The first rays of the dorsal are free of the fin membrane for up to half their length, giving the appearance of a frill. Body covered with scales, small but distinct on the eyed (coloured) side, small and embedded in the skin in the blind side. Dorsal fin rays number 73-83; anal fin rays 56-62.

Colour

Colour Dull sandy-brown with small darker flecks and lighter spots, changing with the bottom it is on; the fins are lighter, the tail fin not spotted; underside creamy-white.

Size

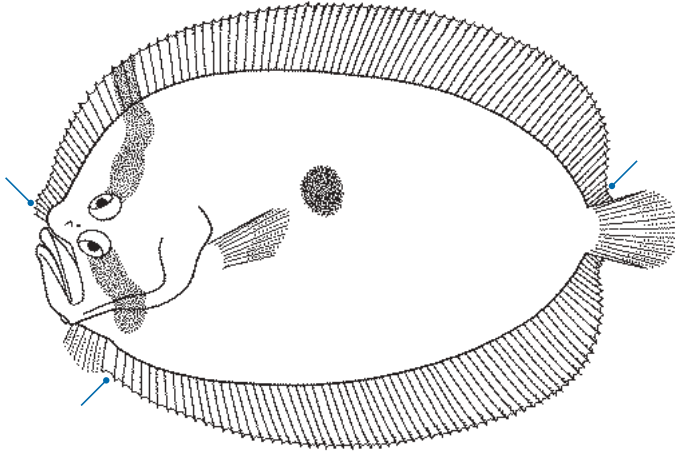
Attains a maximum length of 75 cm, but not usually longer than 50 cm. Usual weights are around 2.3-3.6 kg and the maximum is ca 7.5 kg. British Rod-caught Record: 7.257 kg (1950, Isle of Man). Irish Rod-caught Record: 4.309 kg (1984, Causeway Coast).

Ecology

The Brill reaches the northern extremity of its range in northern Europe, and north of England and Denmark it declines in abundance quickly. It is common to the south of these countries. Adults are bottom-living in depths of 10-70 m, but the young (about postage stamp size) are common close inshore and even in intertidal pools on sandy shores. It is most common on sandy bottoms, but is

occasionally caught on gravel and mud. It preys on a wide range of bottom and near bottom-living fishes, especially sandeels and Whiting, and also eats squids and crustaceans in large quantities. It spawns in spring and summer; the eggs and larvae are pelagic. The larva hatches out at a length of ca 4 mm and becomes bottom-living at 20-35 mm. The Brill is of some commercial importance; as food its flesh is less tasty than that of the Turbot. A number are caught by anglers.

Topknot *Zeugopterus punctatus*



Characteristics

A wide-bodied flatfish with a large head, the dorsal fin origin just behind the upper lip. The dorsal and anal fins end with a distinct lobe on the underside of the tail. Pelvic fins long-based, equal in size, and joined to the anal fin by a distinct membrane. Scales with teeth, which feel rough, on upper side.

Colour

Warm brown on the eyed side with irregular dusky mottling; a rounded dark blotch on the lateral line in the mid-body, diagonal dark lines running to the eyes.

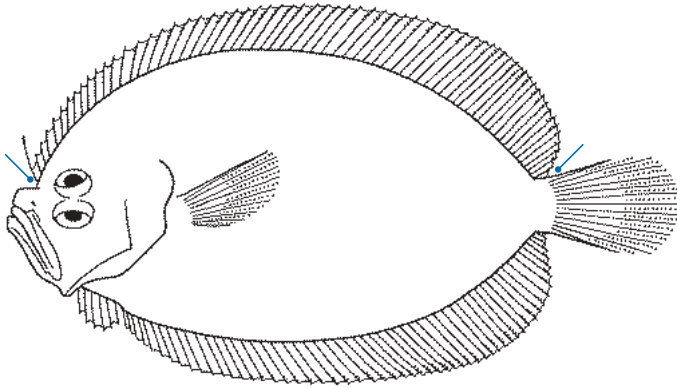
Size

Attains a length of 25 cm.
British Rod-caught Record:
382 g (1998, Guernsey).

Ecology

A rarely seen flatfish of rather restricted distribution, being found all around Ireland and Britain, but not on the east coast due to lack of suitable habitat. It is the only common flatfish that lives among rocks and on rough grounds in 1-40 m and is occasionally captured on the low shore amongst algae. Those on the shore are usually found clinging flattened to the sheltered side of boulders in the kelp (*Laminaria*) zone; these are usually young fish. They shelter upside down on the underside of rocks, where their shape and remarkable camouflage makes them nearly invisible. The food is said to consist largely of young fishes and crustaceans, but the diet has not been adequately studied. The Topknot spawns in spring.

Eckström's Topknot *Zeugopterus regius*



Characteristics

A broad-bodied flatfish with a rather small head, the snout deeply notched in front of the upper eye. The dorsal and anal fins continue on to the lower side of the body forming distinct lobes; pelvic fins are long-based, both equal in size and not joined to the anal fin. Scales small, each with several strong spines on the eyed side, giving a rough feel to the body; on the blind side the scales are less strongly toothed and smaller.

Colour

Warm brown with irregular dusky patches, one distinct dark blotch with lighter centre on the lateral line towards the tail; often with a dark blotch in the middle of the side and indistinct dark bands going diagonally back from it to the unpaired fins giving an inverted V pattern.

Size

Attains a length of 20 cm.

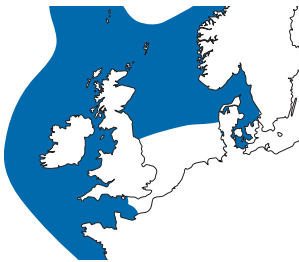
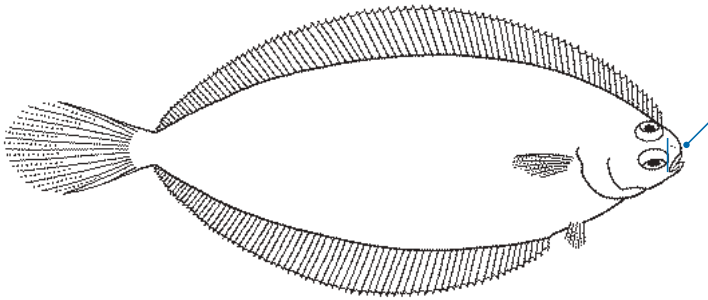
Ecology

A relatively uncommon fish which seems to be found in offshore waters and coastal lochs on the western coast of Europe, and in the mediterranean. It is found on rough grounds, and may cling to the underside of rocks, which would partially explain its apparent rarity. Its depth range is 9-55 m. Occasionally specimens have been caught in sandy bays on the western coast of Britain. It spawns in April to June; the eggs and postlarvae are planktonic. Its biology is little known.

Family: Right-eyed Flatfishes *Pleuronectidae*

The Pleuronectidae is a large family of flatfishes which all have both eyes on the right side of the body, the left eye moving over the head during metamorphosis from post-larva to bottom-living young. Reversed examples, those which have both eyes on the left of the fish, are common in some species, e.g. Flounder, less common in others, e.g. Plaice and Dab, and relatively rare in the remaining species. The family is widely distributed in the cool temperate waters of the Atlantic, Pacific, and Indian Oceans, being best represented in the first. Most are shallow-water, bottom-living fishes, but some are found in deeper water on the upper continental shelf. Some species, especially the Greenland Halibut and to a less extent the Halibut, live at least partly in mid-water and are active hunters of fish. These species have the upper eye closer to the edge of the head (which presumably allows a wider field of vision), and the teeth are strongly developed in both sides of the jaws. Worldwide there are 23 genera with some 60 species. Eight species are known from northern European seas; one of these (the Flounder) also lives in fresh water but does not breed there.

Witch *Glyptocephalus cynoglossus*



Characteristics

A very slender, narrow-bodied flatfish with the eyes on the right side of the head. Head small; eyes relatively large; mouth small. The lateral line is very slightly curved above the pectoral fin; scales are small, lightly toothed and very fragile, particularly on the eyed side. Blister-like cavities on the underside of the head.

Colour

Eyed side a uniform grey or grey-brown with a dusting of darker points on the fins and a dusky pectoral fin. Blind side white.

Size

Attains a maximum length of ca 55 cm; usually around 35 cm. British Rod-caught Record: 533 g (1967, Colwyn Bay).

Ecology

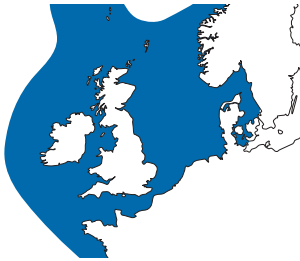
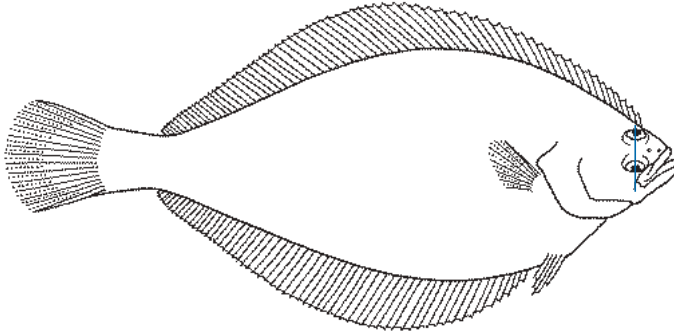
A moderately deep-water flatfish which lives on the lower continental shelf from 50-900 m and deeper. It appears to be confined to mud and mud-sand bottoms, and is especially common in the deep fiords of the Norwegian and Faeroese coasts. Its food consists of bottom-living invertebrates, especially small crustaceans

Continued: Witch *Glyptocephalus cynoglossus*

and worms. It spawns in summer, and the eggs and young stages float near the surface. At a length of 4-5 cm the young fish start living on the sea bed. Its growth is rather slow, sexual maturity is attained in three to four years, and the Witch may live for 14 years.

It is of some importance as a food fish in northern European waters, especially off Iceland, Faeroe, Norway, and Sweden. It is mostly captured in trawls.

Long Rough Dab *Hippoglossoides platessoides*



Colour

Uniform pale brown, sometimes with a russet tinge; ventrally white.

Size

May attain a length of 50 cm, usually around 30 cm. British Rod-caught Record: 155 g (1975, Loch Long).

Characteristics

A rather slender narrow-bodied flatfish with the eyes on the right side of the head, a rather small head, but with a large mouth (the edge of the jaws reaches the middle of the eye). Eyes large (diameter greater than snout length). Lateral line slightly curved over the pectoral fin. Scales relatively large, fine teeth on their edges giving the eyed side particularly a rough texture. Tail fin with middle rays longest.

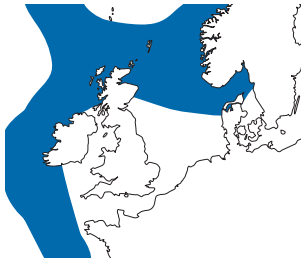
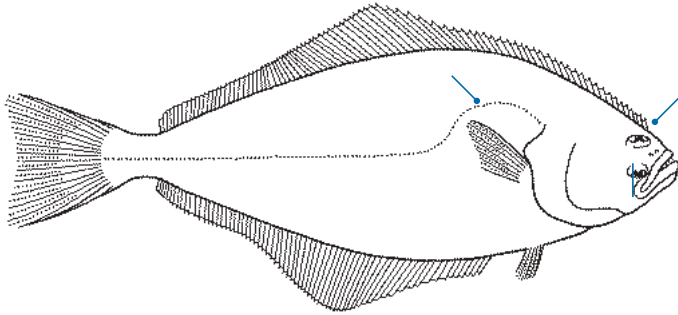
Ecology

A common flatfish which lives in moderately deep water on the lower continental shelf on fine sandy or muddy bottoms.

It seems to be most abundant at depths of ca 40-180 m, although its extreme depth ranges are 4-400 m. These greater depths are usually only in the southern parts of its range. It spawns in spring, the eggs and larvae being pelagic until the latter reach a length of 2-3 cm, when they live in mid-water. Postlarval development continues in deeper water and the young are bottom-living from 3.5-4.5 cm. The Long Rough Dab becomes sexually mature after two or three years, but in the far north after 7 to

10 years. It lives for some 17-20 years; but all such old fish are females. Its food consists of crustaceans of various kinds, worms, molluscs, and brittlestars, and rather few fish. It has virtually no value as a food fish as its flesh is watery and insipid. The Greenland and North American populations are subspecifically distinct, *H. platessoides platessoides*; the European populations are *H. platessoides limandoides*.

Halibut *Hippoglossus hippoglossus*



Characteristics

A slender-bodied but thickset right-eyed flatfish, with a moderate-sized head and very large mouth. Lower jaw is prominent; both jaws have large teeth. The lateral line has a strong curve above the pectoral fin. Dorsal fin originates by the front edge of the upper eye; tail fin square cut or slightly concave. Scales small and embedded in the skin. It has a narrow caudal peduncle and emarginate tail.

Colour

Colour Dull greeny-brown, sometimes almost black; the blind side is pearly white.

Size

The halibut is the largest flatfish and attains a maximum length of 2.54 m and weight of 320 kg; today rarely above 2 m. Records of Halibut of 3-4 m exist from the period before the stocks were heavily fished. British Rod-caught Record: 106 kg (1979, Dunnet Head). Irish Rod-caught Record: 70.762 kg (1972, Belmullet).

Ecology

The Halibut is a deep-water boreal flatfish found at depths of 50-2,000 m, but seasonally migratory and living at different depths at different times of its life. It is found on a wide range of bottoms, from sand and gravel to rocky grounds, but it is not confined to the sea bed, as are most flatfishes, for it is an active predator which forages in mid-water. Young Halibut feed heavily on the deep-sea prawn, *Pandalus borealis*, and other crustaceans; they also eat squids, and fishes such as sandeels, and deeper water flatfishes. The adults, however, eat fishes of many kinds:

Herring, Haddock, Cod, rattails, Capelin, redfish, and small skates, squids, and some crustaceans. There are probably few fish species that are common in the depths inhabited by the Halibut which are not eaten from time to time. The Halibut spawns in winter and early spring close to the sea bed in depths of 400-1,000 m, on the edge of the northern continental shelf. The eggs (which are very numerous) drift in deep water until they hatch in 9-16 days. The postlarvae metamorphose into young flatfish at around 3-3.5 cm, and by a length of 4 cm they are bottom-living. The young fish live close inshore for two to four years, then gradually move into deeper water until they are sexually mature at 10-14 years. Mature females and the well-grown young are more common on offshore banks, but the mature males live on the edge of the continental shelf. The females move into deeper water to spawn, and both sexes make a northerly migration in summer to the richer offshore feeding-

Continued: Halibut *Hippoglossus hippoglossus*

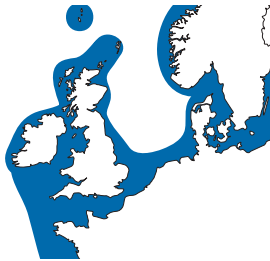
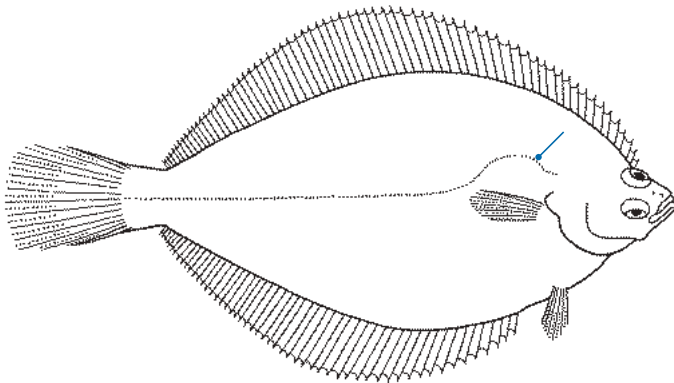
grounds after spawning.

Females are larger than males at all ages, and outlive them today to 35-40 years; formerly, before fishing pressure was intense, to possibly 50 years.

The Halibut is an important food fish caught mainly on hook and long-line, although a few are taken by trawl. Its flesh is firm and of excellent flavour.

However, owing to its slow growth rate, and the relatively late age at which it becomes sexually mature, it is very vulnerable to over-fishing and stocks are greatly diminished in the North Atlantic. The range is itself restricted compared with its original status. It is now listed by the IUCN in the Red Data book as Endangered

Dab *Limanda limanda*



Characteristics

A small diamond-shaped flatfish with a small mouth, but with a moderate-sized head. Teeth better developed on the blind side. The lateral line is strongly curved above the pectoral fin on the eyed side. The scales on this side have fine teeth on their edges and the body has a distinctly rough feel; on the blind side only the edges of the body are rough. Anal fin rays number 50-64.

Colour

Usually warm sandy-brown, varying from light brown to grey-brown with small darker freckles and often small red or yellow spots on the eyed side; white on the blind side.

Size

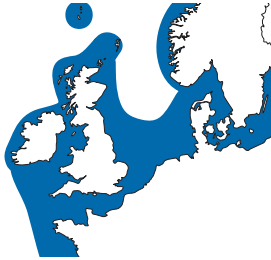
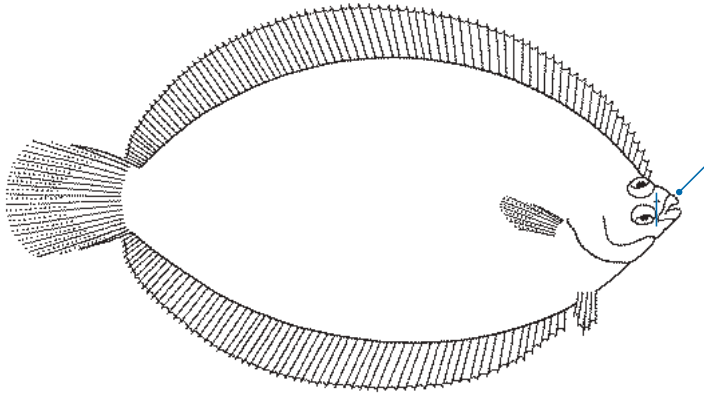
Size Grows to about 42 cm in length and 1.3 kg in weight; not usually longer than 25 cm. British Rod-caught Record: 1.254 kg (1975, Wester Ross). Irish Rod-caught Record: 1.063 kg (2002, Cork Harbour).

Ecology

An extremely abundant fish especially in the North Sea, and on other shallow, sandy grounds in northern Europe. It lives mainly at depths of 20-40 m, but small specimens are found as shallow as 2 m; adults have been caught at 150 m. In addition to the young fish living in shallow water, adults move inshore in the summer in a seasonal migration. The Dab spawns in spring and early summer, the eggs, larvae, and postlarvae being pelagic, while young fish live on the sea bed from a length of 13-18 mm. They become sexually mature at two (males) or three (females) years of age, and live for 11-12 years in all. The food of the Dab is variable with local conditions, but in general it eats almost any

bottom-living invertebrate abundant locally which is small enough to be captured. Numerous kinds of small crustaceans, polychaete worms, and molluscs make up its bulk. It is a moderately important flatfish to the fishing industry and is caught mainly as by-catch in trawls and Danish seines. It is also popular with anglers, despite its small size, for it is common in inshore waters and takes a bait eagerly. When fresh, it has probably the best-flavoured flesh of all the flatfishes.

Lemon Sole *Microstomus kitt*



Characteristics

A very broad-bodied species, its greatest width being almost half its length, thick and fleshy. It has a small head (length about one-fifth of the body length) and very small mouth with protuberant lips. Teeth better developed on the blind side. The scales are smooth-edged and the skin is smooth to the touch; there is a shallow curve in the lateral line above the pectoral fin.

Colour

Generally warm brown with irregular mahogany markings and flecks of yellow and green on the eyed side.

Size

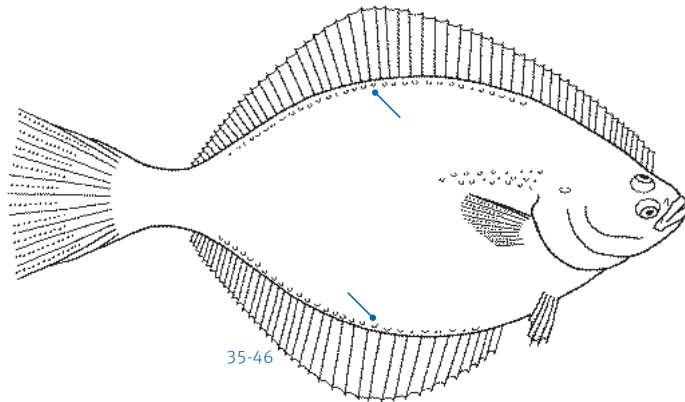
Attains a length of ca 66 cm and a weight of ca 2.9 kg. British Rod-caught Record: 1.500 kg (2006, South Devon).

Ecology

A widespread flatfish in northern European waters where it seems to be common in suitable habitats. It lives on a wide range of bottoms from mud (exceptionally), to sand, gravel, even rocky grounds, in depths of 40-200 m, particularly on offshore banks. Small specimens can, however, be caught close inshore. It spawns in spring and summer in depths of ca 100 m; the eggs and larvae are planktonic, while the postlarvae are found in mid-water and become bottom-living at a length of ca 3 cm. It becomes sexually mature at 3-4 years (males), 4-6 years (females), and may live for 17 years. The

Lemon Sole is rather a specialized feeder on polychaete worms, but it also eats numerous crustaceans and molluscs, although its small mouth is a limiting factor in size of prey. It fasts during most of the winter months. It is a moderately important food fish, especially as it is not on a quota, caught mainly in trawls; the British market takes most of the European catch. It is very rarely caught by anglers.

Flounder *Platichthys flesus*



Characteristics

Similar in general appearance to the Plaice, but lacks the line of bony knobs on the head. Small but sharp prickles along the bases of the dorsal and anal fins. Scales smooth-edged, lateral line straight; also prickly. Anal fin rays number 35-46. Teeth better developed on the blind side. The tail is square-cut. Frequently 'reversed', so that the eyes and colouring are on the left side.

Colour

Dull brown, even greenish-brown with indistinct reddish or orange blotches on the eyed side; blind side opaque and dull white.

Size

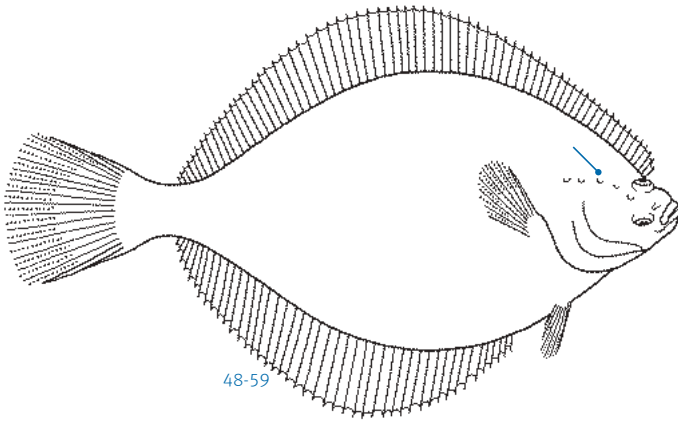
Attains 51 cm in length and a weight of ca 3 kg. British Rod-caught Record: 2.593 kg (1956, Cornwall). Irish Rod-caught Record: 2.227 kg (1993, Ballyteigue).

Ecology

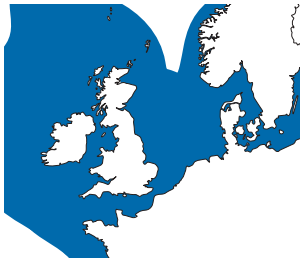
A widespread European fish living from the tide line to 55 m, and also penetrating into fresh water so that it is found in rivers and lakes in communication with the sea, where the water is entirely fresh. The Flounder penetrates further into fresh water in more northern, cooler conditions than in the south. It lives on sandy and muddy bottoms. It feeds on a wide range of bottom-living invertebrates, especially molluscs such as cockles, worms, and crustaceans (brown shrimps particularly). It will graze on the feeding siphons of estuarine bivalves, biting them off when they emerge to seek food. Young fish eat smaller crustaceans, for example, sandhoppers, fairy shrimps, and young

brown shrimps. Close inshore the Flounder makes migrations up the shore to feed at high tide, retreating as the tide falls. It is more active at night-time than by day. It breeds in spring at depths of 25-40 m, the eggs, larvae, and postlarvae being surface-living. The flounder lives on the sea bed from a length of 1.5-3 cm. The very young live close inshore and, at about the size of a postage stamp, are very abundant in the tidal reaches of rivers. The Flounder is caught in some quantity in northern Europe, especially in the Baltic Sea, but it is not an important food fish. It is rather more valuable as an angler's fish owing to its habit of living close inshore. Occasionally it interbreeds with the Plaice; the hybrid is intermediate in form between the parent species.

Plaice *Pleuronectes platessa*



Front view



kg. British Rod-caught Record: 4.635 kg (1974, Longa Sound). Irish Rod-caught Record: 3.733 kg (1982, Ballycotton Pier).

Ecology

The Plaice is a bottom-living fish, most abundant on sandy bottoms, but also found on muddy bottoms and gravel in depths of 0-200 m. It is most common in 10-50 m. Young fish, even newly metamorphosed Plaice of ca 2 cm, live in the shallower depths from the shoreline to 10 m. It is not uncommon to find them in sandy intertidal shore-pools. Large fish also come into the tidal zone to feed at high tide on sand and mud flats. Plaice eat a wide range of bottom-living animals, especially molluscs, including burrowing species which often have their breathing siphons nipped off (the jaws with their teeth larger on the underside are well adapted to do this). They also eat large numbers of crustaceans and worms, and less often brittlestars and sandeels. The Plaice

spawns in the early months of the year, mainly between January and March, throughout its range, but tending to be concentrated on certain areas in depths of 20-40 m. The zeggs float at the surface initially, hatching in 10-20 days depending on the temperature. The larvae and postlarvae are also surface-living for between 4 and 6 weeks, after which, with the eye now migrated to the right side and other internal changes completed, it becomes bottom-living at a length of 10-17 mm. By this time the young fish have usually drifted into shallow inshore water. The Plaice is the most important flatfish of the northern European fishing industry. It is caught mainly in trawls and Danish seines, but can be captured on lines and in set nets. Heavy fishing has resulted in the largest Plaice now being very rare for it is a long-lived species becoming sexually mature at 2-6 years (males) and 3-7 years (females), and living for up to 30 years. It is also commonly caught by anglers.

Characteristics

A typical flatfish, in normal specimens with both eyes on the right side of the head, head and jaws relatively small, eyes moderate in size. Teeth best developed in the jaws of the blind side. Scales smooth-edged; lateral line straight; a line of 4-7 bony knobs on head between upper gill opening and eyes. Anal fin rays number 48-59.

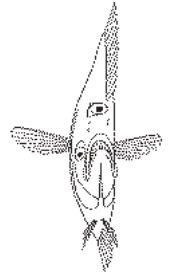
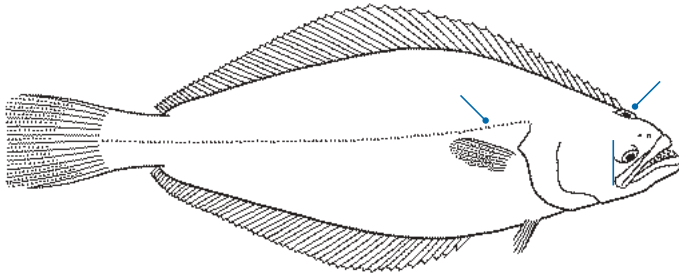
Colour

Eyed side warm brown with large, bright red or orange spots; blind side is clear pearly white.

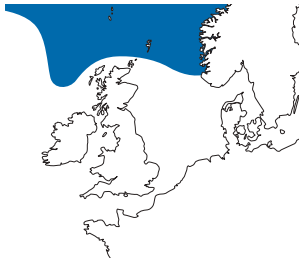
Size

Exceptionally grows to 91 cm in length and weighs 7 kg; more usually around 50 cm and 1.1

Greenland Halibut *Reinhardtius hippoglossoides*



Front view



Colour

Medium brown to dark greeny-brown on the eyed side; blind side dark, brown or bluish.

Size

Size Maximum length ca 120 cm, weight ca 45 kg; usually 80-100 cm and 11-25 kg.

Ecology

The Greenland Halibut is a boreal species which lives in deep water on the edge of the continental shelf in 200-2000 m, although north of the Arctic circle it may be caught in water as shallow as 500 m. It is not a bottom-living fish and ranges in mid-water in search of food such as deep-sea prawns, Cod, Arctic Cod, eelpouts, Capelin, and Redfish, as well as squids. It is an active, mid-water hunter, as its near symmetry (when compared with other flatfishes) and colouring suggest. It spawns in 700-1,500 m in summer, and the eggs, larvae, and postlarvae are all found free-floating in deep water. Metamorphosis is completed at a length of 6-8.5 cm; the young may be

found then in the shallower regions inhabited by this flatfish. The Greenland Halibut is exploited by the fishing industries of the more northerly European countries, as well as by Greenland and North America. Most are captured on long lines. Its flesh is inferior to that of the Halibut. It is also found in the North Pacific.

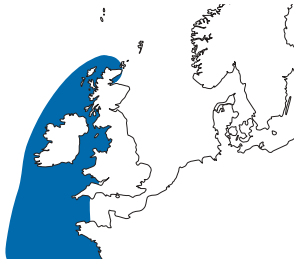
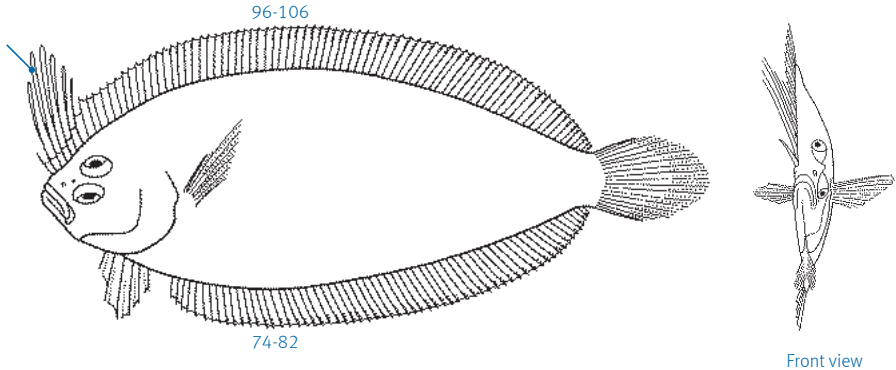
Characteristics

Rather slender-bodied but thickset; eyes on the right side of the head. Head moderately large, jaws very large with long, fang-like teeth. Eyes large, the upper eye on the extreme edge of the body. Lateral line virtually straight from head to tail; scales small and embedded. The dorsal fin origin is beside the rear edge of the upper eye. Tail fin square-cut in adults, slightly concave in young fish.

Family: Scaldfishes *Bothidae*

The scaldfishes are a large family of flatfishes, closely related to left-eyed flatfishes and sharing their feature of having both eyes on the left side of the head. Family members are distinguished by having the dorsal fin beginning right in front of the eyes, and all fin rays segmented and none spiny; the pelvic fins are short-based, that on the eyed side being larger than the other. The family, which has 20 genera and some 140 species, is widely distributed in tropical and warm temperate seas in all the ocean basins. Most live in shallow water, but two of the three northern European representatives are moderately deep-water fishes; others live in the Mediterranean.

Imperial Scaldfish *Arnoglossus imperialis*



Characteristics

Slender-bodied with a small head and a moderate mouth; eyes on the left side. The dorsal fin origin is in front of the upper eye, and the second to fifth rays are long and thickened (free of the membrane and very long in males; free at the tips and about twice the length of the remaining rays in females). Pelvic fin on the blind side shorter than the other fin. Dorsal fin rays number 95-106; anal rays 74-82. Lateral line scales 58-63; fragile and easily shed.

Colour

Pale yellowish-brown with irregular small flecks on back. Conspicuous black patch on the rear edge of the pelvic fin (males), grey in females.

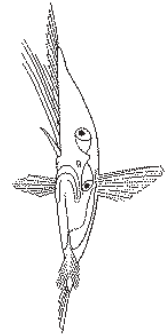
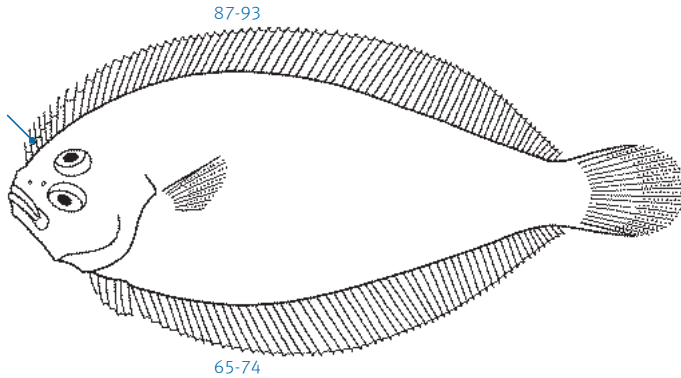
Size

Attains a length of 25 cm.

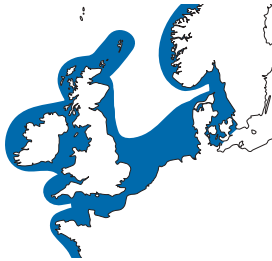
Ecology

Moderately common in deep water to the west of the British Isles from 60-350 m, but most abundant in 60-100 m. It lives mainly on sandy or muddy grounds. Spawning takes place in spring, the planktonic larval stage is prolonged, and the young start to live on the bottom at ca 3-5 cm in length. The biology of this scaldfish is very poorly known.

Scaldfish *Arnoglossus laterna*



Front view



Characteristics

Slender-bodied with a small head and a moderate mouth; eyes on the left side. The dorsal fin begins in front of the upper eye, its first rays free of the fin membrane but not elongate. Pelvic fin on blind side much shorter than the other. Dorsal fin rays number 87-93; anal fin with 65-74 rays. Lateral line scales 51-56; body scales fragile and usually missing in trawl caught specimens.

Colour

Pale brownish-grey with a cryptic pattern of multicoloured blotches, diffuse darker spots and dark dots on the fins; the pelvic with a dusky spot.

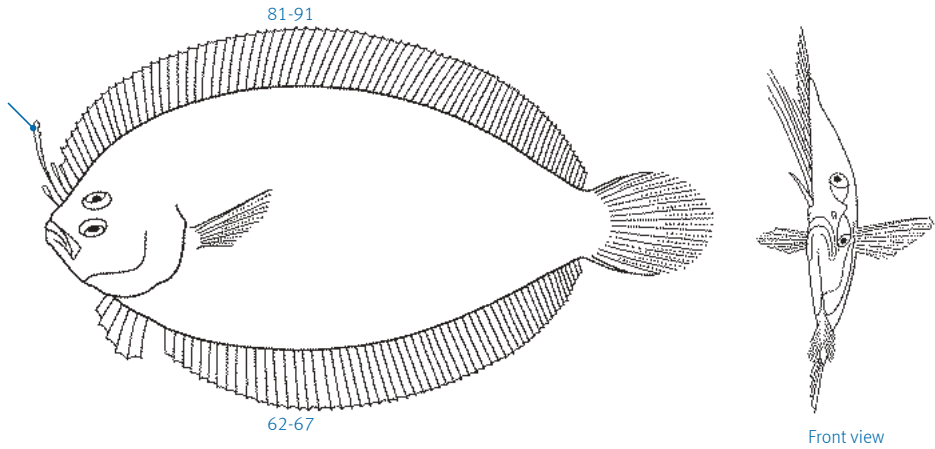
Size

Attains a length of 19 cm.

Ecology

A common fish in shallow water in northern Europe. It lives most abundantly on sandy bottoms at depths of 10-60 m, although occasionally it has been captured as deep as 200 m. It spawns in spring and summer; the eggs and larvae are pelagic, and development often continues for a considerable time. They become bottom-living at a length of 16-30 mm. Little is known of the life history of this fish. It is too small to have any value as a commercial species, but its abundance (as in the southern North Sea) suggests that it may be of importance in the food-chains of such areas.

Thor's Scaldfish *Arnoglossus thori*



Characteristics

Closely similar to the other scaldfishes; like them the pelvic fin on the blind side is much smaller than the other. The dorsal fin origin is in front of the upper eye, the first, third, and fourth rays a little longer and thicker than the remainder, the second very long with a fleshy flap on its edge. Dorsal fin rays number 81-91; anal rays 62-67, lateral line scales 49-56; fragile and easily shed.

Colour

Brown or greyish above, with dusky spots and blotches, two of which (behind the curve in the lateral line, and near the tail fin) are conspicuous. Membrane on second dorsal spine very dark.

Size

Grows to a length of 18 cm.

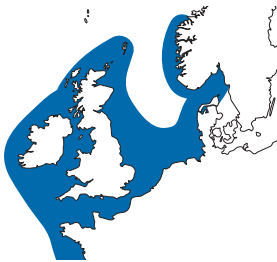
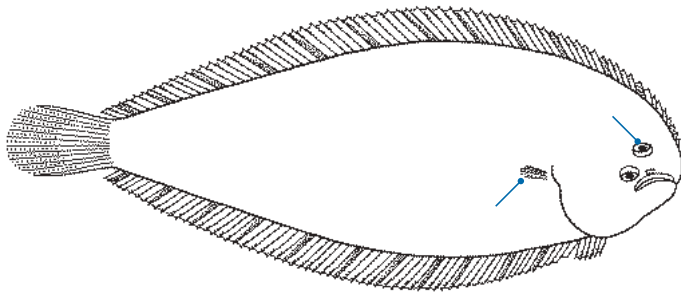
Ecology

Of very restricted distribution in northern European seas. It lives in inshore waters of 15-100 m mainly on mud and sand bottoms, although it has been captured on rough grounds. It spawns in spring in southern Biscay, presumably later further north. The eggs, and characteristically deep-bodied post-larvae, are planktonic, and the postlarval stage continues for a considerable time, as it does not live on the bottom until it is 20-25 mm in length. As with the other scaldfishes its biology is virtually unknown.

Family: Soles *Soleidae*

The soles are a family of flatfishes of worldwide distribution in temperate and tropical seas, and usually found in shallow water. Like other flatfishes they pass through a metamorphosis in their development when one eye (the left in this family) migrates over the top of the head and comes to lie beside the other on the right side. Other adaptations follow; usually the nostrils are expanded and in many species small sensory barbels are present on the blind side. Reversed specimens are very rare. Soles are usually slender-bodied, with rounded snout and small curved mouth; the dorsal fin begins on the snout, and the preoperculum is covered by skin. Worldwide, there are 35 genera with 130 species, but in northern European waters only four are at all common, with another deep sea species occasionally reported.

Solenette *Buglossidium luteum*



Characteristics

Typically sole-like in appearance but very small. Pectoral fins small, that on the blind side vestigial (a single long ray and two smaller ones). Eyes minute, their diameter much less than the snout length.

Colour

Sandy or light yellow-brown, freckled with brown spots; every fifth or sixth ray of the dorsal and anal fins black, almost to the tip. Yellowish ventrally.

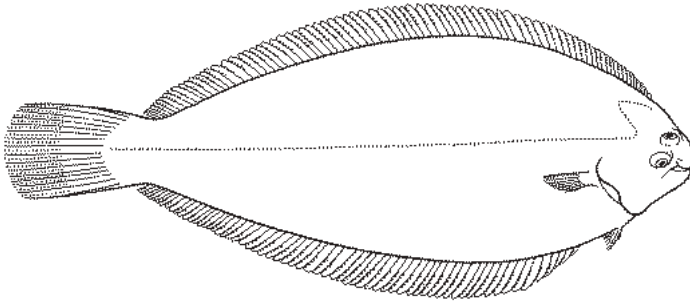
Size

Attains a maximum length of 13 cm.

Ecology

This minute sole, the smallest European species, is widespread and common on sandy bottoms in depths of 5-40 m, but a few live down to 90 m. It feeds on small crustaceans and worms. It breeds during the summer, the eggs and larvae (which are 2 mm long at hatching) are pelagic and the young fish drift down to the sea bed at about 12 mm in length. It has no value to commercial fisheries or angling because of its small size.

Bastard Sole *Microchirus azevia*



Characteristics

Body oval. Dorsal fin beginning level with front of upper eye; with 71-86 soft rays. Anal fin with 58-68 soft rays. Caudal fin separate from last dorsal and anal fin rays. Anterior nostril on eyed side with a backward pointing tube barely reaching front of lower eye.

Colour

Mostly greyish brown on the upper surface with some darker markings. 5-6 ocelli on young below 8-10 cm.

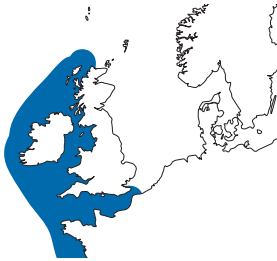
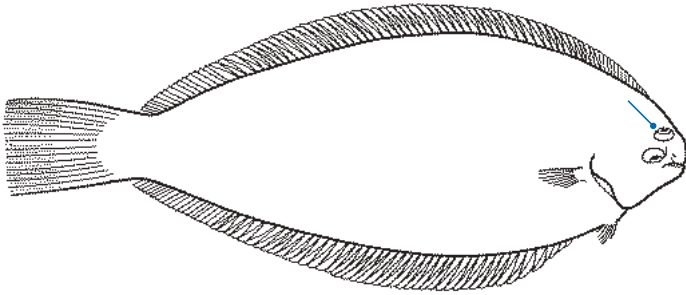
Size

Can reach a length of 40 cm.

Ecology

Occurs in the warmer waters of the eastern Atlantic at depths of 0-250 m. Inhabits mud and sand on the continental shelf from the shore down to deep water. Feeds mainly on small invertebrates, notably amphipods and polychaetes. One caught in the western Channel in 1953.

Thickback Sole *Microchirus variegatus*



Characteristics

Typically sole-like in appearance, but body thickset and deep. Pectoral fins very small, that on the blind side minute. Anterior nostril on the blind side tubular, not expanded into a rosette. Eyes moderately large, the diameter greater than the snout distance; space between the eyes equal to eye diameter.

Colour

Chestnut brown on the back with five darker brown cross-bands ending in dark patches on dorsal and anal fins. White ventrally.

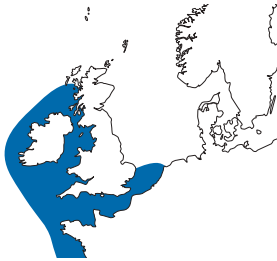
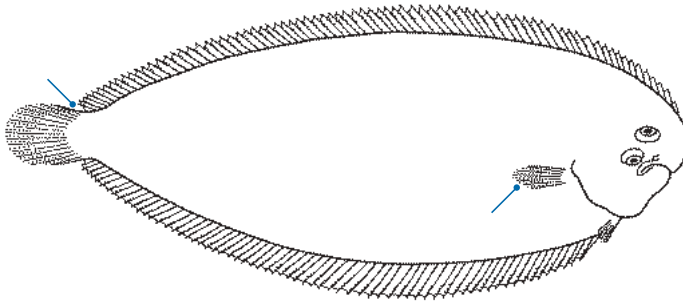
Size

Attains 33 cm in length.

Ecology

An offshore species of sole, living in depths of 40-90 m, but with extremes of its depth range from 18-400 m. It lives on sand, and sand and gravel bottoms. In northern European waters it is rather rare and its biology is little known. Spawning takes place in the English Channel in spring and early summer in deep water, the eggs, larvae, and postlarvae being pelagic at first, but as the postlarvae grow they live deeper down. From about 12 mm the young fish seek the bottom, although they may be more than 18 mm before they live on the sea bed. In northern waters this fish is too rare to contribute much to fisheries, but its flesh is of good quality.

Sand Sole *Pegusa lascaris*



Characteristics

Body shape typically that of a sole. The front nostril on the underside of the head expanded into a broad rosette-like organ as large as the eye diameter. Pectoral fin on blind side only a little smaller than that on the eyed side. Dorsal fin origin in front of upper eye; dorsal and anal fins connected to the base of the tail fin by a low membrane.

Colour

Uniformly light brown with irregular dark spots and freckles on the eyed side; pectoral fin with a black mark contained within a white or yellow "V" on the middle of the fin. Creamy-white on the blind side.

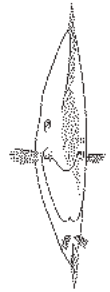
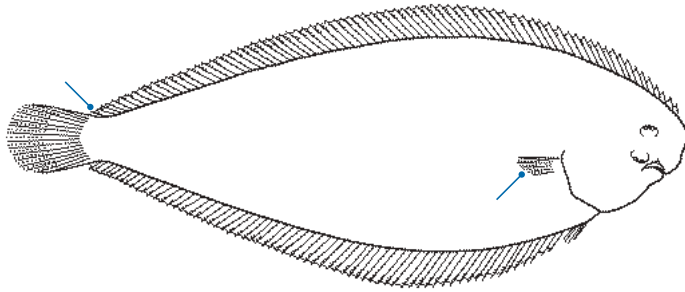
Size

Attains a length of 40 cm.

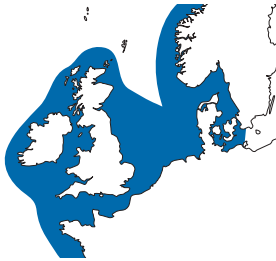
Ecology

A fish of southern Irish and British waters, and usually ranges no further north than the northern Irish Sea. It is found on muddy and sandy bottoms in depths of 30-350 m and appears to live in shallower water mainly during summer. It spawns in the western Channel in July, the eggs and larvae being pelagic. It does not apparently live close inshore, although a few occurrences have been reported as shallow as 8 m. The Sand Sole is said to eat large quantities of molluscs. Its biology has been very little studied in northern waters.

Common Sole *Solea solea*



Front view



Characteristics

Slender-bodied, but thickset, the head small, mouth curved and set to one side; dorsal fin origin in front of upper eye. Pectoral fins moderate, that on the blind side only a little smaller than the other; the dorsal and anal fins joined to the tail fin base by a membrane. Nostril on blind side swollen, but not forming a conspicuous rosette.

Colour

Medium brown to dark brown with irregular dusky patches on the eyed side; pectoral fin with an elliptical black spot on its upper edge. Blind side creamy-white.

Size

Attains a length of ca 70 cm and a weight of 3 kg; usually 30-40 cm. British Rod-caught Record: 2.966 kg (1991, Alderney). Irish Rod-caught Record: 2.867 kg (1986, Ballycotton).

Ecology

The most abundant member of the family in European seas, although it reaches the northern limit of its range to the north of Britain. It is common on sandy and muddy grounds from 10-100 m, occasionally occurring as deep as 160 m, while very young specimens can be caught in intertidal pools on sandy shores and below tide level in 1-2 m. It feeds mainly on small crustaceans and worms, and will also eat small molluscs and sometimes fishes. It is normally a nocturnal feeder, but in conditions of dull weather and in murky water, such as in estuaries, it will feed in daylight. At night it is often well clear of the sea bed, and may even be captured at the surface. It spawns in spring and early summer in shallow coastal

waters of 40-50 m. The eggs and larvae are pelagic, but from 12-18 mm they metamorphose into young soles and live on the bottom, usually having drifted into shallow coastal, and frequently into estuarine water. The very young live in the breakers and on sandy shores. Adults migrate into shallow water during summer and into deeper water in winter; in very cold winters they accumulate in deep pits, for example those in the North Sea where the water is slightly warmer. The Sole is an important and valuable food fish. It is caught mainly in beam trawls, but some are taken in set nets. It has little interest for anglers because of its rather specialized food requirements and nocturnal habits.

Order:

Tetraodontiformes

Plectognaths

Many plectognaths can produce sounds by grinding their jaw or pharyngeal teeth or by vibrating the swim bladder. The stomach of some members of the order is modified to allow inflation to an enormous size. Worldwide, there are nine families with some 101 genera and 357 species.

In this order:



Grey Triggerfish



Oceanic Pufferfish



Smooth Pufferfish



Ocean Sunfish

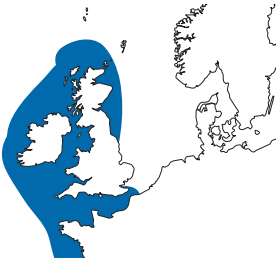
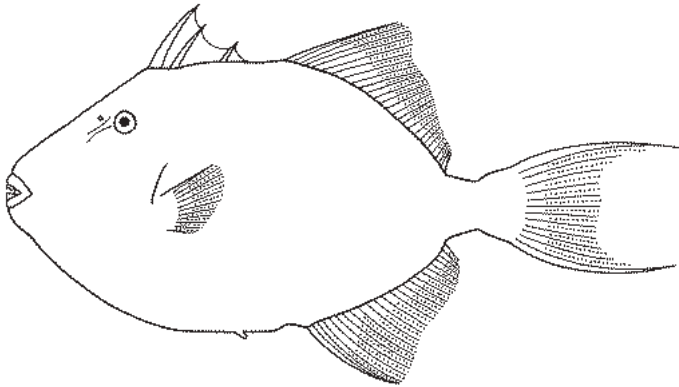


Slender Sunfish

Family: Triggerfishes *Balistidae*

The triggerfishes are mainly tropical and warm temperate fishes found in shallow seas, although a few are oceanic. Worldwide, there are 11 genera with 42 species. Some triggerfishes move into temperate seas with seasonal warming of the water, one such occurring in northern European waters. Elsewhere they are especially well known as colourful inhabitants of coral reefs, but some species rely on their dull colour and compressed shape to frustrate predators by mimicry of algae or driftwood. The triggerfishes have an interesting development of the spines in the first dorsal fin, the first spine being strong and stout, while the slender second spine acts as a lock or trigger which has to be released before the first can be depressed. These fish have the habit of taking refuge in a crevice in the rock or coral and, with the spine locked in position, wedging themselves in, face an attacker with their sharp, rat-like teeth.

Grey Triggerfish *Balistes capriscus*



Characteristics

Deep-bodied, with a long snout, small eye, and small mouth; teeth sharp and incisor-like. First dorsal fin with three spines, the first strong and robust; second dorsal and anal fins well developed; pelvic fins absent, replaced by a rough-edged spine. Two or three enlarged bony plates behind the gill opening.

Colour

Olive brown or greyish; the dorsal and anal fins with blue lines or spots.

Size

Attains a length of 41 cm.
British Rod-caught Record:
2.859 kg (2002, Tywyn Beach).
Irish Rod-caught Record:
2.191 kg (1995, Ballydavid).

Ecology

A regular fish around the southern and western coasts of Britain and Ireland from July to November, now found in the north of Scotland and occasionally penetrating into the North Sea. Numbers are found dead on the coast from December to January, but this is just a small proportion of the population. Where it goes the rest of the year is unknown,

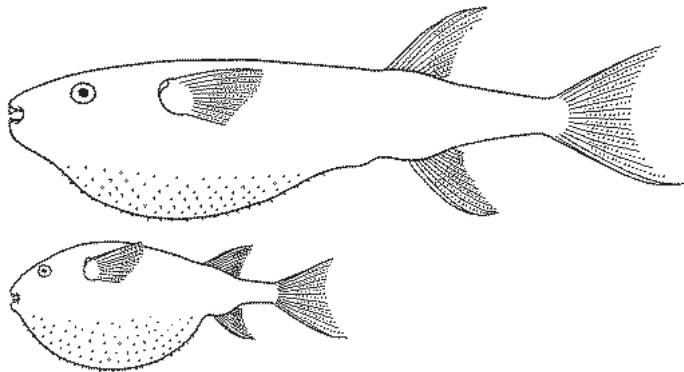
Continued: Grey Triggerfish *Balistes capriscus*

possibly into deeper areas. It occurs around rocky promontories and wrecks sometimes in large shoals, also frequents piers and marinas. It uses its powerful teeth to bite off sessile invertebrates and attack hard shelled creatures such as crustaceans. It has not yet been proven to breed in the British Isles and few individuals have been found of less than 10 cm. The young are pelagic swimming at the surface among drifting weed and debris; this may be why they have not been found, and also aid its spread. It is regularly caught in crab pots and occasionally by anglers. Few are landed by commercial fisheries because of its low value. The appearance is uninviting and the skin tough, but it is a very edible fish

Family: Pufferfishes *Tetraodontidae*

The pufferfishes are a relatively numerous family of mainly tropical or warm-temperate marine fishes, although several freshwater species are known in tropical Africa and Asia. Altogether there are 19 genera and 130 species. Most are stout-bodied, rather rounded fishes with small fins (lacking spiny-rayed fins) and large eyes. Most have fine spines in the skin which stand erect when the body is puffed up with water. They have four teeth in the jaws. Pufferfishes are typically found in shallow, inshore waters around coral reefs, in sea-grass beds, and in estuaries, but a few (including both forms found in northern Europe) are oceanic in life style. They have no economic importance except in Japan, where they are known as fugu and are eaten after special preparation; for their blood, liver, and gonads contain a virulent toxin which, if ingested, can cause painful and even fatal illness. Two species have been recorded in northern Europe.

Oceanic Pufferfish *Lagocephalus lagocephalus*



Lagocephalus lagocephalus inflated



Characteristics

Stout-bodied but with a slender tail, with small dorsal and anal fins, and a lunate tail fin. Four teeth in the jaws form a parrot-like beak. Skin on the back smooth; on the extensible belly-pouch small spines are embedded which become erect

when the pouch is inflated.

Dorsal fin rays 10-16 and anal 12-13. The lateral line is a raised fold of skin along the lower side.

Colour

Back bright blue to steel blue or greenish blue, with darker bars across the back, the belly pure white; small dusky spots along the lower side.

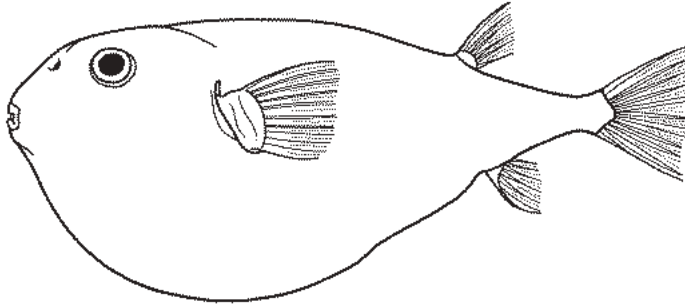
Size

Attains a length of 60 cm. British Rod-caught Record: 2.983 kg (1985, Chesil Beach).

Ecology

A vagrant in northern European waters, which is captured or stranded from time to time mostly in late summer. It is a pelagic species which lives in the open sea in the tropical Atlantic, and in the Indian and Pacific Oceans as well. Its presence in northern waters is presumably due to drift from the south-west in ocean currents. Its biology has been little studied, but some specimens have contained squid's beaks in their stomachs and their skin was scarred by squids' sucker discs; crustacean remains have also been found. The map shows Atlantic range only.

Smooth Pufferfish *Sphoeroides pachygaster*



Characteristics

A fairly stocky puffer with a blunt head; dorsal and anal fins small and to the rear of the body; tail square or emarginate. Skin smooth all over, no prickles on the belly. Dorsal fin with 7-9 soft rays and anal 8-9.

Colour

Two colour forms – light grey with large dusky blotched or greenish brown dorsally; both are white below.

Size

Can reach a length of 40 cm.

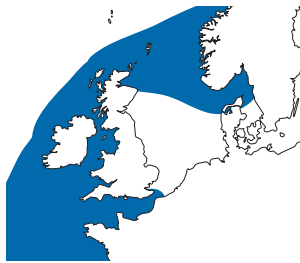
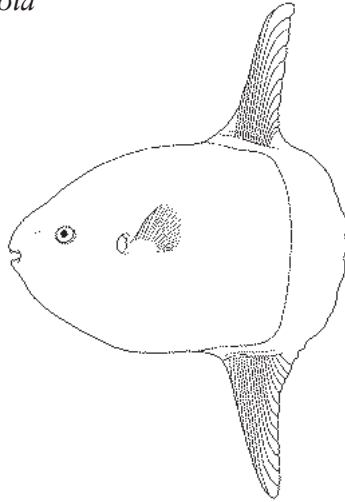
Ecology

Occurs circumglobally in tropical and temperate seas at depths of 50-480 m. A rare vagrant in northern European waters, which is captured or stranded from time to time mostly in late summer, this species has become more common in recent years. Inhabits mainly mud, sand and rocky substrates. Feeds mainly on squid. The young are pelagic.

Family: Sunfishes *Molidae*

The small family Molidae has a worldwide distribution in the upper layers of the oceans in tropical and warm temperate zones, with some seasonal migration into temperate seas. They include some of the largest fishes of the open sea, but despite this their biology is poorly known. They resemble their relatives, the pufferfishes, in having small mouths with well-developed beak-like teeth in each jaw - these are fused in the mid-line so that each half looks very like a bird's bill. Their most striking feature is the apparent absence of a tail, the body ending with the vertical dorsal and anal fins and a frill-like flap which replaces the tail fin. Worldwide, there are three genera and four species, two of which occur in northern European waters.

Ocean Sunfish *Mola mola*



Characteristics

A huge round-bodied fish with dorsal and anal fins near the end of the body, and a rounded lobed tail 'fin' between the two. The eye is small, the gill opening is restricted, the mouth is small; the pectoral fins are rounded; pelvic fins absent.

Colour

Usually lead grey, but can be greyish-brown, or even deep blue with white markings; darker above, light on the belly.

Size

Attains 3.3 m in length and a weight of ca 2,300 kg. It is the heaviest bony fish. . British Rod-caught Record: 48.986 kg (1976, Saundersfoot).

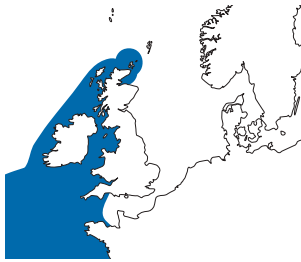
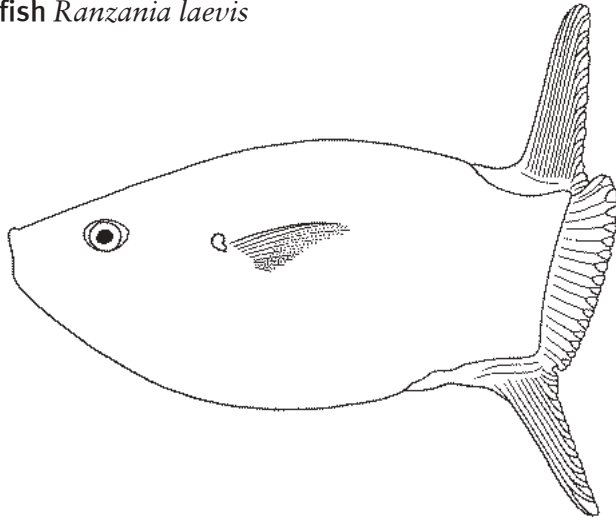
Ecology

The Ocean Sunfish is an open ocean species of worldwide distribution, found in the upper waters and down to depths of several hundred metres. In warm temperate areas aggregations of several thousand have been seen. They are regular visitors to Britain and Ireland in the late summer, June to September, but can be found in small numbers at any time in the year. They are often seen at the surface lying languidly on their side, this could be for thermoregulation, or to let gulls clean them of parasites. If disturbed, they can swim vigorously to great depth or even breach (jump clear of the water). The food of the Sunfish consists mostly of planktonic organisms,

Continued: Ocean Sunfish *Mola mola*

especially jellyfishes, salps, and comb-jellies, but fish, fish larvae and crustaceans are also eaten. A number of specimens have been caught on anglers' baits. They have no value as a food fish; the flesh is soft and insipid, and this and the gut are frequently infested with worm cysts. The status of this fish in northern European waters is that of a relatively widespread but uncommon fish.

Slender Sunfish *Ranzania laevis*



Characteristics

Elongate but deep and compressed in body form. Dorsal and anal fins high, similar in shape and placed opposite one another; pectoral fins small but elongate, pelvic fins absent, tail fin greatly modified. The mouth is small and compressed so that when closed it is a vertical slit.

Colour

Deep blue on the back, metallic silver on the sides with brilliant silvery, black-edged stripes curving across the head and belly.

Size

Attains 80 cm in length.

Ecology

An oceanic sunfish which is found in all the tropical and warm temperate oceans. It probably lives in the upper 200 m of the sea, feeding on medusae, comb-jellies, and other planktonic life forms, but very few observations have been made on specimens captured in their natural habitat. Some reports suggest this is a shoaling species. Most of our slight knowledge of its biology is derived from stranded fish or those caught in inshore waters, which are an alien habitat. Its status in northern European seas is usually that of a very rare visitor mostly in late summer, but in 2000 substantial numbers were captured in the open Atlantic off southwest Ireland.

Rare and vagrant marine fish of British and Irish waters

Fish which have turned up on one or a few occasions in the area, or been found in surrounding waters, and are unlikely to become regular members of the British ichthyofauna.

Some of these are old records and may be unreliable due to misidentification or other errors. These records are in square brackets [].

Class Myxini

Order Myxiniformes

Family Myxinidae

White-headed Hagfish *Myxine ios* – deep water to south of Ireland.

Class Chondrichthyes

Order Squaliformes

Family Somniosidae

Longnose Velvet Dogfish *Centroselachus crepidater* – deepwater species (>200 m) from the continental slope.

Knifetooth Dogfish *Scymnodon ringens* – deepwater species (>200 m) from the continental shelf margins.

Family Etmopteridae

Great Lanternshark *Etmopterus princeps* – a continental slope species (>300 m) that may stray on to the shelf.

Order Rajiformes

Family Rajidae

Spinetail Ray *Bathyraja spinicauda* – deepwater species (>140 m) from the extreme north of the area.

Richardson's Ray *Bathyraja richardsoni* – few found in deep water >2000 m south of Ireland.

Class Actinopterygii

Order Acipenseriformes

Family Acipenseridae

Atlantic Sturgeon *Acipenser oxyrinchus* – an American species which has occurred in the Baltic, and seemingly in Britain.

Order Albuliformes

Family Notacanthidae

Shortfin Spiny Eel *Notacanthus bonaparte* – deepwater species found below 400 m.

Smallmouth Spiny Eel *Polyacanthopus rissoanus* – deepwater species five collected on Irish continental slope in 1907, none seen since.

Order Anguilliformes

Family Nemichthyidae

Snipe Eel *Avocettina infans Avocet* – oceanic 0-2000 m; one found on shore at Borth in Cardigan Bay, Wales, after a storm.

Family Serrivomeridae

Bean's Sawtoothed Eel *Serrivomer beani* – deepwater eel seldom caught in trawls and sometimes found in the gut of other fish.

Order Gadiformes

Family Macrouridae

Armoured Rattail *Nematonurus armatus* – deepwater species.

Family Moridae

Slender codling *Halargyreus johnsonii* – a widespread fish of the continental slope.

Guttigadus latifrons – found on the continental slopes to the west of Ireland.

Family Phycidae

Squirrel Hake or Red Hake *Urophycis chuss* – strays of this western Atlantic species have been caught off Ireland.

Order Ophidiiformes

Family Ophidiidae

[Snake Blenny (Cusk Eel, Bearded Ophidion) *Ophidium barbatum* – a doubtful record based on the report of one from Padstow, Cornwall, in the nineteenth century.]

Order Lophiiformes

Family Antennariidae

Singlespot Frogfish (Big-eyed Frogfish) *Antennarius radiosus* – a West Atlantic species; one pre-juvenile collect off the west coast of Ireland.

Sargassumfish *Histrio histrio* – a tropical species that wanders on the currents and has once been found in Norway; hence could turn up in Irish or British waters.

Family Oneirodidae

Carlsberg's Dreamer *Oneirodes carlsbergi* – One small individual of this deep sea angler caught over the Porcupine Bank to the west of Ireland.

Order Beloniformes

Family Exocoetidae

Bennett's Flying-fish *Cheilopogon pimmatibarbatus* – one found in a box of herring in Hull market in 1967, and a probable nineteenth century record from Helford, Cornwall.

[Tropical Two-winged Flying-fish *Exocoetus volitans* – most nineteenth century reports of flying fish around the British isles were recorded as this species but probably refer to *Cheilopogon heterurus*.]

Mirrorwing flyingfish *Hirundichthys speculiger* – one caught off the Netherlands.

Order Beryciformes

Family Diremidae

Silver Spinyfin *Diretmus argenteus* – an oceanic fish.

Family Trachichthyidae

Orange Roughy *Hoplostethus atlanticus* – a deepwater fish normally in depths of 400 m or more.

Order Scorpaeniformes

Family Scorpaenidae

Spiny Scorpionfish *Trachyscorpia cristulata echinata* – occurs in deep water to the west of Ireland

Family Psychrolutidae

Polar Sculpin *Cottunculus microps* – reported to occur in the North Sea and English Channel, but no evidence of their presence south of the Faeroe-Shetland Channel.

Pallid Sculpin *Cottunculus thomsonii* – found deeper than 200 m (mostly around 1000 m), off Ireland and the north of the Scotland.

Continued: Rare and vagrant marine fish of British and Irish waters

Order Perciformes

Family Moronidae

Spotted Sea Bass *Dicentrarchus punctatus* – a southern species reported from the English Channel and southern North Sea (57-65 lateral line scales).

Family Callanthiidae

Parrot Sea Perch *Callanthias ruber* – a warm temperate (Lusitanian) species that is occasionally found in the English Channel.

Family Blennidae

Variable Blenny *Parablennius pilicornis* – species recently discovered in Britain.

Family Echeneidae

Lousefish (Slender Suckerfish)
Phtheichthys lineatus – One record from the English Channel.

Family Caristiidae

Manefish *Caristius macropus* – an oceanic fish once found to the south west of Ireland.

Family: Lobotidae

Atlantic Tripletail *Lobotes surinamensis* – one caught in a fyke net on mudflats at Newport, South Wales, in September 2006.

Family Sparidae

Morocco Dentex *Dentex maroccanus* – a warm water species once caught in Danish waters in 1962.

Two-banded Sea Bream *Diplodus vulgaris* – an East Atlantic and Mediterranean species that can be found in Brittany; in January 2009 one was caught just north of Guernsey.

Family Sciaenidae

Brown Meagre *Sciaena umbra* – found up to the English Channel, but not yet reported from British or Irish waters.

Corb (Shi Drum) *Umbrina cirrosa* – reaches northern Biscay and may stray into the area.

Family Chaenopsidae

[Eelgrass Blenny *Stathmonotus stabli* – a Caribbean species, a one inch (2.5 cm) specimen said to have been found in the Conwy estuary, North Wales, in 1932.]

Family Tetragonuridae

Bigeye Squaretail *Tetragonurus atlanticus* – a widespread warm water oceanic species which may stray into the south west of the area.

Smalleye Squaretail *Tetragonurus cuvieri* – a widespread warm water oceanic species which may stray into the south west of the area.

Family Stromateidae

Silver Pomfret *Pampus argenteus* – an Indo-Pacific species of which one specimen was caught off the north east of England in 1983.

American Butterfish *Peprilus triacanthus* – a West Atlantic species, one was caught in a trawl in Lyme Bay in 2007.

Order Pleuronectiformes

Family Soleidae

Deepwater Sole *Bathysolea profundicola*
– recorded from deep water below 250 m
off south west Ireland.

Family Cynoglossidae

Nigerian Tongue Sole *Cynoglossus browni* – three of this tropical East Atlantic species were caught off the Dutch coast.

Order Tetraodontiformes

Family Balistidae

[Rough Triggerfish *Canthidermis maculata* – a subtropical species recorded from Cornwall before 1870, probably a misidentification of *Balistes capriscus*.]

Family Diodontidae

Porcupinefish *Diodon hystrix* – a warm water species; one washed up dead on a North Norfolk beach in September 2005, is thought to have been a captive fish that was released.

Non-native freshwater Fish recorded living wild in Britain

These have only been recorded in the past, and are probably no long at liberty in Britain or Ireland.

Class Actinopterygii: Order Cypriniformes

Family Catostomidae

White Sucker *Catostomus commersoni*
– North American species: one found in Hertfordshire in 1992.

Family Cobitidae

Weatherfish *Misgurnus fossilis* - occasional fish in central and eastern England. Now rare in its native Europe.

Order Perciformes

Family Percidae

Walleye *Sander vitreus* – a North American species introduced into England, but now apparently extinct there.

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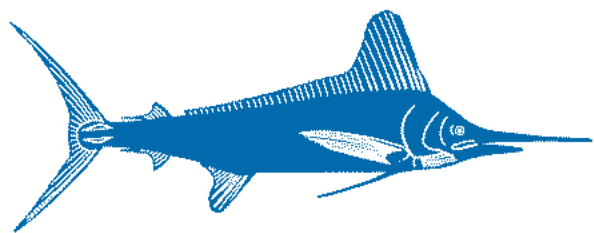
Index

<i>Abramis bjoerkna</i>	115	<i>hemigymnus</i>	171	Black Bullhead	137	<i>Callionymus reticulatus</i>	380
<i>Abramis brama</i>	116	<i>Argyropelecus olfersii</i>	172	Black Goby	389	<i>Camporamma glaycos</i>	311
<i>Acantholabrus palloni</i>	340	<i>Argyrosomus regius</i>	336	Black Scabbardfish	406	Capelin	147
<i>Acipenser baeri</i>	91	Armed Gurnard	278	Black Sea Bream	335	<i>Capros aper</i>	433
<i>Acipenser ruthensis</i>	92	<i>Arnoglossus imperialis</i>	452	Black Skate	79	<i>Caranx chrysos</i>	312
<i>Acipenser sturio</i>	93	<i>Arnoglossus laterna</i>	453	Black-bellied Angler	221	<i>Carassius auratus</i>	119
<i>Agonus cataphractus</i>	287	<i>Arnoglossus thori</i>	454	Black-faced Blenny	367	<i>Carassius carassius</i>	120
Albacore	420	<i>Arteidiellus atlanticus</i>	279	Blackfish	428	<i>Centrolabrus exoletus</i>	341
<i>Alburnus alburnus</i>	117	<i>Aspitrigla cuclius</i>	272	Blackmouth Dogfish	34	<i>Centrolophus niger</i>	428
<i>Alepisaurus ferox</i>	176	<i>Atherina boyeri</i>	234	Bleak	117	<i>Centroscymnus</i>	
<i>Alepocephalus bairdii</i>	143	<i>Atherina presbyter</i>	235	<i>Blennius ocellaris</i>	368	<i>coelolepis</i>	55
<i>Alepocephalus rostratus</i>	144	Atlantic Bluefin Tuna	423	Blonde Ray	69	<i>Cepola macrophthalma</i>	339
Alfonsino	243	Atlantic Chub Mackerel	417	Blue Ling	209	<i>Ceratias holboelli</i>	224
Allis Shad	106	Atlantic Flying-fish	237	Blue Marlin	426	<i>Cetorhinus maximus</i>	30
Almaco Jack	316	Atlantic Footballfish	223	Blue Runner	312	<i>Cheilopogon heterurus</i>	237
<i>Alopias superciliosus</i>	28	Atlantic Gymnast	145	Blue Shark	41	<i>Chelidonichthys</i>	
<i>Alopias vulpinus</i>	29	Atlantic Hookear Sculpin	279	Blue Whiting	208	<i>lastoviza</i>	273
<i>Alosa alosa</i>	106	Atlantic Poacher	288	Bluefish	308	<i>Chelidonichthys</i>	
<i>Alosa fallax</i>	108	Atlantic Sailfin	425	Bluemouth	267	<i>lucernus</i>	274
<i>Ambloplites rupestris</i>	301	Atlantic Salmon	160	Bluntnose Sixgill Shark	46	<i>Cheliodonichthys</i>	
<i>Amblyraja hyperborea</i>	75	<i>Auxis rochei</i>	410	Boarfish	433	<i>obscurus</i>	275
<i>Amblyraja radiata</i>	81	<i>Auxis thazard</i>	412	Bogue	324	<i>Chelon Labrosus</i>	226
<i>Ameiurus melas</i>	137	Baird's Smooth-head	143	Bonito	416	<i>Chimaera monstrosa</i>	25
<i>Ameiurus nebulosus</i>	138	<i>Balistes caprisucus</i>	461	<i>Boops boops</i>	324	<i>Chirolophis ascanii</i>	364
<i>Ammodytes marinus</i>	356	Ballan Wrasse	346	<i>Boreogadus saida</i>	200	<i>Chlamydoselachus</i>	
<i>Ammodytes tobianus</i>	357	Ballion's Wrasse	343	<i>Brama brama</i>	319	<i>anguineus</i>	45
<i>Anarhichas denticulatus</i>	353	<i>Barbatula barbatula</i>	135	Bramble Shark	49	Chub	125
<i>Anarhichas lupus</i>	354	Barbel	118	Brill	439	<i>Ciliata mustela</i>	192
<i>Anarhichas minor</i>	355	<i>Barbus barbus</i>	118	Brook Charr	166	<i>Ciliata septentrionalis</i>	193
Anchovy	105	Barrelfish	429	Brook Lamprey	22	<i>Clupea harengus</i>	110
Angel Shark	61	Basking Shark	30	<i>Brosme brosme</i>	201	<i>Cobitis taenia</i>	134
Angler	222	Bastard Sole	456	Brown Bullhead	138	Cod	204
<i>Anguilla anguilla</i>	100	<i>Belone belone</i>	238	Brown Trout	162	<i>Coelorinchus</i>	
Angular Roughshark	57	<i>Belone svetovidovi</i>	239	<i>Buenia jeffreysii</i>	383	<i>caelorhincus</i>	183
<i>Aphanopus carbo</i>	406	<i>Benthodesmus</i>		<i>Buglossidium luteum</i>	455	Coho Salmon	158
<i>Aphia minuta</i>	382	<i>elongatus</i>	407	Bull Rout	283	Comber	300
<i>Apletodon dentatus</i>	374	<i>Beryx decadactylus</i>	243	Bullet Mackerel	410	Common Bream	116
Arctic Charr	164	<i>Beryx splendens</i>	244	Bullhead	280	Common Carp	122
Arctic Cod	200	Bib	216	Bullseye	307	Common Dolphinfish	309
Arctic Ray	75	Bigeye Rockling	196	Burbot	205	Common Dragonet	378
<i>Argentina silus</i>	141	Bigeye Thresher	28	Butterfish	352	Common Goby	397
<i>Argentina sphyraena</i>	142	Bigeye Tuna	422	Butterfly Blenny	368	Common Gudgeon	123
Argentine	142	Big-scaled Sand Smelt	234	<i>Callionymus lyra</i>	378	Common Seasnail	291
<i>Argyropelecus</i>		Bitterling	130	<i>Callionymus maculatus</i>	379	Common Skate	68

Common Sole	459	<i>Diplodus cervinus</i>	326	<i>Glyptocephalus</i>	Hollownout Rattail	183	
Common Stingray	85	<i>Diplodus sargus</i>	327	<i>cynoglossus</i>	442	<i>Holocentrus</i>	
Common Sturgeon	93	<i>Dipturus batis</i>	68	<i>Gobio gobio</i>	123	<i>adscensionis</i>	245
Conger Conger	103	<i>Dipturus niarosiensis</i>	79	<i>Gobius cobitis</i>	385	Hooknose	287
Conger Eel	103	<i>Dipturus oxyrinchus</i>	80	<i>Gobius couchi</i>	386	<i>Hoplostethus</i>	
Connemara Clingfish	376	Dusky Perch	299	<i>Gobius cruentatus</i>	387	<i>mediterraneus</i>	242
Corbin's Sandeel	359	Eagle Ray	88	<i>Gobius gasteveni</i>	388	Houting	154
<i>Coregonus albula</i>	150	<i>Echiichthys vipera</i>	361	<i>Gobius niger</i>	389	<i>Hyperoglyphe</i>	
<i>Coregonus autumnalis</i>	152	<i>Echinorhinus brucus</i>	49	<i>Gobius paganellus</i>	390	<i>perciformis</i>	429
<i>Coregonus lavaretus</i>	153	<i>Echiodon drummondii</i>	219	<i>Gobiusculus flavescens</i>	391	<i>Hyperoplus</i>	
<i>Coregonus oxyrinchus</i>	154	Eckström's Topknot	441	Golden Grey Mullet	228	<i>immaculatus</i>	359
<i>Coris julis</i>	342	Electric Ray	64	Goldfish	119	<i>Hyperoplus lanceolatus</i>	360
Corkwing Wrasse	344	<i>Eleginus navaga</i>	202	Goldsinny	345	<i>Icelus bicornis</i>	281
Cornish Blackfish	430	<i>Enchelyopus cimbrius</i>	194	Grass Carp	121	Imperial Blackfish	431
<i>Coryphaena hippurus</i>	309	<i>Engraulis encrasicolus</i>	105	Grayling	155	Imperial Scaldfish	452
<i>Coryphaenoides</i>		<i>Enteropus aequoreus</i>	255	Greater Amberjack	315	<i>Istiophorus albicans</i>	425
<i>rupestris</i>	184	<i>Epigonus telescopus</i>	307	Greater Argentine	141	<i>Isurus oxyrinchus</i>	31
<i>Coryphoblennius</i>		<i>Epinephelus marginatus</i>	299	Greater Forkbeard	199	Jeffrey's Goby	383
<i>galerita</i>	369	Esmark's Eelpout	349	Greater Pipefish	261	Jelly Cat	353
<i>Cottus gobio</i>	280	<i>Esox lucius</i>	168	Greater Sandeel	360	John Dory	249
Couch's Goby	386	<i>Etmopterus spinax</i>	54	Greater Weever	363	Johnson's Scabbardfish	404
Couch's Sea Bream	332	European Eel	100	Greenland Halibut	451	<i>Katsuwonus pelamis</i>	414
<i>Crenilabrus bailloni</i>	343	<i>Euthynnus alletteratus</i>	413	Greenland Shark	56	<i>Labrus bergylla</i>	346
<i>Crenilabrus melops</i>	344	<i>Eutrigla gurnardus</i>	276	Grey Gurnard	276	<i>Labrus mixtus</i>	347
Crucian Carp	120	False Catshark	37	Grey Triggerfish	461	<i>Lagocephalus</i>	
Crystal Goby	384	Fifteen-spined		Guillet's Goby	392	<i>lagocephalus</i>	463
<i>Crystalllogobius linearis</i>	384	Stickleback	254	Guinean Amberjack	314	<i>Lamna nasus</i>	32
<i>Ctenolabrus rupestris</i>	345	Five-bearded Rocking	192	<i>Gymnammodytes</i>		<i>Lampetra fluviatilis</i>	21
<i>Ctenopharyngodon idella</i>	121	Flathead Grey Mullet	232	<i>semisuamatus</i>	358	<i>Lampetra planeri</i>	22
<i>Cubiceps gracilis</i>	432	Flounder	449	<i>Gymnocephalus</i>		<i>Lampetra guttata</i>	179
Cuckoo Ray	78	Flying Gurnard	266	<i>cernuus</i>	304	Largemouth Bass	303
Cuckoo Wrasse	347	Four-bearded Rockling	194	Haddock	206	<i>Lebetus guilleti</i>	392
<i>Cyclopterus lumpus</i>	289	Four-horn Sculpin	282	Hagfish	19	<i>Lebetus scorpioides</i>	393
<i>Cyprinus carpio</i>	122	Four-spot Megrim	435	Hairtail	409	Lemon Sole	448
<i>Cyttopsis roseus</i>	247	Fries's Goby	394	Hake	191	Leopard-spotted Goby	401
Dab	447	Frigate Mackerel	412	Hakeling	190	<i>Lepadogaster candolii</i>	376
Dace	127	Frilled Shark	45	Half-naked Hatchetfish	171	<i>Lepadogaster</i>	
<i>Dactylopterus volitans</i>	266	Frostfish	407	Halibut	445	<i>lepadogaster</i>	377
<i>Dalatias licha</i>	59	<i>Gadiculus argenteus</i>	203	<i>Helicolenus</i>		<i>Lepidion eques</i>	189
Darkie Charlie	59	<i>Gadus morhua</i>	204	<i>dactylopterus</i>	267	<i>Lepidopus caudatus</i>	408
<i>Dasyatis pastinaca</i>	85	<i>Gaidropsarus</i>		<i>Heptanchias perlo</i>	47	<i>Lepidorhombus boscii</i>	435
Dealfish	180	<i>argentatus</i>	195	Herring	110	<i>Lepidorhombus</i>	
<i>Deania calceus</i>	53	<i>Gaidropsarus</i>		<i>Hexanchus griseus</i>	46	<i>whiffagonis</i>	436
Deep Sea Angler	224	<i>macrophthalmus</i>	196	<i>Himantolophus</i>		<i>Lepomis gibbosus</i>	302
Deep-snouted Pipefish	263	<i>Gaidropsarus</i>		<i>groenlandicus</i>	223	<i>Leptagonus decagonus</i>	288
Dentex	325	<i>mediterraneus</i>	197	<i>Hippocampus</i>		<i>Leptoclinus maculatus</i>	365
<i>Dentex dentex</i>	325	<i>Gaidropsarus vulgaris</i>	198	<i>guttulatus</i>	257	Lesser Pipefish	262
Derbio	317	<i>Galeorhinus galeus</i>	38	<i>Hippocampus</i>		Lesser Sandeel	357
Devil Ray	89	<i>Galeus melastomus</i>	34	<i>hippocampus</i>	258	Lesser Spotted Dogfish	35
<i>Dicentrarchus labrax</i>	296	Garfish	238	<i>Hippoglossoides</i>		Lesser Weever	361
Diminutive Goby	393	<i>Gasterosteus aculeatus</i>	251	<i>platessoides</i>	444	<i>Lesuerigobius friesii</i>	394
<i>Diplecogaster</i>		Giant Goby	385	<i>Hippoglossus</i>		<i>Leucaspius delineatus</i>	124
<i>bimaculata</i>	375	Gilthead	334	<i>hippoglossus</i>	445	<i>Leuciscus cephalus</i>	125

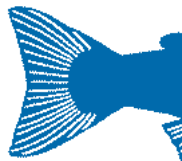
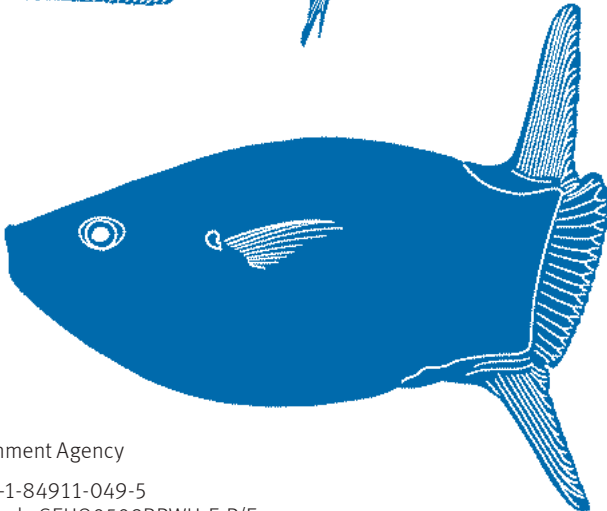
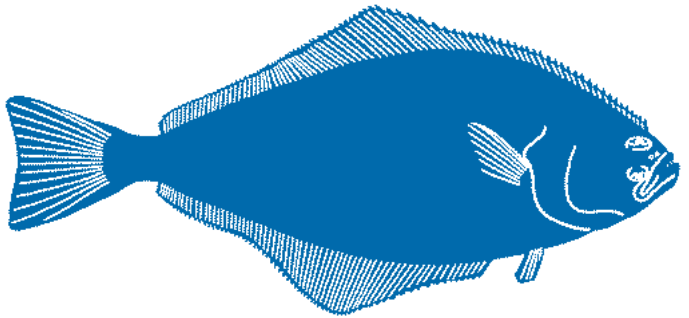
<i>Leuciscus idus</i>	126	<i>Microchirus variegatus</i>	457	Opah	179	<i>minutus</i>	398
<i>Leuciscus leuciscus</i>	127	<i>Micromesistius</i>		<i>Orcynopsis unicolor</i>	415	<i>Pomatoschistus</i>	
<i>Leucoraja circularis</i>	70	<i>poutassou</i>	208	Orfe	126	<i>norvegicus</i>	399
<i>Leucoraja fullonica</i>	73	<i>Micropterus salmoides</i>	303	<i>Osmerus eperlanus</i>	148	<i>Pomatoschistus pictus</i>	400
<i>Leucoraja naevus</i>	78	<i>Microstomus kitt</i>	448	<i>Oxynotus centrina</i>	57	Poor Cod	217
<i>Limanda limanda</i>	447	Minnow	128	<i>Oxynotus paradoxus</i>	58	Porbeagle	32
Ling	211	<i>Mobula mobular</i>	89	<i>Pagellus acarne</i>	329	Portuguese Shark	55
<i>Liparis liparis</i>	291	<i>Mola mola</i>	465	<i>Pagellus bogaraveo</i>	330	Powan	153
<i>Liparis montagui</i>	292	<i>Molva dypterygia</i>	209	<i>Pagellus erythrinus</i>	331	<i>Prionace glauca</i>	41
<i>Lipophys pholis</i>	370	<i>Molva macrophthalma</i>	210	<i>Pagrus pagrus</i>	332	<i>Psetta maxima</i>	438
Little Tunny	413	<i>Molva molva</i>	211	Painted Goby	400	<i>Pseudorasbora parva</i>	129
<i>Liza aurata</i>	228	Montagu's Blenny	369	Pandora	331	<i>Pseudotriakis microdon</i>	37
<i>Liza ramada</i>	230	Montagu's Seasnail	292	<i>Parablennius</i>		<i>Pterplatytrigon violacea</i>	87
Long Rough Dab	444	<i>Mora moro</i>	190	<i>gattorugine</i>	371	<i>Pterycombus brama</i>	321
Longfin Cigarfish	432	Moustache Sculpin	286	<i>Parablennius pilicornis</i>	372	Pumkinseed	302
Long-finned Bream	323	<i>Mugil cephalus</i>	232	<i>Parablennius ruber</i>	373	<i>Pungitius pungitius</i>	253
Long-finned Gurnard	275	<i>Mullus barbatus</i>	337	<i>Paralepis coregonoides</i>	177	Rabbitfish	25
Longnose Lancetfish	176	<i>Mullus surmuletus</i>	338	Pearlfish	219	Rainbow Trout	159
Longnosed Skate	80	<i>Muraena helena</i>	101	Pearlsides	173	Rainbow Wrasse	342
Long-spined Sea		<i>Mustelus asterias</i>	39	<i>Pegusa lascaris</i>	458	Raitt's Sandeel	356
Scorpion	284	<i>Mustelus mustelus</i>	40	Pelagic Stingray	87	<i>Raja brachyura</i>	69
<i>Lophius budegassa</i>	221	<i>Myliobatis aquila</i>	88	<i>Perca fluviatilis</i>	305	<i>Raja clavata</i>	71
<i>Lophius piscatorius</i>	222	<i>Myoxocephalus</i>		Perch	305	<i>Raja microcellata</i>	76
<i>Lota lota</i>	205	<i>scorpius</i>	283	<i>Peristedion</i>		<i>Raja montagui</i>	77
Louvar	402	<i>Myxine glutinosa</i>	19	<i>cataphractum</i>	278	<i>Raja undulata</i>	82
Lowe's Beryx	244	<i>Naucrates ductor</i>	313	<i>Petromyzon marinus</i>	23	<i>Rajella fyllae</i>	74
Lozano's Goby	395	Navaga	202	<i>Pholis gunnellus</i>	352	<i>Raniceps raninus</i>	214
<i>Lumpenus</i>		<i>Nemichthys</i>		<i>Phoxinus phoxinus</i>	128	<i>Ranzania laevis</i>	467
<i>lampretaeformis</i>	366	<i>scolopaceus</i>	102	<i>Phrynorhombus</i>		Ray's Bream	319
Lumpsucker	289	<i>Nerophis</i>		<i>norvegicus</i>	437	Red Bandfish	339
<i>Luvarus imperialis</i>	402	<i>lumbriiformis</i>	259	<i>Phycis blennoides</i>	199	Red Dory	247
<i>Lycenchelys sarsii</i>	348	<i>Nerophis ophidion</i>	260	Pike	168	Red Gurnard	272
<i>Lycodes esmarkii</i>	349	<i>Nesiarchus nasutus</i>	404	Pilchard	111	Red Scorpionfish	269
<i>Lycodes vahlii</i>	350	<i>Nezumia aequalis</i>	187	Pilot Fish	313	Red Sea Bream	330
Mackerel	418	Nine-spined Stickleback	253	Pink Salmon	156	Red Tompot Blenny	373
<i>Macroramphosus</i>		North Atlantic Codling	189	Piper	277	Redfish	270
<i>scolopax</i>	264	Northern Rockling	193	Plaice	450	Red-mouthed Goby	387
<i>Macrourus berglax</i>	185	Norway Bullhead	285	Plain Bonito	415	<i>Regalecus glesne</i>	181
<i>Makaira nigricans</i>	426	Norway Goby	399	Plain Red Mullet	337	<i>Reinhardtius</i>	
<i>Malacocephalus laevis</i>	186	Norway Haddock	271	<i>Platichthys flesus</i>	449	<i>hippoglossoides</i>	451
<i>Mallotus villosus</i>	147	Norway Pout	215	<i>Pleuronectes platessa</i>	450	Remora	310
Marbled Electric Ray	63	Norwegian Topknot	437	<i>Pollachius pollachius</i>	212	<i>Remora remora</i>	310
Marbled Goby	396	<i>Notacanthus chemnitzii</i>	98	<i>Pollachius virens</i>	213	Reticulated Dragonet	380
<i>Maurolicus muelleri</i>	173	Nursehound	36	Pollack	212	<i>Rhodeus sericeus</i>	130
Meagre	336	Oarfish	181	Pollan	152	Risso's Smooth-head	144
Mediterranean Moray	101	<i>Oblada melanura</i>	328	<i>Polyprion americanus</i>	298	River Lamprey	21
<i>Megalop atlanticus</i>	96	Ocean Sunfish	465	<i>Pomatomus saltatrix</i>	308	Roach	131
Megrim	436	Oceanic Pufferfish	463	<i>Pomatoschistus lozanoi</i>	395	Rock Bass	301
<i>Melanogrammus</i>		Oilfish	405	<i>Pomatoschistus</i>		Rock Cook	341
<i>aeglefinus</i>	206	<i>Oncorhynchus</i>		<i>marmoratus</i>	396	Rock Goby	390
<i>Merlangius merlangus</i>	207	<i>gorbuscha</i>	156	<i>Pomatoschistus</i>		<i>Rostroraja alba</i>	66
<i>Merluccius merluccius</i>	191	<i>Oncorhynchus kisutch</i>	158	<i>microps</i>	397	Rough Pomfret	322
<i>Microchirus azevia</i>	456	<i>Oncorhynchus mykiss</i>	159	<i>Pomatoschistus</i>		Roughfish	242

Roughhead Rattail	185	Sharpnose Sevengill	Spotted Ray	77	<i>Torpedo nobiliana</i>	64	
Roughsnout Rattail	188	Shark	47	Spotted Snake Blenny	365	Torsk	201
Round Ray	74	Shore Clingfish	377	Sprat	112	<i>Trachinotus ovatus</i>	317
Roundhead Rattail	184	Shore Rockling	197	<i>Sprattus sprattus</i>	112	<i>Trachinus draco</i>	363
Rudd	132	Short-beaked Garfish	239	Spurdog	51	<i>Trachipterus arcticus</i>	180
Ruffe	304	Shortfin Mako	31	<i>Squalus acanthias</i>	51	<i>Trachurus trachurus</i>	318
<i>Rutilus rutilus</i>	131	Short-snouted Seahorse	258	<i>Squatina squatina</i>	61	<i>Trachyrincus scabrus</i>	188
<i>Ruvettus pretiosus</i>	405	Shovel-nosed Shark	53	Squirrelfish	245	Transparent Goby	382
Saddled Bream	328	Siberian Sturgeon	91	Starry Ray	81	Transparent Hatchetfish	174
Sailfin Dory	248	Silurus glanis	139	Starry Smooth Hound	39	<i>Trichiurus lepturus</i>	409
Sailfin Roughshark	58	Silver Bream	115	Sterlet	92	<i>Trigla lyra</i>	277
Saithe	213	Silver Hatchetfish	172	<i>Sternoptyx diaphana</i>	174	<i>Triglops murrayi</i>	286
<i>Salmo salar</i>	160	Silver Pomfret	321	Steven's Goby	388	<i>Triglopsis quadricornis</i>	282
<i>Salmo trutta</i>	162	Silver Rockling	195	Stone Loach	135	<i>Tripterygion delaisi</i>	367
<i>Salvelinus alpinus</i>	164	Silver Scabbardfish	408	Straight-nosed Pipefish	260	<i>Trisopterus esmarkii</i>	215
<i>Salvelinus fontinalis</i>	166	Silvery Pout	203	Streaked Gurnard	273	<i>Trisopterus luscus</i>	216
Sand Goby	398	Skipjack Tuna	414	Striped Red Mullet	338	<i>Trisopterus minutus</i>	217
Sand Smelt	235	Skipper	240	Sunbleak	124	Tub Gurnard	274
Sand Sole	458	Slender Snipe Eel	102	Swordfish	424	Turbot	438
<i>Sander lucioperca</i>	306	Slender Sunfish	467	<i>Syngnathus acus</i>	261	Twaite Shad	108
Sandy Ray	70	Small-eyed Ray	76	<i>Syngnathus rostellatus</i>	262	Two-horn Sculpin	281
<i>Sarda sarda</i>	416	Small-headed Clingfish	374	<i>Syngnathus typhle</i>	263	Two-spotted Clingfish	375
<i>Sardina pilchardus</i>	111	Small-scaled		Tadpole Fish	214	Two-spotted Goby	391
<i>Sarpa salpa</i>	333	Scorpionfish	268	<i>Taractes asper</i>	322	Undulate Ray	82
Sar's Eelpout	348	Smelt	148	<i>Taractichthys</i>		Vadigo	311
Saupe	333	Smooth Hammerhead	43	<i>longipinnis</i>	323	Vahl's Eelpout	350
Scad	318	Smooth Hound	40	Tarpon	96	Variable Blenny	372
Scaldfish	453	Smooth Pufferfish	464	<i>Taurulus bubalis</i>	284	Velvet Belly	54
Scale-rayed Wrasse	340	Smooth Rattail	187	<i>Taurulus lilljeborgi</i>	285	Vendace	150
<i>Scardinius</i>		Smooth Sandeel	358	Tench	133	Viviparous Blenny	351
<i>erythrophthalmus</i>	132	Snake Blenny	366	<i>Tetrapturus albidus</i>	427	Wels Catfish	139
<i>Schedophilus</i>		Snake Pipefish	255	Thickback Sole	457	White Marlin	427
<i>medusophagus</i>	430	Snipefish	264	Thick-lipped Grey Mullet	226	White Sea Bream	327
<i>Schedophilus ovalis</i>	431	Softhead Rattail	186	Thin-lipped Grey Mullet	230	White Skate	66
<i>Scomber colias</i>	417	<i>Solea solea</i>	459	Thornback Ray	71	Whiting	207
<i>Scomber scombrus</i>	418	Solenette	455	<i>Thorogobius</i>		Witch	442
<i>Scorpaenopsis saurus</i>	240	<i>Somniosus</i>		<i>ephippiatus</i>	401	Wolffish	354
<i>Scophthalmus rhombus</i>	439	<i>microcephalus</i>	56	Thor's Scaldfish	454	Worm Pipefish	259
<i>Scorpaena porcus</i>	268	Spanish Ling	210	Three-bearded Rockling	198	Wreckfish	298
<i>Scorpaena scrofa</i>	269	Spanish Sea Bream	329	Three-spined		<i>Xenodermichthys copei</i>	145
<i>Scyliorhinus canicula</i>	35	<i>Sparus aurata</i>	334	Stickleback	251	<i>Xiphias gladius</i>	424
<i>Scyliorhinus stellaris</i>	36	<i>Sphoeroides</i>		Thresher Shark	29	Yarrell's Blenny	364
Sea Bass	296	<i>pachygaster</i>	464	<i>Thunnus alalunga</i>	420	Yellowfin Tuna	421
Sea Lamprey	23	<i>Sphyrna viridensis</i>	403	<i>Thunnus albacares</i>	421	Yellowmouth Barracuda	403
<i>Sebastes marinus</i>	270	<i>Sphyrna zygaena</i>	43	<i>Thunnus obesus</i>	422	Zander	306
<i>Sebastes viviparus</i>	271	<i>Spinachia spinachia</i>	254	<i>Thunnus thynnus</i>	423	Zebra Sea Bream	326
<i>Seriola carpenteri</i>	314	Spined Loach	134	<i>Thymallus thymallus</i>	155	<i>Zenopsis conchifer</i>	248
<i>Seriola dumerili</i>	315	Spiny Eel	98	<i>Tinca tinca</i>	133	<i>Zeugopterus punctatus</i>	440
<i>Seriola rivoliana</i>	316	Spiny Seahorse	257	Tompot Blenny	371	<i>Zeugopterus regius</i>	441
<i>Serranus cabrilla</i>	300	<i>Spondyliosoma</i>		Tope	38	<i>Zeus faber</i>	249
Shagreen Ray	73	<i>cantharus</i>	335	Topknot	440	<i>Zoarces viviparus</i>	351
Shanny	370	Spotted Catfish	355	Topmouth Gudgeon	129		
Sharpchin Barracudina	177	Spotted Dragonet	379	<i>Torpedo marmorata</i>	63		





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