

Understanding Historic Change and Natural Processes to Inform Future Decision Making

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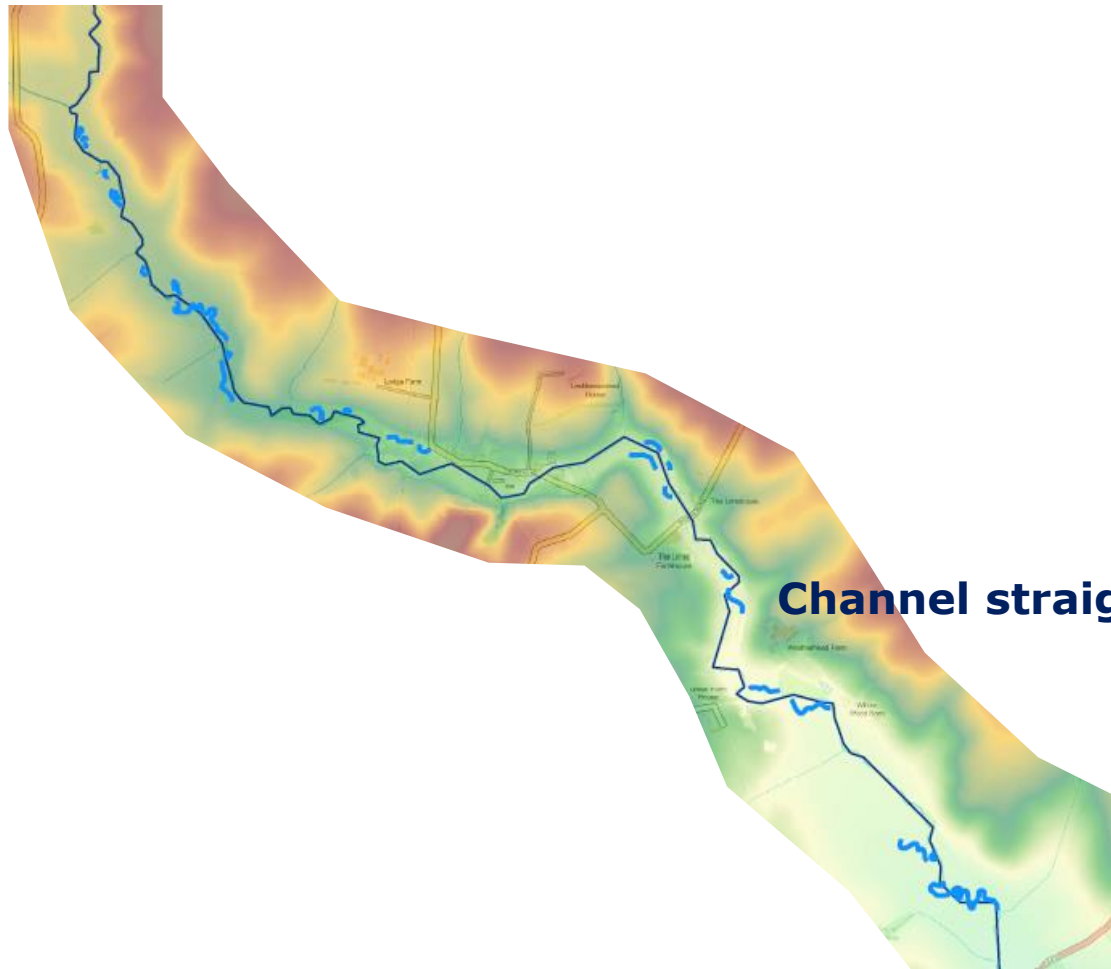
Overview

- Common problems and past mistakes
- What does this mean today?
- What can we do today?
 - Working with Natural Processes
 - Natural Flood Management
 - River Restoration
 - Flood Risk Management
 - Catchment Based Approach
 - Process Based Approach

Problems and mistakes from the past

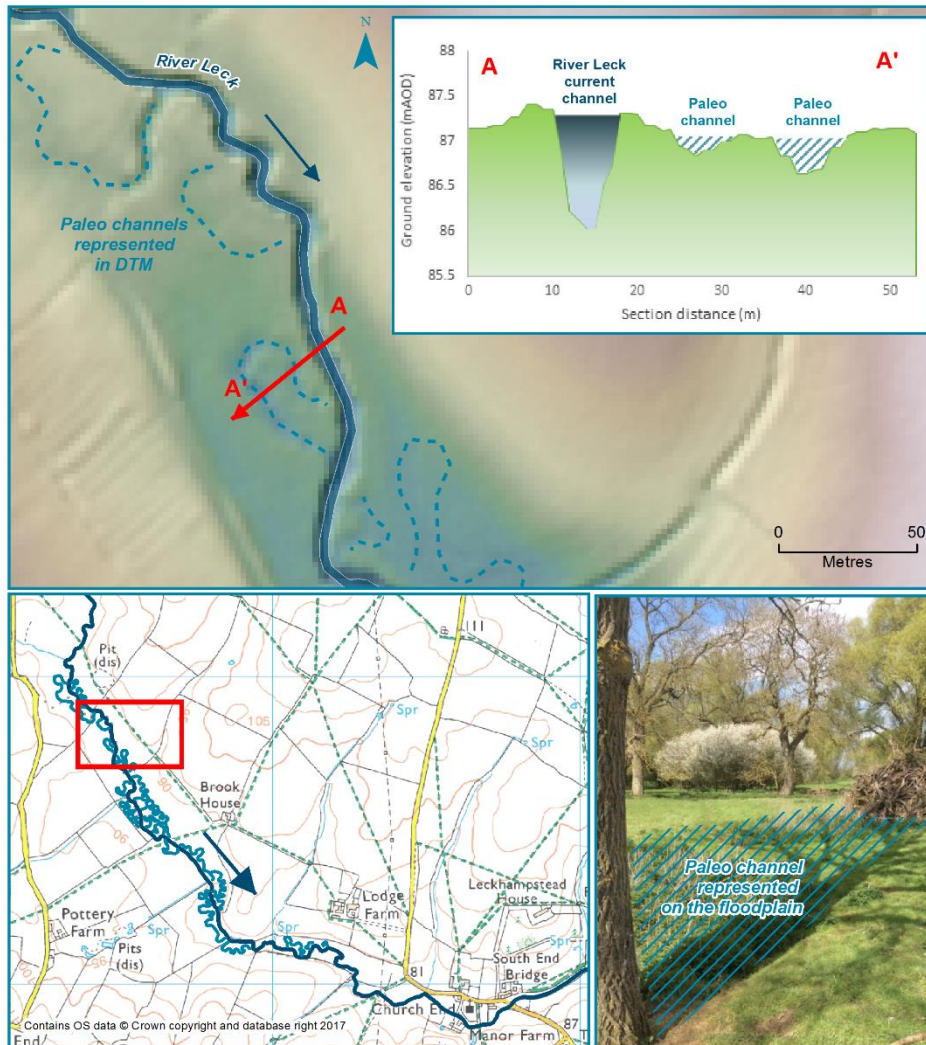


Problems and mistakes from the past



Channel straightening

Problems and mistakes from the past



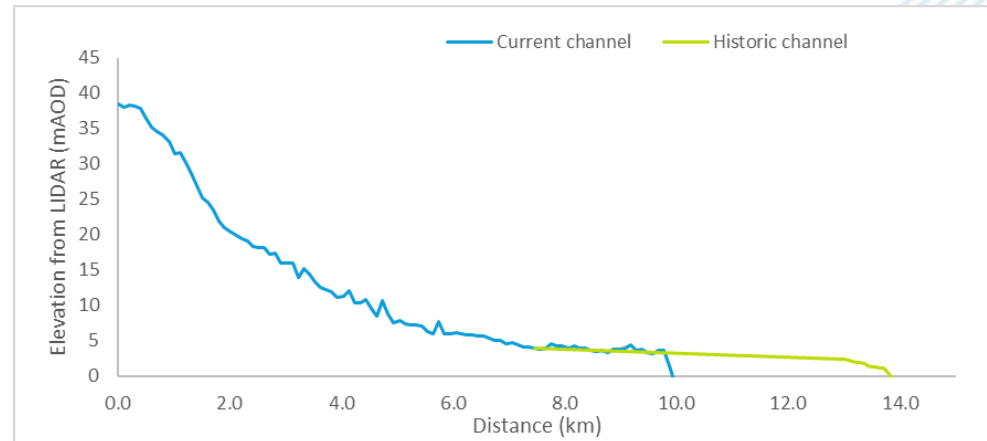
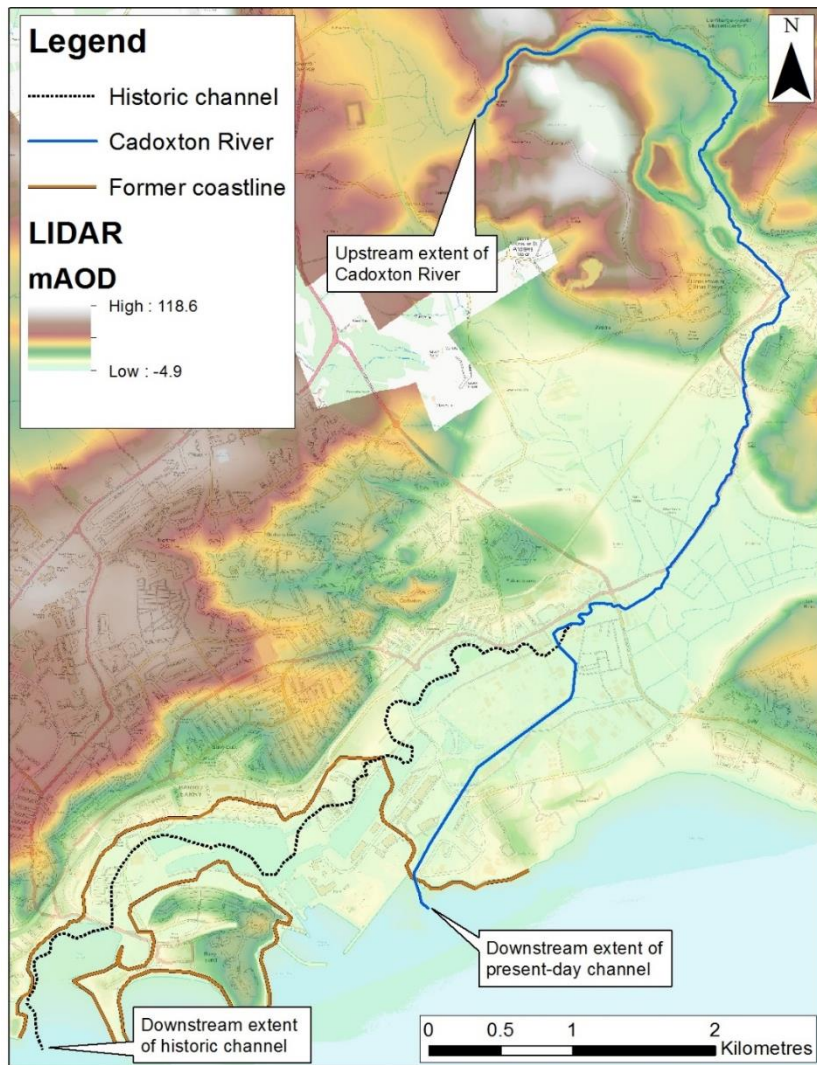
Channel straightening

Total channel length today
= 8km

Lost channel length
= 5km

Flood risk impact
Fisheries impact
Biodiversity impact
Habitat impact
Geomorphology impact

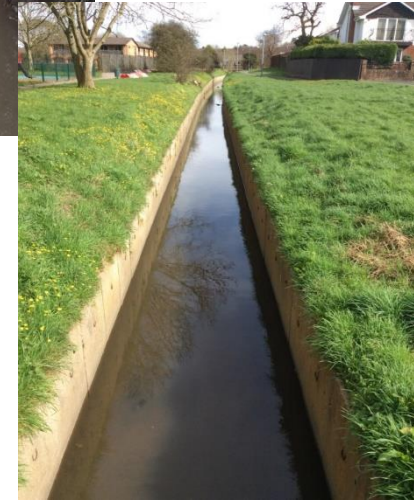
Problems and mistakes from the past



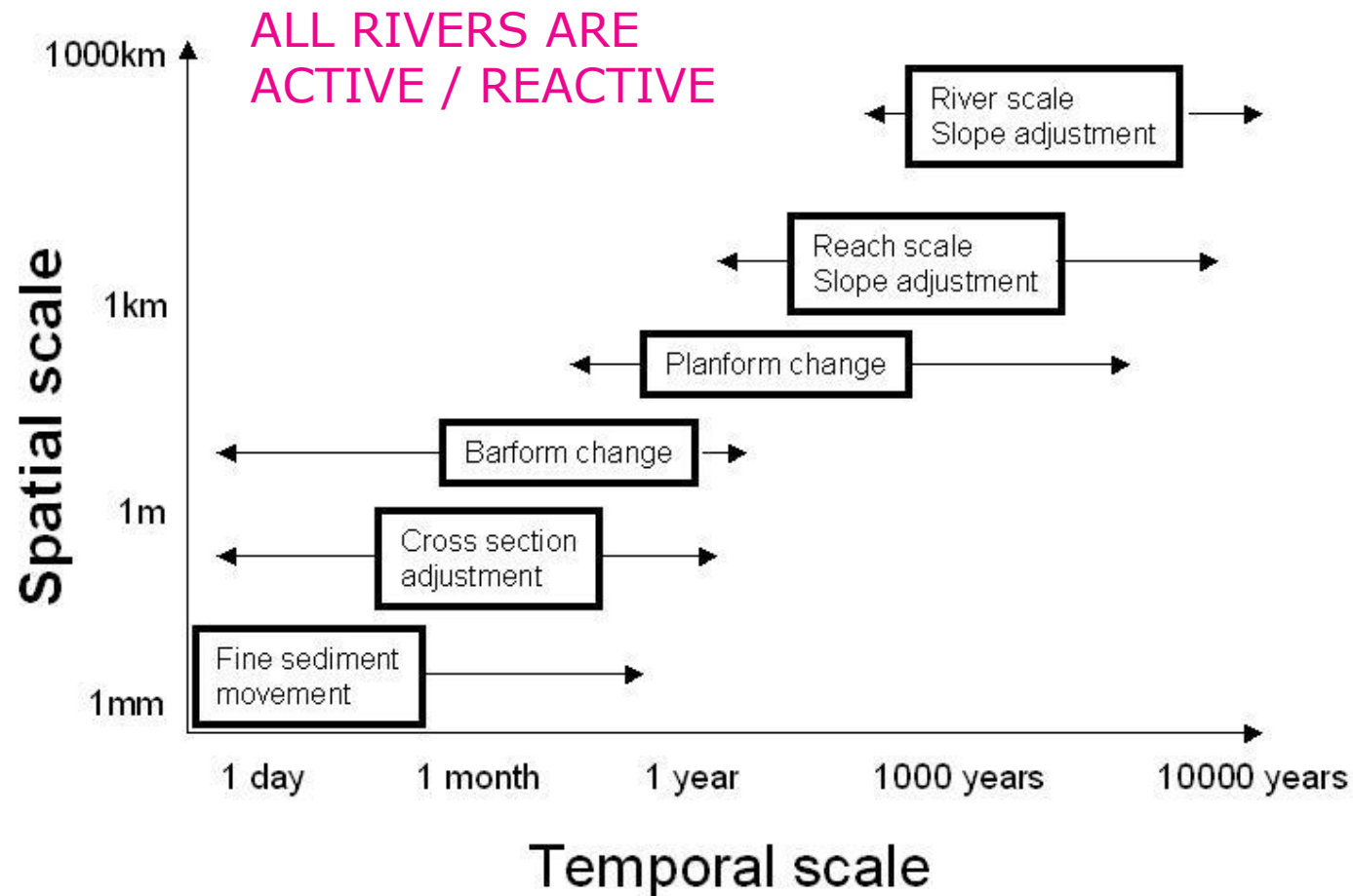
5km+ of more natural channel lost

Incision – sediment transport
Lost floodplain connectivity
Habitat loss

What does it mean today?



Scales of change



What can we do today

Case study

- Small village with frequent flood history
- 'Traditional flood risk management scheme' investigated but ruled out:
 - Too costly
 - Change the look of the village
- Alternative solution?
 - Upper catchment Natural Flood Management measures
 - River and floodplain restoration
 - Added benefits – habitat and biodiversity improvements
 - hydromorphology improvements
 - recreation and wellbeing opportunities



What can we do today?

Case study

- Natural Flood Management only
 - Woodland planting (e.g. wider catchment, riparian, floodplain)
 - Leaky barriers
 - Runoff attenuation features
 - Soil structural improvements (arable and improved grassland)
 - In-field vegetative buffers strips
 - Offline temporary storage areas

What can we do today?

- River and floodplain restoration
 - Floodplain reconnection
 - Restore floodplain paleo-features
 - Restore the channel course to a more sinuous nature
 - Riffles
 - Woody material in channel
 - Pools and Glides
 - Backwater areas
 - Bar creation
 - Buffer strips

Numerous benefits: Increased flood storage, improved biodiversity and habitat, better hydromorphology

What can we do today?

- NFM and River Restoration together
 - Multiple distributed measures within catchment
 - Targeted individual measures and combinations of measures
 - E.g. leaky barriers encouraging flood water to spill into bunded floodplain storage areas (with controlled outlets)
 - Design informed by modelling outcomes to deliver downstream benefits to communities at risk
- Consideration of multiple benefits integral to design development
- Active stakeholder engagement and participation from outset

Benefits

- Long term planning
- Understanding short-term and long-term benefits
 - Things take time to establish, stabilise, mature!
- Re-establish more natural processes within river & catchment systems
- Improved biodiversity
- Enhanced habitat connectivity
- Increased resilience to climate change impacts
- Provision of recreation and wellbeing opportunities

Common problems / hurdles

- Incentives and funding
- Stakeholder engagement and participation
- Changes to land use / land management
- Confidence
 - Importance of monitoring effectiveness and performance
 - Sharing success – big or small
 - What works
 - What doesn't work
- Management and maintenance responsibilities
- Statutory processes, planning & appraisal systems

Thank you for listening

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