

The Opportunity for Natural Water Retention Measures in Inishowen

Executive Summary

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APPLYING WORLD-CLASS ACADEMIC EXPERTISE

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Disclaimer:

The full report [Bourke *et al.*, 2020] was commissioned by the Inishowen Rivers Trust and funded by the Office of Public Works (OPW). The information contained in this document should be viewed in conjunction with the accompanying GIS datasets. Permission to use any of the content or image data from this document requires the expressed written consent of the authors, the Inishowen Rivers Trust or the OPW.

Specific locations identified on the maps are *not* agreed locations for measures. Further investigation and liaison with landowners and the appropriate authorities is required to precisely identify the type and location of each measure.

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Executive Summary and Recommendations

There has been a loss of floodplain's natural ability to attenuate flood waters due to land use changes and climate changes in recent times. As a result, flooding and coastal inundation has been widespread across Ireland including extensive flooding during the winters of 2013-14 and 2015-16.

The Environment Protection Agency and the Office of Public Works have called for a form of catchment intervention for flood prevention known as 'Catchment-Based Flood Management' (CBFM). Natural Water Retention measures (NWRM) are part of the CBFM approach. In this report we identify the opportunities for implementation of NWRM on the Inishowen Peninsula in Donegal, Ireland.

In this report we introduce Natural Water Retention and describe several runoff attenuation features (measures) that may be suitable for immediate installation. For Inishowen we considered both online measures (e.g., leaky dams) and offline measures (e.g., floodplain and paleochannel storage). These measures temporarily store flood water and have been demonstrated elsewhere to slow the flow to, and in, the channel.

We find that there are widespread opportunities for NWRM implementation in Inishowen. We provide map data for 6 catchments (associated with OPW Areas for Action and WFD Priority Areas for Action).

Upstream of Carndonagh these include:

- The River Donagh
- Ballywilly Brook
- The Glennagannon River
- The Tullanree River

Upstream of Buncrana we mapped offline storage opportunities for:

- The Crana River

Upstream of Clonmany we examined:

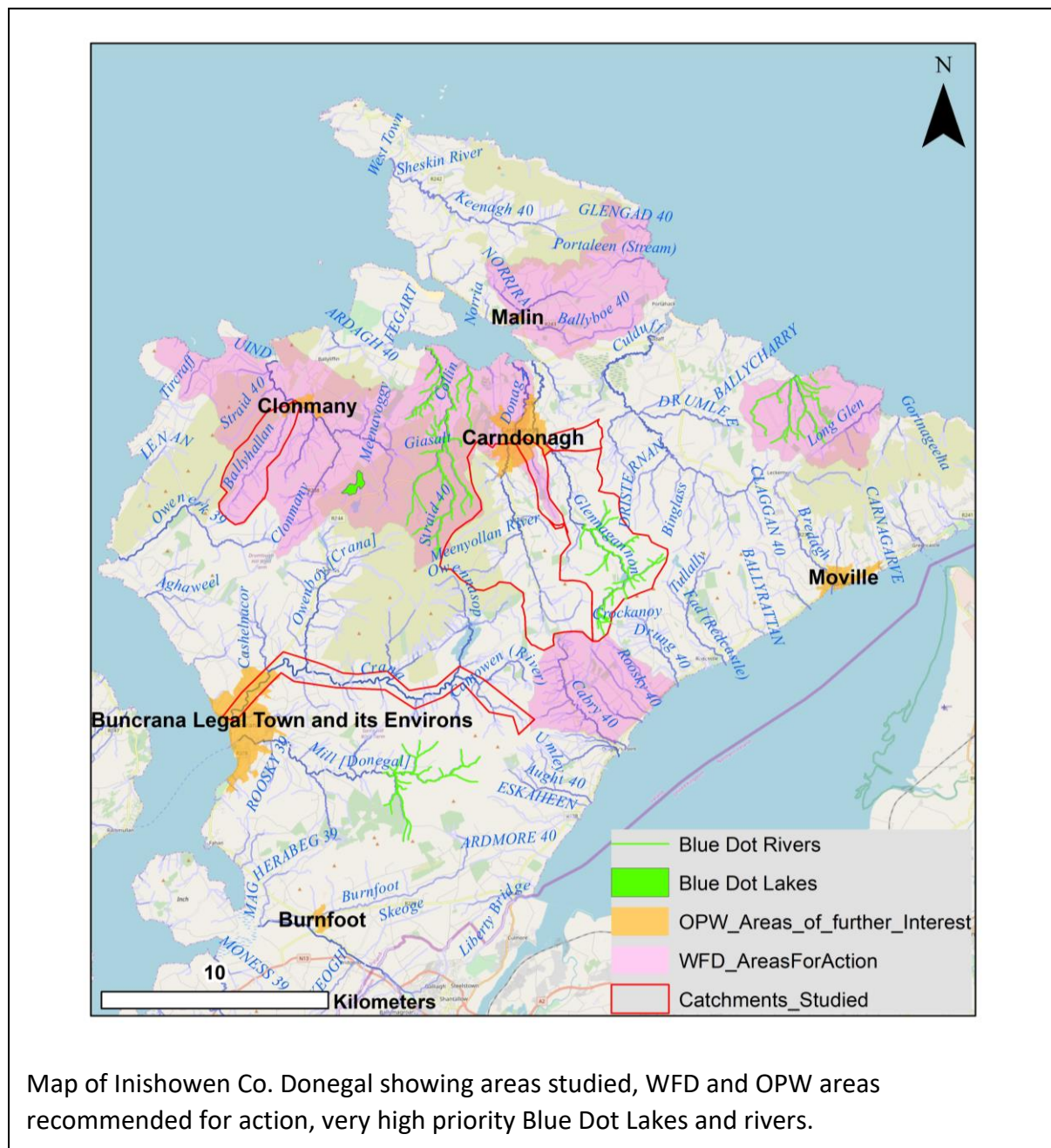
- The Ballyhallan River

The map data are provided in three digital forms:

1. An ArcGIS database
2. *.KMZ files for easy viewing in Google Earth
3. Large format (A2) colour maps for printing.

We provide an estimate of costings that serve as a guide for first order budget estimates. We caution that future-proofing measures is required and a budget estimate for feature maintenance should be included.

Recommendations (R):



► Increasing flood frequency and magnitude trends in Ireland suggest that many of the existing flood defence structures may be inadequate.

R1: A catchment-scale approach to flood risk mitigation that utilises best practice for structural and non-structural measures.

R2: We suggest that NWRM be implemented widely in Inishowen.

R3: We suggest that a NWRM be implemented in a relatively easy access location first, as demonstration site. This should be accompanied by sketches of other measures that could be deployed in other locations (e.g., leaky dams).

R4: We agree with the OPW that local level co-ordination for local flood risk management is appropriate and we recommend the Inishowen Rivers Trust.

R5: We recommend that funding be sought soon to a) conduct a local-scale investigation for specific measure installation (including flow modelling). b) cover costs of installation, monitoring and maintenance for the medium to long term.

R6: We recommend that local resources be used and that local operators be trained in the installation and maintenance of features so that the local communities can benefit from the skill development and financing that will be sought.

► Data analysis suggest that climate-driven changes are already happening.

R7: These require full consideration in flood risk management and planning for effective adaptation strategies. Local communities should be up-skilled to assist in the long-term monitoring that is required.

► NWRM provide a broad range of ecosystem services and are known to provide some water quality benefits. NWR results in nutrient and sediment retention, especially from agricultural land.

R8: We suggest that NWRM be implemented widely in Inishowen, in order to improve water quality status and move towards meeting the European Water Framework Directive.

► The available free topographic data sets in Ireland are not of adequate resolution (need 5m or higher) to be effectively used in the design and implementation of NWRM.

R9: The Opportunity Maps should be used as a guide to identify potential locations for implementation of specific measures.

R10: A more detailed design phase is required prior to implementation of NWRM in Inishowen using appropriate flow modelling approaches.

END