

# WATERMEADOWS : VICTIMS OR SAVIOURS?

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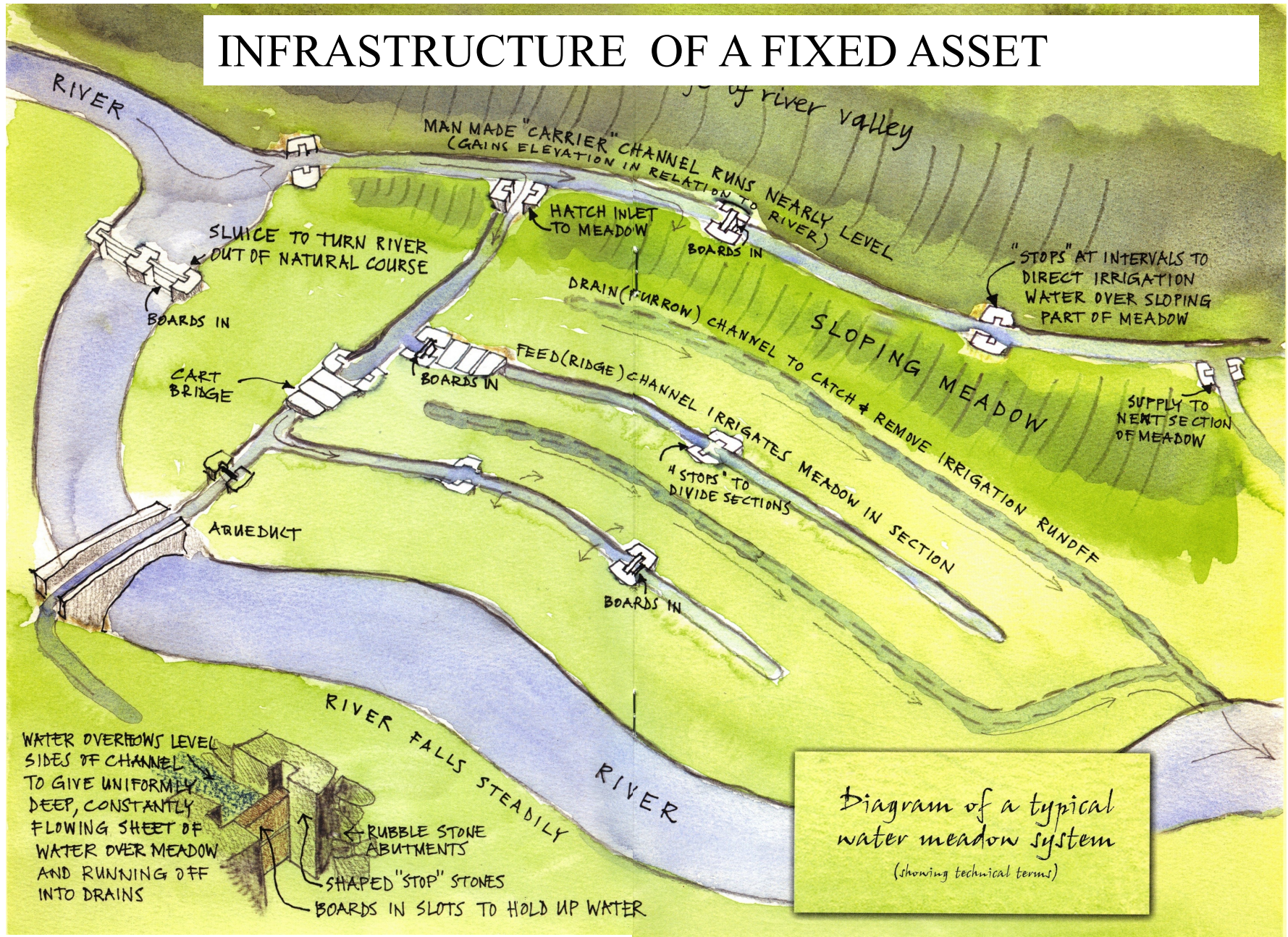
## **Acknowledging:**

Roger Cutting,  
Ian Cummings,  
Kathy Stearne,  
Eva Valsami-Jones &  
Tom Williamson

# So...what is a watermeadow?

- A *watermeadow* is a system of grassland irrigation operated at the discretion of the farmer. It forces an ‘early bite’ of grass in the late winter/early spring, typically one month earlier than un-irrigated land, and produces hay crops later in the season.
- Part of integrated water management in Wessex
- Mechanisms are: *Soil warming, oxygenation and nutrient addition*
- *Floodmeadows* are where periodic flooding occurs when the river exceeds bankful discharge.
- *Grazing marshes* are where the shallow watertable is manipulated, by means of a network of ditches, that provide sub-irrigation in the summer.

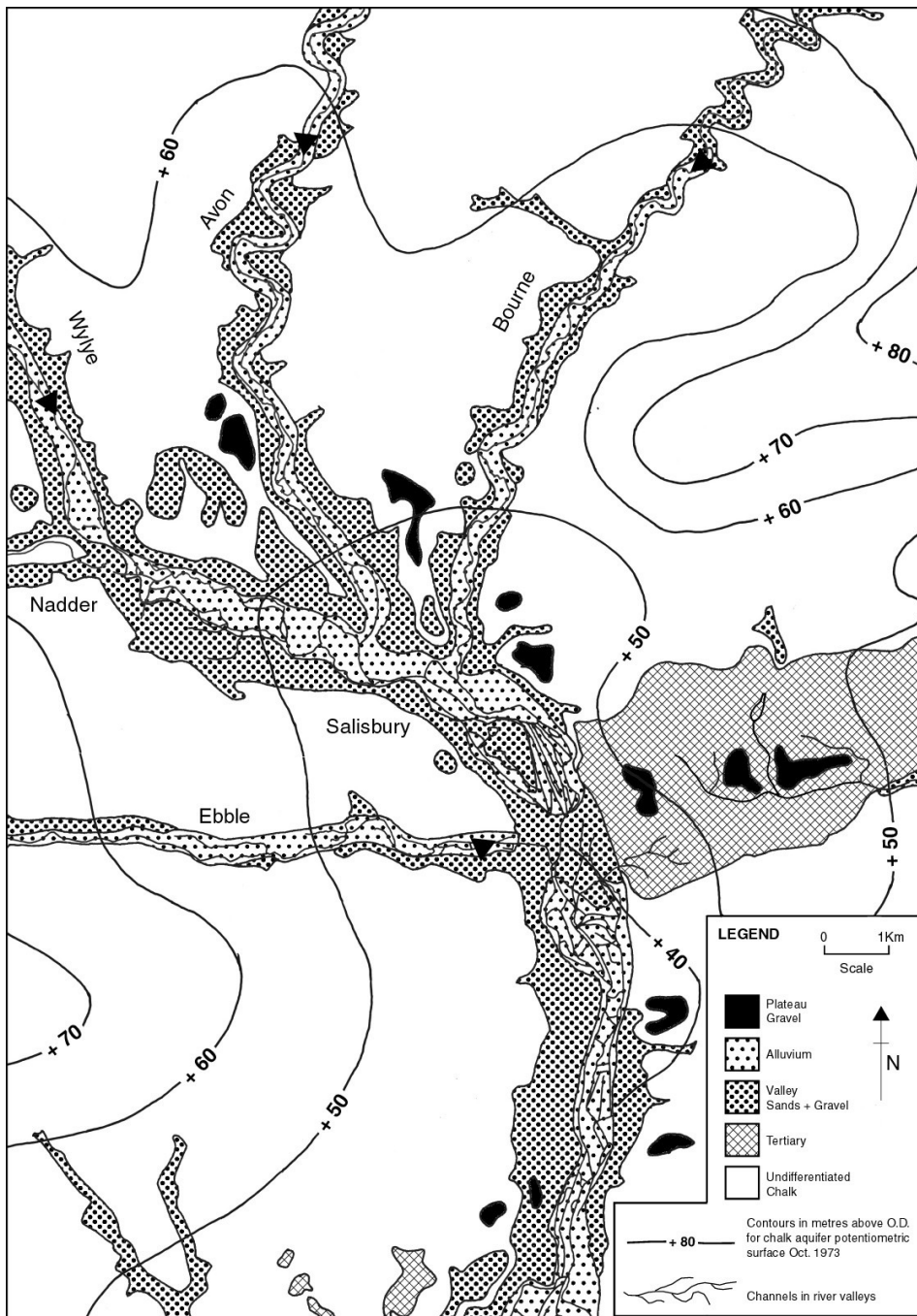
# INFRASTRUCTURE OF A FIXED ASSET



Environmental and archaeological resource (after Hampshire County Council)

# Chalk streams

- Chalk is 330-400m thick in Wiltshire
- Water is stored and transmitted in fissures and cracks in the Chalk
- Rainfall evened out so river flow relatively steady and reliable throughout year
- Without agriculture and sewage discharges, water filtered so pure groundwater source
- Hydrochemistry of waters favours watermeadow operation



# Historic Temperatures for England since AD 900.

**Drowning of Lower Seven Acres,  
Harnham Water Meadows**  
**Example temperatures 10.30am  
25<sup>th</sup> Jan 2007:**

Source: Based on original by H.H. Lamb

Air at 1m = 4.1°C

Dry frosted soil = 3.0°C

Water in carrier = 7.8°C

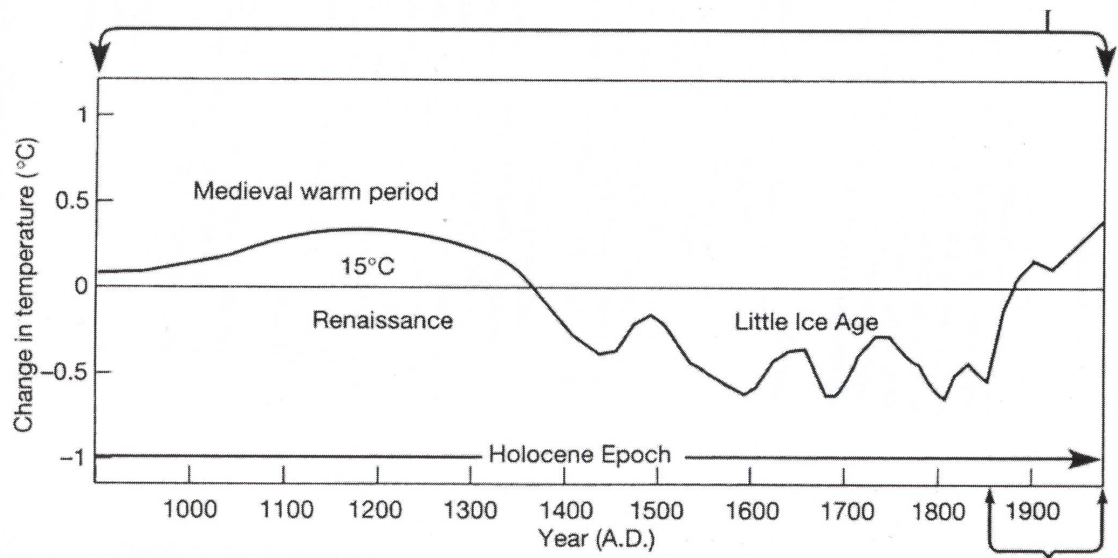
Water on meadow = 7.8°C

Wet soil (20cm) = 7.8°C

**(Grass grows > 5.5°C)**

No warming effect in water  
returned to the river, and %  
Oxygen saturation remained high

**Figure 5.** Historic Temperatures for England since AD 900.  
Source: USC Geology 150 Climatic Change.



Fitzherbert, writing in 1535, describes the technique of creating an artificial wet meadow as follows:

*Another maner of mendyng of medowes is, yf there by any runnyng water or lande flodde, that may be set or brought to ronne over the medowes, from the tyme that they are mowen unto the begynninge of Maye, and they wyll be moche the better, and it shall kyll, drowne and dryve away the moldye-warpes and fyll up the lowe places with landes and make the ground evyn and good to mowe. All maner of waters be good, so that they stande not styl upon the grounde; but specyally that water that cometh out of a towne from every mannes myddyng or dunghyll is best and wyll make the medowes most rankest (quoted in Kerridge, 1967).*

‘How could this be otherwise in the days of square fields,  
plashed hedges, and meadows watered on a plan so rectangular  
that on a fine day they looked like silver gridirons?’

Thomas Hardy *The Return of the Native* 1878. Belgravia

Viz: Clym Yeobright sees watermeadows seen as a part of an ordered landscape, in  
contrast to the ‘abandoned’ Edgon Heath



Lower Farm at Britford, Wiltshire

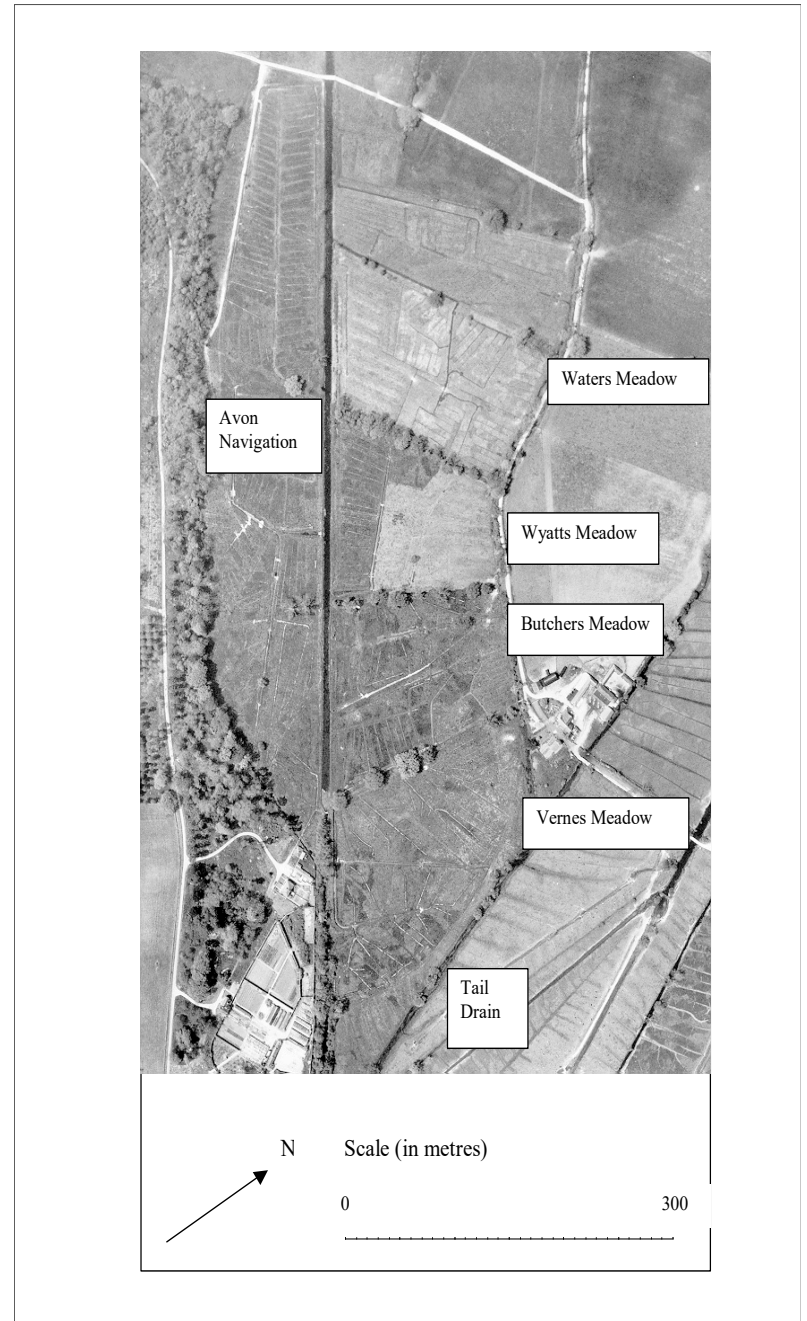
# Britford, Wiltshire



Bedwork at Britford



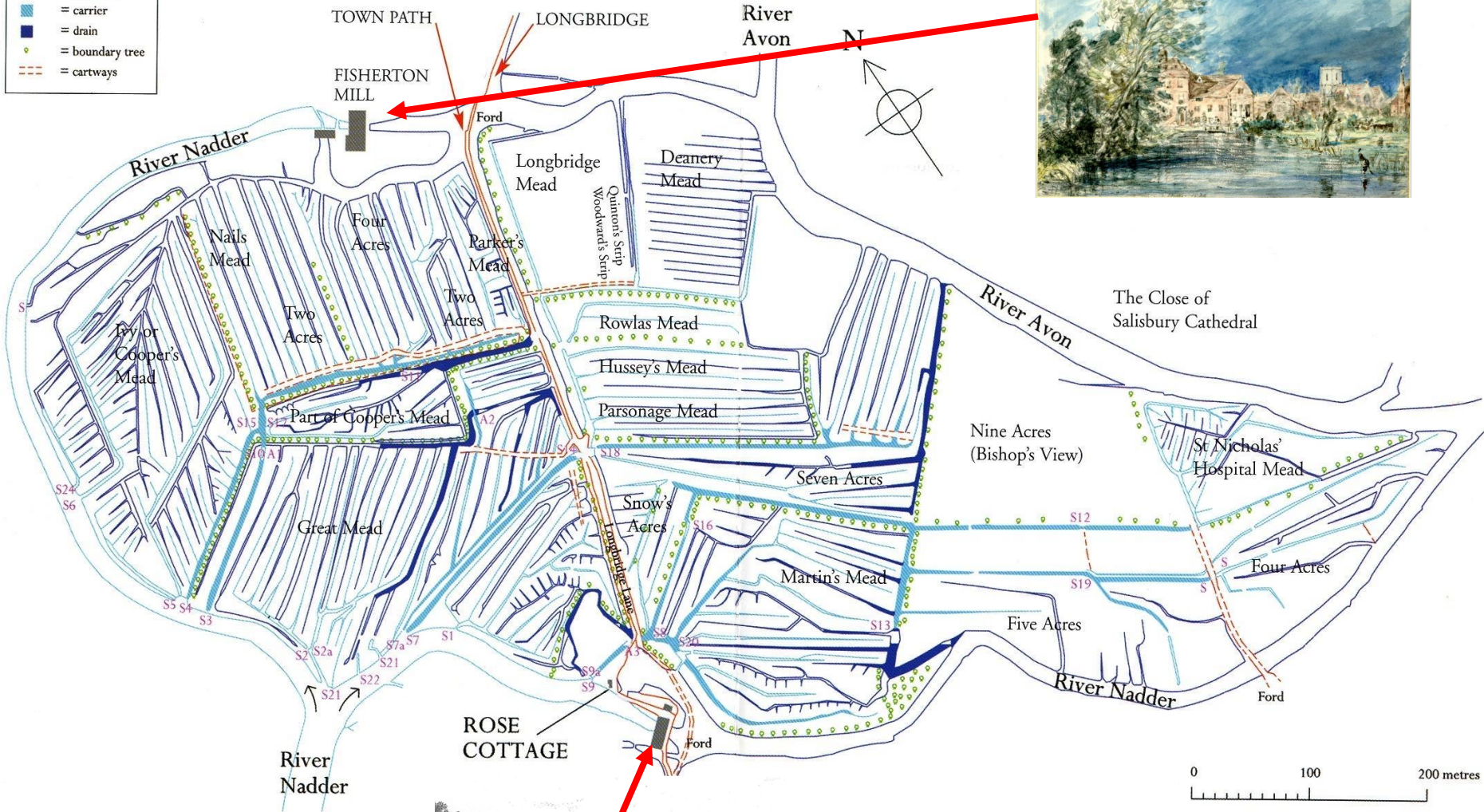
Britford  
SSSI in  
1974





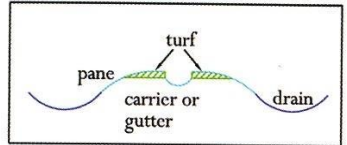
# IRRIGATION

- FB = footbridge
- S = sluice
- A = aqueduct
- [Blue hatched box] = carrier
- [Dark blue box] = drain
- [Green circle] = boundary tree
- [Dashed line] = cartways



programme  
atch) 9

Map based on 1787 inclosure map, drawn by Tim Tatton-Brown 1996 and transferred to CAD by Howard Austin Jones 2004; iron work drawn by Howard Austin Jones 2005.





# In-channel infrastructure

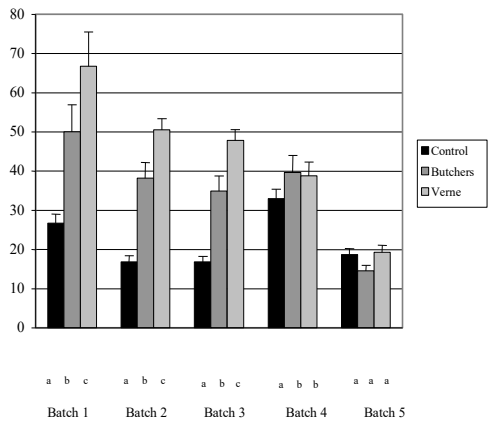
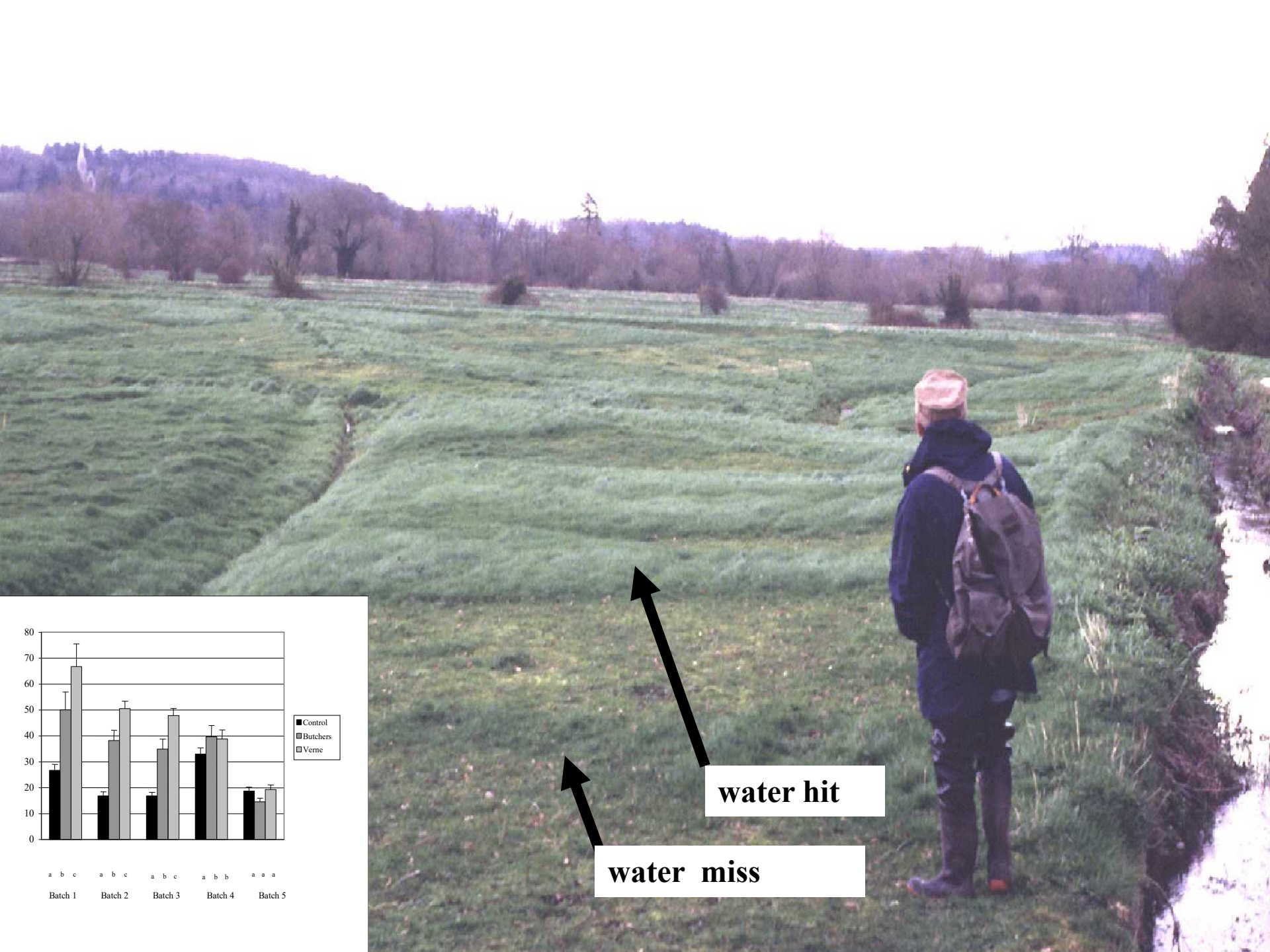
Watermeadows, mills, watercress beds, canals eels traps are controlled by:

- Hatches – open vertically
- Weirs – fixed in channel, overtopped by water
- Mill leats, tails, wheels, screens, spillways etc
- (Modern) radial gates, fish pass weirs

Modern trend is to reduce in-channel obstructions

# In-channel infrastructure



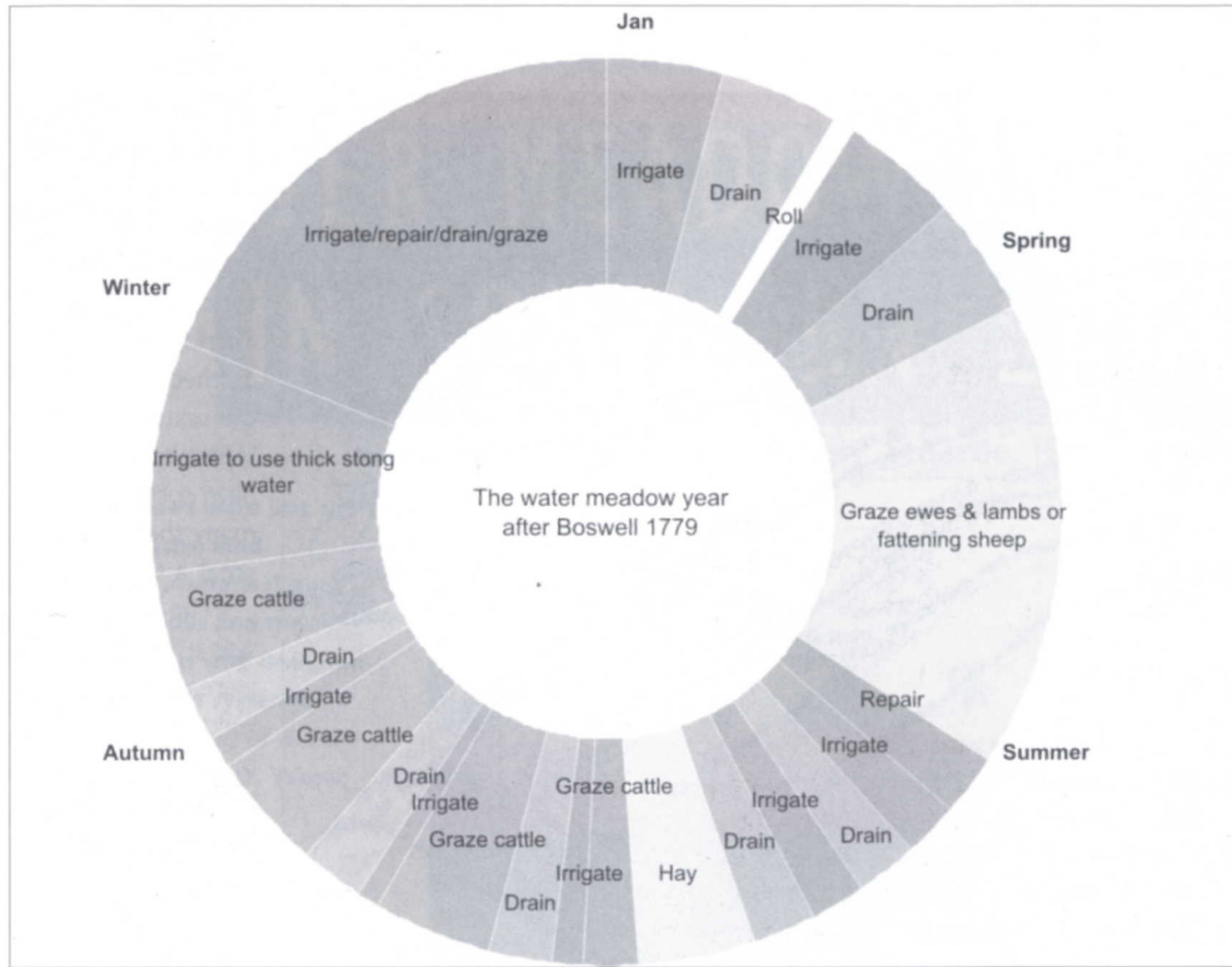


**water miss**

**water hit**



**Wiltshire horn ram**



## **Watermeadow operation and management**

**Fixed asset on farms, can produce a range of agricultural products as well as environmental goods**



*I AM A  
VOLE AND  
I LIVE IN A  
HOLE*

**But some  
don't make life  
easy!**

## **Conservation issues on watermeadows.....**

*Where history, archaeology,  
ecology, hydrology,  
agriculture and landscape –  
- all collide*

# Policy considerations

- 1879 crisis in English agriculture, watermeadows found to be expensive to maintain.
- Government backed intensification of agriculture from 1940.
- Yet today UK is a long way from food security.
- Loss of semi-natural habitats especially grassland.
- Interest in ‘environmental goods’ from farmers.
- Modern Environmental Land Management Schemes (ELMS) recognises them at last in option ‘HS7’ (*Management of historic water meadows through traditional irrigation*).
- ‘Sustainable agriculture’ remains an important issue.
- Watermeadows improve water quality and provide habitats.

## **Victims? Saviours?**

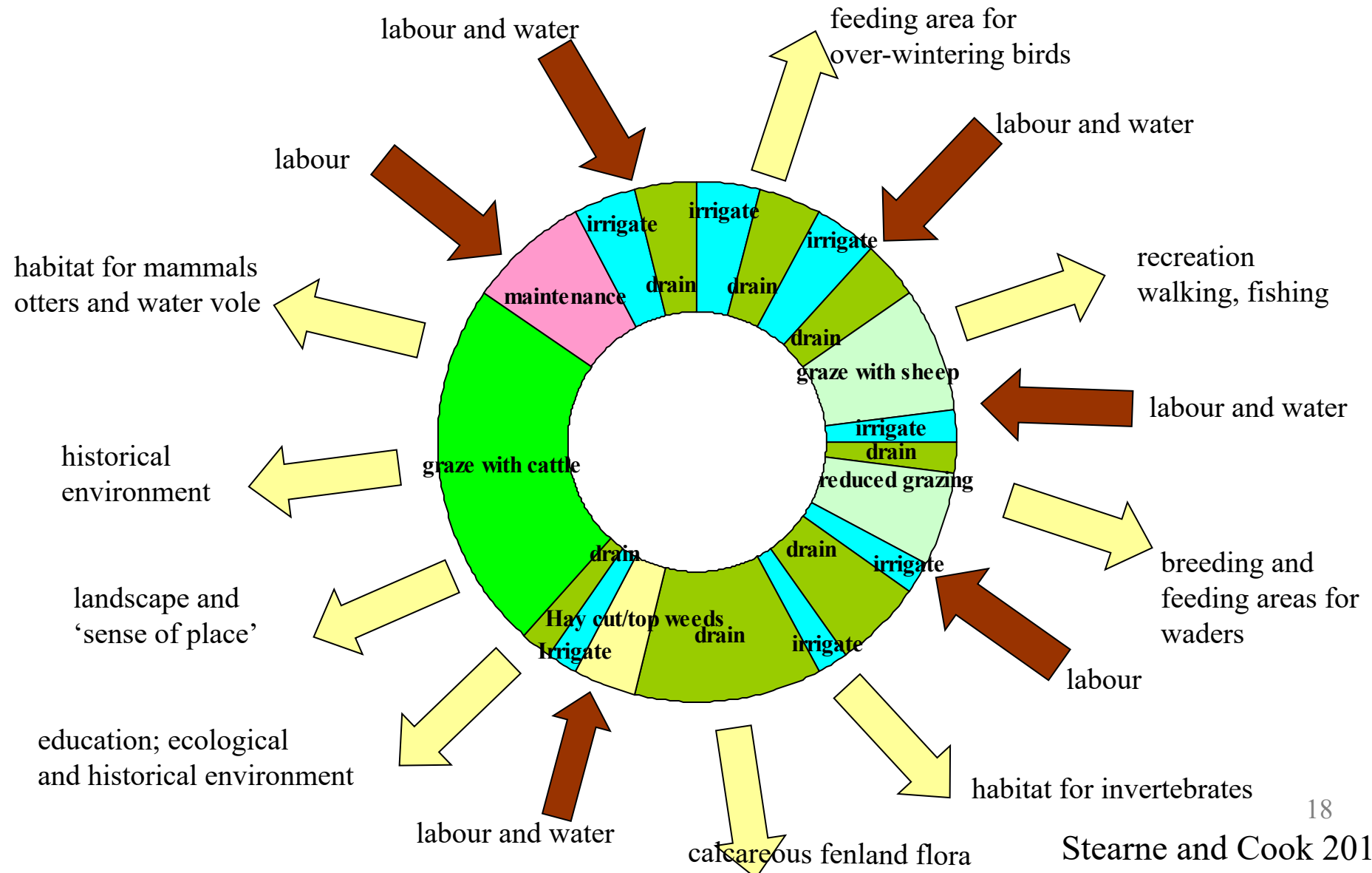


# Summary of benefits of watermeadows

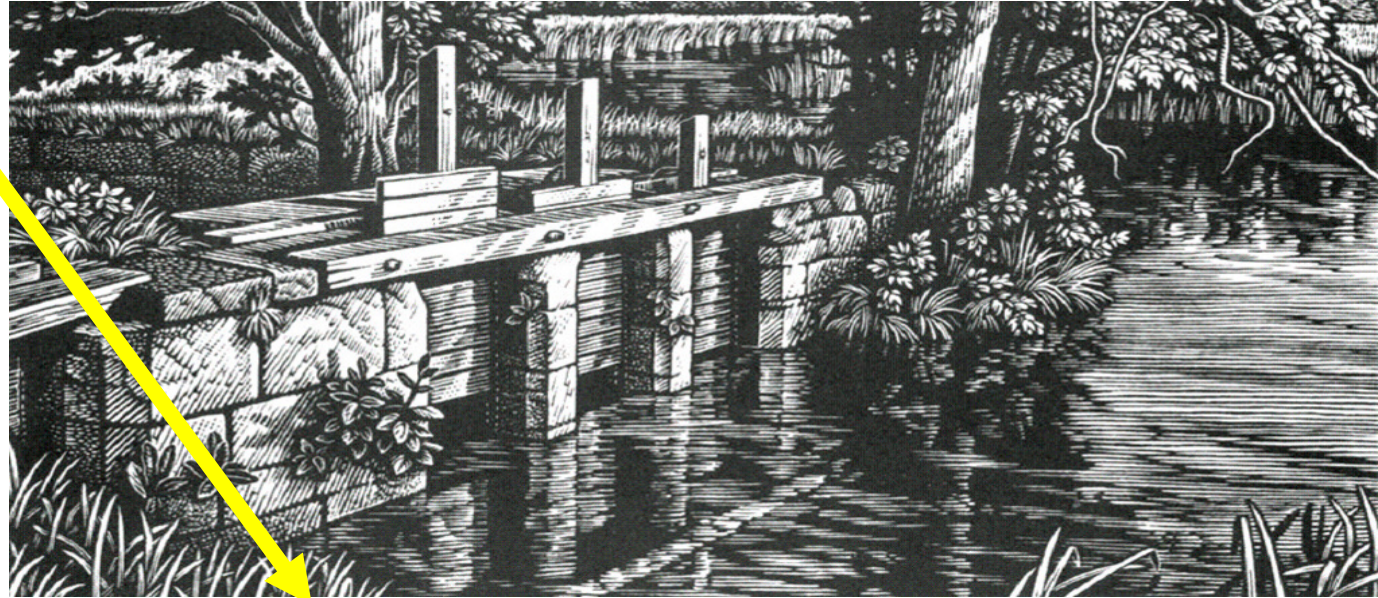
- Impacts important; managed under agri-environment schemes.
- Mitigate local flooding where water diverted the floodplain surface, in functioning ‘bedworks’,
- Valley bottom watermeadows retain floodwater.
- Oxygenation high in mobile water returned to the river.
- No known adverse impacts on temperature of river water.
- Sediment trapping: systems reduce silt in deposited sediment.
- Phosphorus mobility is reduced by about one third.
- Across meadows, soils decline in plant-available phosphorus.
- Nitrogen story is complicated but no sign of net production.
- Range of habitats created for plants, animals and birds.
- Interest in meadow irrigation is gradually growing!



# Watermeadows at the beginning of the twenty first century



# Thank you from HWMT



Engraving by Howard Phipps

*No moldye-warpes were  
harmed during the making  
of this presentation*

THE HARNHAM WATER MEADOWS TRUST  
(Charity Number 1001360)



[www.salisburywatermeadows.org.uk](http://www.salisburywatermeadows.org.uk)

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