**Peatland forestry/grassland catchment interview: Reporter Thomas Deane (TD) and Researcher Liwen Xiao (LX)**

**TD**: Tell me a little about your research:

**LX**: Well, my group is made up of 10 postdocs, PhD and Masters students, and we are interested in the effects that forestry practices have on surrounding ecosystems. We look at a load of different things, including changes in species diversity and abundance in relation to nutrient input, fungal signalling pathways in root systems, and the carbon and nitrogen cycle changes resulting from planting different types of forests. Our main thing recently has been to look at the impacts that happen after a large area of trees has been forested for wood, in terms of the sudden nutrient release into surrounding habitats.

**TD**: And sudden nutrient release is a bad thing?

**LX**: It depends very much on the surrounding habitat, and on which types of nutrients are released, and on where these nutrients end up. But in our experience it is usually a bad thing because forested habitats tend to support lots of other species, of animals, plants and fungi. When a huge amount of nutrients are suddenly released, these can lead to algal and fungal outbreaks, which is often too much for the other species in the system to handle. Trees are also very important in terms of the carbon they use and lock up, so when they are felled, a lot of this goes back into the atmosphere.

**TD**: And I understand you have been working in peatland ecosystems lately. Can you tell me about these, and why you have focused on them?

**LX**: Yes certainly. Basically, throughout areas of Europe, especially Scandinavia, and some parts of North America, a lot of natural peatland was ‘afforested’ in the last 100 years or so. That just means that trees were planted where they had never been before, by man, for the purpose of harvesting further down the line. Now, and over the past decade or so, a lot of these afforested peatlands had trees that had reached maturity and were ready to be felled for timber. What we noticed is that there were some huge effects in nearby oligotrophic rivers, in terms of the way that aquatic species were affected. So we wanted to know more about this and have been working in sites in County Wicklow, Ireland, to find some answers.

**TD**: What is an oligotrophic river?

**LX**: Sorry, I forget sometimes that not everyone is focused on the same research as me! Oligotrophic just means naturally very low in nutrients. Typically these are the rivers and streams at the top of water systems, where the currents are fast and the waters pure and cold.

**TD**: I see. So what happens when trees are felled around these rivers?

**LX**: More often than not, a relatively huge amount of nutrients, such as nitrogen, and phosphorus (which can both be toxic in large concentrations) move from the previously planted areas and find their way into the rivers. This has been linked to severe local population crashes in over 80% of the species that are typically found in these rivers, including salmon species and freshwater mussels that are very important economically.

**TD**: So will this research be used to lobby against felling trees in these peatlands?

**LX**: I don’t know about that really. It is usually very hard to make a strong enough case with this sort of research when there is money invested in the forestry plantations. In this case, a lot of the afforested areas were planted up by governments all those years ago. I think governments will have been banking on collecting the money invested in this timber so I suspect the trees will be felled as planned in all of these areas.

**TD**: So what can be done to help out the aquatic species?

**LX**: Well, this is what we’ve been working on. We just had a really good article published in a leading journal that showcased our work. About six months ago, we found that if you seed the areas immediately surrounding the afforested plantations with grass species, the grasses do a pretty good job of taking up the nutrients that are released when the trees come down. This is the first time anyone has tested this experimentally, which means we might be the first group to have even thought of the idea.

**TD**: Do you think this is a solution then, or is it just something that will reduce the impact to a manageable level?

**LX**: It’s not a complete solution because high concentrations of nutrients are still going to appear in the system very suddenly, but our experiments have shown that between 20 and 40% of the nutrients are taken up by the grasses. That might not seem much, but it means the levels entering the water system are below the threshold considered dangerous by the Environmental Protection Agency. All in all, we’re confident that the grasses take up enough nutrients that aquatic species populations will not be adversely affected anymore.

**TD**: And how long does it take for the grasses to establish once you have seeded them?

**LX**: That’s the beauty of our idea. The grasses establish and dominate the surrounding areas in less than three years, which means that if we start sowing seeds now, these areas should be safeguarded to an extent before the trees come down. If forestry managers work with us to implement this idea, we believe the salmon and mussels can breathe a big sigh of relief.”