

## 5 Freshwater Pearl Mussel

Engineering operations associated with the construction of the AWPR have the potential to affect freshwater pearl mussel in the River Dee SAC as follows:

- Water quality deterioration:
  - Increased sedimentation affecting habitat suitability for adult and juvenile freshwater pearl mussel, causing sub-lethal damage or mortality to individual mussels;
- Release of other contaminants causing pollution and resulting in one or more of the effects above.
- Habitat deterioration:
  - Sediment deposition within substrates causing habitat to become unsuitable for supporting freshwater pearl mussel.
- Alteration of the availability of larval hosts for freshwater pearl mussel (noise, vibration, sediment/contaminant emissions and habitat fragmentation affecting the presence/abundance of salmonid fish).

During the operation of the proposed scheme, the key potential impacts relate to the possible runoff of sediment and contaminants from the normal road operation or from an accidental release of contaminants due to maintenance works or an accident.

### 5.1 Surveys for Freshwater Pearl Mussel

#### 5.1.1 Survey Areas and Methods

For the purposes of the Environmental Impact Assessment of the AWPR (Jacobs, 2007a), freshwater macro-invertebrate, River Habitat Surveys and fish habitat assessment (HABSCORE) surveys were completed during June 2006 on all watercourses falling within the 500m buffer zone of the proposed scheme. During these surveys the suitability of each watercourse for supporting freshwater pearl mussels was determined on the basis of habitat present and the likelihood of the watercourse supporting salmonids which provide hosts for the mussel larvae.

A recent assessment of freshwater pearl mussels within the River Dee SAC (SNH, 2005b) found that the species was in unfavourable condition. The total population of the Dee, estimated at about 1.3 million mussels, is greatly reduced compared to past levels and has been adversely affected by past pearl fishing and river engineering activity, resulting in a low density (<1 mussel/m) and fragmented mussel beds. Surveys conducted for the site condition monitoring (SNH 2005b) indicated a low percentage of juveniles and lack of very young mussels (<30mm), suggesting that the population may be unable to sustain itself naturally. It is considered unlikely that the availability of juvenile salmonids as hosts is limiting the pearl mussels in the River Dee. The lack of juvenile mussels could be associated with problems such as depressed local water quality (e.g. there is evidence that phosphorus concentrations at Milltimber may exceed the current target for the species). The apparent low number of juveniles may also be an artefact of the small sample size taken at some sites as earlier, more intensive surveys of the River Dee (Hastie 1999) recorded a high proportion of juveniles, including mussels <30mm, at locations in ECS 32 and 33. Juvenile mussels may be easily missed, particularly in areas of faster flow, as they may be completely buried in gravels and only revealed by careful excavation (Dr. Andy MacKenzie, pers. comm. 2008).