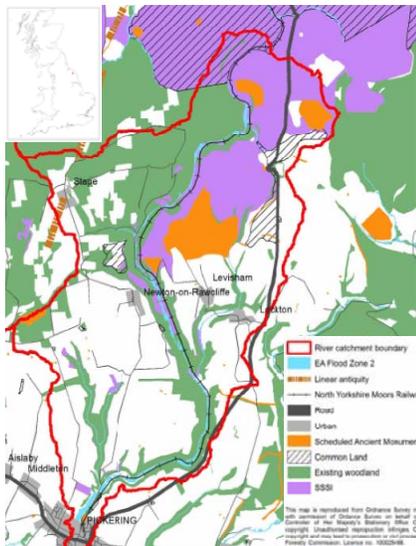


Slowing the Flow at Pickering: Using woodland to reduce flood risk

Tom Nisbet, Centre for Ecosystems, Society and Biodiversity



Aim: To demonstrate how the integrated application of a range of land management practices can help reduce flood risk at Pickering (from 25% to 4%), as well as deliver wider multiple benefits for local communities.



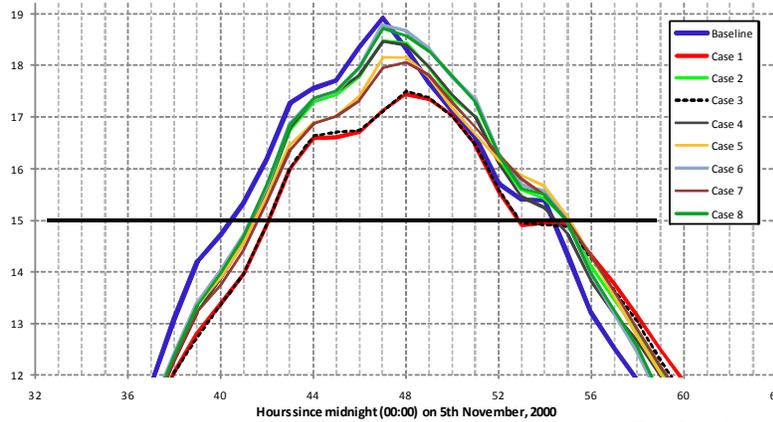
Targeted planting of 19 ha of riparian woodland and 23 ha of farm woodland to increase soil infiltration and slow down runoff to watercourses



Installed 175 LWD dams and experimenting with two 'timber minibunds' to reconnect river with its floodplain and increase flood storage

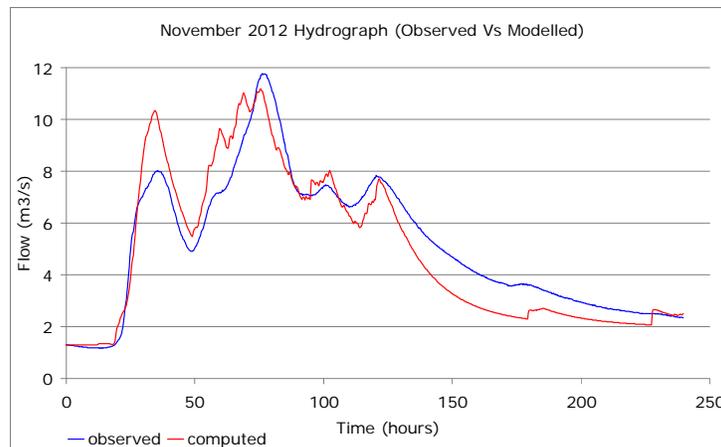


Discharge, cumecs Test runs for the November 2000 flood, highlighting results for the first flood on 6th-7th November. See text for explanation of the crims and debris dam sections used in each case.



(From Odoni & Lane, 2010)

50 ha of riparian woodland and 100 LWD dams could reduce 1 in 25 yr peak by 4% (21% of margin)

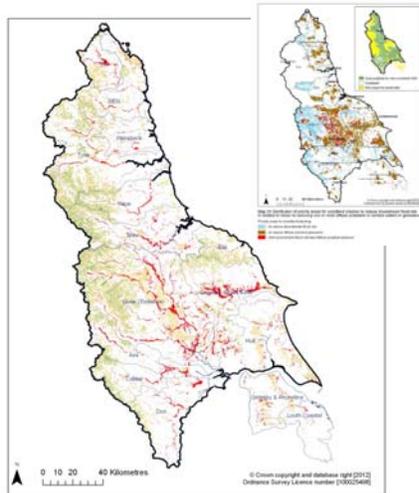


Rainfall-runoff modelling over-predicted 1st peak by 30%; reduced time to peak and height of second (but single vs multiple peak); and enhanced rate of recession limb

- Valuations are subject to change and uncertainty;
- Need for peer-reviewed transfer values;
- Climate regulation represents largest value for woodland creation;
- Flood regulation benefit may be similar to forest cost.

	Low (£k)	Central (£k)	High (£k)
Habitat creation	£76	£135	£172
Flood regulation	£88	£175	£292
Climate regulation	£265	£801	£1,561
Erosion Regulation	£0	£3	£6
Education and knowledge	£0	£1	£6
Community development	£0	£17	£64
Agricultural production	-£136	-£106	-£17
Forestry Costs	-£231	-£174	-£117
Net Present Value	£62	£851	£1,966

Indicative ecosystem service present values (£k at 2013 prices)



Map 17: Distribution of preferred areas for planting floodplain, riparian and wider woodland to reduce downstream flood risk.
 ■ riparian woodland
 ■ riparian woodland
 ■ woodland in wider catchment
 □ Catchment flood management plan boundary



Conclusions:

- Modelling predicts that woodland measures can make a significant contribution to flood risk management (greatest scope in small catchments (<100 km²)).
- The scale, location, type of woodland and the way it is managed all influence its ability to affect flood flows.
- Most of the land management measures installed at Pickering are observed to be working at the local scale but we can't be definitive about their contribution to the November 2012 near-flood.
- Local community have largely embraced the concept of a whole-catchment approach to flood risk management.
- Project has gained a national profile and is helping to shape government policy on flood risk and land use management.