Saltmarsh Management

Lead author: English Nature - Emma Hawthorne and Kate Jennings.
Additional Input: Ian Higginson, RSPB. Andrew Grieve, HAG.

The saltmarshes on the Humber Estuary play an important role in estuarine processes, both through the recycling of nutrients within the estuary, and through their role as soft sea defences, dissipating wave energy. They are highly productive biologically, providing nutrients that support other features within the marine ecosystem and they also have an important physical role, acting as a sediment store to the estuary.

The pioneer saltmarsh forms a key stage in the transition from intertidal sand and mud flats to saltmarsh vegetation and provides an important feeding area and a food source for many species of waterfowl. Recent saltmarsh surveys have determined that pioneer saltmarsh species are found predominantly in the outer estuary on both the north and the south banks with the largest concentration south of Cleethorpes. In the upper Humber, bare mud and sand flats are colonised by small amounts of common cordgrass *Spartina anglica* (SM6), and where freshwater influence is greater, sea club-rush *Scirpus maritimus* (S21). Common cordgrass is a non-native species that was first planted on the Humber in 1936 to assist with land claim. It is a fertile hybrid and a naturally invasive species that may be considered damaging to other pioneer marsh species, although on the Humber it's extent appears to be decreasing.

The Atlantic salt meadows of the Humber provide a valuable habitat for a range of marine and terrestrial fauna and flora, including rare coastal invertebrates such as the scarce pug moth, and they also provide roosting sites for waders and wildfowl at high tide. The combination of historical land claim for agricultural use, and erosion has reduced the saltmarshes on the Humber. Also, the effects of "coastal squeeze", whereby saltmarshes (and other intertidal habitats) are squeezed out between artificial sea defences and rising sea levels, has caused the saltmarsh to erode at its seaward edge. On the Lincolnshire coast, south of Cleethorpes the absence of artificial defences along much of the coast has allowed large areas of marsh to develop, together with sand dune and wetland habitats. There are an estimated 627ha of saltmarsh on the Humber Estuary (Humber BAP, 2002) and the composition of the remaining saltmarsh is unusual compared to other UK estuaries. Over half the marsh is dominated by common reed *Phragmites australis* and sea club-rush *Scirpus maritimus* especially in the inner estuary, and typical saltmarsh communities – pioneer marsh and low, mid and upper marsh communities are scarce, amounting to less than 1% of the total estuarine area.

The Atlantic salt meadows of the Humber are also notable as being predominantly ungrazed and subsequently support a range of communities dominated by sea purslane *Halimione portulacoides* and *Puccinellia* species with frequent sea aster *Aster tripolium* and sea lavender *Limonium vulgare*.

Today, few saltmarshes in the UK show a full transition from pioneer species through to non-tidal vegetation, due to coastal squeeze and historic land claim. On the Humber, at Welwick on the north bank, and to the south of Cleethorpes, there is some transition of saltmarsh vegetation from pioneer species, through to mid to upper marsh communities. Over the last 30 years, sections of the north Lincolnshire coast from Humberston to Saltfleet have seen substantial saltmarsh accretion.

Activities relating to management of saltmarshes on the Humber Estuary include the following:

Stock grazing - The saltmarshes of the Humber Estuary are predominately ungrazed. Areas that are grazed include the north and south banks of the Upper Humber, which support grazing cattle, sheep and horses. There is also a limited amount of grazing by sheep at the Grues.

Grazing by livestock radically alters the floristic composition and structure of a saltmarsh, suppressing many of the dominant dwarf shrub and herb species and promoting the dominance of grasses. However, grazed sites result in a short turf that provides an important feeding and roosting habitat for many bird species. Once grazing is established, its abandonment leads to invasion of the upper saltmarsh communities by sea couch grass, which suppresses other plants and is unpalatable to wildfowl. Therefore, traditionally grazed marshes should continue to be grazed, although overgrazing can cause physical damage by trampling, which can damage plants, compact mudflats and lead to a localised loss of habitat and excessive bare ground on saltmarshes. Traditionally ungrazed marshes should not be grazed to ensure the conservation of their plant and invertebrate interests. Redshank have benefited from a lack of grazing in the outer estuary. Historically, there have been higher levels of grazing on some marshes than at present and it would be beneficial to reintroduce grazing to these areas to maintain their bird interest.

The North Lincolnshire Coast is not grazed and has not been grazed since at least the 1940s. However, in the future some grazing will be proposed for some areas of the saltmarsh/ dune transitions.

Plant gathering - There have been reports of commercial samphire collections on the Lincolnshire coast at Humberston and also on Spurn Bight. Samphire picking can be classed as a traditional longshore activity and may be sustainable when traditional methods are employed. However, commercial exploitation for restaurants is unlikely to maintain this interest feature in favourable condition. It has been reported that the samphire is uprooted and there are few plants left after these large-scale collections. This is likely to result in the loss of the seed-bank and a lack of recolonisation of the mudflats. It may also have a knock-on effect on birds such as wigeon, pochard and brent geese that feed on these pioneer marsh plants and their seeds. Commercial gathering may also cause physical damage to non-target species such as the *Suaeda maritima* (sea-blite) that grows on the lower shore alongside the samphire.

Reed cutting - Stands of common reed *Phragmites australis* are found throughout the estuary. They exist as a fringe of varying width along the banks or as substantial reedbeds, such as at Blacktoft Sands, which is the second largest tidal reedbed in Britain. The reedbeds at Blacktoft Sands began to form after the construction of a training wall in the late 1920's and early 1930's which caused silt to be deposited on an existing low lying mud bank. Broken stands of reed are also found along the north Lincolnshire coast. The reedbeds are an important habitat for rare breeding birds such as bittern, bearded tit and marsh harrier and are also used a roosting site for overwintering hen harrier. They provide protection from predators and human disturbance, and wildfowl feed and roost in the reedbed pools. Several species of invertebrate are restricted to this habitat including the reed leopard moth *Phragmataecia castaneae*. Passerines such as reed warbler *Acrocephalus scirpaceus* and reed bunting *Emberiza schoeniclu*s breed in high densities and time their breeding with the life cycle of several invertebrates including the emergence of the plum reed aphid and the various wainscot moths that lay their eggs in the reed stems.

Tidal reedbeds are dry for significant periods of the year, becoming wet during Autumn and Winter, and during spring tide inundations. The tidal action may clear areas of reed litter, which often build-up and dry out freshwater reedbeds. On the Humber, the suspended silt that is present in the water column may be washed into the reedbeds on a high tide and may significantly raise the ground level of the reedbed.

The RSPB is carrying out an experimental rotational reedbed cutting programme at Blacktoft Sands. Rotational cutting will be carried out over 150ha of intertidal reedbed, with a maximum of 10ha cut annually and the reeds removed and burnt. If too large an area of reeds is cut in one year it can reduce cover and foraging areas for the birds that utilise these areas. This is less of an issue on large areas of reedbed such as those found at Blacktoft Sands, but is important to bear in mind with regard to the smaller linear reedbeds on the Humber. Bearded tit and marsh harriers tend to favour areas of reed with some leaf litter in the bottom and a diversity of standing reeds. This can only be achieved if reedbed management incorporates rotational cutting. Bearded tit will only breed where the reed litter occurs over shallow water of around 10cm and rotational reed cutting is to be extended within the intertidal reedbed at Blacktoft Sands to create these conditions in areas that have become too dry.

Also, one of the farms in the Upper Humber has entered the Countryside Stewardship Scheme to manage their extensive reedbeds through cutting. They are also creating scrapes to encourage use of the reeds by bitterns. The reedbeds along the North Lincolnshire coast are not cut.

Hay cutting - There is some cutting of transitional saltmarsh communities for hay in the Upper Humber.

Sea defences - Historically, land claim has been the greatest cause of saltmarsh loss on the estuary. Today, the Humber is almost entirely confined by sea defences, and coastal squeeze is the biggest threat to the remaining saltmarsh, particularly the upper marsh communities, which may be 'squeezed out' and replaced by lower marsh communities. In a few areas, there has been some encroachment onto the saltmarsh by sea defences, and there may also be some localised damage caused by maintenance work and access routes to these areas. (See Annex B - Flood Defence & Land Drainage for further details including the creation of habitat to offset losses)

Access - Many paths cross the saltmarshes of the Humber Estuary and are used for a wide variety of reasons such as recreational access to the beach, to access cockle beds, or for bait digging. Pedestrians are unlikely to have a significant effect on the saltmarsh vegetation, unless large numbers of people use the paths over a period of time. This may result in the widening of paths, and the loss of saltmarsh vegetation. The main damage caused to the saltmarshes through access, results from vehicles such as quad bikes and four-wheel drive vehicles.

Until recently (June 2002), cockle fishing took place at Horseshoe Point and the beds were accessed via an area of saltmarsh. This led to significant localised damage, both to the saltmarsh habitat and to the intertidal flats, particularly from the quad bikes and tractors that drove onto the site. The cockle beds are currently closed but are expected to re-open in the future, and this issue will need to be resolved. A new access route away from the saltmarsh has been negotiated with several local cocklers. There is also some damage caused to the saltmarsh around Cleethorpes by bait diggers, who cross the marsh to reach the intertidal flats and may also dig up some of the pioneer marsh communities.

Within the Upper Humber, several concrete or Tarmac ramps leading from the flood bank across the saltmarsh have appeared. This has resulted in the localised loss of saltmarsh plants and will also prevent any migration across this artificial substrate by other saltmarsh communities. Motorbikes and quad bikes at Saltfleet Haven Bank and at Humberston Fitties have caused damage to the saltmarsh and motorbikes are also known to drive along the flood bank at Barton and Barrow, although it is not known whether they come down onto the saltmarsh. There may also be some localised damage caused to the saltmarshes from maintenance work to sluices and drains, and access routes to these areas.

Management
Sites that are historically grazed are important roosting and feeding areas for birds, and these sites are managed for their bird interest. Sites that are ungrazed are botanically rich and support important invertebrate species. These areas of saltmarsh should not be grazed to ensure the conservation of these interests.

Statutory bodies
English Nature
Defra

Current management objectives
The objectives are to maintain the saltmarshes in favourable condition. If their current state is unfavourable, the aim should be to restore them.

Current management for nature conservation
English Nature's consent under CROW is needed for management activities within the SSSI. EN are also consulted on Countryside Stewardship agreements for SSSIs, commenting on whether the management will maintain the site in favourable condition, or help bring it into favourable condition. For example, management activities may include light grazing management or control of invasive grasses. In addition, land managers need Environment Agency consent to graze EA owned flood banks. The Environment Agency may also restrict grazing by horses as these may damage the flood defences.

The plant and bird interests on saltmarshes are to some extent mutually exclusive; sites that are historically ungrazed are richer in plants and invertebrates, whilst grazed sites are richer in birds. However, some bird species such as teal prefer ungrazed marshes and the ungrazed marshes at Tetney and Grainthorpe Haven also appear to have higher densities of breeding redshank than are found on grazed marshes.

Some of the saltmarsh that is grazed on the Humber Estuary has been entered into management agreements with English Nature and the Countryside Stewardship Scheme. The objective is to graze saltmarsh that is important for wildfowl, to produce a short sward height of between 2-8cm long. This is ideal for feeding and roosting wildfowl. On other areas of saltmarsh, grazing may be implemented to achieve a mosaic of short vegetation with patches of longer vegetation such as rushes. Once grazing is established, its abandonment leads to invasion of the upper saltmarsh communities by sea couch grass, which suppresses other plants and is unpalatable to wildfowl. Therefore, traditionally grazed marshes should continue to be grazed. Traditionally ungrazed marshes should not be grazed to ensure the conservation of their plant, invertebrate and breeding bird interests.

English Nature's objective is to maintain the saltmarsh in favourable condition, and therefore the grazing management of the saltmarshes within the European marine site should already provide for the integration of nature conservation. There is no active management on the saltmarshes that are found within the North Lincolnshire Coast, where they have a policy of allowing natural processes to occur.
Activities such as commercial samphire collecting are currently unregulated, but this may need to be reviewed.

Further Information
Livestock grazing is regulated through the Wildlife and Countryside Act 1981, as amended by the Countryside and Rights of Way Act 2000.
The Conservation (Natural Habitats, &c.) Regulations 1994.
The Countryside Stewardship Scheme Handbook.

Factors arising from the activity

The activities identified under Section 1.1 could affect the saltmarshes on the Humber Estuary through loss or damage of the habitat. Activities such as commercial samphire collection and the unbroken lengths of sea walls along the estuary may result in the loss of saltmarsh communities, whereas overgrazing and vehicles such as four wheel drives or quad bikes accessing the site will lead to physical damage.

Activity	Location	Present /historic levels of activity	Existing management Responsible Organisation	Relevant authority Bold = Lead	Possible effect on features	Significant Effects
F1/ Stock grazing	Upper Humber and the Grues	Present and historic levels low	**EN** Defra	**EN**	**Physical loss:** Grazing previously ungrazed marsh can result in a loss of plant and invertebrate diversity, and breeding birds. Failure to graze traditionally grazed sites can result in a loss of suitable habitat for feeding and roosting birds. **Physical damage:** Overgrazing can lead to poaching and damage the saltmarsh communities.	NO At current levels YES In localised areas
F2/ Plant gathering (Annex G13)	Humberston Fitties, Spurn Bight	Present levels high in localised areas. Lower levels in past as it is believed that only traditional gathering was practiced	**EN**	**EN**	**Physical loss:** Commercial samphire collections will result in the loss of both plants and seeds. **Physical damage:** Commercial collecting, particularly using machinery will result in damage to the remaining samphire plants and also to the annual sea-blite that grows alongside. **Non-physical disturbance:** Machinery and vehicles will cause disturbance to feeding and roosting birds. **Biological disturbance:** Commercial samphire collecting results in the selective extraction of species.	YES Localised YES YES YES

Activity	Location	Present /historic levels of activity	Existing management Responsible Organisation	Relevant authority Bold = Lead	Possible effect on features	Significant Effects
F3/ Reed cutting	Upper Humber	Low Low	**EN** Defra	**EN**	**Physical loss:** Reed cutting is a management tool to maintain the quality of the reedbed and prevent it from drying out and becoming grassland or scrub. It may result in the loss of hibernating invertebrate species and so timing is important.	YES
F4/ Sea defences (Annex B)	Throughout most of estuary	High ???	**EA** Landowners can construct sea defences on their private land	**EA**	**Physical loss:** Sea walls can result in coastal squeeze, whereby saltmarshes are trapped between hard sea defences and rising sea levels leading to a loss of upper marsh communities. In severe cases where the upper marsh is already lost, lower marsh communities may also begin to disappear.	YES
F5/ Access through saltmarsh	Throughout the estuary	Med Lower?	**LA** **EN** **NESFC**?	**LA**	**Physical Damage:** Can cause localised damage, particularly from vehicles. Damage from vehicles accessing cockle beds. **Non-physical disturbance:** Disturbance to birds using the saltmarshes and intertidal flats for feeding, roosting or nesting.	YES Localised YES

Internal Natural factors

Natural processes can affect the development of saltmarshes, for example storm events may change the wave exposure to an estuary by removing offshore barriers, and this may result in saltmarsh erosion. Long-term changes in the deposition of sediments in an estuary may also lead to the erosion of saltmarshes from one area, while marsh development may take place in another. In addition, deposition of silt and sand on saltmarshes, as part of the natural accretion process, can affect the growth and availability of saltmarsh grasses to waterfowl.

External factors

Set against these natural factors are changes caused by human activities. The natural succession of saltmarshes is affected by changes to the sediment supply (for example by dredging), changes in wave action (for example by coastal defence work) or more directly by reclamation for development or agriculture. Alongside these, are the changes caused by rising sea levels, resulting in the erosion of saltmarsh, often with limited potential for the marsh to migrate landward due to sea defences – known as coastal squeeze. The confinement of saltmarshes by flood defence and coast protection structures reduces their ability to function naturally and hard coastal defences can also deflect wave energy along the coast, leading to scouring of the marsh communities.

Future management

Rationale

Further information is required to determine if the saltmarshes on the Humber Estuary are in favourable condition. The most current threat to the Atlantic salt meadows, particularly the mid to upper marsh communities is coastal squeeze. In some places on the Humber, the saltmarsh has been squeezed out completely and the mudflats themselves are now being lost. Further investigation to monitor the rate of change in the saltmarsh communities, and the degree to which this can be attributed to coastal squeeze is needed. It is difficult to 'manage' coastal squeeze, although there are current proposals on the Humber for managed realignment sites and also for schemes creating land to compensate for lost wetlands. This may help to offset the loss of some saltmarsh communities and create areas showing a full transition from pioneer species through to non-tidal vegetation.

The commercial gathering of samphire at Humberston and also on Spurn Bight is likely to need some form of management to avoid the loss of this feature from these areas. Samphire picking can be classed as a traditional longshore activity and is probably sustainable when traditional methods are employed. However, commercial exploitation is unlikely to maintain this interest feature in favourable condition, particularly as the collecting occurs in the areas where this feature is most abundant. Extensive collecting and the uprooting of plants may also result in the loss of the seed-bank, leading to a lack of recolonisation of the mudflats. The use of heavy machinery may cause physical damage to other saltmarsh communities and to the intertidal flats.

The issue of access routes through the saltmarsh may also require some management measures. When the cockle beds at Horseshoe Point were open, the beds were accessed via an area of saltmarsh. This led to significant localised damage, both to the saltmarsh habitat and to the intertidal flats, particularly from the quad bikes and other vehicles that were driven across the marsh onto the site. It is possible to access the cockle beds via Stonebridge car park and when the cockle beds reopen, this alternative access route will be implemented.

The current levels of grazing and reed and hay cutting are unlikely to have a significant effect. However, these activities should be monitored to avoid negative impacts.

Management Action

Activity	Factor	Proposed management actions	Timetable	Implementation Bold = Lead RA
F1/ Stock grazing	F3 Localised F5	**Surveillance & promotion** of the Countryside Stewardship Schemes to support low-intensity grazing. Also promotion and support of revisions to agreements where necessary.	Ongoing	**EN**
F2/ Plant gathering (Annex G13)	F5	**Surveillance** Erection of notices on site, explaining the nature conservation importance of the site and information on third party damage. **Codes of Conduct** Liaise with local police wildlife liaison officer?	2005/6?	**EN**
F3/ Reed cutting	F3	**Surveillance, research and trial management**	Ongoing	**EN**
F4/ Sea defences	(Annex B)			
F5/ Access through Saltmarsh	F5	**Surveillance,** of areas where this is an issue. Monitoring to inform management actions.	Ongoing	**EN** LA