APPENDIX A3.5.2

REVIEW OF INTERNATIONAL HABITAT CREATION AND RESTORATION INITIATIVES

Table A3.5.2 Examples of International Habitat Creation and Restoration Initiatives

i. Sand Dune Habitats

Location/Habitat	Brief Description	Cost	Success	Reference
Portrush, Co. Antrim, Northern Ireland. Natural beach/dune system low sediment supply therefore sand conservation is essential.	Need for foredune restoration following degradation by recreation pressure. a. 1969/70 - brushwood fencing, thatching and planting. b. 1973 - dune was regraded, planted with marram and mulched, except for the seaward edge.		a. Largely unsuccessful because fences too widely spaced, lack of sediment to trap and inability of marram grass to grow on steep slopes. b. Successful. Good, stable accumulation, good marram growth.	Wilcock et al (1977)
Lincolnshire, UK (Mablethorpe to Skegness); Norfolk, UK (Holkham Gap to Wells) Sand Dunes	Foredune creation by kidding to extend present dunes seaward. Trenches are dug and filled with brushwood providing a brushwood structure to trap and accumulate sand.		Successful foredune creation.	Anglian Regional Meeting
Sefton, Merseyside, UK Sand dunes	Dune stabilisation by planting of vegetation and fencing. Sand trapping fences collect blown sand in the summer months and release sand back to the beach in winter.		Successful in some areas, but at Ainsdale NNR, dune stabilisation by afforestation led to a lowering of the water table and the loss of some slack communities.	Houston and Jones (1987). North West Regional Meeting. Doody (1989b)

Location/Habitat	Brief Description	Cost	Success	Reference
Camber, Sussex, UK. Small bay dune system associated with shingle spit formation. Abundant sand supply.	1967 - Shoreline fencing to recreate dune followed by planting of marram. Inner dunes bulldozed to smooth contours and stabilised by hydraulic seeding.	£100,000 Capital Costs. Annual budget at 1977 was £6,000	Within 4 years the system was under control. By 1980 a coastal dune up to 6m high had been created and the shoreline had advanced 5-10m seaward.	Pizzey (1975) Ranwell and Boar (1986)
East Lothian, Scotland. Medium sized bay dune system which presently has a low sand supply.	1960's - buckthorn brushwood and wooden palings were used to build a 3.6m high coastal dune. This was planted on the seaward side with lyme-grass and on the landward side with marram. Blowouts were contoured and planted with marram.	1968-69 £10,500 1969-79 £23,000 1979 + £24,000	Successful - marram stablised sand on the created foredune ridge.	Ranwell & Boar (1986)
Braunton Burrows, Devon, UK. Sand dunes.	Planting of marram to trap sand and rebuild foredunes. Hessian supported on wire netting with wooden fence posts to protect dunes. Also, construction of sea buckthorn traps checks wind in its passage and allows sand accumulation on both sides.		Growth of foredunes via sand trapping deprived inner dunes of their sand supply and the middle ridge lost sand where it was still unprotected.	Kidson & Carr 1961, cited in Quinn (1977)
Rosslare, Wexford, Surfers Paradise and Noosa Bay, Queensland, Australia. Sand dunes.	Beach feeding associated with plans to trap sand. Dune-grass plantings on the backshore and coastal dunes.		Not known.	Ranwell & Boar (1986)

Location/Habitat	Brief Description	Cost	Success	Reference
Hart Warren SSSI, Cleveland, UK. Sand dunes.	Sand fences were erected to trap sand and stabilise the dunes.		Small dunes have been formed and planted with marram.	Urban Wildlife News (1990)
Pendine Sands, Carmarthen Bay, Wales, UK. Sand dunes.	Rock mounds placed at base of dunes.		Checked wave action, encouraged sand deposition, raised beach level and lowered gradient.	Colquhorn 1969, cited in Quinn (1977)
Goerre, Netherlands. Sand dunes.	Dune reinforcement was carried out by importing sand to create and reinforce dunes.		Successful as a sea defence and also fitted in to the natural environment due to careful planning.	Jong and Visser (1983)
Terrebonne Parish, Louisiana, USA. Sand dunes.	Barrier Island dunes susceptible to erosive forces of sea, due to loss of sand supply. i. Timbalier Island - 350m experimental sand fencing, vegetational stabilisation, and the building of 1-2m high dunes. ii. Grand Isle - sand placed directly on crest of barrier island dune.		Withstood 1985 hurricanes by preventing "overwash" and breaching. Acting as a sediment source for the beach.	Davis and Gorman, (1983) Penland et al (1987)

Table A3.5.2 Examples of Habitat Creation and Restoration Initiatives

ii. Marsh Habitats

Location/Habitat	Brief Description	Cost	Success	Reference
Altamaha River, Georgia, USA. Brackish marsh.	3 acre brackish water marsh was established on sandy dredged material.		Cordgrass formed a dense lush mass of vegetation and visually the marsh was identical to other marshes in the vicinity.	Landin et al (1989) Saucier et al (1978)
Bolivar Peninsula, Galveston Bay, Texas, USA. Saltmarsh.	9 acre saltmarsh established on sandy dredged material, with severe to moderate erosion.		Sandbags, breakwaters and erosion control matting proved to be effective methods in protecting the marsh. Smooth cordgrass survived at intertidal elevations while saltmarsh cordgrass invaded the upland site.	Landin et al (1989) Saucier et al (1978)
South San Francisco Bay, California, USA. Saltmarsh.	Marsh was developed in an old 10 acre salt pond on confined dredged material.		The site was planted with Pacific cordgrass, Pacific glasswort and pickleweed. It took 11 years to achieve total plant cover.	Landin et al (1989) Saucier et al (1978)
Apalachicola, Florida, USA. Saltmarsh.	A small marsh development project on poorly consolidated fine grained marine sediments in an area subject to long wind fetches. Spartina sp. were planted.		Spartina sp. is stabilising. The saltmarsh, fish populations and other estuarine habitats have been improved by the formation of tidal channels and tidal pond.	Landin et al (1989) Saucier et al (1978)

Location/Habitat	Brief Description	Cost	Success	Reference
Texas, USA. Saltmarsh	Developed marsh on dredged material in moderate to high wave-energy environments. Breakwater was used to protect the planted marsh sprigs. Erosion control mats and plant-rolls were also used.	Planting techniques ranged from $48 to $242 per linear metre for a marsh 20m wide in 1988.	Still experimental.	US Army Corps of Engineers (1988)
Lower Mississippi River, Louisiana, USA. Saltmarsh.	Unconfined dredged material placement to elevate shallow bay bottoms to allow natural growth of emergent marsh.	$1.50 to $3.00/cu. m (1987).	Resulted in the development of 2000 ha of man-made intertidal marsh.	Landin et al (1989)
Warm Springs Marsh, San Francisco, USA.	Embankment protecting deep borrow pit deliberately breached in 1986 in area of high suspended sediment content. Bunds used to reduce effect of wave action in areas of 3m tidal range.		Several years of monitoring demonstrate very rapid siltation and development of fringing vegetation.	Personal Communication; Philip Williams Associates, San Francisco; 1990
Haywards Shoreline, San Francisco, USA. Marsh.	Complex system of culverts and control weirs to maintain shallow breeding habitat for birds.	$550,000	Partially successful. Plant colonisation was slower than anticipated. However, the site attracts large bird populations to rest and feed.	Personal Communication; Philip Williams Associates, San Francisco; 1990
Galveston, Texas, USA. Marsh.	Site protected with temporary sandbag breakwater to protect young plants.		After 10 years, breakwater began to fail. Structure has now gone but a healthy marsh remains.	Personal Communication; Philip Williams Associates, San Francisco; 1990

Location/Habitat	Brief Description	Cost	Success	Reference
Shooters Island, New York, USA. Marsh.	Breakwater created out of rubble, dredged fill placed behind breakwater.		Significant habitat improvement in dredged and badly eroded location.	Personal Communi-cation; US Army Corps of Engineers; (1990)
Bogue Banks, North Carolina, USA. Saltmarsh.	Golf course eroding at a rate of 7.0m/year following large scale clearance. Sea wall was too costly, so planted 0.5m strip of vegetation (Spartina though to Juncus).		Developed into full marsh community 30m wide. Only erodes during storms.	Personal Communi-cation; Prof. O. Pilkey, Duke University, Durham, USA (1990)
Maryland, USA. Saltmarsh.	Experimental "soft" stabilisation along shore. Rock revetment with salt marsh planted behind. Latter depends on water splashing over.		Not known.	Personal Communi-cation; Prof. O. Pilkey, Duke University, Durham, USA (1990)
Essex, UK. Saltmarsh.	Spartina transplants within Schleswig-Holstein type polders or with groynes.		Largely experimental. Varying degrees of success.	Mascall 1987 cited in EAU (1989)
South-East USA. Saltmarsh.	Planting of Spartina sp. on dredged material to create saltmarsh habitat.		Both Spartina species showed a very good response in terms of marsh establishment.	Reinhold (1976)
North Carolina, USA. Saltmarsh.	The stabilisation of dredge spoil and the establishment of a new tidal marsh on the North Carolina coast.		Spartina marsh developed from seed and from transplanted seedlings to give complete cover within two growing seasons.	Wood-house et al (1972)

Location/Habitat	Brief Description	Cost	Success	Reference
Lancashire, UK. Saltmarsh.	Stabilisation of intertidal flats with Puccinellia thrown onto high level sand flats on transects normal to shore on the Ribble Estuary, Lancs.		Clods took root and saltmarsh developed which has since been subject to land claim.	Barron, J. (1983) EAU (1989)
San Francisco, USA. Saltmarsh.	San Francisco Bay, Alameda Creek. Construction of substrate using dredged material and planting of saltmarsh species Spartina and Salicornia.	$26,000 per ha 1975 prices.	The planting and monitoring of replicate test plots in an unconfined area has affirmed that dredged material is a suitable substrate for the propagation of intertidal vegetation in San Francisco Bay.	Knutson (1976)
Southampton Water, UK. Saltmarsh.	Spartina transplants to areas of marsh damaged by persistent oil pollution.		Not known.	Dicks (1977)
Hampshire, UK. Saltmarsh.	Farlington Marshes, Langstone Harbour. Improvement of sea defences in 1979-80, using thick Reno mattresses, covered in mud dredged from in front of the embankment.	Work done by southern Water Authority, Southamp ton	Saltmarsh plant communities have developed in the sheltered and transitional sections.	Lewis et al (1984)

Location/Habitat	Brief Description	Cost	Success	Reference
Muzzi Marsh, San Francisco, USA. Saltmarsh.	Mitigation work for dredging ship channel and constructing Larkspur Ferry Terminal. Breached the dyke and flooded dredged spoil disposal area behind.		Successful growth of small plants. Work was completed in 1981. By 1987 the site was densely vegetated but only following extensive regrading exercise.	San Francisco Bay Conser-vation and Develop-ment Commiss-ion (1988)
Benicia Marina Marsh, Benicia, USA. Saltmarsh.	The City of Benicia proposed creating an 18.6 acre tidal marsh to improve marina water quality. Excavation completed in 1977. The area supports diverse habitats including an open water channel.		Dense stands of bulrushes, pickleweed, cattail and saltmarsh grass plants colonised the sites naturally.	San Francisco Bay Conser-vation and Develop-ment Commiss-ion (1988)
Sulphur Spring Creeks, Benicia, USA. Marsh.	Returned an 11.3 acre seasonal wetland to tidal action.		Unsuccessful. Plans failed to include elevations, appropriate plants and details of channels to allow tidal action. Therefore only the highest tides reached the sites.	San Francisco Bay Conser-vation and Develop-ment Commissi on (1988)

Location/Habitat	Brief Description	Cost	Success	Reference
Brittany Coast, France. Marsh restoration.	Experimental plantings of Halimione portulacoides, Juncus maritima, Puccinellia maritima, Spartina anglica and Triglochin maritima to restore salt marsh that was damaged or destroyed by the Amoco Cadiz oil spill and subsequent clean up operations.		Survival and growth of transplants of Puccinellia and Halimione were better than with those of the other three species.	Restor-ation of habitats impacted by oil spills. J. Cairns, A.L. Buikema.
Corte Madera Shorebird Marsh, Redwood High, School Marsh, San Francisco, USA. Marsh.	Marsh plain; through from pristine marsh to artificial tidal marsh. Used as flood storage basin in winter; complex water control structures requiring continuous management. Islands created for bird habitat.		Mostly very successful. However, breaching at one site led to a loss of habitat because of an insufficient sediment supply and exposed location. Establishing vegetation cover on islands was difficult.	Marin Audubon Society (1987)

Table A3.5.2 Examples of Habitat Creation and Restoration Initiatives

iii. Other Coastal Habitats

Location/Habitat	Brief Description	Cost	Success	Reference
North Carolina, USA. Island for Birds.	Construction of two islands out of dredged material for sea birds and aquatic biota. Planting of smooth and saltmarsh cord-grass. Similar islands have been developed in Alabama, Florida, Maryland, Texas and Louisiana.		A marsh developed and benthic organisms thrived. Terns and skimmers nest on the islands.	US Army Corps of Engineers (1988)
Gaillard Island, Alabama, USA. Island from dredged material.	Island of silty and dredged material; interior containment pond of 250-300ha of shallow water.		Seabirds and pelicans nest successfully on the island.	Landin et al (1989)
North Carolina, USA. Island habitats.	Dredged material islands provide isolated, relatively predator-free habitats which are heavily used by colonies of nesting seabirds and wading birds.		It was reported that approx. 83% of the colonial sea birds nesting in North Carolina in 1973 used dredged material islands.	Smith (1976)
Dorset, UK. Artificial islands.	Artificial islands have been created in the lagoon on Brownsea Island, Dorset.	Costs from National Trust or DTNC	The islands support breeding terns.	Personal Communication; Dorset Trust for Nature Conservation (1991)
Florida, USA. Spoil islands.	Tampa Bay, Florida. Proposed construction of spoil islands using maintenance dredgings.		Not known.	Limoges (1976)

Location/Habitat	Brief Description	Cost	Success	Reference
Dorset, UK. Artificial islands.	Poole Bay, Dorset. BP proposal to build artificial island for offshore oil exploration using dredged fill material.	£150-200 million		Smith (1990)
North East, USA. Intertidal mudflats.	Pumped dredged material onto rocky beach, creating intertidal flats.		Commerical clam and worm beds established naturally.	Personal Communication; US Army Corps of Engineers (1990)
Le Havre, France. Mudflats.	Proposed creation of artificial mudflats along channel sides to provide fish, shellfish and bird habitat and a natural water purification facility.	6.45 million French Francs (1989)	Not known.	Cellule de Suivi du Littoral Haut Normand, (1989)
Chesapeake Bay, USA. Oyster beds.	25000m^3 dredged material placed subtidally, capped with dead oyster shells for lining to settle on.		Good settlement rate. Oysters harvestable in third year.	Personal Communication; US Army Corps of Engineers (1990)
Suffolk, UK. Brackish and freshwater lagoons; reedbeds and grazing marsh.	Proposed in 1988. Trimley marshes, Suffolk Development. Brackish and freshwater lagoons surrounded by reedbeds and grazing marsh will create a valuable nature reserve.	Suffolk Wildlife Trust	The 208 acre created reserve has proved successful.	Beardall et al (1988)
Titchwell, Norfolk, UK. Fresh and brackish water habitats.	An area of tidal saltmarsh was converted into fresh and brackish habitats using seawall, dam and sluice construction.	Total cost of defences was £125,000 in 1986 prices.	By regulating salinity and water levels the bird diversity has increased in all seasons.	Sills and Becker (1988)

Location/Habitat	Brief Description	Cost	Success	Reference
Yuzhny Port, USSR. Artificial shallow bank.	Concentrated soil dumping for construction of Yuzhny Port.		Soil dumping resulted in the formation of an artificial shallow bank, where the water warms up, is well lit and there is no shipping. As a result the soil dumping site has become a most productive area of the sea.	Inter-national Bulk Journal (June, 1990)
Swinefleet, River Ouse, Yorkshire, UK. Reedbeds.	Common reed was planted to trap silt and help prevent scour. Rhizome clumps were planted at MHW.		Once established the reed grew into the area below MHW.	Lewis et al (1984)
Norfolk, UK. Reedbeds.	■ River Bure, Thurne mouth - asphalt matting to rear of low level piling.	£260/m (1985)	Good reed growth after third season.	Brooke and Ash (1988)
	■ River Thurne - asphalt matting laid to grades bank of 1:4 slope.	£160/m (1985)	Difficulties establishing reeds below MHW. Floats used to prevent grazing by wildfowl.	
	■ River Bure, Upton Mill - Three dimensional plastic grid.	£220/m (1986)	Wash damage and loss of backfill experienced.	
	■ River Ant - asphalt matting laid to graded bank of 1:3 slope.	£105/m (1987)	Early signs of success.	

Location/Habitat	Brief Description	Cost	Success	Reference
Netherlands. Artificial seaweed.	Experiments using polypropylene fronds secured to a mattress and laid in 5-15m of water.		The artificial substrate accreted 0.35m of sediment within the first 3-4 weeks and retained this fill over four years. Fronds were especially successful in stabilising tidal gullies and inlet channels.	Carter (1988)
Oregon, USA. Clam flats.	Dredged material disposal site developed as commercial Clam Bed.		Habitat suitable for clams has been inadvertently produced by the disposal of dredged material.	Smith (1976a)
Florida, USA. Mangrove.	Three mangrove species have been naturally and artificially propagated on disturbed soils including dredged material.			Smith (1976a)
Essex, UK. Rock pools.	Rock pools built into groynes to provide positive contribution to the amenities of the coast. Proposal by local council, Clacton on Sea, Essex.		It is possible that there may be problems with sand-scour.	Marine Conser-vation Society (1988)
Suffolk, UK. Brackish Lagoons.	RSPB reserve, Havergate Island. Conversion of grazing marsh into brackish lagoons.		Created an exceptional habitat for breeding waders, wildfowl and terns.	Beardall et al (1988)

APPENDIX A3.5.3

REVIEW OF BRITISH HABITAT CREATION AND RESTORATION INITIATIVES

Table A3.5.3 Examples of British Habitat Creation or Restoration Initiatives by NRA Region.

Region: Anglian

Location and Habitat Type	Restoration (R) or Creation (C)	Details
Hamford Water *Saltmarsh*	R	Old Thames barges and pumped sediment have been used in an attempt to increase elevation to a level suitable for saltmarsh development.
Horsey Island, West Mersea, Ray Island, Deal Hall, Wallasea Island *Saltmarshes*	R	Various groynes, and fencing and channelling techniques have been used to encourage accretion and protect saltmarshes. Also some planting of cordgrass.
Levington Lagoon, River Orwell *Lagoon system*	C	Suffolk Wildlife Trust manage dredged material disposal site as a lagoon system, piping in fresh and salt water as required.
Sales Point; Dengie *Saltmarsh*	R	Construction of various types of groyne to encourage accretion and elevate the land to a level suitable for saltmarsh development. Use of old Thames barges (filled with mud and topped with aggregates) as breakwaters to reduce wave energy.
Shotley Marshes *Saltmarsh*	R	Suffolk Wildlife Trust built a series of chestnut stake and brushwood groynes to encourage accretion and therefore protect saltmarshes along 300m of coast.
Trimley, River Orwell *Freshwater lagoon system*	C	Suffolk Wildlife Trust created a 208 acre freshwater marsh and lagoon system behind a sea wall. Total cost £250,000.
Cleethorpes *Sand dunes*	R	Standard dune stabilisation including planting buckthorn.

Location and Habitat Type	Restoration (R) or Creation (C)	Details
South bank of Humber *Lagoons*	C	LTNC and others creating and managing lagoons as habitats for birds. Some successes. Some failures may be due to lack of appropriate food for waders. Difficulties achieving correct water levels.

Region: **North West**

Location and Habitat Type	Restoration (R) or Creation (C)	Details
Morecambe Bay *Saltmarsh*	R	Restoration was carried out following the removal of sea washed turf.
Piel Channel, Barrow *Saltmarsh*	R	Damaged saltmarsh was restored by turf transplants.
Pilling and Cockerham Marshes *Saltmarsh*	R	A new sea defence structure caused a decrease in salinity which threatened a resident natterjack toad population. NRA pumped sea water into the area to increase the salinity. This was not too effective and a more vigorous attempt is planned in the future.
Roosecoat Sands, Barrow Docks *Lagoon*	C	Aggregate was excavated to create a borrow pit which now forms a large, fully tidal marine lagoon.
Sandscale Haws, Duddon Estuary *Sand dunes*	R	Planting of dunes with marram.
Sefton Coast *Sand dunes*	R	Restoration by planting, fencing, etc.
South Walney *Lagoons*	C	Extraction of gravel was followed by a lagoon creation initiative by the Cumbrian Wildlife Trust.

Region: **Severn Trent**

Location and Habitat Type	Restoration (R) or Creation (C)	Details
Frampton Breakwater to Hock Ditch *Marsh; brackish wetland*	C (proposed)	Managed retreat back to secondary line of defence to create habitat for wildfowl.
Blacktoft Sands *Lagoons*	C	Lagoons, reedbeds, etc created outside main defence but inside training wall.

Region: **Southern**

Location and Habitat Type	Restoration (R) or Creation (C)	Details
Camber Sands *Sand dunes*	R	Chestnut paling windbreaks, planting and fertilising as part of a dune restoration project produced a very successful initiative.
East Head, Chichester Harbour *Sand dunes*	R	Brushwood fencing and trapping of windblown sand were successful until coast protection works reduced sediment supply.
Elmney *Wet meadows*	C	Managed flooding of existing meadowland aided by RSPB management agreement.
Farlington Marshes *Scrapes*	C	Naturalists Trust - water manipulation to create new pools using pre-18th century pattern of tidal creeks. Local Nature Reserve.
Newtown Harbour *Scrapes*	C	Naturalists Trust Scrape. Sunk into saltmarsh.
Normandy Marsh *Wetland*	C	Creation of wetland site where incursions into brackish lagoons occurred. Borrow pit habitats were provided as mitigation for engineering works.
Pagham Harbour *Shingle Island*	R	Rebuilding of Tern island using imported shingle.

Location and Habitat Type	Restoration (R) or Creation (C)	Details
Rye Harbour *Scrapes*	C	Wader pools/scrapes created using dredged material and then lined.
Thorney Deeps *Scrapes*	C	Scrape creation
Titchfield Haven *Scrapes*	C	Series of scrapes below MHWS; freshwater marsh habitat in dammed area.
West Solent *Shell beach*	R	Hampshire and IOW Naturalist Trust successfully rebuilt shell beach along front of Spartina marsh, using groyne system, to recreate Tern breeding area.

Region: **South West**

Location and Habitat Type	Restoration (R) or Creation (C)	Details
Penhale and Hayle Dunes *Sand dunes*	R	Bulldozing, netting and hydroseeding to stabilise the dunes as part of major rehabilitation programme.
Isles of Scilly	R	Stabilisation and rebuilding of boulder beaches breached in 1989/90 storms on St. Marys, Bryher and St. Agnes.

Region: Welsh

Location and Habitat Type	Restoration (R) or Creation (C)	Details
Burry Inlet *Scrapes*	C	Creating wetland scrapes at WWT reserve on saltings in front of sea defences.
Gwent Levels *Mudflats*	C (proposed)	Proposed barrage across Cardiff Bay will cause a loss of mudflats. By breaching a sea wall a small area of upper mudflat will be created on a grazing marsh by Cardiff Bay Development Corporation at an approximate cost of £5 million.
Gwent Levels, Rumney Great Wall *Saltmarsh*	R	Saltings in front of the seabank have had blockstone placed at the edge. In 1988 temporary fences were placed to reduce tidal action and encourage silt to settle on the foreshore, creating saltmarsh.
Newborough Warren, Morfa Harlech, Aberdovey, Dee, Oxwich. *Sand dunes*	R	Stabilisation of dunes at all sites has been assisted by NRA as dunes serve as natural sea defences.

Region: **Wessex**

Location and Habitat Type	Restoration (R) or Creation (C)	Details
Blakes Pools *Lagoons*	C	Creation of wetland/open water areas in former borrow pits by Avon Wildlife Trust.
Bridgwater Bay, Stert Peninsula *Lagoons and scrapes*	C	Creation of wetland scrapes, lagoons, etc by Avon Wildlife Trust.
South of Clevedon *Saltings*	R	Attempts at regenerating saltings following set back of flood defences, but problems possibly because too dry in summer.
Somerset Levels *Reedbeds*	C	Reedbed planting by Somerset Trust for Nature Conservation.

Region: **Yorkshire and Northumbria**

Location and Habitat Type	Restoration (R) or Creation (C)	Details
Beacon Ponds, Spurn Point *Lagoons and reedbeds*	C	Lagoons and reedbeds produced using sluices to control high tide flooding inside the sea wall, but problems achieving good water level control.
Hauxley *Tidal brackish wetlands*	C	Wildlife Trust using tidal sluices to manage former open-cast sites as controlled brackish water habitats.
Various sites in Northumbria *Sand dunes*	R	Dune stabilisation including brushwood and marram planting.