TOOLKIT 2

DESIGNING & DELIVERING A SCHEME

FARMING FLOODPLAINS for the FUTURE

There is clearly scope for the Farming Floodplains for the Future project approach to be applied in other parts of the country. Therefore, based on the experiences, results and findings of the project, two toolkits have been devised to guide the establishment and implementation of similar projects in other geographic locations.

This second toolkit is intended for project officers, advisers and individual landowners, providing guidance on the identification and realisation of land management and land use change opportunities on individual holdings (from initial assessment to implementation of works)[1].

Toolkits such as these cannot hope to be definitive, covering every eventuality and the nuances of specific geographical areas or individual sites. They are therefore presented as a series of logically ordered questions designed to stimulate structured and challenging thought processes. Key questions are shown in blue, with questions that are subsidiary to these being indented and coloured black and green.

Clearly the toolkits have been designed with flood risk management projects in mind, although the thought processes may also be applicable to other catchment-orientated projects. Ideally the toolkits should be considered alongside the other output from the Farming Floodplains for the Future project (i.e. final report, case studies and issue studies) to help to contextualise some of the questions asked. It is also noted that while this toolkit has been subject to consultation, it should be seen as a dynamic document that is likely to evolve and develop over time.

[1] This builds on the first toolkit, produced to guide key organisations and decision makers in the targeting and setting up (from inception to engagement with landowners) of projects looking to use land management and land use change as flood management tools.

LAND MANAGEMENT

- Is every effort being made to reduce run-off and increase infiltration rates across the farm (i.e. Can land management be improved to slow flood generation)?

    - Are cross-compliance requirements (Statutory Management Requirements + Good Agricultural & Environmental Conditions) being met?
        - Has a Soil Protection Review been completed (and are the findings being implemented)?
    - Has a field-by-field soil management plan been completed, identifying actual and potential problems on the holding (e.g. long / steep slopes prone to erosion; compaction; poor drainage etc)?
    - Is good practice being implemented in terms of cultivation (see Box 1)?
    - Is good practice being implemented in terms of livestock management (see Box 2)?

    - Where run-off is an issue, can mechanisms be employed to control it?
        - Can beetle banks, buffer strips or areas of arable reversion be used to break slopes or trap run-off (e.g. at the base of slopes or adjacent to watercourses)?
        - Are field boundaries appropriately maintained?
        - Are there opportunities for the (re-)planting of field boundaries (or woodland strips)?
        - Are there issues associated with access, both for machinery and livestock? In particular could gateways (which can act to 'funnel' flows) be better located?
        - Are there opportunities to better manage run-of from yards, buildings etc.?
    - Are there opportunities to review the maintenance of watercourses?

Box 1: Good Practice Cultivation

In terms of cultivation, consideration should be given to:-

- Crop rotations and crop selection, particularly in vulnerable fields.
- Retaining appropriate stubbles or using cover crops where suitable to avoid leaving bare soil for long periods (particularly over winter).
- Increasing the organic matter content of soils.
- The suitability of operations in relation to soil type (especially on 'heavier' soils), topography (including contour cultivation) and conditions (particularly when wet).
- Avoidance of excess cultivation through utilisation of combined operations or alternative approaches such as non-inversion techniques / direct drilling / minimum tillage.
- Use of the correct machinery for the job, at the right speed and with the correct tyres and pressures.
- Alleviating areas of compaction (especially headlands, gateways, tramlines, routes used during harvesting etc.) and sub-surface capping.
- Carefully managing any irrigation undertaken (including ensuring equipment is maintained to avoid leakage).

Box 2: Good Practice Livestock Management

In terms of livestock management, consideration should be given to:-

- Stocking rates, bearing in mind soil types, time of year etc.
- Minimising poaching.
- Careful selection of out-wintering sites.
- Management of any supplementary feeding.
- Avoidance of damage to the banks of watercourses.

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LAND USE CHANGE

SITE ASSESSMENT

- Has the whole holding been considered?
  - Have all watercourses and waterbodies (including those that are seasonally wet) been identified and assessed?
  - Is the current hydrology understood, both for normal circumstances and during / following extreme events?

- Are there any opportunities for the implementation of sustainable flood management techniques, based on the presence of relevant features (see Box 3)?
  - Could a combination of techniques be utilised to maximise flood management benefits?

Box 3: Features and their Relevance to Flood Risk Management

- Field drains, shallow drains (grips) or ditches
  - Could these be beneficially blocked, or water levels managed?

- Channels that have historically been engineered
  - Can the banks be re-profiled?
  - If devoid of natural features, can debris dams or other obstructions be added to the channel that might slow flows and re-instate natural geomorphological processes?
  - Where straightened, can the channel be returned to its original course or be re-meandered?
  - Where deepened, can appropriate leaky barriers be installed to fully utilise channel capacity?

- Banks adjacent to watercourses (either designed floodbanks or accumulations of dredgings)
  - Can these be removed, lowered or otherwise breached to allow the flooding of adjacent land during flood events?

- Existing floodplain
  - Is there scope to slow / attenuate flood flows for example through the planting of hedgerows or woodland?

- Areas of apparent floodplain that are now dis-connected from the adjacent river
  - Can these areas be re-connected to the river using spillways, land re-profiling, raising of river bed levels etc?

- Fields adjacent to watercourses
  - Could water realistically be diverted onto these fields (and stored) during flood events?

- Areas of existing floodplain woodland
  - Are there opportunities to add structure to the woodland to slow flood flows, including increasing debris on the woodland floor, establishing under storey, or felling and re-planting?

- On-line waterbodies
  - Do these include sufficient ‘freeboard’ to allow additional water storage?
  - Can outflow arrangements/structures be better used or re-designed to take advantage of storage opportunities?

- Evidence of historic wetland habitats (for example relict channels, areas of rush)
  - Could wetland habitats be realistically restored?

- Evidence of historic water management (for example infrastructure associated with water meadows)
  - Could these systems be re-instated, or carefully adapted to serve flood management purposes?

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- Are there opportunities to deliver multiple benefits?
  - Can habitats be restored or created?
  - Are there opportunities to improve water quality (e.g. through the trapping and filtering of nutrient-rich water)?
  - Are there opportunities to influence water supply (e.g. reducing seasonal variations in downstream flow, or attenuating peak flows to allow irrigation)?

SCHEME DESIGN

- Will the proposed project work hydrologically?
  - Is appropriate data available to support the design process?
    - Are there existing flood models that cover the site (most likely held by the Environment Agency) that could be used to inform the design process?
    - If not, can site-specific modelling be justified?
    - Is relevant topographical data available?
      - Can this be sourced from a relevant organisation (e.g. LIDAR from the Environment Agency)?
      - If not, has a levels survey been undertaken as a matter of necessity?
    - Is the nature of the soil important to the success of the design?
      - If so, has appropriate soil analysis been undertaken?

- Can the planned outcome be affected through a simple design?
  - Does the design utilise natural processes and the predictable behaviour of water?
  - If considering anything other than a low-tech solution (e.g. if pumps might be required), is this sustainable and thus justifiable?
  - Will the scheme operate with minimal input from the farmer / landowner?

- Can the scheme be implemented without adverse impact on adjacent landowners (both upstream and downstream)?

- Are there other constraints that will influence design?
  - Based on site survey / biological records (contact the local Biological Records Centre or Wildlife Trust), are there habitats of existing value that would be affected by the works?
  - Based on biological records / site observation, are there any priority species that may be affected by the work?
  - Are there any sites of historic or archaeological importance that may be affected by the scheme? (Contact the county archaeolgist)
  - Will the proposed scheme be suited to and of a scale appropriate to the local landscape?

- What materials are required for completion of the works?
  - Can these be sourced from on site?
  - If not, can sourcing from off site be justified in terms of sustainability and cost?
  - If materials are to be imported to site, are they fit for purpose and do they have appropriate environmental credentials (e.g. are they locally sourced, or manufactured from re-cycled materials)?

- Is the design manageable?
  - Does the scheme work in the context of the associated farm (or other) business?
  - Will the business be able to manage the scheme (e.g. can grassland created on an otherwise arable farm be appropriately managed)?
  - Has the need for on-going maintenance been minimised as far as possible?

- On review of the design, does it meet objectives and contribute to overall project targets?
  - Does it contribute effectively to flood risk management?
  - Have other potential benefits been successfully factored into the design, with necessary compromises balanced to achieve the best overall result?

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SCHEME PREPARATION

- Has due consideration been given to the time required to realise effective delivery?
- Have appropriate consultations been undertaken (see Box 4a)?
- Have appropriate consents been obtained (see Box 4b)?
- Is appropriate funding in place?
  - Have appropriate applications been made to Natural England where agri-environment funding is being used?
  - Have potential alternative sources of funding been reviewed and tapped (e.g. Forestry Commission grants for woodland work)?
  - How will any shortfalls in funding be bridged?
  - Is a contingency fund required should any subsequent alterations to schemes prove necessary?
- Is monitoring of the site being undertaken?
  - Where appropriate / necessary has a relevant baseline been recorded?

Box 4a: Potential Consultations Required

- Environment Agency
  - Information on flooding and guidance on scheme designs
  - The need for relevant consents relating to flood management, water abstraction, watercourse impoundment and waste management
- Internal Drainage Board
  - The need for relevant consent relating to drainage and flood management
- Natural England
  - Information and guidance relating to designated sites (notably SSSIs)
  - Guidance in relation to all aspects of agri-environment schemes (including any necessary consents)
  - Guidance on the application of the Environmental Impact Assessment (Agriculture) Regulations 2006
- County Wildlife Trust and/or local Biological Records Centre
  - Information and guidance on the presence and management of priority habitats and species
  - Information and guidance on the management of County Wildlife Sites
- County Archaeologist (plus potentially English Heritage)
  - Information and guidance on the presence and management of archaeological or other historic features
- Forestry Commission
  - The need for relevant consents relating to the felling of trees
  - Guidance in relation to potential grant funding of woodland related work
  - Guidance on the application of the Environmental Impact Assessment (Forestry) Regulations 1999
- Organisations responsible for Infrastructure (e.g. Highways Agency, Network Rail, British Waterways)
  - Guidance relating to the suitability of proposed schemes and safe working practices where in proximity to key infrastructure
- Organisations responsible for Services – including overhead and underground cables, pipelines etc
  - Guidance relating to the suitability of proposed schemes and safe working practices where in proximity to key services
- Local Authority - Public Rights of Way
  - Guidance on the management of footpaths and bridlepaths adjacent to or crossing sites

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Box 4b: Potential Consents Required

- Environment Agency
  - **Flood Defence Consent** – for any works associated with designated 'main river' and its floodplain, or the introduction of structures into 'ordinary watercourse' channels.
  - **Abstraction / Impoundment Licences** – for any abstraction of water or impoundment of watercourses
  - **Environmental Permitting** – for pollution prevention and waste management (e.g. registering exemptions for the burning of 'lop & top' from forestry operations)
- Internal Drainage Board
  - **Land Drainage Consent** – for any works potentially affecting drainage and flood management within relevant Districts
- Natural England
  - **SSSI Consent** – for any works affecting Sites of Special Scientific Interest
  - **Agri-Environment Derogation** – to allow variation of management under an existing agreement
  - **EIA Scoping Decision** – regarding the applicability of the relevant Regulations
- Forestry Commission
  - **Felling Licence** – for the felling of trees
  - **EIA Scoping Decision** – regarding the applicability of the relevant Regulations
- Organisations responsible for Infrastructure / Services
  - These organisations may have their own specific procedures that need to be followed

- Have all the practicalities associated with delivery been considered, and are these adequately reflected in any necessary contractual arrangements?
  - Has an appropriate schedule of works been drawn up?
  - Who is to undertake the work?
  - When will the work be undertaken?
    - Are there any restrictions in terms of the farming calendar, impacts on wildlife, likely ground conditions etc?
  - Can the site be adequately accessed (including consideration of the width of gateways, weight limits on bridges etc), and have access routes been agreed?
  - Are all responsibilities clear?
    - Who is to provide plant and labour?
    - Who is to source materials?
    - Who is responsible with regard to Health & Safety?
    - Are relevant insurances in place (notably for public liability)?
    - Who is responsible for overseeing the works, checking progress and signing them off upon completion?
  - Can adequate checks (particularly of levels) be made on site, both during the works and prior to their signing off?
  - Has a price and payment schedule been agreed for the works?