# Recognising water meadows: A field guide and fact-sheet

## Water meadows – Definition and Description

The term 'water meadow' typically refers to an area of land, usually adjacent to a watercourse, which could be deliberately flooded under the control of the landowner, usually via the use of a series of artificial, graded channels. The point of deliberate, controlled flooding should be emphasized here, as it is the use of a careful system to manage the flow of water across the field which truly characterises these features and distinguishes them from fields allowed to flood naturally.

The careful control of this flooding, to a prescribed timescale in order to create the maximum benefit to the landowner is largely a post-medieval technology, particularly in regards to the most technically involed system form, the bedwork water meadow. The benefits of flooding or 'floating' a meadow are multiple, so long as the system is managed. By floating the fields early in the year, usually between Christmas and March, the farmer could reduce the effects of frost and gain an early growth of grass, allowing him to over-winter his sheep for a shorter period. Selective floating later in the year could also produce a further hay crop by maintaining moisture levels within the fields. Additionally, floating served to fertilise the fields, with the key component being the maintenance of a constant flow of water over the meadow, with no areas of standing water. It is this factor which leads to the development of the features which typify water meadows, the use of carefully designed channels, coupled with sluice hatches for flow control. Water meadows appear in the archaeological record in the seventeenth century and continue in use until the early twentieth century, with select examples still in use today

Three primary forms of water meadow have been identified, known as catchwork, 'floating upwards', and bedwork systems.

**Catchwork systems**
This system uses a main carrier to divert water from a stream along the flanks of the hill from which it springs, following the contours. This gutter is then blocked with turves by the drowner. This causes the water to overflow across swathes of the hillside, running through the grass (sometimes via more drains lower down also following the contours), before reaching the base of the field where another drain takes it away. This process is designed to achieve a constant flow across the field through the employ of gravity. This simple system seems likely the oldest of the three, with some suggestions of use in England as early as the 12$^{th}$ century.

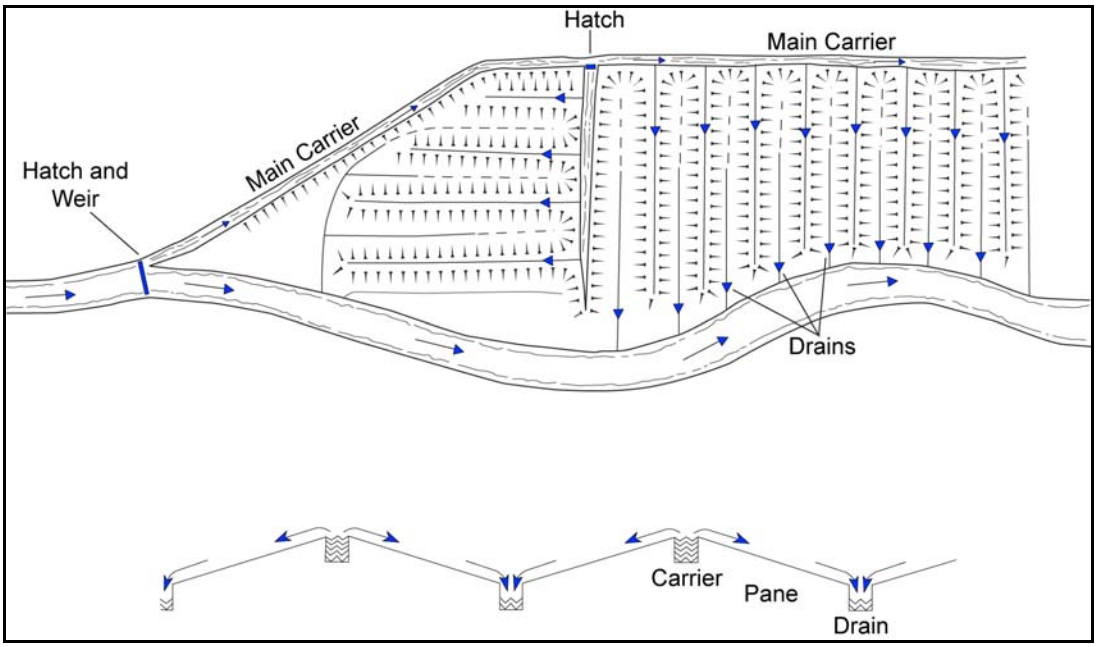
 

**The 'floating upwards' system**

The floating upwards system, documented from the 17h century, but likely even earlier in principle, involved simply damming a watercourse to force the water to accumulate upstream and flood over the adjacent areas of farmland. The primary feature of this system to be visible in the field would be the remains of a former sluice gate blocking the course of the stream at the downstream end of field systems.

**The Bedwork system**

This system is usually seen adjacent to major rivers with broad floodplains, and involved the use of sluice gates to divert the river water into a series of carefully created channels. A 'main carrier' took the water from the river, which had often been partially dammed by a weir, into a series of 'carriers'. These were graded channels on top of wide grassy banks that were designed to overflow, watering the sides (or 'panes') of the banks. Excess water was then taken by drains at the bottom of the banks to a large 'tail drain' which led back to the River. This careful system meant that fresh water moved in a constant flow over the meadow, without producing standing water, and resulted in intricate interlocking patterns of channels and banks, known as bedworks (Figure 1). This method, employable over large areas, and carefully maintained, was the pinnacle of water meadow management, allowing the strict control of the floating of the fields to suit the landowner. This resulted in large swathes of landscape being occupied by the ornate bedwork features, which were flexible enough in principle, if carefully maintained (often by a skilled craftsman known as a *drowner*), to conform to the vagaries of the river valley and meanders, resulting in a huge variety of earthwork patterns. The origins of this system are difficult to ascertain, however it is generally taken that the system was in use by the 16th century, and widely adopted within it.




*Plan showing typical arrangement of features within a bedwork water meadow (adapted from Williamson and Cook 2007)*

# Recognising Water Meadows In The Field

Earthworks

Earthworks visible in the field indicative of former water meadow include:

- Grid-like patterns of drains, which may still be carrying water, or lush in vegetation.
- Areas of wide flat banks (panes) with linear drains or hollows between them, with banks often several metres across.
- Connected series of drains, particularly when linear drains connect at unusual angles.

Examples of how to spot water meadow features:

*Variations in vegetation type and colour*

*Standing water*

*Extant channels*

*Frost and shadows highlighting features*

*Elevated viewpoints- often allow systems to be seen as a whole which may not be clear from ground level*

Structural remains

Particular structural features can be found in association with former water meadows, these can be made of stone, wood, brick or even concrete or metal, depending on the date of the meadow. Common forms of structure typical of meadow include:

*Sluice hatch settings- support or housings for sluice hatches, often with a pair with matching vertical slots where a hatch once was.*

*Bridges and culverts- used to provide access across a meadow and for water control*

*Other associated structures:*

Remains of former lined channels, often seen near to banks of rivers or streams,

Collections of loose structural material, particularly conspicuous in open fields, possibly the remains of former meadow structures such as sluices or culverts.

## Recording Water Weadows In The Field

In order to investigate water meadows, archaeologists require particular details which can be simply recorded in the field.

Field notes and record cards

The collection of field notes recording precisely where possible water meadow features have been seen, and the details of these features. Ideally these should include a sketch plan recording how features appear, and their rough dimensions. If drains are numerous and obvious, a quick sketch of how the system may appear from a birds-eye-view is ideal.
Using the following record card will help to record the relevant information. Whilst mainly designed for meadow structures, these cards can also be used to record channels and banks.

*Site name* will be a convenient name for the area (often the farm name), *feature ID* a number assigned by you to each structure. *Structure type* can be ticked next to the appropriate heading for what the feature is thought to be, as can the material it is made from in the *Material* section. *Orientation* records the direction you are facing when you make the sketch. Within the *Details* section, simply record as much detail as you can think to about the feature, dimensions, etc. If available, *GPS position* should be recorded to the highest number of figures possible. *Part of* refers to what part of a system it may represent, based upon the prior descriptions.

## WATER MEADOWS STRUCTURE CARD

FEATURE ID _____ SITE NAME + ID_____

Structure type:
Sluice __ Sluice (Hatch remains)__ Sluice (Mechanism)__ Aquaduct__

Lined channel___ Weir___ Bridge___ Other (state)_____

Material:
Wood___ Brick___ Concrete___ Metal____ Other_____
Details: (for brick, dimensions in inches, colour +texture)_____
_____

SKETCH Orientation:

Details:_____
_____
_____
_____
_____
_____
Provisional Date:

Medieval___ Post-Medieval___ Recent___ Modern___

GPS position: _____ _____ Channel Orientation_____

Part of:
Main Drain___ Carrier___ Drain___ River Control ___ Meadow connection _____

Date of survey_____ Recorded by_____

Recording a location

In order to precisely record the location of possible features the ideal approach is to use a hand-held GPS system, if available. Failing this, the recording of the distance of the feature from two to three different landmarks (which occupy a fixed position and will be visible on maps, for example field boundaries) will suffice.

Ground photography

If possible, photographs of features will help archaeologists to determine if the features may represent former water meadow. These should ideally include some form of scale in the foreground which will be easily recognisable in terms of size. Photographs from several angles are useful, with the subject centrally framed.

## Who to contact:

If you think you may have found water meadow remains, you can contact:

**Stephen Dean**

Principal Archaeologist

Environment and Countryside

Staffordshire County Council

Riverway

Stafford, ST16 3TJ

Stephen.dean@staffordshire.gov.uk

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