

Freshwater Pearl Mussel (*Margaritifera margaritifera*)



Freshwater pearl mussels
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The freshwater pearl mussel has a heavy, rough rather compressed kidney-shaped shell that is yellow/brown when young and black-brown in older specimens.

Freshwater pearl mussels are among the longest lived of all invertebrates - evidence from annual growth rings on shells attests to some individuals reaching more than 100 years of age.

Over this kind of lifespan, it is theoretically possible for one adult mussel to produce 200 million eggs⁽²⁾. Yet, despite this and the fact that Mussel colonies can number thousands of mature individuals, many old, established colonies in Britain do not appear to have recruited new members for 30 or more years⁽¹⁾. Such populations must be considered to be in terminal decline.

It is not presently known exactly why these pearl mussel populations are in such a perilous state but it does appear that this is an international problem. A 90% reduction in European stocks is estimated to have occurred over the last 100 years. The species is regarded as being 'globally threatened' on the IUCN's Red Data List.

Main Habitat(s): Clear, calcium-poor water in fast flowing rivers. The mussels live partially buried in stable gravel beds.

National Status

The UK range is north and west of a line drawn between Scarborough, North Yorkshire and Beer Head, Devon. The species appears widespread in Britain, having been recorded from 151 ten km squares since 1950. However, many of these records relate only to observations of empty shells⁽³⁾.

The only English rivers currently supporting significant populations of Mussels are in Cumbria and Northumberland.

The pearl mussel is legally protected under the Wildlife and Countryside Act (1981). It is a Priority Species in the UK BAP.

Regional Status

The largest and most viable population remaining in England occurs in Cumbria.

Local Status

The distribution of pearl mussels in Lancashire is believed to have altered very little from that recorded at the end of the 19th century. The only known population in the county is in the river Lune. This is a single colony of only about 160 aged individuals and there is no evidence of recruitment in the last 40 years.

It is considered that if there is no change in the current situation, this population will disappear and the species will become extinct in Lancashire within the next 25 years ⁽⁴⁾.

Current factors affecting the species

Freshwater pearl mussels are very sensitive to changes in water quality. Nutrient enrichment and increased amounts of water-borne sediment can pose serious threats to colonies, and populations have been decimated by even single instances of industrial or agrochemical contamination.

Pearl mussel larvae spend part of their life cycle as parasites on trout or salmon hosts. The loss of salmonid fish from many river systems is assumed to have badly affected mussel reproductive success.

Physical removal or modification of river habitat near colonies can be detrimental. For example, altered water flow regime could increase sediment loading and/or bed stability/mobility.

Illegal destructive pearl fishing is a potential threat to populations and for this reason, the precise location of the Lancashire population must be treated as confidential information.

Current Action / Mechanisms

A national Action Plan for this species has been produced which identifies the Environment Agency as the national lead organisation.

The Environment Agency and English Nature commissioned a survey of pearl mussels in North West England during 2000. The conclusion from this survey for the Lune population was that "conservation measures specific to the small surviving mussel population are not justified".

"With our present knowledge of the decline of the mussel in England and Wales, we cannot offer any positive suggestions to arrest these declines. However, an annual survey to check on the main 'bed'... may prove useful in monitoring the rate of decline. The population should, however be protected through the Environment Agency's Land Drainage powers" ⁽⁴⁾.

Objectives, targets and proposed actions for freshwater pearl mussel in Lancashire

Broad Objective:	A. Monitor the mussel population in the Lune.			
Operational Objective	Action Required (Priority)	Partners	Time-scale	Type
1. Establish system to annually monitor the Lune's pearl mussel population	1. Re-survey population in 2001(High).	EA	S	RM
	2. Repeat survey on annual basis from 2002 onwards (High).	EA	O	RM
Broad Objective:	B. Maintain a pearl mussel presence in the Lune.			
Operational Objective	Action Required (Priority)	Partners	Time-scale	Type
1. Maintain water quality in the appropriate stretches of the Lune suitable for pearl mussel (as per objectives set in Lune LEAP).	1. Promote river and riparian habitat management likely to benefit pearl mussel (Medium).	EA, Land-owners, FWAG, BHSP	O	A, LM
	2. Screen all applications for discharge consents and abstraction licences to identify those with possible negative impacts on pearl mussel population. (Medium)	EA	O	RM
	3. Assess applications for development for potential to damage pearl mussel population (Medium).	Lancaster City Council, EA	O	RM
2. Deter illegal pearl fishing	1. Liaise with Lancashire Constabulary to ensure that legislation on pearl fishing is enforced. (Medium)	Police, EN	O	A
Broad Objective:	C. Actively seek ways to re-establish a viable pearl mussel population in the Lune by 2015			
Operational Objective	Action Required (Priority)	Partners	Time-scale	Type
1. Keep under review current research underway into mussel ecology and conservation requirements.	1. Periodically review current state of knowledge to identify measures that could be implemented in the Lune to re-establish a viable population of mussels (High)	EA	O	RM

2. Include suitable prescriptions in Lune LEAP	1. Ensure that future versions of the Lune LEAP include measures to restore a viable pearl mussel population including enhancement of salmonid populations. (Medium)	EA	L	P
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Related Action Plans:

- Rivers and streams HAP

References & additional reading:

1. Environment Agency (2000) Focus on Biodiversity.
2. Fryer, G. (1991) A Natural History of the Lakes, Tarns and Streams of the English Lake District. Freshwater Biological Association.
3. HMSO (1995) Biodiversity: The UK Steering Group Report. Volume 2: Action Plans. Freshwater Pearl Mussel Species Action Plan, pp.162-3
4. Killeen, I.J. & Graham-Oliver, P. (2000) A survey of rivers in Cumbria and North Lancashire for the Freshwater Pearl Mussel (*Margaritifera margaritifera*). Unpublished Report to Environment Agency and English Nature. National Museum of Wales 2000.
5. Cosgrave, P. Hastie, L & Young, M. (2000) Freshwater pearl mussels in peril. *British Wildlife*, 11, 5, pp. 340 -347.

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