

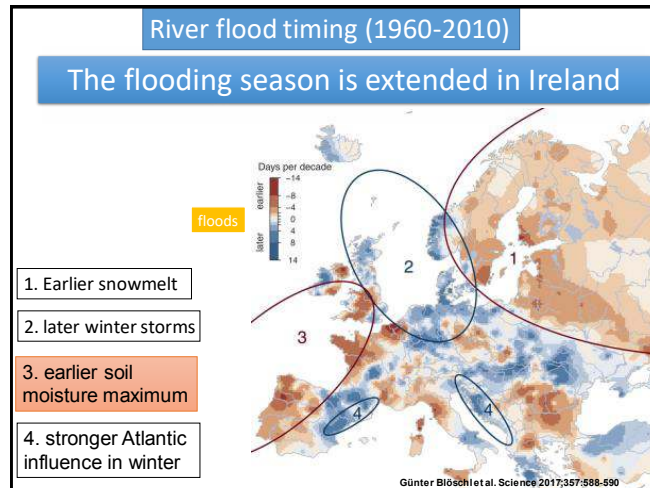

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Opportunities for Natural Water Retention in Inishowen

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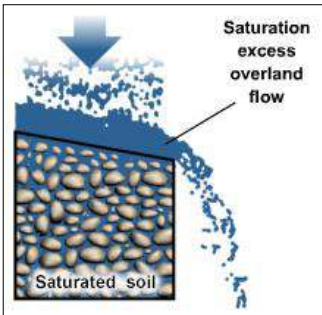
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Types of surface runoff:

i) Saturation excess overland flow
(typical in humid climates)


Wet august + low temperatures

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Natural Water Retention Measures

Restore or enhance catchment processes that have been affected by human intervention.

Aim to: reduce flood hazard



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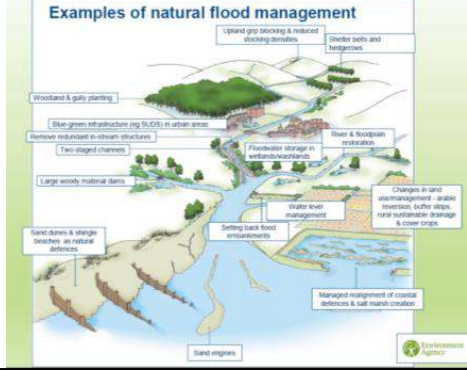
Retain water in the landscape for longer (12-24 hours)



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Large number of small interventions dispersed around catchment, low risk, low Cost.



Environment Agency

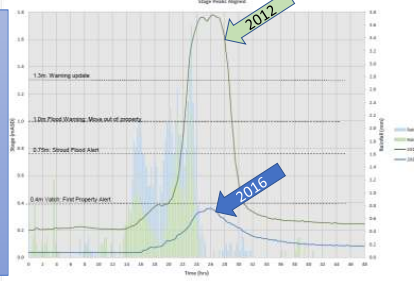
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Does it work?

Yes. It has been proven for small catchments and lower magnitude floods.

21% of the Stroud Frome catchment discharges through NFM features.

280+ Interventions (170 Large Woody Debris leaky dams in 4 tributaries).



But don't have the data yet to assess of it is applicable to large catchments OR large magnitude floods.

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Nuisance floods

Low magnitude

+


High frequency


→

Higher cost

Leads to public inconvenience:


- road closure
- overwhelms storm drains
- compromises infrastructure





The cumulative cost of frequent floods over time may exceed the costs of the extreme but infrequent events for which societies typically prepare

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Leaky dams

Large number of small interventions dispersed around catchment,
low risk, low Cost.

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<https://twitter.com/i/status/1227878810546266113>



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2018-2022



'Working with nature: Turf dams in peatland drains



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Fig. 3.9. Left: Timber online ditch barriers in a land drain in a forest (Source: Quinn et al., 2013). Right: An online ditch barrier, formed from willow planted into the banks (Source: Newcastle University & EA, 2011).

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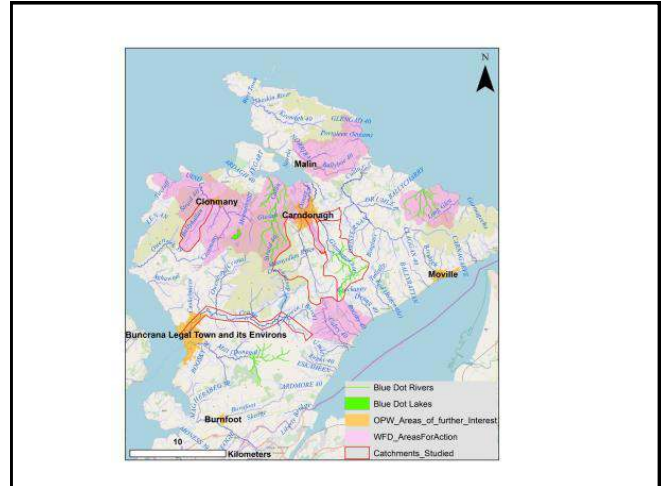
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Table 3.4. Summary of NFM features, storage, costs and maintenance required (Anon, 2017a; Environment Agency, 2012; Newcastle University & EA, 2011; SEPA, 2015; Quinn et al., 2013).

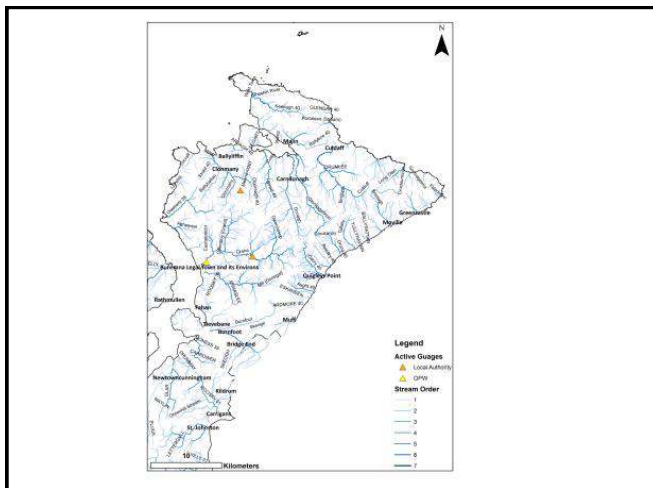
Feature	Target	Storage	Cost per Feature	Maintenance
Bunds	Temporary Overland Flow or Offline Storage Areas	200 to 2000 m ³	€850 - 50 m long, 1 m high, using local soil Source/type of material main control on cost	Inspection, dredging. Wood may need replacing
Woody Debris	Peak Flow	Difficult to quantify, attenuate rather than store	€100-€1000 (and replacing felled trees)	Inspection, 2-10 year life span
Online Ditch Barriers	Peak Flow in small streams/ditches	100 m ³ or 1000 m ³ if used in a series	Timber can be expensive while willow is cheap	Copping willow, timber replacement, sediment removal
Swales	Runoff or storage from main channel	Variable, but should not exceed >10,000 m ³	Low cost, excavation & reseeded are the main expenses.	Inspection, life span dependent on dredging
Sediment Traps	Sediment laden runoff, diffuse pollutants	Variable, but should not exceed >10,000 m ³ in the UK due to Reservoirs Act	Low cost, excavation is main cost. Check groundwater vulnerability	Inspection, life span dependent on dredging, fencing for safety
Offline Ponds	Peak flow in small channels & local overland flow pathways	300-800 m ³	€5500 but it can be reduced if several are constructed in sequence	Inspection, cut grass once a year, dredging periodically, 10-20-year life span

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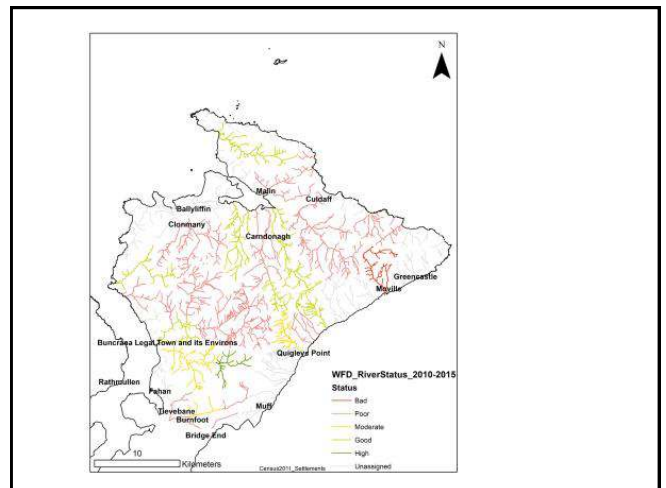
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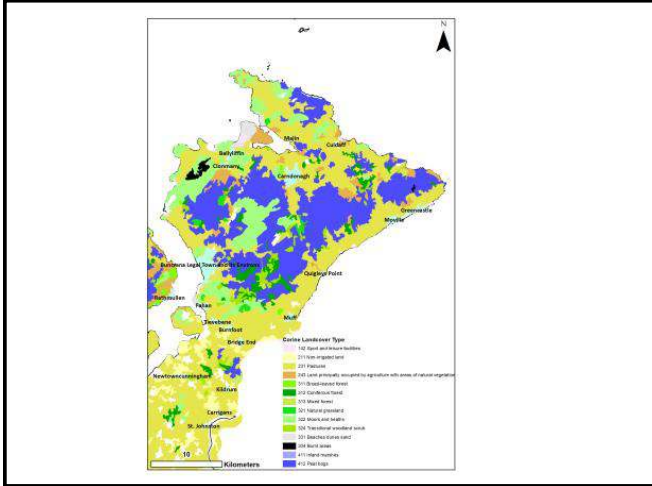
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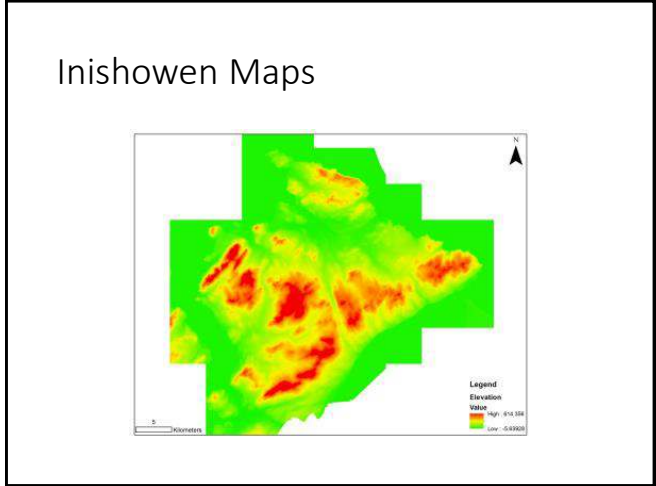
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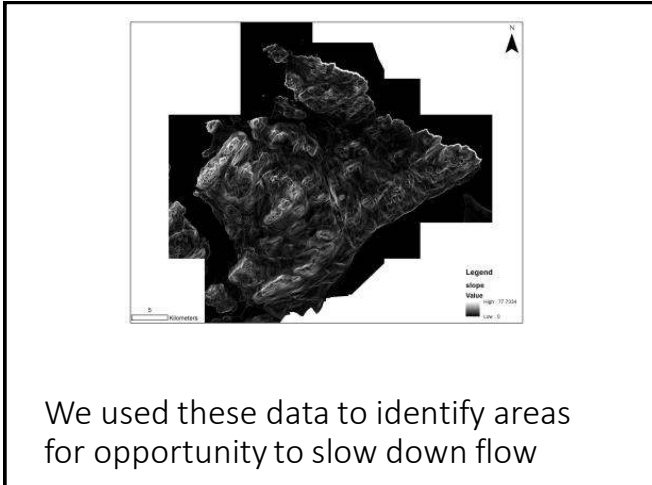
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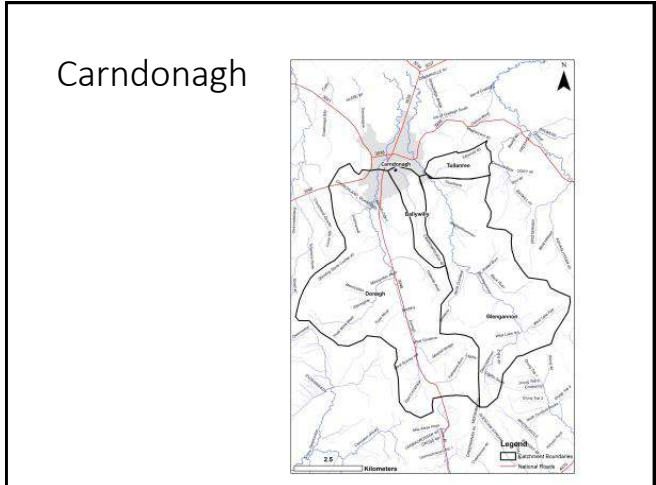
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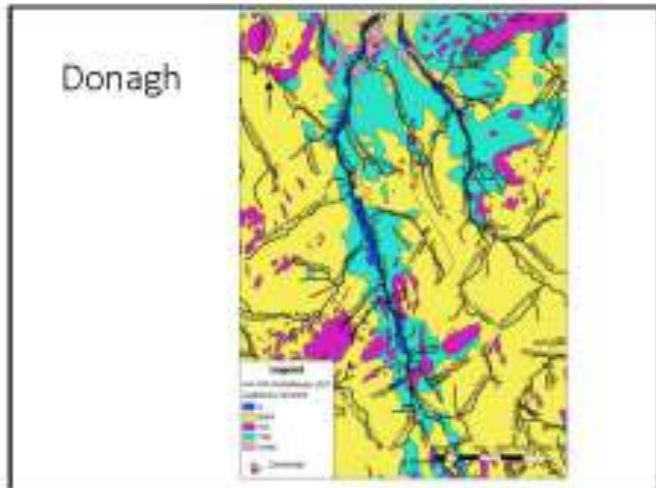
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