

AN SLÍOGÁN DUBH - FRESH WATER PEARL MUSSEL

PROJECT NEWSLETTER – SUMMER 2014

Donegal County Council, in partnership with Northern Ireland Environment Agency (NIEA) - grant aided under the European Union's INTERREG IVA Programme, as part of the Environment strand, under Priority 2.2

Now that we are approaching the end of this particular project it's time to take stock and consider the WHY and the WHAT of the past 3 to 4 years. Why have we put all this time and effort into a project to help save the pearl mussel. What have we achieved and what is the future likely to hold for the beleaguered freshwater pearl mussel?

Why – A PLEA FOR THE PEARL MUSSEL

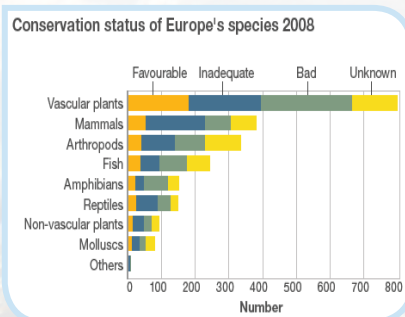


On occasion, I have been scolded for wasting my time saving spiders from the bathtub! It does take a little time since the ungrateful spider generally doesn't want to be saved. It's only a spider they say. But no two spiders are the same. Every living thing is completely unique, a most improbable assemblage of parts and processes that combine in a miraculous, if fleeting life. We will never see their likes again, and the loss of any one unique individual leaves the world a little poorer.

How much poorer then the world for the loss of a whole species – a life form that has been shaped and honed over millennia to occupy its own little corner of the universe. The extinction of a species is like tearing a hole in a tightly woven and beautifully embroidered cloth. The immediate damage is evident and compromises the beauty of the whole piece, but the subsequent unravelling of the cloth's fabric gives way to wider destruction and eventually perhaps to the loss of the whole work.

We can make lots of scientific arguments for protecting the many living things that share our world:- sources of food, providers of services, energy, medicines and undiscovered cures, and architects of a stable environment in which our own future and that of our children is secured. Sure, mankind can probably get along okay with a few less species on the planet,

but the present rate of loss is truly astounding and we are approaching a critical point where human well-being is being jeopardized.



Biodiversity loss (the loss of species) is an enormous challenge in the EU, with around one in four species currently threatened with extinction and 88% of fish stocks over-exploited or significantly depleted. The services that nature provides for us, like clean water, clean air, fertile soil, and food, are not only crucial for the well-being of human kind, they also

represent an enormous economic value. According to economists, each year in the EU we lose 3% of GDP due to the loss of biodiversity. That costs the EU €450 billion year after year. Compared to such figures, investing in protecting and conserving our species of animals and plants is a bargain.

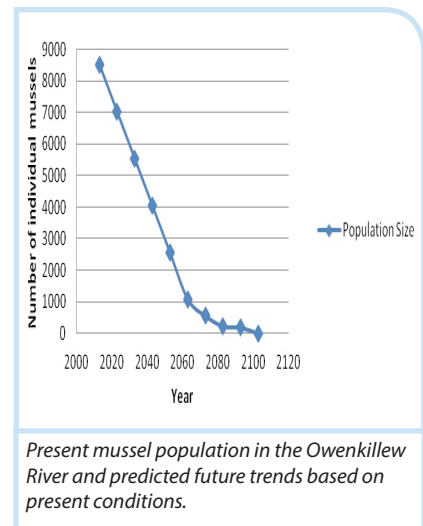
Even if we choose to ignore this line of reasoning and its compelling scientific analysis, there are moral and emotional reasons that oblige us to act. Life in all its varied forms is a source of wonder and great beauty. I for one would not want to live in a world of sprawling cities set in a monotonous landscape of vast monoculture, even if it could be made sustainable.

We have only identified a small fraction (perhaps less than 10%) of all the life forms living on the planet. We just don't know what each one may have to offer. You might not

cont.

be very impressed by the carpet of blue-green mould that slowly engulfs that piece of forgotten fruit lying at the bottom of the bowl, but surely that tiny fungus goes up in your estimation when you realise that it had revolutionized twentieth century medicine by giving us penicillin! There's one thing we know for certain about 'life', it's full of surprises.

The watercolour illustration of the Nore Pearl Mussel shown below is based on the shell of a long dead animal. It is estimated that only 500 Nore Pearl Mussels (a form that is unique to the southeast of Ireland) remain in the wild. Perhaps all our children and grandchildren will ever know of this mussel are pictures such as this, and lifeless shells on museum shelves! Based on the data collected during this project and elsewhere, we believe that most of the pearl mussel populations on the island of Ireland will be extinct by the end of this century unless we act now.



Nore Mussel

AMN

Can we
save the
freshwater
pearl
mussel?
Yes

Is it worth
the effort?
*Most
certainly
Yes!*

WHAT HAVE WE ACHIEVED?

We set ourselves three main tasks in this project:

- Try out some practical measures to see if they might help protect pearl mussels
- Put together proposals for actions in pearl mussel catchments
- Draw up some guidance notes to help inform certain activities

PRACTICAL MEASURES

We identified three types of activities that commonly occur in pearl mussel catchments and that can put pressure on mussels and their habitat – agriculture, forestry and one-off housing. We chose the catchments in which to try protective measures carefully, and made contact with landusers and residents, all of whom gave us tremendous support, and permission to install water monitoring stations.



Water Quality monitoring station installed in our catchments

In agricultural river catchments we looked at how much sediment was being eroded in drainage ditches, and measured the amount of sediment settling on the river bed in mussel habitats. We found that sediment and silt eroding into rivers is a really big problem for the pearl mussel, and that as much as 3.5 tonnes of sediment was being carried into the river from a square kilometer of grazed land each year! This figure could be substantially higher if regular ditch cleaning and maintenance is undertaken.



Sediment trapping in FPM Habitat



Nature of Sediment (microscopic image)



Sediment trapping



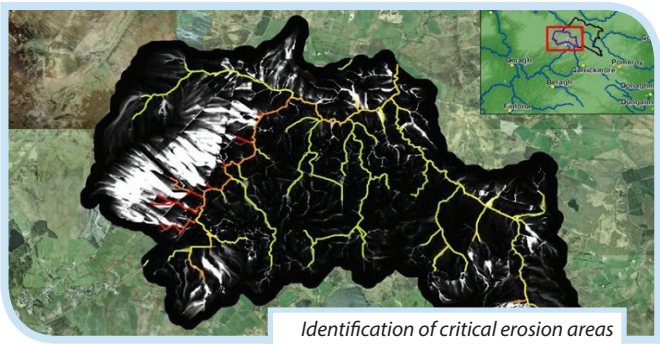
Sediment trapping

When we analysed the nature of this sediment and the water flows in the ditches, it was quite apparent that installing sediment traps was not the solution. Such traps would have to be very large and very numerous, requiring regular maintenance. We believe that a better approach is to prevent sediment from eroding in the first place.

So we went back to our catchments and mapped the key areas that were likely to be sensitive to erosion because of the type of land use, drainage or topography. This showed us the target areas where preventive measures should be focussed. These areas require careful stock management, and control of erosion by working within the tolerances of the land, retaining natural control features such as wetlands where possible. Catchment inspections confirmed that this preferred approach was a realistic management tool.



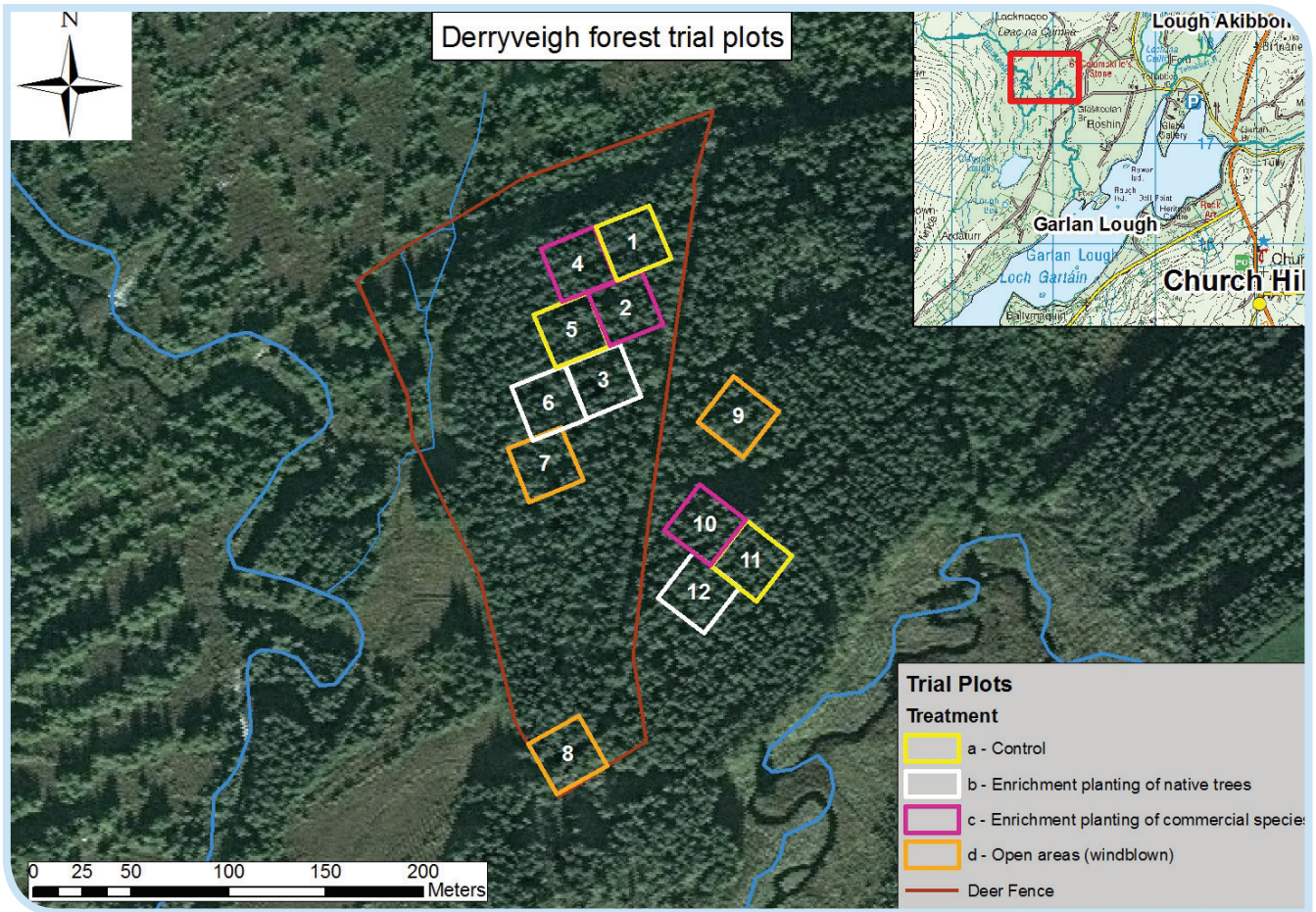
Catchment monitoring



Identification of critical erosion areas

Forestry is also a common land use activity in many pearl mussel catchments, and presents two different issues. One is how to deal with the legacy issue of older forests that were planted before we really understood the problems they can create. The second relates to the ongoing management of forests to prevent impact on mussels.

Many of the problems that may arise with forestry relate to establishing new forests and felling mature crops. We set up a trial in 2011 to test whether an old forest could be replaced without the need for clearfelling and widespread ground preparation that traditional methods require, methods that can be so damaging to mussel rivers. Coillte provided us with an experimental site in Donegal in which we have planted plots with a range of understorey trees, native and commercial broadleaves and conifers. We have been measuring their performance since then, and indications are that this approach might provide an alternative to conventional forestry methods in some very sensitive catchments.

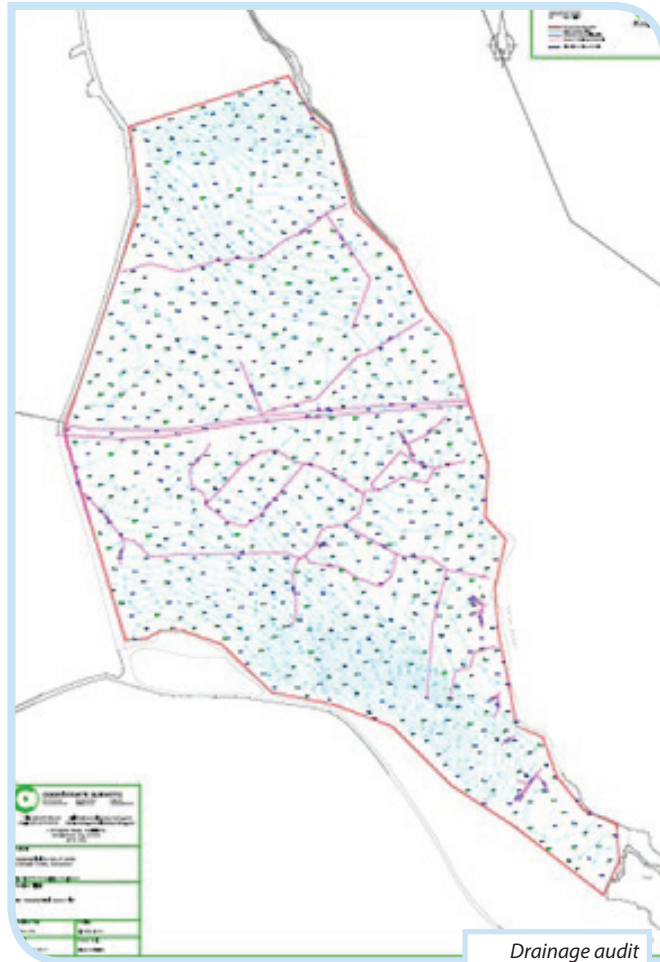


Experimental Plots for understorey establishment trial

We have also been liaising closely with DARD Forest Service during felling and afforestation operations in another catchment in Tyrone. We have shown that careful preparation and planning can greatly reduce the losses of sediment during largescale forestry operations. Key to this is a detailed knowledge of the local drainage patterns, the establishment of effective buffer zones along waterways, and avoidance of sensitive areas.



Drain Blocking Measures in the Davagh Forest



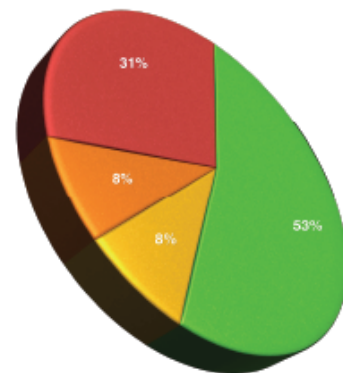
Drainage audit

Finally, we looked at the issue of one-off housing and the types of pressures they generate in pearl mussel catchments. Improved regulation and maintenance of septic tank systems definitely brings substantial benefits by reducing nutrient and sediment losses to rivers. We found that residents in pearl mussel catchments are well disposed to conservation and environmental protection. However, many are unaware of the presence of mussels, or the potential impact that seemingly innocuous activities can have on them. Information and awareness raising measures are therefore of vital importance if we are to succeed in protecting our remaining mussel populations. We hope our Newsletter has helped in this regard, but we have also produced some learning material for younger environmentalists who will be the decision makers of the future.



Question 14: Age of Waste Water System

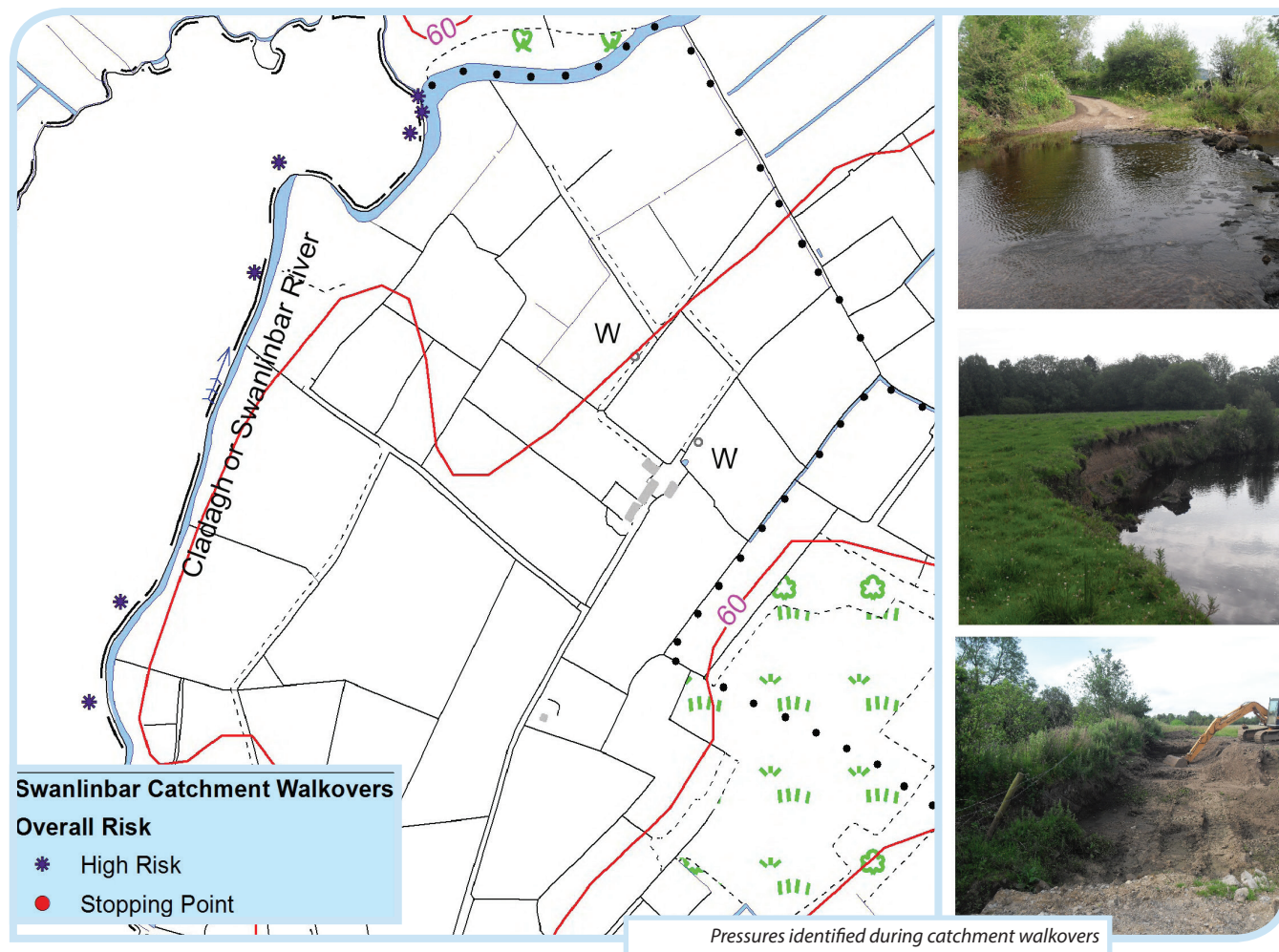
The ages of the septic tank or proprietary systems varied from 7 years old to over 60 years old.



< 5 years 5-10 years 10-15 years 15-20 years 20+

PROPOSALS FOR SUB-BASIN MANAGEMENT PLANS

Three rivers in Northern Ireland have Special Areas of Conservation that have been designated specifically for the freshwater pearl mussel, the Owenkillew, the Ballinderry and the Swanlinbar. A well thought out and informed plan is essential to protect the long term future of these mussel rivers. In the case of the Ballinderry, much good work has been done by the Ballinderry Rivers Trust over many years to conserve pearl mussels, and we liaised closely with this group in relation to our own work.



Starting in 2011, we have studied the three catchments in great detail, walking the river and land to identify key issues and possible solutions to problems.



We have studied the mussel populations to provide up to date data on mussel numbers and location. We have analysed the water and river bed habitat that the mussels live in, and surveyed the salmon and trout that host juvenile mussels. The picture is clear and stark – we must act now or it is likely that all these pearl mussel populations will be extinct by the end of this century.

Having gathered all the information, and considering our own trials with protection measures and best practice at home and abroad, we have proposed a toolbox of measures that we believe could be selectively used to restore the failing mussel populations to favourable condition.

GUIDANCE NOTES

We recognize that people have needs too, and have lived side by side with pearl mussels for millennia. Only relatively recently has human pressure and intensification of land uses tipped the scales against the mussel. But we can do our business in an environmentally friendly manner with foresight and planning, and hopefully with minimum inconvenience or additional cost. We have drafted some notes that we hope might assist particular sectors to avoid causing damage to pearl mussel populations when operating in or near mussel catchments.

The sectors and activities that we have addressed are:-

- Agriculture
- Forestry
- Peat Extraction
- Mining and Quarry Practices
- Housing and Industrial Development
- Roads, Water and Sewerage Infrastructure
- Water Abstraction, Physical Modifications and Impoundments
- Windfarm Development
- Major Emergency Planning
- Habitats Directive Appropriate Assessment



We realise that if these notes are to be of real use and be applied, they must be 'user friendly' and not packed with technical jargon or mind bending detail. It has not been an easy compromise to provide short practical documents and yet give enough detail and justification for what is being proposed. Therefore we have put much of the 'techy stuff' into an overall background Technical Support Document for the 'anoraks', while condensing the notes for coal face operatives as much as possible.

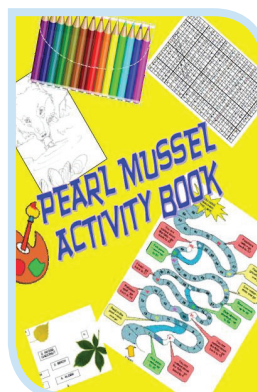
WHAT DOES THE FUTURE HOLD?

Well as you have read above, the future of the pearl mussel is bleak as things stand at the moment. The only reason we still have our remaining mussels is because they are so long-lived (up to 140 years). The ageing mussels are hanging on but conditions are not allowing young mussels to survive. The pearl mussel's plight is symptomatic of a wider problem, the slow relentless

degradation of our most pristine rivers and streams over recent decades. As much as 50% of our very best high status sites have been damaged in the last twenty years. This is not just a problem for the pearl mussel. Many other species are being affected, perhaps somewhat less dramatically in some cases. Such unspoiled rivers and their catchments are the last bastion of many of our

rare and unique species. Are they to follow the same path?

There is a growing appreciation of the economic and cultural / aesthetic value of all aspects of our natural heritage, and of the pervasive nature of threats to its preservation. The protection of that heritage through a sustainable approach to resource utilisation is rapidly finding its way



FURTHER INFORMATION / CONTACT DETAILS

The FPM project is being promoted by Donegal County Council (www.donegalcoco.ie) in partnership with NIEA (www.doeni.gov.uk/niea/), and delivery of the project is through a full time project coordinator and consultancy services provided by RPS (www.rpsgroup.com/). Further information is available through our website www.freshwaterpearlmussel.com where you may also wish to leave a comment or request information.

You can also contact the Project Coordinator:

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The Special EU Programmes Body is a North/South Implementation Body and is responsible for managing the INTERREG IV programme under which the FPM Project is funded. For more information on the SEUPB please visit www.seupb.eu

into all our mainstream policies, from greening of the CAP to spatial planning. 'Needs must' has instilled us with a new sense of urgency, a resolve to reverse our losses of natural capital – the animals and plants, the air, soil and water that sustain us.

So now we need to act. Plans and guidance notes are all very well, but without a willingness to support these initiatives and play our part, they are of little value. I hope that our project newsletters, educational material, public meetings and website have helped to inform you about the freshwater pearl mussel and the issues surrounding its conservation.

I have learned over the course of this project that there is generally no single big issue and no single solution to the pearl mussel's problems. It is usually the cumulative impact of many small things throughout the catchment that has resulted in decline. Regulation certainly has a role to play, but if we each take ownership and responsibility for our own actions we can reverse that trend and ensure that our children and grandchildren can experience the wonder of a pristine stream in all its splendid diversity.



A WORD OF THANKS.

Many individuals and agencies have helped and supported the work of the project. In particular a special word of thanks is due to the landowners and residents in the catchments we have been studying for providing access and local knowledge. Members of the project Steering Committee and Technical Group have guided and supported the project, overseen its outputs and facilitated access to agency personnel. Their expertise has been invaluable. Thanks are also due to the Special EU Programmes Body for the efficient and flexible manner in which they managed the IR IV Programme under which the project was grant aided. Many other individuals, agencies and groups have played key roles in supporting, and delivering this project and their support is greatly appreciated.