

WATER RESOURCES ACT 1991

THE WALES ROD AND LINE (SALMON AND SEA TROUT) BYELAWS 2017

THE WALES NET FISHING (SALMON AND SEA TROUT) BYELAWS 2017

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APPENDIX 3 TO THE PROOF OF PETER GOUGH:

GLOSSARY

**On behalf of
NATURAL RESOURCES WALES**

NOVEMBER 2018

1 Sea Winter	Fish that has spent one winter at sea
2 Sea Winter	Fish that has spent two winters at sea
Adult	Salmon after the middle of the first winter spent at sea, after which the main categorisation is by sea-age, measured in sea-winters (e.g. grilse, or 1SW; two sea winter, or 2SW).
Anadromous fish	Fish, born in freshwater, that migrates to sea, to grow and mature, and then returns to freshwater as an adult to spawn (e.g. salmon, sea trout).
At Risk	When river stocks are statistically failing to meet their management objective. (Strictly, there is a less than 5% chance that they are meeting the objective.)
Bait fishing	Fishing with natural or artificial bait, typically worm, shrimp or prawn (does not include fly and spinning baits)
Barbless/debarbed	Barb removed from a hook by the fisherman squashing, crimping or filing it down.
Bayesian credible intervals	The range of values within which a parameter has a given probability of falling. For instance, if there is a 95% chance that the true value of the parameter is above one figure (X) and below another figure (Y) then the range from X to Y is a 95% credible interval. This may be distinguished from a “confidence interval”, which is the likelihood of a parameter falling within a particular range.

By-catch	The capture of non-targeted fish
Catadromous fish	Fish that are born in saltwater, migrate into freshwater as juveniles, where they mature before migrating back to the ocean as adults to spawn (e.g., eels).
Catch and Release	A method of angling where some or all of the fish caught are released after capture.
Catchment	The area of land drained by a river (e.g. River Tywi catchment).
Conservation Limit	Conservation Limits serve as biological Reference Points, used to define the minimum levels below which stocks should not be allowed to fall. The CL for each river is set at a stock size (defined in terms of eggs deposited) below which further reductions in spawner numbers are likely to result in significant reductions in the number of juvenile fish produced in the next generation.
Coracle	A small, rounded 1-man boat. Coracles fish in pairs on the Tywi, Taf and Teifi estuaries. A net is suspended between the two coracles.
Diadromous Fish	Diadromous fish spend part of their life cycles in fresh water and part in salt water. These represent both anadromous and catadromous fish.
Draft or seine net	A long fishing net which hangs vertically in the water with floats at the top and weights at the bottom edge, the ends being drawn together to encircle the fish. Can be fished from a boat or by wading.
Ecosystem	A community of organisms and their physical environment interacting as an ecological unit.

Egg shortfall	The difference in the number of eggs required to meet the management objective and what is calculated to be produced.
Electrofishing	A sampling method commonly used on small to medium sized streams (usually up to c.10m wide) to obtain abundance estimates for juvenile salmon and trout. The technique uses a small electric field delivered into the water by a portable anode carried by the sampler. Fish within the field are stimulated to swim involuntarily, making them vulnerable to capture by hand-net. The fish are unharmed by this process.
Escapement	Fish that survive to spawn after exploitation of the stock.
EU Directive	European Union legislation with objectives that are binding on Member States, but which must be implemented through national legislation within a prescribed time-scale
Exploitation	Removal of fish from a stock by fishing
Fecund	Fish producing or capable of producing an abundance of offspring or new growth.
Fishery	An area where it is, or may be, lawful to fish and where the resource is exploitable.
Fly fishing	An angling method in which an artificial "fly" is used to catch fish. The fly is usually cast using a fly rod, reel, and specialised line.
Flying C	The Flying Condom also known as the Flying C is a particular style of lure commonly used in spinning for salmon and sea trout.
Fry	Young salmon or trout that have hatched out in the current year, normally in May at the stage from independence of the yolk sac as

the primary source of nutrition up to dispersal from spawning areas (redds).

Future Lifetime Egg

A spreadsheet model developed to calculate various metrics of sea trout stocks in order to support decisions on catch regulation. The principal feature is the use of life table approaches which allow the calculation of future life time egg production (FLE) of individual fish, age and size classes.

Generation Time

The duration of a generation. Salmon can be considered to have a generation time of up to 5 years in Wales, spending 1 to 3 years in freshwater before migrating to sea, typically returning either after 1 year as grilse, or 2 or (occasionally) 3 years as MSW salmon.

Gillnet

A fishing net which is hung vertically so that fish get trapped/meshed in it by their gills.

Good ecological status

A key target under the EU Water Framework Directive. Water bodies of 'good ecological status' should have the biological and chemical characteristics expected under sustainable conditions. Practicality and the cost to society have to be considered in achieving this and this principle is also inherent in the WFD.

Grilse

An adult salmon that has spent only one winter feeding at sea (1SW salmon) before returning to freshwater to spawn; normally only applied to salmon in homewaters.

Heritage fishery

A fishery which uses a method that is considered to have an aspect of worth or importance attached by people to qualities of places, communal or historical value. e.g. coracle fishing.

Holarctic

The biogeographic range of wild Atlantic salmon in the northern hemisphere.

Juvenile	Young fish including fry, parr and smolt.
Licensee	A holder of a licence which permits them to fish with the use of a net.
Lure	A type of artificial fishing bait which is designed to attract a fish's attention. The lure uses movement, vibration, flash and colour to bait fish.
Management Objective	The 'management objective' used for each river in England and Wales is that the stock should be meeting or exceeding its CL in at least four years out of five (i.e. >80% of the time), on average.
Management target	A spawning stock level for managers to aim at to meet the management objective.
Mixed stock fishery	A fishery that predominantly exploits mixed river stocks of salmon. The policy in England and Wales is to move to close coastal net fisheries that exploit predominantly mixed stocks where the capacity to manage individual stocks is compromised. Fisheries, including MSFs, operating within estuary limits are assumed to exploit predominantly fish that originated from waters upstream of the fishery; these fisheries are carefully managed to protect the weakest of the exploited stocks, guided by the decision structure and taking into account socio-economic factors and European Conservation status where applicable.
Multiple-run fishings	Electrofishing survey method involving multiple fishing runs (usually 2 or 3) on the same sampling occasion. The fish caught are removed and counted at the end of each run and the depletion in catch over 2 or 3 runs is used to estimate the total fish population within the site

Multi-beam sonar	A device used to detect fish by emitting a fan of sound waves into water.
Multi-Sea-Winter salmon	An adult salmon that has spent two or more winters at sea.
Natura 2000	The European network of protected sites (SPAs and SACs) that will be established under the Birds and Habitats Directives
Net Limitation Order	Mechanism under the Salmon and Freshwater Fisheries Act, 1975 to limit the number of nets or traps fishing a public fishery. Each order limits the number of licences for fishing with nets that may be issued in any specific fishery for up to 10 years.
Not at Risk	When river stocks are statistically meeting their management objective. (Strictly, there is at least a 95% chance that they are meeting the objective.)
Parr	Juvenile salmon in the stage following fry until its migration as a smolt, Salmon parr are typically <16 cm long and have parr-marks (dark vertical bars) on the sides of the body.
Pelagic fisheries	Fish which live in the pelagic zone of ocean or lake waters being neither close to the bottom nor near the shore, typified by high seas fisheries. In contrast with demersal fish, which do live on or near the bottom, and reef fish, which are associated with coral reefs.
Plugs	A popular type of hard-bodied fishing lure. They are widely known by a number of other names depending on the country and region. Such names include crankbait, wobbler, minnow, shallow-diver.
Post-smolt	Young salmon, at the stage from leaving the river (as smolts) until the middle of its first winter in the sea.

Precautionary Approach or Precautionary Principle

An approach to risk management whereby if there is the possibility that a given policy or action might cause harm to the public or the environment and if there is still no scientific consensus on the issue, the policy or action in question should not be pursued.

Principal Salmon River

Rivers which on average have a catch of over 50 fish per year and therefore require a Salmon Action Plan to ensure that conservation limits are met. Listed in 1998 Ministerial Direction. In Wales, they are the Wye, Usk, Taff & Ely, Ogmore, Tawe, Tywi, Taf, Eastern Cleddau, Western Cleddau, Nevern, Teifi, Rheidol, Dyfi, Dysinni, Mawddach, Dwyryd, Glaslyn, Dwyfawr, Seiont, Ogwen, Conwy, Clwyd, and Dee

Probably At Risk

When the likelihood of river stocks passing their management objective is between 5% and 50%.

Probably Not At Risk

When the likelihood of river stocks passing their management objective is between 50% and 95%.

Quantitative Survey

Quantitative surveys utilise a catch depletion method, which gives a population estimate. Electric fishing is carried out for a measured length of the watercourse, which is netted at either end to ensure a closed population. This area is fished three times successively or until a good depletion is obtained. The fish are then identified, measured and counted.

Recruits

The abundance of fish measured at a particular point in the life cycle, e.g. at the juvenile stages, the smolt stage, prior to the first fishery (recruitment to the fishery), or as returning spawners.

Reference point

An estimated value derived from an agreed scientific procedure and/or model which corresponds to a state of the resource and/or

of the fishery and can be used to assess stock status or inform management decisions.

Run -

The number of adult salmon ascending, or smolts descending, a river in a given year. The main smolt run takes place in spring, whereas adult salmon runs may occur in spring, summer, autumn or winter.

Salmonid

A fish belonging to the family *Salmonidae*, which includes the Atlantic salmon (*Salmo salar*), brown and sea trout (*Salmo trutta*)

Sea age

The number of winters that a salmon has remained at sea.

Sea trout

Anadromous form of the trout (*Salmo trutta*) from the post-smolt stage; the brown trout remains in freshwater throughout its life

Semi-Quantitative Survey

Electrofishing is carried out for a measured length of the watercourse. The fish are then identified, measured and counted. Unlike the quantitative method this method does not rely on a depletion, so a P value can be applied to calculate and estimate of what a quantitative method would have produced.

Smolt

The stage in the life cycle of a salmon when the parr undergo physiological changes, become silver in appearance and migrate to sea. Salmon smolts are typically 12-16 cm long and migrate to sea in spring.

Smolt age

The number of winters, after hatching, that a juvenile salmon remains in freshwater prior to emigration as a smolt (this does not, therefore, include the winter in which the egg was laid).

Smolt Output

A general term that refers to the numbers of salmon or sea trout smolts produced by a river system usually on an annual basis. The capacity of a system to produce smolts (and earlier life stages) is largely dependent on the extent and quality of the freshwater environment. This capacity is also referred to as the 'carrying capacity' and signifies that there are limits to the numbers of fish any one river can produce. Poor survival at sea is currently a major and universal constraint on the numbers adults returning to our rivers, but an area where we have little control. Hence, ensuring that as many fish as possible survive to spawn and maintaining and improving the quality of the freshwater environment in order to maximise smolt output are key management objectives.

Spatial Survey

Surveys that are completed once every 6 years on a rolling programme and consist of a greater number of sites which cover the entire catchment. These surveys aim to show spread of species rather than trends over time (see temporal surveys).

Spawning stock

The part of a stock which is mature and breeding, the number or biomass of all fish beyond the age or size class in which 50% of the individuals are mature.

Special Area of Conservation

An area designated under the EU Habitats Directive (92/43/EEC) giving added protection to identified species and habitats. Where salmon is a "qualifying species", additional protection measures are required specifically for salmon.

Spoons, Spinners, Plugs

Three main types of lures used to spin for salmon and sea trout.

Spring salmon

Multi-sea-winter salmon which return to freshwater early in the year, usually before the end of May.

Statistically Significant	When there is a less than 95% chance that the outcome is down to chance.
Stock	A management unit comprising one or more salmon populations, which may be used to describe those salmon either originating from or occurring in a particular area. Thus, salmon from separate rivers are referred to as “river stocks”. (N.B. Very large management units, such as the salmon exploited at West Greenland, which originate from many rivers, are often referred to as ‘stock complexes’).
Stock recruitment models	Fishery models that predict the amount of juvenile recruitment as a function of the parent stock.
Stocking	The intentional release of fish into an ecosystem.
Sustainable management of natural resources	Using natural resources in a way and at a rate that maintains and enhances the resilience of ecosystems and the benefits they provide, in doing so, meet the needs of current generations without compromising the ability of future generations to meet their needs, and contribute to the achievement of the well-being goals set out in the Well-being of Future Generations (Wales) Act 2015. Also referred to as sustainable management.
Sustainable use	The use of a biological resource in a way and at a rate that does not lead to the long-term decline of its potential to meet the needs and aspirations of present and future generations. Sustainable use does not imply that abundance is constant.
Tagging	Marking or attaching a tag to an individual or group of individuals, so that it or they can be identified on recapture; used to estimate population size or loss, or for the study of movement, migration and

stock delineation, for the examination in a stock and for the recovery of biological specimens.

Temporal Survey	Surveys that are completed once a year to show population trends over time.
Traditional Fishery	A fishery which uses a long-established method such as seine netting.
Trammel net	A three-layered net, designed so that a fish entering through one of the large-meshed outer sections will push part of the finer-meshed central section through the large meshes on the further side, forming a pocket in which the fish is trapped.
Tube flies	Common type of fly for salmon and sea trout fishing tied on a tube made of plastic or metal
Waddington	Type of metal mount commonly used tying salmon and sea trout flies.
Whitling	Returning sea trout coming back to the river after only a few months at sea (less than 1 year). Small sea trout are variously called whitling, finnock, peal and herling (although whitling is a term generally used for small sea trout in estuaries).

Abbreviations

1SW One sea winter

2SW Two sea winter

ACAP Agreement on the Conservation of Albatrosses and Petrels

ASCOBANS Agreement on the Conservation of Small Cetaceans in the Baltic, North-East Atlantic, Irish and North Seas

C&R Catch and Release

CEFAS Centre for Environment, Fisheries and Aquaculture Science

CL Conservation Limit

CPUE Catch per Unit of Effort

DCF Data Collection Framework

DEFRA Department for Environment, Food and Rural Affairs

DIDSON - Dual Frequency Identification Sonar

DS Decision structure.

DSAP Dee Stock Assessment Programme

E&W England and Wales

FLE	Future Lifetime Egg
GVA	Gross added value
ICES -	International Council for the Exploration of the Sea
IMO -	International Maritime Organization
IUCN	International Union for Conservation of Nature
MSF	Mixed stock fishery
MSW	Multi sea winter
MSY	Maximum Sustainable Yield
MT	Management Target
N2K	Natura 2000
NASCO	North Atlantic salmon Conservation Organization
NEAC	North-East Atlantic Commission
NLO	Net Limitation Order
NRW	Natural Resources Wales
PFA	Pre-fisheries abundance

PSB	Public Services Board
RSEs	Returning Stock Estimates
SACs -	Special Areas of Conservation
SER	Spawner escapement reserve
SMNR	Sustainable Management of Natural Resources
SoNaRR	State of Natural Resources Report
SR	Stock recruitment
UDN	Ulcerated Dermal Necrosis
UN ECE -	the UN Economic Commission for Europe
WFD -	The Water Framework Directive 2000/60/EC
WG	Welsh Government
WTP -	Willingness to pay