Progress report on planting trees where riparian vegetation is inadequate

Action C6

Willow slip showing signs of rejuvenation after being planted into the river bank (Photo: Nuala Riordan)

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Introduction:

Developments in agriculture over the last 50 years, such as increase in field size, loss of hedgerows and use of heavier machinery have increased the risk of soil erosion. Climate change and a predicted increase in frequency of severe weather events is likely to magnify the impact of erosion.

Erosion leads to sedimentation and contamination of streams, rivers and other water bodies, damaging fisheries and wildlife, and increasing water treatment costs. Sediment deposits can increase the turbidity of water bodies and settle in spawning beds affecting valuable fisheries. In some cases sediment deposits can increase the risk of flooding (Woodland Trust, 2013).

The extent of riparian woodland has declined in many areas, but there is a large body of research demonstrating the potential value of such woods as a natural feature of healthy, functioning watercourses. Riparian woodland can aid sediment removal and erosion control, and protect water quality by buffering from pollutants and nutrients. Evidence shows that riparian and floodplain woodland, in addition to acting as a barrier or intercepting sediment and chemical pollutants, also contributes to protecting river morphology (the shape and form of the river channel) by helping to stabilise river banks. The dappled shade provided by riparian trees helps to lower water temperatures and can be associated with improved oxygen levels to the benefit of fish and other wildlife. Shade influences growth of aquatic plants, freshwater algae and ground plants, and moderates water temperatures (Woodland Trust, 2013).

In the Allow Catchment, exposed river bank is eroding at an excessive rate. This is causing hardship not only to the landowners with farmland adjacent to the river but also to wildlife, both in the river and along the riparian zone. One of the actions of the IRD Duhallow LIFE Project is to rebalance riparian vegetation by addressing areas where riparian cover is inadequate (Action C6).

Objectives:

- Plant a range of native trees species (including willow species) of local provenance along specific sections of river banks in the Allow catchment (6.84km).
- The objective is to:
    - Added protection of river banks against excess erosion (reduce soil erosion and river siltation).
    - The creation and connecting of wildlife corridors.
    - Protection of watercourses from excess nutrients and runoff.

Methodology:

Areas requiring work were identified early in the course of the project. The majority of the trees planted were locally sourced willow. A range of techniques were tested to determine the most efficient5 and effective techniques for the re-establishment of the riparian zone.

1. Stakes: A range of willow trees (Goat willow and grey willow mostly) were cut into stakes (ranging between 1 and 12cm in diameter and approximately 0.4m in length) and driven into the affected banks 45cm apart. On higher and steeper banks longer stakes were inserted at many height levels. All of these were driven into the banks using mallets and post-hammers. Where ground was harder, willow stakes were driven into pre-bored holes by electric drills with extra long drill bits.
2. Extra large stakes were used as a trial to double as both a substrate to attach bank revetment Christmas trees and as a stake in their own right. These were driven with an excavator that was on site.
3. Willow slips: willow slips were utilised in sections where water level fluctuations were deemed an issue for longer term survival.
4. Native tree planting: local trees of native progeny were donated by the local community, e.g., Alder, ash and oak.

Results:

Results have varied depending on where the trees were planted. The higher, steeper banks gave the least satisfying results but still had some measure of success.

Willow stakes planted into high bank which did not take root and grow

Willow stakes after rooting and branching 100m upstream of previous photo.

Large willow stake showing signs of rejuvenation. Note three buds.

Sometimes the erosion was too quick for the stakes to root and protect the bank in time

To date 5.2km of river bank has been planted.

Extent of tree planting in Allow Catchment

Discussion:

Good progress was made on planting in 2013. However due to some losses of previous planted stakes, replanting was necessary in some treated areas. These areas include areas where erosion was severe and stakes were lost or in 2012 where water levels were consistently high over protracted periods of time and the trees effectively drowned (e.g., Freemount). For these flood prone areas the project team have moved towards of planting slips which are longer and therefore may have a better chance of withstanding long high water periods.

A significant development has been the donation of trees by the public. These trees are native and of local providence.

The importance of local providence

Various studies have shown that plants evolve to match their local environment and over thousands and even tens of thousands of years they acquire characteristics more in tune with their local environment and other wildlife that depend on them also may have adapted their lifecycles to match. Eg., timing of flowering and pollination. Provenance describes the area from which seed was collected and should not be confused with origin which describes that part of the natural range of the species from which the parent plant material originally derived. In other words provenance is local.

Provenance is an issue that has been to forefront of the DuhallowLIFE projects collective mindset from the very beginning as the Duhallow LIFE project is a large scale catchment wide project and it is important that strategies utilises not only best scientific practice but best conservation practices. Our tree planting programme is on the large scale (<6km) and therefore will leave a lasting impact (and genetic footprint) on the integrity of the riparian plant community composition on the River Allow catchment. Therefore we have adopted the following strategy:

1. Collect native willow slips for planting within the river catchments

2. Collect native sapling donations from the public

3. Encourage school children to collect oak acorns for planting

4. Identify samplings and label for removal and replanting (with landowners permission)

To date the project has been very successful in expanding the riparian tree community following natural patterns identified in previous survey work on the lower Allow catchment. Below is just one example of the excellent community participation being experienced by the project to the benefit of the local riparian plant community.

Over 1000 trees native willow, alder, oak and ash were donated by a local landowner, following from the increased public awareness created by our school visits. In autumn 2012 a large donation of willow was also made to the project and these were subsequently planted

Currently the project team are labelling native tree saplings in the River Allow catchment which will be removed from site later in the season and planted out in autumn to compliment the willow trees that have already been planted along the Rivers Allow and Dalua.

According to Ecoland landscapes (http://www.ecolandscapes.ie) "the majority of landscape planting in Ireland, whether in gardens, urban parks, private developments, and retail and industrial estates is dominated by non-native tree, shrub and ground flora species. Where native species are utilised, for example, on national road schemes, it generally consists of foreign provenance plant material from countries such as Holland and Hungary....and in the absence of appropriate environmental education and awareness, non-native species continue to be utilised in landscape planting across Ireland. Foreign provenance plant material also continues to flood the Irish horticultural market with the result that landscape planting schemes - and even the hedgerows planted on REPS farms - consist of foreign provenance plant material. This has negative consequences, especially for genetic pollution of the native gene pool, co-incident with the threat of disease importation. There also continues to be a tendency to utilise non-native species or cultivars of native species, especially in urban areas and rural gardens.

The IRD Duhallow LIFE project has aimed to avoid falling into the trap of planting so called “native species” which in fact are not of native origin. The strategy adopted to date appears to be working and will continue into 2013.

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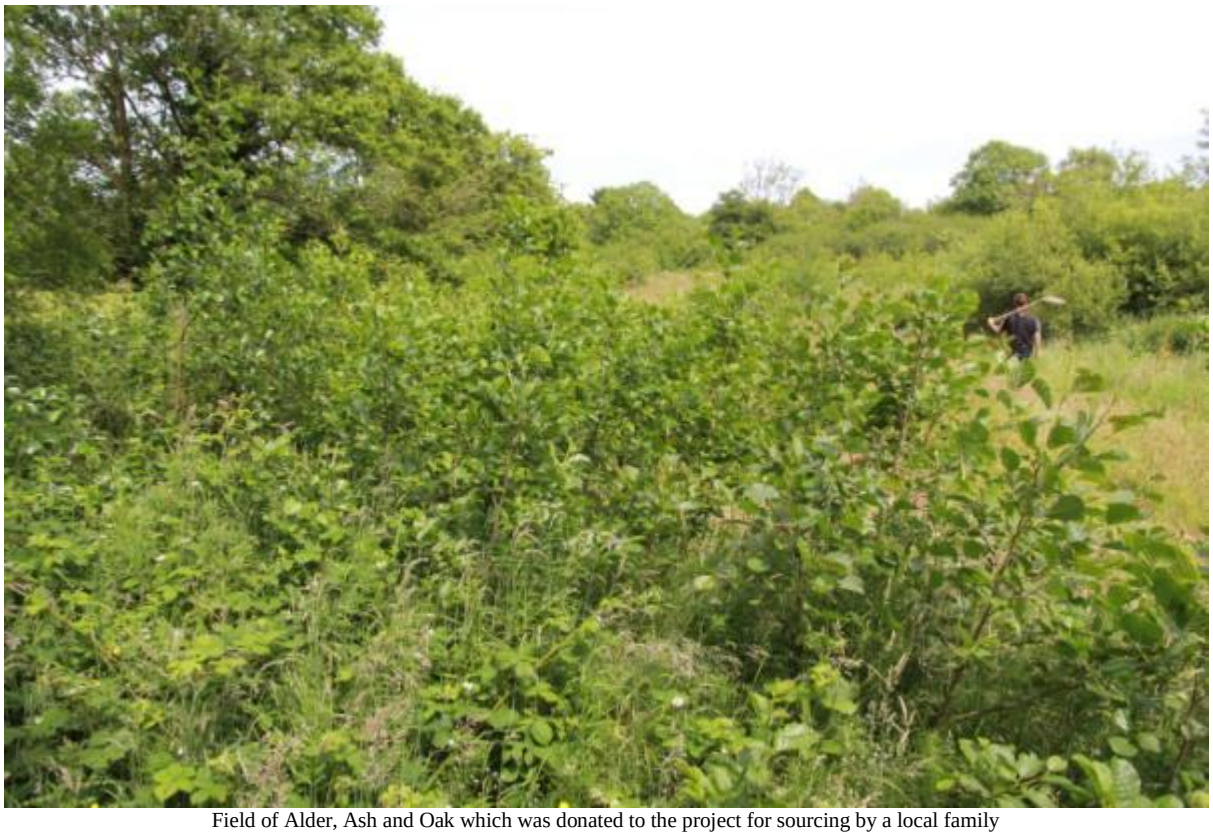
Appendix



Field of Alder, Ash and Oak which was donated to the project for sourcing by a local family

RSS participant carefully removing alder for transplanting to the banks of the Allow.

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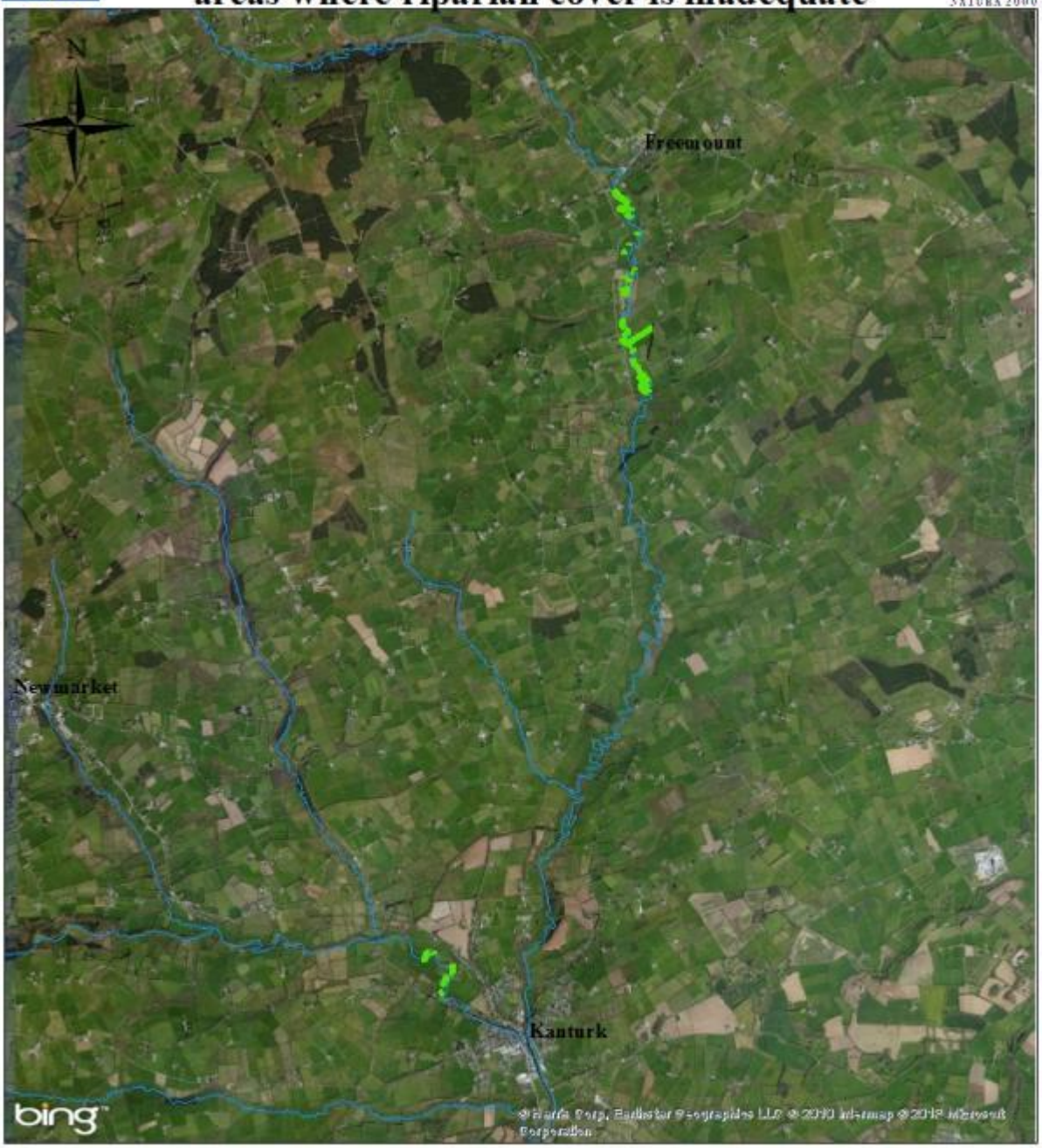
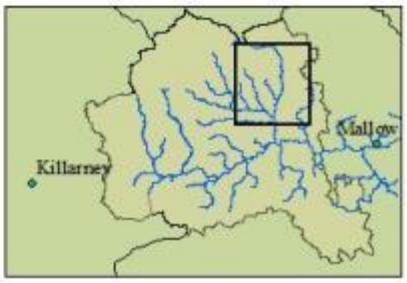
C6 - Rebalancing of vegetation to address areas where riparian cover is inadequate



Legend

- Planting along riverbank
- Allow Catchment Rivers
- IRD_Boundary
- Blackwater_BWtributaries

0 1 2 4 km



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