REF.	ACTIONS	PARTNERS (lead partners in bold)
27.1	**Identify current status of freshwater pearl mussels in River Dee and significance of threats.**	**SNH** / SEPA / SGRPID / SW / NESBReC
27.1.1	Assess threats to River Dee freshwater pearl mussel populations, including: - Population fragmentation & potential for recovery to required population densities. - Thresholds of tolerance for survival of juvenile mussels. - Significance of water quality including cumulative levels of phosphorous within catchment. - Significance of salmonid abundance for the life-cycle of the freshwater pearl mussel.	**SNH** / NESBReC
27.1.2	Agree targets for River Dee population of the freshwater pearl mussel & necessary actions to achieve targets.	**SNH**
27.1.3	Assess existing data to identify locations of existing mussel beds, areas of good quality habitat, & areas where habitats have been degraded.	**SNH**
27.1.4	Where existing data are not available, undertake/commission surveys using approved methodology to determine locations of mussel beds and both potentially good quality & degraded habitat.	**SNH** / NESBReC
27.2	**Control operations that would have an adverse impact on freshwater pearl mussel populations.**	**AC** / **ACC** / **CNPA** / SEPA / SGRPID / SNH / SW / DDSFB
27.2.1	Ensure the application of appropriate assessments into plans or projects that are likely to have a 'significant effect' upon freshwater pearl mussels (or good quality potential habitat).	**AC** / **ACC** / **CNPA** / SEPA / SGRPID / SW
27.2.2	Ensure *either* effective regulation *or* removal of permitted development rights for operations that could have a significant effect upon freshwater pearl mussel or salmonid habitats.	**AC** / **ACC** / **CNPA**
27.2.3	Facilitate projects demonstrating good practice.	DDSFB
27.2.4	Raise awareness of relevant best practice guidance.	**AC** / **AC** / **CNPA** / SNH
27.3	**Maintain water quality.** *See Action Cards 1-12.*	**Partners in Water Quality Action Cards 1-12**
27.4	**Maintain River Dee Atlantic salmon population.** *See Action Card 27.*	**Salmon partners**
27.5	**Considering extending measures to bolster existing River Dee freshwater pearl mussel populations and encourage recolonisation of vacated habitats.**	**SNH** / **CNPA** / **AU** / DDSFB
27.5.1	Extend ongoing captive breed and release project if results are positive.	**AU** / DDSFB
27.5.2	Consider extending ongoing re-introduction programme if results are positive.	SNH
27.6	**Raise awareness of freshwater pearl mussel populations in the River Dee SAC and the legal protection afforded to them.**	**AC** / **ACC** / **CNPA** / **DDSFB** / **SEPA** / **SNH** / SW / Fishing proprietors / Canoe clubs / SCA / Recreation groups
27.6.1	Promote the results of mussel surveys to relevant owners/ occupiers and other parties likely to undertake works in the river system, together with guidance on the legal protection mechanisms from disturbance.	SEPA / DDSFB
27.6.2	Maintain/raise awareness (amongst river workers and users) of legal protection from pearl fishing and the appropriate action if pearl fishing is suspected.	SNH / SEPA / SW / DDSFB / Fishing proprietors / Canoe clubs / SCA / Recreation groups
27.7	**Promote collaboration between public bodies and other stakeholders.**	**DCP** / **NELBAP** / **CLBAP** / **MI** / **SNH**
27.7.1	Hold stakeholder workshop.	MI / SNH

Acronyms are listed in the center of this Action Card

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freshwater pearl mussel

27 SPECIES

OBJECTIVE 27. Implement measures to achieve agreed targets for the River Dee freshwater pearl mussel *Margaritifera margaritifera* population.

BACKGROUND

The River Dee catchment qualifies as a special Area of Conservation due to the importance of its **freshwater pearl mussel**, otter and Atlantic salmon populations. Although the freshwater pearl mussel population of an estimated 1.3 million mussels (Cosgrove et al. 2004) is one of the largest in the world, it has been adversely affected by past pearl fishing, catchment drainage schemes and river engineering activity, resulting in low densities and fragmented mussel beds. Although water quality is generally good the lower catchment has significant agriculture and consequently some tributaries are nutrient enriched. Although there are a few mussel beds that appear to be in 'healthy', recruiting condition, it is unclear if the River Dee pearl mussel population is viable under current conditions.

ISSUES

- Most of the mussel beds in the River Dee are failing to achieve European targets set for juvenile recruitment (at least 20% of population ≤65mm) and population density (≥ 5 mussels per m^2).
- River engineering works for flood defence purposes and fishery improvements pose a serious localised threat.
- There are water quality concerns, including the effects of the cumulative impact of phosphorous within the catchment.
- Catchment drainage/hydrological changes:
  - The river is now much more dynamic than previously, with bigger, more frequent floods during the last two decades (large floods are detrimental to mussel populations (Hastie et al. 2001).
  - Each year there are substantial movements of many hundreds of tons of gravels, pebbles, cobbles, and even boulder deposits. Some of these are encroaching on mussel beds and such movements must have a detrimental impact on the availability of riverbed habitat suitable for pearl mussels
  - More frequent flooding brings pressure for more river engineering works to repair damaged banks etc.
- Historic declines in Dee stocks of migratory Salmon and sea trout (upon which mussel larvae are dependent) is a considerable cause for concern.
- Illegal pearl mussel fishing has occurred in recent years.

EXISTING / RECENT INITIATIVES

- The main pressures on the River Dee pearl mussel population have been identified and measures recommended to address these pressures (Scottish Natural Heritage (SNH), The Macaulay Institute (MI). 2006).
- Adult River Dee mussels were reintroduced to two selected locations in the Dee catchment by SNH in 2005. The location details of re-introduction sites are confidential due to the threat of illegal pearl fishing.
- Recent surveys (Cosgrove et al. 2004) of the broad distribution of mussels in the River Dee and its tributaries recorded mussels over 100km of the river, from 6-7 km upstream from its mouth as far upstream as Braemar (SNH).
- A project to investigate the practicality and effectiveness of breeding and releasing freshwater pearl mussels from local stock is ongoing at the Dinnet hatchery (SNH, Aberdeen University, DDSFB).
- Both the Cairngorms and North East Local Biodiversity Action Plans have actions to benefit the River Dee freshwater pearl mussel populations.
- The recent Operation Necklace campaign highlighted the continued threat of pearl fishing and the legal protection afforded to the species (SNH. 2005).

ACTIONS REQUIRED

- The reasons for population declines need to be investigated urgently.

WHO IS INVOLVED?

Aberdeenshire Council

Aberdeen City Council

Aberdeen University

Canoe clubs

Cairngorms National Park Authority

Cairngorms Local Biodiversity Action Plan

Dee Catchment Partnership

Dee District Salmon Fishery Board

Fishing proprietors

Macaulay Institute

North East Local Biodiversity Action Plan

North East Scotland Biological Records Centre

Recreation groups

Scottish Canoe Association

Scottish Environment Protection Agency

Scottish Government Rural Payments & Inspections Directorate

Scottish Natural Heritage

Scottish Water

Partners in Water Quality and Atlantic salmon Action Cards (1-12 & 26)

Further copies can be downloaded at www.theriverdee.org. For further information contact the Dee Catchment Officer c/o The Macaulay Institute, Craigiebuckler, Aberdeen AB15 8QH Telephone: 01224 498200 email: info@theriverdee.org

deecatchment partnership

- There are areas where more detailed surveys are required, in particular to record the location and extent of suitable habitat. River Habitat Survey methodology can be useful (Hastie et al. Characterisation of freshwater pearl mussel (*Margaritifera margaritifera*) riverine habitat using River Habitat Survey data).
- To safeguard remaining populations, it is imperative that those undertaking river works are aware of the presence of mussels and the consequences of the legal protection afforded to them.
- The significance of these threats needs to be identified and action taken to address outstanding concerns.
- Investigate the significance of recent declines in spring run salmon.
- There is a continued need for more widespread awareness of the River Dee mussel populations, the legal protection afforded to them and the need to report suspected pearl fishing to local police.
- To *clarify our understanding* of the threats to mussels and necessary appropriate actions, there is an overall need for further collaboration between public bodies and other stakeholders (SEPA, SGRPID, SNH, local authorities, CNPA, Scottish Water & DDSFB).

LEGISLATION

See Action Pack Annex for information sources

- Listed in Schedule 5 of the **UK Wildlife and Countryside Act 1981**, the freshwater pearl mussel is fully protected against intentional killing, injuring, taking or disturbance, and its habitat is protected against damage or destruction.
- The **EC Habitats and Species Directive** lists the freshwater pearl mussel under Annexes II (species of community interest whose conservation requires the designation of Special Areas of Conservation) and Annex V (species whose exploitation must be subject to management); the listing under Annex V is largely irrelevant in the UK following the complete ban on pearl fishing in 1998.
- The **UK Conservation Regulations** require consenting authorities to undertake an 'appropriate assessment' of proposed works which may have a significant impact on the integrity of the River Dee mussel population.
- The freshwater pearl mussel is listed under Appendix III of the **Bern Convention** and is included on the **IUCN Invertebrate Red List**, where its status is described as Vulnerable.



Freshwater pearl mussels (S. Cooksley)

GUIDELINES AND INFORMATION

See Action Pack Annex for information sources

- **Guidance for those intending to undertake works to the river channel or its banks:**
  - Riparian Management leaflet (SEPA)
  - Managing River Habitats for Fisheries (SEPA)
  - Best Practice Guidelines for River Engineering (AC)
  - Works to Watercourses
  - Water Environment (Controlled Activties) (Scotland) Regulations 2005 – A Practical Guide (SEPA)
  - Good Practice Guidance: Construction of River Crossings (SEPA)
  - Good Practice guidance: Bank Protection: Rivers and Lochs (SEPA)
  - Other good practice and regulatory guidance on SEPA website under WFD and engineering links
- **Reporting suspected pearl fishing incidents:**
  - **Aberdeen Wildlife Crime Officer** 0845 600 5700
- **Other Plans with actions to benefit River Dee freshwater pearl mussel populations:**
  - UK Biodiversity Action Plan (BWG)
  - Cairngorms Local Biodiversity Action Plan
  - NE Local Biodiversity Action Plan
- **Information about the ecology of the freshwater pearl mussel:**
  - LIFE in UK Rivers Project publications: Ecology of the freshwater pearl mussel, Monitoring protocols, Conservation issues – captive breeding, Conservation issues – Relationship with salmonids, River conservation strategies (Kerry, Borgie and Moidart)
  - 'River Runners' (SNH, 2003)
  - Natural historywww.english-nature.org.uk
- **SACs where the freshwater pearl mussel is a qualifying interest**
  - www.jncc.gov.uk/ProtectedSites/SACselection/species.asp?FeatureIntCode=S1029

BENEFITS TO PROTECTED SPECIES

The following specially protected species will benefit from the Actions:

- Freshwater pearl mussel *Margaritifera margaritifera*

27 SPECIES

RELATED ACTION CARDS

1-11 (Water quality Cards)

14. Water abstraction

15. Land management & river flows

16. Flood alleviation

17. Engineering works

18. Obstacles to fish passage

19. Impacts of changes in land use

22. Floodplains

26. Atlantic salmon

32. Fish data

33. Access & recreation