

A Guide to Improving Habitat for Wildfowl



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(Above) Bassenhally Pits (SSSI) – owned and managed by Whittlesey Wildfowlers & Conservationists

*What would the world be, once bereft
Of wet and wilderness? Let them be left,
Oh let them be left, wilderness and wet;
Long live the weeds and wilderness yet.
(from **Inversnaid** by **Gerard Manley Hopkins**)*

Introduction

This guide has been commissioned by the Countryside Alliance. Thyme Consultants Ltd are a leading conservation, project and land management consultancy operating throughout the UK with a range of clients including the shooting community. It is not intended to be a detailed technical manual but rather a practical look at the broad options available to shoots, conservationists and land managers to maintain, create and enhance wetland habitats for the benefit of both breeding and wintering wildfowl. All the examples and case studies used in the guide are taken from the last ten years or so from within the shooting community – including clubs, syndicates, farm shoots and estates. These examples alone are indicative of the significant contribution shooting plays in maintaining and enhancing wetland habitats and we anticipate that this guide may also be an inspiration, catalyst and source of ideas for many more wetland creation and enhancement projects.

Summary

Virtually all shooting land, regardless of size and location will have the potential for some form of wetland habitat creation, restoration or enhancement to benefit wildfowl and also other wildlife.

There are a series of detailed technical manuals available concerning the management of most wetland habitats (wet grassland, saltmarsh, reedbeds etc) but this guide focuses specifically on the habitat requirements of wildfowl (and associated potential sporting benefits) and takes its examples and case studies exclusively from the practical experiences derived from projects over the last ten years within the shooting community.

It considers management options at a broad scale, looks at practical examples, likely outline costs, grant possibilities, consent requirements etc and also points the reader in the right direction regarding further research, advice and liaison with other like-minded individuals or organisations.

Every site will be different and there will never be one simple answer in any one situation – there are so many factors at work (local, regional and wider) that there necessarily has to be an element of trial and error overlaying the broad principles and informed judgement to get things right. In short, it is not all science – knowing your site, its history and potential is usually a better starting point than even the most detailed prescriptive manual.

There are general principles that apply in all cases however such as detailed prior planning, getting tasks organised in the right order, ensuring all necessary permissions are in place, linking in to wider habitat corridors and networks, maximising habitat edge effect, close liaison with graziers and other partners to ensure that aims are fully understood and being flexible and willing to amend and fine-tune management practices.

Food availability is a critical factor for wildfowl – both wintering and breeding. This guide does not consider artificial feeding – in fact the only time that artificial feeding would be considered is in periods of severe weather when shooting is either under voluntary or statutory suspension. Open water and waterside cover is also a critical factor for breeding wildfowl.

Wildfowl (and particularly migratory wildfowl) are a shared resource – the shooting community has a responsibility to ensure the sustainable use (harvest) of this resource, both individually at a local level and cumulatively at a national and international levels. Enhancing the wildfowl holding capacity of your land in the breeding season and in the winter at a local level is an important element of this contribution towards sustainable use along with the adoption of established shooting best practice guidance such as the Code of Good Shooting Practice, voluntary restraint in cold weather plus pest and predator control.

A general background principle of most wetland projects is the simple aim of making land and the general area more attractive to nesting and feeding wildfowl. Typically, the core areas of habitat are shot only lightly or not at all but the spin-offs of new adjacent flight-lines and more wildfowl on the land generally provides added shooting opportunity and quality.

Saltmarsh



(Above) – sea wall and saltmarsh, North Norfolk

Broadly speaking, saltmarsh vegetation develops between Mean High Water of Spring tides (MHWS) and Mean Low Water of Neap tides (MLWN) where there is a net accumulation of sediment – i.e. predominantly where there is some degree of shelter from wave action. Early saltmarsh vegetation is composed of a few salt-tolerant plants establishing on inter-tidal mud or sand and as vegetational succession takes place, further sediment is trapped and the surface of the saltmarsh gradually rises. As the saltmarsh vegetation becomes progressively covered by fewer tides the plant community becomes more diverse.

Traditionally management of saltmarshes has included stock grazing in some parts of the country and various forms of seas defence aimed at stabilising and protecting the saltmarsh. Saltmarshes are by their nature a very dynamic habitat and marsh stability (whether accreting, eroding or in balance) is an important factor to consider when looking into site-based management, restoration or creation options.

Saltmarshes have long been subject to enclosure (and drainage) for agricultural use, port development and other infra-structure developments. Hard sea defences, rising sea levels and increased wave action are all factors leading to “coastal squeeze” and loss of saltmarsh habitat. Saltmarshes also have a wider economic significance in that they can provide grazing, conditions for the early stages of some species of fish (e.g. Bass) and have an important role in sea defences.

Saltmarshes are important for wintering (rather than breeding) wildfowl and provide roosting and loafing sites as well as feeding for grazing ducks and geese such as Wigeon and Dark-bellied Brent Geese, where they will seek out open areas with close cropped vegetation, often close to pools or lagoons. In addition, grazing wildfowl such as Wigeon also feed on certain types of vegetation on adjacent inter-tidal mud such as eel grass beds (*Zostera angustifolia* and *Zostera noltii*) – often also known as Wigeon Grass. Historically there have been issues on a number of sites with eelgrass beds being lost to Common Cord Grass (*Spartina anglica*) encroachment (a non-native hybrid plant species).



(Above) – Dark-bellied Brent Geese at Hamford Water Essex

As well as their importance for wildfowl, saltmarshes have a wide range of interests such as specialist plant communities and are often designated for their nature conservation interests (Sites of Special Scientific Interest (SSSI), Special Protection Areas (SPA)).

To a certain extent these site-based designations will limit or determine practical management and restoration options on any piece of saltmarsh – for example, typically a SSSI consent from Natural England would be required to re-introduce grazing, restoration of and creation of saline lagoons.

Under agri-environment grant schemes such as Higher Level Stewardship (HLS) sites suitable for restoration options are typically ones that are inappropriately grazed, over-grazed, have an inappropriate timing of grazing, or sites that are difficult to graze. There are also saltmarsh creation options and the possibility of supplementary payments for extensive grazing and in some cases livestock exclusion.

Inter-tidal Habitat Management and Creation

It is rare for inter-tidal flats (i.e. the area between Mean High Water and Mean Low Water) in England to be privately owned and also much of our inter-tidal flats are designated as SSSIs but it is still technically possible in certain limited circumstances to work with a landlord (often the Crown Estate) and other partners (such as Natural England) to create and restore inter-tidal habitat.

Over and above schemes that involve the realignment of sea defences (which are covered later in this section) and large scale, multi-functional and multi-partners approaches such as the insertion of sediment trapping devices like groynes or soft sediment recharge (all of which are outwith the scope of most of the shooting community if acting alone) the main areas of focus on inter-tidal habitat creation and restoration have been attempts at eelgrass (*Zostera spp*) re-establishment and Common Cord Grass (*Spartina*) control.

Detailed studies at Lindisfarne National Nature Reserve (NNR) in Northumberland have shown correlations between *Spartina* encroachment, *Zostera spp* decline and changes in wildfowl numbers and it is here that much experimentation has gone on regarding *Spartina* control techniques. Some of this work has been funded directly and indirectly by the shooting community.

A brief review of techniques tried for controlling *Spartina* at Lindisfarne NNR and elsewhere indicates that grazing has had no discernible effect and that cutting can actually have the reverse effect (i.e. stem density increases). A combination of cutting and a smothering element such as turning over the surface of the mud (in effect ploughing) and chemical application (e.g. glyphosate) have been shown to be more successful.

These are very expensive techniques however and in addition a natural 'die-back' of *Spartina* has taken place on a number of sites so the case for control (in the England at least) is not considered to be so strong now as it was say 10-15 years ago.



(Above) - *Zostera noltii* (Dwarf Eelgrass or Wigeon Grass)

There have also been a number of *Zostera* transplanting trials mainly on the east and south coast of England but some of these are quite old – for example, trials of *Zostera* turf transplanting in Norfolk and Suffolk in the late 1960s and early 1970s did show that field scale transplanting could be feasible but at 1973 prices of an eye-watering £1,000/ha the cost large scale transplanting has been prohibitive. All trials seem to show limited early success but in the longer term the plants either tend to disappear or patches do not expand as hoped.

Saltmarsh Creation and Restoration Techniques

In simple terms, saltmarsh habitat creation is the process of allowing saltmarsh communities to spread landwards from existing sea defences. It can be divided into two basic options – firstly, the removal or lowering of sea defences (managed realignment) and secondly regulated tidal exchange where saline influence comes via pipes or spillways rather than a breach in sea defences. Both processes may require the building of new inland sea defences thus the general term managed realignment.

There are considerable funds available for managed realignment projects Environment Agency and Defra have regional and national saltmarsh re-creation targets as a result of saltmarsh loss resulting from maintaining hard sea defences (coastal squeeze) and port developments and other large infrastructure projects often also need to compensate habitat loss.

Managed Realignment

Managed realignment is not a suitable option in all locations – for example, if the land inward of the sea wall to be inundated is of very high nature conservation value (e.g. SSSI and SPA wet grassland) or if very large areas of low lying land or settlement would be inundated.

Managed realignment can be an expensive process (costs include plant machinery and earthworks) so is best done at a fairly large scale however (economy of scale) and where the land subject to the realignment is of low nature conservation value such as arable land (i.e. so there are no knock on mitigation or compensation requirements).

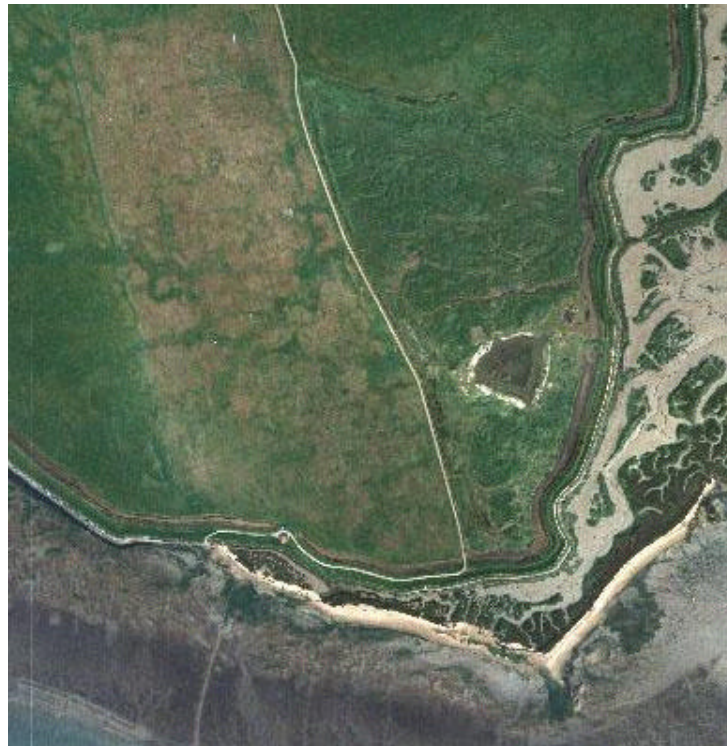
Satellite levelling plots showing levels against Ordnance Datum have become a particularly useful tool in recent years to identify possible locations for managed re-alignment via breach and also regulated tidal exchange.



(Above) – satellite levelling plot for Gloucestershire WA land at Poulton Court prior to regulated tidal exchange

Current guidance on inter-tidal habitat management and creation identifies that saltmarsh habitat creation is broadly limited to the area between MHWN (Mean High Water Neap) and MHWS (Mean High Water Spring) if sea defences are removed or altered – i.e. the area that would be flooded during regular high tides. Transitional saltmarsh habitat creation (saline tolerant plants in transition to terrestrial plants) is broadly limited between MHWS and HAT (Highest Astronomical Tide) – i.e. that area flooded less than 24 times a year, excluding extraordinary meteorological conditions.

As well as breaching and re-positioning of sea defences, managed realignment schemes also often involve the re-creation of creeks, tidal pools etc, although these do also tend to develop naturally. Old creek lines and features are often still visible on aerial photographs of reclaimed marsh (either arable crop marks or colour variations in grass pasture reflecting wetness variations – usually darker areas being lower lying and wetter).



(Above) – Aerial photo of Blackwater WA's land at Joyce's Marsh, Blackwater Estuary showing old creek lines. Although this site is reclaimed marsh it was deemed to be currently unsuitable for managed realignment and has become a wet grassland restoration project.

Although not exclusively so, the southeast of England has until now been the main focus for managed realignment projects. There are currently two particularly good examples of sea wall breach managed realignment delivered (along with project partner§) by the shooting community – these are Brandy Hole (a site owned by Blackwater Wildfowlers Association on the Crouch Estuary) and Orplands (a site part-owned by Dengie Hundred Wildfowlers Club), both in Essex where there has been great concern in recent decades over saltmarsh habitat loss through rising sea levels, increased estuarine storminess and infrastructure projects such as port expansion.

The Environment Agency was the main project partner in both of these projects and assisted with design and capital works. The Orplands project required a new inland sea wall building to protect

high value agricultural land but over much of its length the Brandy Hole project did not – the gently sloping land inland allows the tide to naturally find its level and change gradually over time.



(Above) – Recently re-established saltmarsh at Brandy Hole, Essex (BWA)

Saltmarsh vegetation can establish itself very quickly post-breach as non-saline tolerant plants die off and typical pioneer saltmarsh species take over.



(Above) – pioneer saltmarsh community in year 2 after breach at Orplands (Dengie Hundred WC)

Managed realignment is possible and worth considering in most coastal locations, particularly but not exclusively where there has been a history of saltmarsh reclamation for agricultural purposes. There are also attractive agri-environment payments potentially available for such projects – currently up to £700 per Ha per year – and in many cases a partner such as Environment Agency will be willing to cover the capital works costs (as they need to meet regional and national saltmarsh habitat creation targets to compensate losses elsewhere). Although Blackwater Wildfowling Association and Dengie Hundred Wildfowling Club both stretched themselves financially to acquire

the land to allow their respective partnership managed realignment schemes to go ahead, this is seen by all as money well spent in the long-term.

The following are the current HLS payment rates for various saltmarsh options in England.

Maintenance of coastal salt marsh	HP5	£30	Ha/yr
Restoration of coastal salt marsh	HP6	£30	Ha/yr
Creation of inter-tidal and saline habitat - arable	HP7	£700	Ha/yr
Creation of inter-tidal and saline habitat - grassland	HP8	£500	Ha/yr

Spillways and Regulated Tidal Exchange

Regulated Tidal Exchange (RTE) uses of pipes, sluices or tide-gates to allow regulated tidal flushing by seawater to create saline and brackish habitats behind hard defences such as a sea wall.

Spillways and other structures for regulated tidal exchange are most appropriate for sites where there is a need to control the frequency and amount of flooding. Instead of a breach, tidal water enters the site on tides over a spillway (effectively a broad crested weir) built in the seawall or via a pipe. It is also possible to reverse existing fresh water outlet sluices to allow the inflow of sea water.

An advantage of this technique is that the number of inundations a year can be controlled. The design height of the spillway is determined by compiling a curve showing the tidal height above which the corresponding frequency of desired flooding per annum is obtained.

A recent example of the creation of saline habitat by regulated tidal exchange from within the shooting community can be seen at Poulton Court, on the Severn Estuary, Gloucestershire (a site owned by Gloucestershire Wildfowlers Association). This involved extensive capital works which were funded by Environment Agency via the Severn & Avon Vales Wetlands Partnership.



(Above) – main water outflow via a split level sluice as seen during construction at Poulton Court

A sluice level has been set at 8.3mAOD (Above Ordnance Datum) at Poulton Court which means that any tide in the Estuary larger than that will cause a saline influx into the site (as can be seen below). The creek system that has been created is aimed at getting tidal water throughout the site, maximising the potential for saltmarsh plants to colonise and to create a diversity of habitats.



(Above) – the newly created creek system on low lying land at Poulton Court filled by tides above 8.3m AOD.

Saltmarsh Management and Improvement Techniques

Some saltmarsh sites will never have been grazed and the justification for introducing grazing is usually weak in these circumstances but where there is a local history of saltmarsh grazing it is worth further consideration.

Restoring degraded saltmarsh commonly involves the control of grazing regime or the re-introduction of grazing on abandoned sites where coarse vegetation has become dominant and wildfowl usage / nature conservation interests have declined.

Grazing density decisions must also factor in grazing by wildfowl. Grazing by wildfowl or a combination of this with light, intermittent stock grazing of saltmarshes which have a complete sequence of vegetation from pioneer to strandline communities have the widest nature conservation interests (plant diversity, invertebrates and breeding birds). Intermittent light grazing is typically from April to October at a stocking rate of circa 0.7LU/ha (i.e. circa 2 sheep or 0.7 head of cattle per Ha).

However, purely from a wildfowl perspective it is also probably fair to say that species such as Wigeon use tighter grazed saltmarsh more frequently than they do un-grazed or lightly grazed saltmarshes. Obviously there are multiple factors operating (such as saltmarsh size) but this pattern

can be seen on a very broad scale from Wetland Bird Survey (WeBS) peak counts where Wigeon and Pintail numbers are generally higher on more heavily grazed saltmarshes of the north-west of England such as the Ribble Estuary, Morecambe Bay, Dee Estuary and Mersey Estuary than on ungrazed marshes.

These more heavily grazed saltmarshes can have year round grazing and typically stocking rates of up to 2.5LU/ha (i.e. up to circa 7 sheep or equivalent per Ha) – i.e. stocking rates similar to those of intensively managed inland grasslands.

The above grazing density figures are indicative only. Setting grazing levels for a particular marsh is difficult. Prevailing weather conditions, previous stocking rates and other environmental considerations must all be taken into account. Do animals, for example, have access to the marsh all year round and at all stages of the tide? Is there a link between grazing on the saltmarsh and adjacent farmland, such that the marsh is used only infrequently? When deciding on an appropriate grazing regime the existing interests and history of management are important considerations.

Stocking Rates / Density – Livestock Unit Equivalents (LUs)	
Dairy Cow	1.0
Beef Cow	1.0
Cattle over 2 years old	0.7
Cattle 6 months to 2 years	0.6
Lowland ewe and lamb	0.12
Ram or teg over 6 months	0.15
Ewe follower or store lamb	0.08
Horse	1.0
Pony	0.8

From bag return analysis the type of grazing also has an influence on wildfowl usage. There appears to be a strong correlation between sheep grazing (with its resultant tighter and sweeter protein rich sward) and higher Wigeon (and Pintail) bags both between sites and within Estuaries where some parts of the Estuary are grazed and some not.

It must also be remembered that for species such as Wigeon and also some species of geese there is nationally a super-abundance of feeding habitat inland not only on wet grassland (fresh marsh) but also on arable crops such as winter wheat, recreational grounds and golf courses etc where conflict may result.

Light cattle grazing is acknowledged to have wider nature conservation benefits because cattle produce a structurally more diverse vegetation (catering in part for grazing sensitive plants) than sheep grazing and it is primarily for this reason that Gloucestershire Wildfowlers Association maintain traditional light cattle grazing on their saltmarsh at Poulton Court on the Severn Estuary.

However, sheep grazing produces close-cropped swards which have the greatest value for wintering (especially grazing) ducks and geese.

Hull & East Riding Wildfowlers Association and Holderness & Humber Wildfowlers Association have recently entered some of their land (Welwick) into a joint project with Yorkshire Wildlife Trust that will look at the re-instatement of light cattle grazing and a small scale-mowing regime to benefit both saltmarsh vegetation diversity and wildfowl. Other parts of their saltmarsh landholdings on the North bank of the Humber are either un-grazed or tightly sheep grazed so excellent scope for direct comparisons now exist.

Hull & East Riding Wildfowlers Association and Holderness & Humber Wildfowlers Association currently do not own any stock of their own (although this may change in the future) but have close working relationships with the graziers of their land to achieve habitat management aims. Without grazing, in the Upper Humber, estuarine reedbed typically develops and saltmarsh grassland grazing is lost.



(Above) – sheep-grazed saltmarsh grassland at Crabley, Humber Estuary



(Above) – saltmarsh at Welwick where there will be a re-instatement of light cattle grazing and a mowing trial.

There have been a number of experiments in small scale saltmarsh cutting over the years (particularly around saline lagoons) by wildfowling clubs around the country with the intention of creating favourable conditions for grazing wildfowl such as Wigeon but these have been on a scale which make it difficult to quantify success (although there is a clear perceived benefit from those involved in such management).

Saline Lagoons

Saline lagoons within or adjacent to saltmarshes of varying salinity are an important conservation feature and can also be attractive to wintering wildfowl – over time lagoons can sediment up or be choked by vegetation. They can be maintained through periodic vegetation and sediment clearance but there may also be opportunities to create new saline pools on saltmarsh (with appropriate consents) via small scale excavation and creation of small bunds or dams to slow down drainage. There has been experimentation on sites such as the Wash and the Humber as well as being incorporated in to the design of larger managed re-alignment and regulated tidal exchange projects.



(Above) – recently created saline lagoon on the high saltmarsh transition, Brandy Hole, Backwater Wildfowlers Association, Essex

Fresh Marshes

Grazing marsh is a term used to describe permanent pasture used for grazing or haymaking that originally originated from reclaimed and drained saltmarsh or other tidal wetland, separated from the influence of the tide by a linear earth sea bank or sea wall. Along with river valley wet grasslands and washlands they make up our fresh marshes – in effect wet grasslands of distinct nature conservation value.

Typical management involves low intensity grazing, and fluctuating water levels are the key to maintenance of the nature conservation value of most grazing marshes. Low or zero input of fertilisers, pesticides and herbicides are characteristic of the best areas. Wildfowl and other nature conservation interest co-exist with traditional agricultural use and are to a large extent dependent upon it. Hydrological regimes which favour both high winter and summer water levels provide good opportunities for wintering and breeding birds and well-managed wet grasslands can provide excellent wintering and breeding habitat for wildfowl.

In particular, winter flooding creates islands of damp grassland surrounded by shallow surface water to provide secure feeding and roosting sites. Shallow flooding concentrates seeds and invertebrates that can attract large numbers of wildfowl and also wading birds.



(Above) – surveying winter water levels on river valley wet grassland managed for wintering wildfowl

Since the 1940s major losses to fresh marsh habitat (both coastal and river valley) have resulted from the combined effects of drainage to allow for more intensive stocking (reducing winter flooding etc) and also in some cases intensive arable cultivation of these marshes.

Today, intensive stocking and arable management of such land is in effect working against nature and the financial returns when set against the difficulties of intensive drainage and cultivation are often quite marginal in today's economic climate.

With good agri -environment payments now available for wet grassland management, creation and restoration (through arable reversion), positive action for wildfowl is now also often an attractive proposition financially as well as for nature conservation and sporting purposes.

The following are the current HLS payment rates for various wet grassland options in England.

Maintenance of wet grassland for breeding waders	HK9	£335	Ha/yr
Maintenance of wet grassland for wintering waterfowl	HK10	£255	Ha/yr
Restoration of wet grassland for breeding waders	HK11	£335	Ha/yr
Restoration of wet grassland for wintering waterfowl	HK12	£255	Ha/yr
Creation of wet grassland for breeding waders	HK13	£355	Ha/yr
Creation of wet grassland for wintering waterfowl	HK14	£285	Ha/yr
Haymaking supplement	HK18	£75	Ha/yr
Raised water level supplement	HK19	£80	Ha/yr
Inundation grassland supplement	HQ13	£85	Ha/yr
Native breeds at risk grazing supplement	HR2	£70	Ha/yr



(Above) – reviewing coastal grazing marsh restoration works at Joyce's Marsh, Blackwater Estuary, Essex, with Blackwater Wildfowlers Association members.

The key elements to good fresh marsh management and restoration are controlling seasonal water levels and grazing (and or cutting) management – i.e. a more traditional form of agricultural management (reversing the process of agricultural intensification) – which also produces attractive conditions for nesting and wintering waterfowl. Additional works such as scrape creation, ditch restoration and re-profiling often also add additional benefits for breeding and wintering wildfowl.

The good news is that reversing this process of agricultural intensification is well understood and relatively easy to achieve – particularly for breeding and wintering wildfowl. Restoring plant and animal diversity is more problematic however.

Many wildfowling clubs, estates and syndicates have decades of experience in managing and restoring fresh marshes for wintering wildfowl.

Restoring and Managing Water Levels

Increasing ditch water levels to those which existed prior to agricultural intensification is the first requirement – i.e. higher levels than those created and maintained under more intensive agricultural use and higher than those usually considered optimum for grazing stock.



(Above) – at this site in the Fens water levels are set particularly high after Autumn stock removal to benefit wintering waterfowl.

A variety of methods can be used. The overall aim is to create conditions where winter flooding takes place (providing habitat for wintering waterfowl) and in summer pools occur adjacent to breeding sites. In broad terms where possible, ditch levels held close to (say within 10cm) of average field height are perfect.

Typically, land with wet grassland potential (whether grassland or arable) will also have a fairly extensive field drainage system. In some circumstances it may be appropriate to simply break the existing drainage routes or alternatively block them at the point of egress into an adjacent ditch and in doing so, the water table will rise.

However, by raising ditch levels these field drains can also be used in reverse to get water back into field scrapes and low points from the perimeter ditch. Within the field these field drains can also be intercepted to feed existing or newly created scrapes and other surface water areas. In fact in many cases it is not necessary for large scale earthworks to create scrapes etc – raised ditch levels and backing up field drains often does this anyway.



(Above) – natural scrapes formed by raising ditch water levels and reversing flow in field drains at Joyce’s Marsh and Ulting Hall, Essex

Sluices

Sluice type can vary a great deal from detailed adjustable mechanisms to cruder drop board sluices to simple fixed level devices (dams). Decisions on sluice type will be deepened upon a number of factors such as how much water is being held back, level of detail required on water level setting, budget and size of channel or ditch to be sluiced etc.



(Above) – adjusting a 10inch twin-wall, rotating right-angle sluice to manage scrape water levels (Cambridgeshire Field Sports Association)

Generally it is best to keep water management as simple as possible – both from a practical management perspective and also regarding any consents requirements. One point (sluice) to set water levels is normally fine unless it is a very large or complicated site. Lifting gate sluices of the type often used by Environment Agency for drainage purposes are not particularly good for wet grassland management as precise water level control is difficult to achieve.



(Above) – the main outlet drop board sluice at Deepdale Marsh allows for ditch and field water levels to be set across the whole site.

Most capital items are potentially eligible for financial support through agri-environment schemes such as HLS. The following are the current HLS payment rates for various water management structure capital works.

Soil bund	S1	£149	each
Culvert	C	£153	each
Timber sluice	S2	£314	each
Brick, stone or concrete sluice	S3	£960	each
Wind pumps for water-level measures	WWP	80%	costs
Construction of water penning structures	WPS	80%	costs

Restoring and Maintaining Grazing & Cutting

Given that water levels are generally higher than those considered optimum for grazing stock, breed of stock often needs consideration. Traditional breeds that have been bred to cope with wetter underfoot conditions generally do better – e.g. Highland Cattle have been used on a number of sites along with Romney sheep (i.e. breeds that were developed to cope with wet underfoot conditions).

On sites such as Deepdale Marsh in Norfolk, the aim is to achieve a short sward height of say 3cm to 5cm over much of the site with some taller sections up to 15cm by the end of the grazing season which usually runs to the end of October before stock removal in the winter months. Mechanical topping can be used to ensure that sward height is perfect at the very end of the grazing season and is also a useful tool for the control of weeds such as creeping thistle.

This provides perfect conditions for grazing wintering wildfowl such as Wigeon and Pink-footed Geese and European White-fronted Geese. Dunging from cattle in particular tends to make areas

more attractive to Snipe and small areas of poaching (by cattle feet) around water body edges can also be beneficial so long as it does not cover say more than 2% of the field area.



(Above) – a new Highland Cattle fold has been established at Deepdale Marsh, Norfolk to deliver detailed grazing requirements (and beef!).

Areas managed for wintering wildfowl also tend to be good for breeding waders so typically the aim would be to hold back grazing as long as possible in the spring (even into July in some cases) with a maximum stocking density of 0.75LU/ha between mid-April and mid- June to ensure light grazing and a reduced risk of trampling of nests.

Cattle in particular can be rather partial to ditch side vegetation (e.g. reed) so if this is not fenced off, by electric or traditional fencing, in the spring and early summer potential wildfowl breeding areas can be compromised.

In some circumstances it is traditional and / or beneficial to take a hay cut prior to aftermath grazing to get the sward right ready for wintering waterfowl. Cutting would normally be late (say after 15th July) to ensure that other nature conservation interests such as breeding waders are catered for.

Rush and *Glyceria* Management

In very wet conditions where standing water is present for long periods certain species can begin to dominate over the more palatable grass species. In washland situations this is typically Reed Sweet Grass (*Glyceria maxima*) which is palatable to cattle in its early stages but not later in the year when it is fully grown. Likewise the proportion of wet rush cover in rush pasture can become too high (say >30% cover) to be beneficial for wildfowl if left unchecked.

There are two main options – repeated mechanical topping / cutting followed by aftermath grazing or chemical treatment. Experimentation by Frodsham & District Wildfowling Club suggests that an early cut of rushes followed by chemical treatment (by weed-wiping) of the uniform height re-growth is particularly effective.



(Above) – Frodsham & District Wildfowling Club have used mechanical and chemical techniques to maintain rush cover at or below 30% on Frodsham Marsh.

Chemical treatment may not be an option in all cases however – particularly where the land is very wet or sensitive in terms of plant diversity. At Millennium Wash, Cambridgeshire Field Sports Association cut, baled and removed *Glyceria* prior to aftermath grazing with cattle and this, along with water level management, brought the land back into good wet grassland management.

Arable Reversion

There have been some very high profile successes within the shooting community in restoring grazing marsh and washland which had been subject to “agricultural improvement” to arable use. Such projects have occurred at Frodsham Marsh, Joyce’s Marsh, Ulting Hall and Deepdale Marsh for example – all of which have delivered much improved conditions for breeding and wintering wildfowl as well as the associated wider nature conservation benefits.

Sites suitable for arable reversion are typically those that were historically grazed but can be anywhere where hydrological circumstances are right. In the majority of arable reversion projects the reversion back to grassland has been achieved by natural regeneration and regular topping rather than the sowing of grass mix. A vegetation community tolerant to the wet conditions will develop in time and often light grazing can be introduced at the end of the second year.

In circumstances where grass mixes are sown we have often experienced one or two grass species becoming dominant very quickly – quite often not the most desirable or palatable species for grazing stock or indeed grazing wildfowl .

Given that arable reversion starts with disturbed (ploughed) land it is also important to monitor weed growth, particularly undesirable species such as Creeping Thistle, in the early years of reversion. If necessary, selective spraying for such species complements the regular topping and grazing (when re-introduced).

The early stages of arable reversion, before a wet grassland sward has developed and while the land is still disturbed, provide an opportunity for extensive restoration of ditches, scrapes etc (see also wet grassland and ponds, scrapes and ditches sections). This is also the time to put in place the infrastructure required for the re-introduction of stock grazing such as fencing, drinking bays, handling facilities etc – all of which can attract grant support from agri-environment schemes such as HLS.

All the usual guidance on wet grassland grazing, stocking densities, water level management and ditch clearance rotation etc then kicks in. One of the joys of restoring wet grassland on arable land is that you start with such a blank canvas – there are far fewer constraints or other interests to consider and the benefits for wildfowl are proportionally very large set against the work involved.



(Above) – Before and during arable reversion, wall-to-wall winter wheat at Deepdale Marsh and early stages of arable reversion (prior to stock grazing re-introduction) achieved through topping, water level controls, ditch re-profiling, scrape creation etc.

Many suitable sites for arable reversion are difficult to maintain in arable production anyway and are often too wet to get machinery onto in the spring. Consequently autumn / winter sown crops predominate and consideration has to be given to either improving drainage or letting nature take its course. A few decades ago the economics of re-draining land made sense because of the higher margins on grain crops but these days it will often make more sense financially to consider arable reversion – supported by generous agri-environment payments (up to £355/ha plus supplements).



(Above) – river valley arable reversion at Ulting Hall, Esse x prior to stock re-introduction. Established through topping and in-field water level rise through the restoration of drains and ditches and insertion of sluices. The scrapes have formed naturally as a result.

Reedbed

Reedbeds are freshwater or saline wetlands dominated by stands of the Common Reed *Phragmites australis*, where the water table is at or above ground level for most of the year. They tend to incorporate areas of open water and ditches, and small areas of wet grassland and carr woodland may be associated with them. Reedbeds, and particularly the open water areas within them, can be very attractive to wintering waterfowl with Teal in particular having a strong association.

Reedbed is in effect a transitional habitat (between open water and wet woodland) so some form of management is normally required to halt the vegetational succession and maintain areas of open water. Most reedbeds are managed by rotational cutting (6 – 9 year cycle) to ensure that the cover of scrub is less than 10% and open water covers 10-30%. Managed reedbed tends to be better for wildfowl in that a percentage of open water is always retained through rotational cutting.

A variety of management techniques are applied which help to restore and maintain the range of open water and reed and prevent the built up of litter and the development of scrub and woodland. These are mainly hydrological management (as per sluices etc) and cutting to control or harvest reed and remove scrub encroachment. Historically, burning was often employed to control of older stands of reed (and was very effective at removing dead reed litter) but is somewhat out of fashion – certainly in the nature conservation world.

The nature conservation industry has a bit of an obsession with large blocks of reed often driven by targets for scarce species such as Bittern and Bearded Reedling but the cover, shelter and feeding opportunities for wildfowl can be enhanced significantly even on a small scale at a local level. This can be as simple as re-profiling reedy ditches, fencing ditch margins (either stock fence or electric) and allowing reed to spread out into shallow water and damp ground on field edges.



(Above) – at Deepdale Marsh reed has been encouraged to re-establish along ditch lines and water to spill into the field edges

The manipulation of water levels and periods of flooding require suitable structures to be installed or restored. As well as main sluices, smaller internal dams within reedbed areas are often useful as an aide to management (to allow isolation of sections for rotational management). There are many similarities with the structures and principles of wet grassland management.

In most cases reed will establish naturally if conditions are appropriate but it can also be planted on a small scale to get the process going – the transfer of root clumps is the most often used technique.

Given that reedbed development requires the water table to be at or above ground level for most of the year in some cases some form of shallow excavation may be required so as not to impact on a wider area than that targeted.



(Above) – before and after - reedbed creation works prior to water level rise and establishing reed at Poulton Court, Gloucestershire

Reedbed options are covered by agri-environment schemes such as HLS – the following are the current HLS payment rates in England.

Maintenance of reedbeds	HQ3	£60	Ha/yr
Restoration of reedbeds	HQ4	£60	Ha/yr
Creation of reedbeds	HQ5	£380	Ha/yr

Fen

The term 'fen habitat' covers a wide range of wetlands from those dominated by grasses, rushes and sedges to areas that are dominated by mosses but in this guide we are mainly concerned with low marshy land which might usually be termed 'swamp'. Their creation and management requirements are very similar to those for reedbed areas (and there is often an element of reed in their make-up). They will develop naturally where conditions are right (often the most difficult areas to farm) and can become degraded by drainage, scrub encroachment or nutrient input.

Fen habitat can provide useful breeding opportunities for breeding, loafing and roosting wildfowl but as with reedbeds there must be a portion of open water.

Typically, management includes water level control, scrub clearance to ensure that scrub cover is less than 5%, light cattle grazing and / or a rotational late cut (after mid July).

Current basic payment rates for fen options under HLS in England are as follows.

Maintenance of fen	HQ6	£60	Ha/yr
Restoration of fen	HQ7	£60	Ha/yr
Creation of fen	HQ8	£380	Ha/yr



(Above left) – fen managed through light cattle grazing and rotational cutting by Whittlesey Wildfowlers & Conservationists at Bassenhally Pits, Cambridgeshire

(Above right) – planning fen restoration works (light cattle grazing, rotational cutting and scrub clearance) on the Exminster Marshes, Devon Wildfowlers Association

Ponds, Scrapes and Ditches

The benefits of ponds, scrapes and ditches for wildfowl are well established – particularly for dabbling ducks such as Mallard, Teal and Gadwall – and there will be opportunities to improve and create such habitat for breeding and wintering (feeding) wildfowl on virtually all landholdings.

Drainage Channels and Ditch Restoration

As well as providing valuable wetland habitat drainage channels can be important corridors for wildlife through the wider countryside. This is equally the case on arable land as it is on stock farms.

Most wildfowl generally like a mix of open water and cover of varying height to provide feeding opportunity, cover and breeding habitat. The keys to good management of drainage channels are water quality, cleaning out on rotation (a little and often basis is best), maintaining a variety of habitats on the channel banks, water level management and in some scenarios leaving a buffer zone of up to 5 metres beside the channel (i.e. an uncultivated strip on arable land and an un-cut or fenced-off strip in grassland situations).



(Above) – fencing of ditches at Frodsham Marsh, Cheshire to provide habitat for breeding wildfowl (and water voles)

In arable situations it may be possible to maintain a variety of bank habitats around the farm by cutting banks on a 2-5 year rotation. For all drainage channels periodic vegetation cutting and slubbing (removal of accumulated silt) will be required which is best done in later summer when water levels are low, after plants have seeded and the bird breeding season is over but before migratory wintering wildfowl arrive.

Ditches are very important features in their own right but are also the arteries of the marsh – it is usually important to be able to get water to all parts of a site so it is often worth looking at the lie of the land, old maps and aerial photographs to identify where old ditches or creeks ran (where now filled in or overgrown) and restoring them where possible prior to re-instating little and often rotational slubbing.



(Above) – restoring an old overgrown ditch at Deepdale Marsh, Norfolk prior to re-profiling and new water level management.

Re-profiling Drainage Channels

Typically ditches designed and maintained purely for agricultural drainage purposes are steep sided. By re-profiling one or both ditch sides the proportion of gently shelving edge can be increased significantly and consequently the benefit for breeding and feeding wildfowl, invertebrates and marginal plants, can be increased.



(Above) – Ditch re-profiling at Deepdale Marsh and Bassenhally Pits to provide gently shelving edges for feeding and breeding wildfowl

Within the shooting community there have been some particularly innovative and interesting ditch initiatives – Whittlesey Wildfowlers & Conservationists for example have doubled the width (and re-profiled) some of their ditches in the Nene Washes to provide additional loafing and roosting areas for wildfowl as well as additional breeding habitat and Frodsham & District Wildfowlers Club have fenced off buffer zones beside many of their ditches to create breeding wildfowl habitat.

Ponds, Scrapes and artificial islands

Ponds and scrape restoration and creation is already common within the shooting community and the benefits for breeding and wintering wildfowl are well understood – particularly the need to consider maximising the amount of edge (through irregular shape designs, scalloping and islands) and provision of shallow areas for feeding.

Existing ponds will need careful clearing out from time to time to maintain open water and shallows and this may also provide an opportunity to extend or alter the pond.



(Above) – re-profiled edges, extension and island creation to attract wildfowl, Deepdale Marsh, Norfolk and Long Marsh Wildfowl Refuge, Essex (Tendring & Halstead Wildfowlers Association)

Sometimes ponds have become so plant and sediment choked that to maintain their value for wildfowl and other wildlife they need a major clear out before reverting back to smaller-scale periodic clearing. There have been some good examples of pond restoration within the shooting community – for example at Poulton Court, Gloucestershire (Gloucestershire Wildfowlers Association) and at Joyce’s Marsh, Essex Blackwater Wildfowlers Association restored an old duck decoy.



(Above) – recently completed pond restoration works at Poulton Court, Gloucestershire (GWA)

Scrapes in open situations (such as wet grassland sites) have benefit for both grazing and dabbling wintering wildfowl as well as for breeding waders.



(Above) – newly created scrapes with islands at Deepdale Marsh, Norfolk, attractive to wintering wildfowl and also for breeding waders



(Above) – large numbers of breeding Avocets on recently created scrapes at Deepdale Marsh, Norfolk

Islands in ponds, scrapes and drainage channels, provide nesting, roosting and loafing sites secure from land based predators and also create additional edge effect and shallows for feeding (wildfowl and waders). The size and shape of an island or islands is best determined by practical considerations – for example, if there is wave erosion from a particular wind direction the shape and alignment of an island should be determined by the prevailing flow of water.

The creation of additional edge (margin) through scalloping edges and creation of sheltered bays provides shelter and additional feeding opportunity for wildfowl. It is for these reasons that many artificial islands turn out to be tear-drop or kidney shaped.

The creation of islands for wildfowl does not require polythene layers, shingle etc as is often the case for islands created for terns or breeding waders. Primarily we are looking to develop a taller vegetation to provide cover, shelter and edge feeding opportunity as well as breeding site potential. Exact profile and location for waterfowl is also not as critical but it is important that islands are allowed to vegetate until they support a tall (say 50cm to 2m) vegetation cover because this provides ideal waterfowl nesting habitat and reduces predation of nests (in areas where nests are accessible).

Although floating platforms are a possibility it is better where possible to plan and create islands at periods of low water levels or prior to raising water levels (as below). Here, an island is being created

beside an existing channel along with shallow feeding areas prior to sluice boards being put in place downstream along the ditch to raise water levels. The second picture shows the completed works prior to raising water levels and the third picture shows the same island a few months later during the highest water levels of the year after a down-stream sluice had been inserted.



(Above) – creation of a new island and surrounding shallows prior to water level management at Deepdale Marsh, Norfolk

There are a number of capital payment options available the current HLS rates in England are as follows.

Maintenance of ponds of high wildlife value <100m ²	HQ1	£90	Pond/yr
Maintenance of ponds of high wildlife value >100m ²	HQ2	£180	Pond/yr
Ditch, dyke and rhine restoration	DR	£2.90	m
Creation of ditches, dykes and rhines	WDC	£3.60	m
Creation of gutters	WGC	£1.90	m
Creation of temporary ponds (scrapes) – first 100m ²	SCR	£1.40	m ²
Creation of temporary ponds (scrapes) – over 100m ²	SCP	£0.90	m ²
Pond creation – first 100m ²	PC	£3.00	m ²
Pond creation – over 100m ²	PCP	£1.00	m ²
Pond restoration – first 100m ²	PR	£2.10	m ²
Pond restoration – over 100m ²	PRP	£0.80	m ²

Practical and legal constraints

A presumption is made that sufficient rights of occupation (ownership, terms of lease etc) are in place to allow for habitat management works but in addition to this there are a number of other legal considerations. When undertaking any habitat creation or restoration scheme there may be a variety of licenses, consents and approvals that will be required. These may include the following:

- Where building or large-scale engineering works are proposed planning permission may be required and depending on the nature and scale of the proposed works a full Environmental Assessment may be needed;
- Where sites with nature conservation interests or designations are involved consent may be required under SSSI legislation from Natural England.
- Some protected animals and habitats may require special measures (e.g. timing of works) to be adopted when undertaking habitat restoration, re-creation or creation schemes – for example, where Water Voles or other protected species are known to be present.
- Proposals affecting tidal land will require contact with the Crown Estate Commission who own most of the foreshore in England.

- Structures involving water level management and new waterbodies can require consents from the Environment Agency (EA) and the relevant Internal Drainage Board (IDB).
- Other consents licenses or approvals will be required if flood defence or navigation are likely to be affected, as in managed realignment schemes – such as Flood Defence Committee approval, Crown Estate and Department of Transport Ports Division etc.

If in doubt about the requirement for consultation and approvals please take further advice.

Summary of costs and grants available

The costs associated with wetland habitat management, creation and restoration vary from project to project and are difficult to quantify, particularly with variables such as fuel costs etc to consider. The more specialised the equipment the more expensive it is to hire but it can often turn out cheaper in the long-term to have the right bit of equipment for a shorter period. Always establish exactly what you want doing, with what kit and get a range of estimates or quotes.

The following are our current adjusted estimates of mid-range contractor costs for recent wetland habitat projects in England (set out per acre and hectare):

Operation	Unit	£/ac	£/ha
Grass seed - broadcasting	-	10.50	-
Grass seed - drilling	-	13.00	-
Spraying - for areas smaller than 50 acres	-	8.00	19.80
ATV spraying	£30/hr	-	-
Topping - margins	-	12.50	-
Topping – wet grassland	-	11.50	-
Mowing	-	12.50	-
Stock fence – erection and materials post, net & barb	£4.75/m	-	-
Tractor & post knocker	£40/hr	-	-
Ditching, scrapes etc with 360 degree digger	£35/hr	-	-
Rotary ditcher	£1,500/day	-	-
Tractor plus trailer plus man (spoil movement)	£35/hr	-	-

Note: these figures do not include transport / delivery costs

A number of the case studies used in this guide were based on partnership projects with other bodies such as Environment Agency and in such situations it is common for a partner to take on the capital works as part of their contribution to a project (e.g. some of the works at Deepdale Marsh, Brandy Hole and Poulton Court).

Certain consents and approvals from EA, IDBs etc have fees associated but one of the additional benefits of doing such capital works through an agri-environment scheme such as HLS is that Environment Agency etc will often waive their usual consent fees.

Grants are often available for habitat creation and restoration works such as scrapes, ditch restoration etc but rarely for ongoing maintenance works such as rotational ditch maintenance.

Typically grant payments are aimed at covering materials or a portion (not all) of the cost of works but many of our clients either own or have access to wetland management machinery so net costs can be reduced significantly in many cases. Agri-environment grants tend to be paid on achieving the work, not the financial outlay so with grant support it can be possible to break even.

External grant funding can potentially be accessed from a number of sources such as local authorities, the Water Framework Directive, Aggregates Levy, Heritage Lottery Fund and Crown Estate (Marine Stewardship Fund) but realistically the main source of such funding is via agri-environment schemes such as Higher Level Stewardship (HLS) which is administered by Natural England (NE) and very well tailored to wetland management for wildfowl.

The current main wetland area based and capital options under HLS are summarised below.

Environmental Stewardship Scheme (England) –Wetland Area-based Options / Payments

HLS Options	Code	Payment	Units
Maintenance of traditional water meadows	HD10	£350	Ha/yr
Restoration of traditional water meadows	HD11	£350	Ha/yr
Buffering in-field ponds - improved permanent grassland	HE7	£400	Ha/yr
Buffering in-field ponds - arable	HE8	£400	Ha/yr
6m buffer strips next to watercourse - cultivated	HE9	£400	Ha/yr
6m buffer strips next to watercourse - grassland	HE10	£400	Ha/yr
12m buffer strips for watercourses - cultivated land	HJ9	£400	Ha/yr
Maintenance of watercourse fencing	HJ11	£4	100m/yr
Buffering in-field ponds - organic grassland	OHE7	£500	Ha/yr
Buffering in-field ponds - organic rotational	OHE8	£500	Ha/yr
6m buffer strips next to watercourse - organic rotational	OHE9	£500	Ha/yr
6m buffer strips next to watercourse - organic grassland	OHE10	£500	Ha/yr
12m buffer strips for watercourses - organic rotational	OHJ9	£500	Ha/yr
Maintenance of watercourse fencing- organic	OHJ11	£4	100m/yr
Maintenance of wet grassland - breeding waders	HK9	£335	Ha/yr
Maintenance of wet grassland - wintering waterfowl	HK10	£255	Ha/yr
Restoration of wet grassland - breeding waders	HK11	£335	Ha/yr
Restoration of wet grassland - wintering waterfowl	HK12	£255	Ha/yr
Creation of wet grassland - breeding waders	HK13	£355	Ha/yr
Creation of wet grassland - wintering waterfowl	HK14	£285	Ha/yr
Maintenance of grassland for target features	HK15	£130	Ha/yr
Restoration of grassland for target features	HK16	£130	Ha/yr
Creation of grassland for target features	HK17	£210	Ha/yr
Raised water level supplement	HK19	£80	Ha/yr
Inundation grassland supplement	HQ13	£85	Ha/yr
Maintenance of coastal salt marsh	HP5	£30	Ha/yr
Restoration of coastal salt marsh	HP6	£30	Ha/yr
Creation of inter-tidal and saline habitat - arable	HP7	£700	Ha/yr
Creation of inter-tidal and saline habitat - grassland	HP8	£500	Ha/yr
Creation of inter-tidal and saline habitat - non-intervention	HP9	£150	Ha/yr
Extensive salt marsh grazing supplement	HP10	£70	Ha/yr
Salt marsh livestock exclusion supplement	HP11	£40	Ha/yr
Maintenance of high wildlife value ponds (<100m ²)	HQ1	£90	Pond/yr

Maintenance of high wildlife value ponds (>100m ²)	HQ2	£180	Pond/yr
Maintenance of reedbeds	HQ3	£60	Ha/yr
Restoration of reedbeds	HQ4	£60	Ha/yr
Creation of reedbeds	HQ5	£380	Ha/yr
Maintenance of fen	HQ6	£60	Ha/yr
Restoration of fen	HQ7	£60	Ha/yr
Creation of fen	HQ8	£380	Ha/yr
Maintenance of lowland raised bog	HQ9	£150	Ha/yr
Restoration of lowland raised bog	HQ10	£150	Ha/yr
Wetland cutting supplement	HQ11	£350	Ha/yr
Wetland grazing supplement	HQ12	£200	Ha/yr
Shepherding supplement	HL16	£5	Ha/yr
Cattle grazing supplement	HR1	£35	Ha/yr
Native breeds at risk grazing supplement	HR2	£70	Ha/yr

Environmental Stewardship Scheme (England) –Wetland Capital Works

Capital Item	Code	Payment	Units
Ditch, dyke and rhine restoration	DR	£2.90	m
Coppicing bankside trees	CBT	£29.00	each
Stock fencing	FSB/H	£1.80	m
Wooden field / river gate	GF	£149.00	each
Wooden wings for gates	LWW	£70.00	each
Native seed mix	GS	100%	of costs
Cattle drinking bay	CDB	£119.00	each
Water supply (to troughs)	WS	£2.00	m
Water trough	WT	£85.00	each
Livestock handling facilities	CLH	60%	of costs
Creation of ditches, rhines and dykes	WDC	£3.60	m
Creation of gutters	WGC	£1.90	m
Soil bund	S1	£149.00	each
Culvert	C	£153.00	each
Timber sluice	S2	£314.00	each
Brick, stone or concrete sluice	S3	£960.00	each
Creation of scrapes (shallow temporary ponds) - 1 st 100m ²	SCR	£1.40	m ²
Creation of scrapes (shallow temporary ponds) - > 100m ²	SCP	£0.90	m ²
Wind pump for water-level measures	WWP	80%	of costs
Construction of water-penning structures	WPS	80%	of costs
Pond creation - first 100m ²	PC	£3.00	m ²
Pond creation - over 100m ²	PCP	£1.00	m ²
Pond restoration - first 100m ²	PR	£2.10	m ²
Pond restoration - over 100m ²	PRP	£0.80	m ²
Special projects	OES	No set	payment

In addition, it is possible to gain funding towards the production of a Farm Environment Plan (FEP) under the HLS application process. Please contact a skilled consultancy firm such as Thyme Consultants Ltd to see what possibilities there might be in your particular situation.

Case Studies



(Above) Location of the case studies included in this guide

The following examples and case studies have been drawn upon in this guide. Actions taken to maintain, create and restore wetland habitat for wildfowl are listed in bullet point form.

A – Devon Wildfowlers Association – Exminster Marshes, Devon



- Wet grassland management
- Fen management
- Ditch and scrape management
- Light cattle grazing
- Rotational cutting
- Scrub clearance

B – Gloucestershire Wildfowlers Association– Poulton Court, Severn Estuary



- Light cattle grazing of saltmarsh
- Reedbed creation and management
- Fen management
- Pond and scrape creation and restoration
- Saline reversion by regulated tidal exchange (sluices and spillway)
- Partnership project with EA and Severn & Avon Vales Wetlands Partnership

C – Frodsham & District Wildfowlers Club– Frodsham Marsh, Cheshire



- Arable reversion / wet grassland restoration
- New network of sluices to manage ditch and field water levels
- Scrape creation in arable reversion areas
- Fencing of buffer zones on ditches
- Reedbed extension and management (partly in partnership with Cheshire Wildlife Trust)
- Rush pasture management
- Light cattle grazing of fresh marshes (sheep grazing on saltmarsh)
- Next phase of arable reversion currently underway

**D – Hull & East Riding Wildfowlers Association and Holderness & Humber Wildfowlers Association
– North bank of Humber Estuary**



- Light cattle grazing of saltmarsh (in partnership with Yorkshire Wildlife Trust)
- Cutting of patches in saltmarsh (in partnership with Yorkshire Wildlife Trust)
- Sheep grazing of saltmarsh
- No grazing / estuarine reedbed
- Saline lagoon creation (with EA)

E – Cambridgeshire Field Sports Association – Millennium Wash, Ouse Washes



- Wet grassland restoration (from *Glyceria* monoculture)
- Reinstatement of traditional washland cattle grazing
- New sluices and water management controls
- Scrape / pond creation with island
- Ditch re-profiling

F – Mr Andrew Crean, Deepdale Marsh, North Norfolk Coast



- Arable reversion / wet grassland restoration
- New sluices and internal water control measures
- Ditch re-profiling, scrapes and ponds with islands
- Broad and reedbed restoration and creation
- Reinstatement of light cattle grazing (native breed)
- Partnership project with EA and NE
- Further works to be carried out later this year (rotary ditcher)

G –Tendring & Halstead Wildfowlers Association, Long Marsh Wildfowl Refuge, Essex



- Wet grassland management – sheep grazing and cutting
- Scrape / pond restoration and extension
- Reedbed management
- Partnership project – including heritage Lottery Fund (HLF)

H –Blackwater Wildfowlers Association , Joyce’s Marsh and Brandy Hole, Blackwater and Crouch Estuaries, Essex



- Wet grassland restoration
- New sluices and water management control
- Reinstatement of traditional cattle grazing (native breed)
- Duck decoy restoration
- Managed realignment via breach
- Saline lagoon creation
- Fencing of delph boundaries to provide buffer zones
- Partnership projects with Environment Agency and Heritage Lottery Fund

I –Mr Nigel Musto, Ulting Hall, Essex



- Two phases of arable reversion / wet grassland restoration
- New sluices and water management structures
- Reinstatement of traditional cattle grazing (native breed)
- Scrape creation

J –Dengie Hundred Wildfowling Club , Orplands, Blackwater Estuary, Essex



- Managed realignment via breaching
- Partnership project with Environment Agency

K –Whittlesey Wildfowling & Conservationists, Bassenhally Pits and Nene Washes, Cambs



- Fen and reedbed management
- New water management structures
- Ditch restoration and re-profiling
- Traditional washland grazing and hay cutting
- Scrapes and ponds
- Scrub clearance

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Further Advice and Contact Details:

For further information, to discuss wetland improvement possibilities, project planning and access to grants on your land or to arrange a site visit please contact Simon Breasley at Thyme Consultants Ltd



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