Dundalk Bay SAC (site code 455)
Conservation objectives supporting document -coastal habitats

Version 1

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1 Introduction

Achieving Favourable Conservation Status (FCS) is the overall objective to be reached for all Annex I habitat types and Annex II species of European Community interest listed in the Habitats Directive 92/43/EEC (Commission of the European Communities, 2003). It is defined in positive terms, such that a habitat type or species must be prospering and have good prospects of continuing to do so.

Dundalk Bay SAC is designated for a range of marine and coastal habitats including vegetated shingle and saltmarsh. The following four coastal habitats are included in the qualifying interests for the site:

- Perennial vegetation of stony banks (1220)
- *Salicornia* and other annuals colonising mud and sand (1310)
- Atlantic salt meadows (Glauco-Puccinellietalia maritimae) (1330)
- Mediterranean salt meadows (Juncetalia maritime) (1410)

The first habitat is associated with shingle, while the other three are found in saltmarshes, where they occur in complex mosaics.

This backing document sets out the conservation objectives for the four coastal habitats listed above in Dundalk Bay SAC, which is defined by a list of parameters, attributes and targets. The main parameters are (a) Range (b) Area and (c) Structure and Functions, the latter of which is broken down into a number of attributes, including physical structure, vegetation structure and vegetation composition.

The targets set for the shingle is based in part on the findings of the National Shingle Beach Survey (NSBS), which was carried out in 1999 on behalf of the National Parks and Wildlife Service (NPWS) (Moore & Wilson, 1999). The targets set for the saltmarsh habitats are based primarily on the results of the Saltmarsh Monitoring Project (SMP) (McCorry, 2007; McCorry & Ryle, 2009) and this document should be read in conjunction with those reports.

The NSBS visited the following six sub-sites within Dundalk Bay SAC:

1. Annagassan Pier to Ardsallagh
2. Castlebellingham to Annagassan Pier
3. Eggleston Point to Dundalk
4. Giles Quay
5. Lurgan White House
6. River Foot

Profiles and transects were recorded from each shingle beach and each site was assigned a crude High/Medium/Low interest ranking. A ‘high interest’ ranking denotes a site that is of high conservation value. The site may be of interest botanically or geomorphologically. A ‘medium interest’ ranking implies the site may be extensive but not of particular interest either botanically or geomorphologically. A ‘low interest’ ranking is reserved for small sites, highly damaged sites or sites that are of a very common classification. The habitat was not mapped but the vegetation was recorded, as were the human impacts and alterations at the site, which are useful tools for assessing the Structure & Functions of the site.

During the Saltmarsh Monitoring Project (SMP), Dundalk Bay saltmarsh system was surveyed, mapped and assessed (McCorry & Ryle, 2009). A detailed individual report and habitat maps were produced for this site and these are included in an Appendix to this document. The conservation objective for the saltmarsh habitats within the

entire SAC is extrapolated from this report. There are additional areas of saltmarsh known to be present within the site, however, it is estimated that the Dundalk Bay saltmarsh site as surveyed by the SMP represents almost 95% of the total area of saltmarsh within Dundalk Bay SAC.

2 Conservation Objectives

The conservation objective aims to define the favourable conservation condition of a habitat or species at a particular site. Implementation of these objectives will help to ensure that the habitat or species achieves favourable conservation status at a national level.

3 Perennial vegetation of stony banks

Perennial vegetation of stony banks is vegetation that is found above the high tide mark on beaches comprised of shingle (cobbles and pebbles). It is dominated by perennial species (i.e. plants that continue to grow from year to year). Vegetated shingle occurs on deposits of shingle lying at or above mean high-water spring tides. The first species to colonise are annuals or short-lived perennials that are tolerant of periodic displacement or overtopping by high tides and storms. Level, or gently-sloping, high-level mobile beaches, with limited human disturbance, support the best examples of this vegetation. More permanent ridges are formed by storm waves. Several of these storm beaches may be piled against each other to form extensive structures.

3.1 Overall Objective

The overall objective for 'perennial vegetation of stony banks' in Dundalk Bay SAC is to 'maintain the favourable conservation condition'. This objective is based on an assessment of the current condition of the habitat under a range of attributes and targets. The assessment is divided into three main headings (a) Area (b) Range and (c) Structure and Functions.

3.2 Area

3.2.1 Habitat extent

Habitat extent is a basic attribute to be assessed when determining the condition of a particular habitat. The target for favourable condition is *'no decrease in extent from the established baseline'*. Bearing in mind that coastal systems are naturally dynamic and subject to change even within a season, this target is assessed subject to natural processes, including erosion and succession.

The exact current extent of this habitat is unknown, but it is thought to be widespread. The shingle is mostly stable, occurring on post-glacial raised beaches. It often occurs in close association with the intertidal area, saltmarsh habitats and coastal grassland. It is difficult to measure the area of this habitat, but assuming an average width of 10m and a total length of approximately 12km then the estimated area that the shingle covers is 12ha, although not all of this would be vegetated.

3.3 Range

3.3.1 Habitat distribution

Shingle is currently known to display a widespread distribution throughout the site, occurring almost continuously from Salterstown to Lurgan White House in the south bay and from Jenkinstown to east of Giles Quay in the North Bay.

There should be no decline or change in the distribution of this habitat, unless it is the result of natural processes, including erosion and succession.

3.4 Structure and Functions

A fundamental aim of shingle conservation is to facilitate natural mobility. Shingle beaches are naturally dynamic systems, making them of geomorphological interest as well as ecological interest. They are constantly changing and shingle features are rarely stable in the long term.

3.4.1 Functionality and sediment supply

The health and on-going development of this habitat relies on a continuing supply of shingle sediment. This may occur sporadically as a response to storm events rather than continuously. Interference with the natural coastal processes, through offshore extraction or coastal defence structures in particular, can interrupt the supply of sediment and lead to beach starvation.

The target is to maintain, or where necessary restore, the natural circulation of sediment and organic matter, without any physical obstructions.

3.4.2 Vegetation structure: zonation

Ecological variation in this habitat type depends on stability; the amount of fine material accumulating between the pebbles; climatic conditions; width of the foreshore and past management of the site. The ridges and lows also influence the vegetation patterns, resulting in characteristic zonations of vegetated and bare shingle. In the frontal less stable areas of shingle, the vegetation tends to be dominated by annuals and short-lived salt-tolerant perennials. Where the shingle is more stable the vegetation becomes more perennial in nature and may include grassland, heathland and scrub, depending on the exact nature of the site.

The target is to maintain the shingle habitat, as well as transitional zones, including those to terrestrial communities.

3.4.3 Vegetation composition: typical species & sub-communities

The degree of exposure, as well as the coarseness and stability of the substrate determines species diversity. The shingle at Dundalk Bay is known to support species such as spear-leaved orache (*Atriplex prostrata*), grass-leaved orache (*A. littoralis*), sea mayweed (*Tripleurospermum maritimum*), sea beet (*Beta maritima*), sea rocket (*Cakile maritima*), wild carrot (*Daucus carota*), sea holly (*Eryngium maritimum*), sea milkwort (*Glaux maritima*), silverweed (*Potentilla anserina*), curled dock (*Rumex crispus*), lyme grass (*Leymus arenarius*), sea sandwort (*Honckenya peploides*) and sea radish (*Raphanus raphanistrum* ssp. *maritimus*). Yellow-horned

poppy (*Glaucium flavum*) occurs here at its most northerly station on the east coast, as well as the Red Data Book species sea kale (*Crambe maritima*).

The target for this attribute is to ensure that the typical flora of vegetated shingle is maintained, as are the range of sub-communities within the different zones.

3.4.4 Vegetation composition: negative indicator species

Where the shingle becomes more stabilised negative indicator species can become an issue. Negative indicator species can include non-native species (e.g. *Centranthus ruber, Lupinus arboreus*); species indicative of changes in nutrient status (e.g. *Urtica dioica*) and species not considered to be typical of the habitat (e.g. *Pteridium aquilinum*).

The target for this attribute is that negative indicator species (including non-native species) should make up less than 5% of the vegetation cover.

4 Saltmarsh habitats

Saltmarshes are stands of vegetation that occur along sheltered coasts, mainly on mud or sand, and are flooded periodically by the sea. They are restricted to the area between mid neap tide level and high water spring tide level. In Ireland, there are four saltmarsh habitats listed under Annex I of the EU Habitats Directive (92/43/EEC):

- *Salicornia* and other annuals colonising mud and sand (1310)
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) (1330)
- Mediterranean salt meadows (*Juncetalia maritimi*) (1410)
- Mediterranean and thermo-Atlantic halophilous scrub (1420)

The first three of these habitats are found within Dundalk Bay SAC, with Atlantic salt meadows occupying the greatest proportion of the saltmarsh area. The area of *Salicornia* flats, however, is one of the most extensive examples of this habitat found in Ireland, according to the SMP (McCorry & Ryle, 2009). Detailed descriptions of each habitat in Dundalk Bay can be found in Appendix I.

4.1 Overall Objectives

The overall objective for '*Salicornia* and other annuals colonising mud and sand' in Dundalk Bay SAC is to '*restore the favourable conservation condition'*.

The overall objective for 'Atlantic salt meadows' in Dundalk Bay SAC is to '*maintain the favourable conservation condition*'.

The overall objective for 'Mediterranean salt meadows' in Dundalk Bay SAC is to '*maintain the favourable conservation condition*'.

These objectives are based on an assessment of the current condition of each habitat under a range of attributes and targets. The assessment is divided into three main headings (a) Area (b) Range and (c) Structure and Functions.

4.2 Area

4.2.1 Habitat extent

Habitat extent is a basic attribute to be assessed when determining the condition of a particular habitat. The target is no decrease in extent from the established baseline. Bearing in mind that coastal systems are naturally dynamic and subject to change, this target is assessed subject to natural processes, including erosion and succession.

Baseline habitat maps were produced for the saltmarsh in Dundalk Bay during the SMP. These maps are included with the individual site report in an Appendix at the end of this document.

The total area of each saltmarsh habitat within the SAC and the total area of each habitat within the site as mapped by the SMP are presented in the following table.

Habitat	Total area (ha) of habitat (excluding mosaics) from SMP	Total area (ha) within SAC boundary (including mosaics)
Salicornia mudflat	34.84	35.00
ASM	330.15	357.57
MSM	0.04	0.045

There are a number of differences in the figures above. Most of the differences can be explained by the fact that the SMP mapped the total saltmarsh resource at Dundalk and not all of the saltmarsh mapped is contained within the SAC boundary. In addition, the total area within the SAC can be greater than given in the SMP as the SMP did not include any mosaics when calculating their total areas. The following rules were applied when calculating the areas for the site's conservation objectives:

1. Where a polygon was identified as a mosaic of an Annex I habitat and a non-Annex I habitat, then the entire area was counted as the Annex I habitat.
2. Where a polygon was identified as a mosaic of two Annex I habitats, the area was divided 50:50 for each habitat.

In addition to the total area of ASM that was mapped within the SMP, an area of 22.42ha of potential ASM habitat was also identified through an examination of orthophotographs. This gives an estimated total area of 379.98ha of ASM within the SAC.

4.3 Range

4.3.1 Habitat distribution

Saltmarsh is currently known to display a widespread distribution throughout the site, with concentrations at Lurgangreen, Marsh South, Dundalk Harbour and Bellurgan. Atlantic salt meadows are widely distributed, while some of the most extensive concentrations of *Salicornia* mudflats in the country occur along the eastern fringes of the saltmarsh. Mediterranean salt meadows are found throughout the site, but are more restricted in their distribution than the *Salicornia* mudflats or the ASM.

There should be no decline or change in the distribution of these saltmarsh habitats, unless it is the result of natural processes, including erosion, accretion and succession.

4.4 Structure and Functions

The location, character and dynamic behaviour of saltmarshes are governed by sediment supply, tidal regime, wind-wave climate and sea level change. The slope of the saltmarsh allows the development of several ecological gradients such as tidal submergence and salinity, and this influences the development of distinctive zones of halophytic and salt tolerant plant communities. Maintaining the favourable conservation condition of the three saltmarsh habitats in Dundalk Bay in terms of its structure and functions depends on a range of attributes for which targets have been set as outlined below.

4.4.1 Physical structure: sediment supply

Accretion and erosion are natural elements of saltmarsh systems. Maintaining the sediment supply is vital for the continued development and natural functioning of a saltmarsh system. Interruption to the sediment circulation through physical structures can starve the system and lead to accelerated erosion rates.

The target is to maintain, or where necessary restore, the natural circulation of sediment and organic matter, without any physical obstructions.

4.4.2 Physical structure: creeks and pans

Saltmarshes can contain a distinctive topography with an intricate network of creeks and pans occurring on medium to large-sized sites. Creek density is influenced by vegetation cover, sediment supply and tidal influence. Creeks absorb tidal energy and assist with delivery of sediment into the saltmarsh. The efficiency of this process depends on creek pattern. Creeks allow pioneer vegetation to become established along their banks higher up into the saltmarsh system. Major erosion of saltmarsh is indicated by internal dissection and enlargement of the drainage network, ultimately leading to the creation of mud basins.

The target is to maintain creek and pan networks where they exist and to restore areas that have been altered.

4.4.3 Physical structure: flooding regime

The regular ebb and flow of the tide brings salinity, but also nutrients, organic matter and sediment, which are central to the development, growth and indeed survival of saltmarshes. Saltmarsh vegetation consists of a limited number of halophytic (salt-tolerant) species that are adapted to regular immersion by the tides. Species in the lowest part of the saltmarsh require regular inundation, while those higher up on the marsh can only tolerate occasional inundation.

The target is to maintain a flooding regime whereby the lowest levels of the saltmarsh are flooded daily, while the upper levels are flooded occasionally (e.g. highest spring tides).

4.4.4 Vegetation structure: zonation

Saltmarshes are naturally dynamic coastal systems. As is the case on the majority of Irish saltmarshes, ASM is the dominant saltmarsh habitat at Dundalk Bay where it occurs in a mosaic with other saltmarsh habitats, including '*Salicornia* and other annuals colonising mud and sand' and 'Mediterranean salt meadows'. In order to

ensure the ecological functioning of all of the saltmarsh habitats it is vital to maintain the zonations and transitions to other habitats.

The target is to maintain the range of saltmarsh habitats, as well as transitional zones, including those to terrestrial communities.

4.4.5 Vegetation structure: vegetation height

A varied vegetation structure is important for maintaining species diversity and is particularly important for invertebrates and birds. Grazing is often used as a tool for maintaining structural diversity in the sward but stocking levels need to be appropriate. Overgrazing can lead to loss of species and destruction of the vegetation cover, while undergrazing can lead to a loss of plant diversity due to competitive exclusion.

The target is to maintain structural variation within the sward. A general guideline is that there should be a sward ratio of 30% tall:70% short across the entire saltmarsh.

4.4.6 Vegetation structure: vegetation cover

Vegetation cover can have a major effect on saltmarsh development by reducing the velocity and thereby enhancing the deposition of sediment. Excessive bare mud, however, is often a sign of overuse by livestock or humans and can lead to destabilisation and accelerated erosion of the system.

The target is to maintain 90% of the area outside of the creeks vegetated.

4.4.7 Vegetation composition: typical species & sub-communities

Saltmarshes contain several distinct zones that are related to elevation and frequency of flooding. The lowest part along the tidal zone is generally dominated by the most halophytic (salt-tolerant) species including common saltmarsh-grass (*Puccinellia maritima*) and species more usually associated with *Salicornia* muds. The mid-marsh zone is generally characterised by sea thrift (*Armeria maritima*), sea plantain (*Plantago maritima*) and sea aster (*Aster tripolium*). This mid-zone vegetation generally grades into an herbaceous community in the upper marsh, dominated by red fescue (*Festuca rubra*), sea milkwort (*Glaux maritima*), saltmarsh rush (*Juncus gerardii*).

The target for this attribute is to ensure that a typical flora of saltmarshes is maintained, as are the range of sub-communities within the different zones. Below are lists of typical species for the different saltmarsh zones, although some of these species have a restricted distribution nationally and may not occur in the Dundalk Bay area.

Typical species		
Lower marsh	**Low-mid marsh**	**Mid-upper marsh**
Salicornia spp.	*Puccinellia maritima*	*Festuca rubra*
Suaeda maritima	*Triglochin maritima*	*Juncus gerardii*
Puccinellia maritima	*Plantago maritima*	*Armeria maritima*
Aster tripolium	*Atriplex portulacoides*	*Agrostis stolonifera*
	Aster tripolium	*Limonium humile*
	Spergularia sp.	*Glaux maritima*
	Suaeda maritima	*Seriphidium maritimum*
	Salicornia spp.	*Plantago maritima*

	Glaux maritima Turf fucoids	*Aster tripolium* *Juncus maritimus* *Triglochin maritima* *Blysmus rufus* *Eleocharis uniglumis* *Leontodon autumnalis* *Carex flacca* *Carex extensa* Turf fucoids

4.4.8 Vegetation structure: negative indicator species

The only invasive and non-native species recorded on saltmarshes during the SMP was common cordgrass (*Spartina anglica*). Significantly large stands of *Spartina* have been recorded within Dundalk Bay (see site report in Appendix I) and the continued spread of this species is considered a potential threat to the *Salicornia* mudflats.

The target is that negative indicators such as *Spartina* should be absent or under control. The current aim for this particular site is to limit expansion to less than 1% per annum during a reporting cycle.

5 References

Commission of the European Communities (2003). Interpretation Manual of European Union Habitats – EUR 25. DG Environment – Nature and Biodiversity, Brussels.

McCorry, M. (2007). Saltmarsh Monitoring Project 2006. Unpublished report to the National Parks and Wildlife Service, Dublin.

McCorry, M. & Ryle, T. (2009). Saltmarsh Monitoring Project 2007-2008. Unpublished report to the National Parks and Wildlife Service, Dublin.

Moore D. & Wilson, F. (1999) National Shingle Beach Survey of Ireland 1999. Unpublished report to NPWS, Dublin.

Appendix I – Dundalk Bay site report and habitat map from SMP

1 SITE DETAILS

SMP site name: **Dundalk**	SMP site code: **0032**
Dates of site visit: **28/08, 3&4&5/10/2007, 03/03/2008**	CMP site code: **N/A**
SM inventory site name: **Dundalk Marshes**	SM inventory site code: **237**
NPWS Site Name: **Dundalk Bay**	
NPWS designation cSAC: **455**	MPSU Plan: **New Format – Draft 2: 2005-2010**
pNHA: **455**	SPA: **4026**
County: **Louth**	Discovery Map: **36** Grid Ref: **307000, 300000**
Aerial photos (2000 series): **O 1632-C,D; O 1633-C,D; O 1702-B,D; O 1771-B,D; O 1832-B,D; O 1893-B**	6 inch Map No: **Lh 004, 007, 008, 012, 015, 016**

Annex I habitats currently listed as qualifying interests for Dundalk cSAC:

H1310 ***Salicornia*** **and other annuals colonizing mud and sand**

H1330 **Atlantic salt meadows (Glauco-Puccinellietalia maritimae)**

H1410 **Mediterranean salt meadows (Juncetalia maritimi)**

Other SMP sites within this SAC/NHA: **N/A**

Saltmarsh type: **Estuary** Substrate type: **Mud/Sand**

2 SITE DESCRIPTION

Dundalk Bay is located in north-east Co. Louth along the east coast of Ireland. This was the largest site surveyed during the SMP project. This large bay extends for 15 km from Annagassan in the south to Dundalk Harbour in the north and extends along the Cooley Peninsula for 5 km. The bay is quite shallow and open to the Irish Sea, being partially sheltered by the Cooley Peninsula along the northern side and Dunany Point to the south. The site includes the estuarine sections of the Castletown River (Dundalk Harbour) and Ballymascanlan River estuary at the northern end of the site. Several other rivers flow into the site.

The landscape around this bay is mostly quite low-lying and flat. As the site is so large the adjacent habitats vary somewhat. Most of the land adjacent to the shore is dominated by farmland including significant areas located behind tall berms in low-lying areas. These areas contain a variety of habitats including wet grassland in unmanaged areas and large areas of tillage in some more intensively managed sections. There is also some extensive urban development with Dundalk Town adjacent to northern section.

Dundalk Bay contains the most extensive saltmarshes found in Ireland. These saltmarshes are more easily described as several sub-sites and there are four main saltmarshes. The southern section is found north of Castlebellingham and extends to the River Fane. There is a significant gap in saltmarsh development along the Blackrock shoreline, which is mainly exposed bedrock. Saltmarsh develops again north of Blackrock and extends to the main estuary channel. Saltmarsh has also developed within Dundalk Harbour in the main estuary channel, east of the main bridge over the channel. A large saltmarsh has also developed along the northern shoreline adjacent to Bellurgan and Jenkinstown. Each of the saltmarshes have developed adjacent to extensive sand or mudflats. Sandflats predominate at the other parts of the bay with soft mudflats found within the main estuary channel. Saltmarsh is also found within the Ballymascanlan Estuary. However, as this is classified as a separate saltmarsh site on the saltmarsh inventory (Curtis and Sheehy-Skeffington 1998), it was not surveyed.

This site is part of the Dundalk Bay candidate Special Area of Conservation (cSAC 455). This large cSAC covers most of the bay and includes extensive intertidal and sub-tidal areas seaward of the saltmarsh and some adjacent wet grassland adjacent to the Castletown and Ballymascanlan River estuaries. This site is also internationally important for wintering waders and wildfowl that are attracted to these intertidal habitats. Three Annex I saltmarsh habitats are found at this site including *Salicornia* flats, Atlantic salt meadows (ASM) and Mediterranean salt meadows (MSM). There is also extensive development of *Spartina* swards, which is not now considered to qualify as an Annex I habitat.

Nearly the entire saltmarsh habitat is found within the digital cSAC boundary. The upper shoreline boundary as mapped by the old OSI 2nd edition 6 inch map is taken as the boundary of the cSAC along much of the estuary. Small rectification differences between the OSI 6 inch map and the OSI aerial photos means that some minor saltmarsh habitat extends behind this boundary in places.

The various sub-sites were reached from easily accessible access points around the bay. It should be noted that part of the saltmarsh lies in front of the army Firing Range. Anecdotally, some of the bullets have strayed over the berm and into the marsh. The saltmarsh developing within the Castletown Estuary is developing adjacent to very soft and treacherous mudflats.

3 SALTMARSH HABITATS

3.1 General description

This site has been split into several sub-sites, which are described in more detail below. Most of the sub-sites are dominated by Atlantic salt meadows (ASM) (Table 3.1). *Spartina* swards are also quite extensive in each of the sub-sites. There is only a very small area of

Mediterranean salt meadows (MSM) at this site. Some of the saltmarsh is also made of brackish vegetation types including stands of Sea Club-rush (*Bolboschoenus maritimus*) and bands of upper saltmarsh dominated by Twitch (*Elytrigia repens*). These are mapped as other saltmarsh (CM2) or non-Annex vegetation in accordance with the SMP project classification.

Castlebellingham marsh

This large saltmarsh is found in the southern part of the bay and extends from the shoreline adjacent to Dromiskin Village north to the southern side of Blackrock Town. This saltmarsh has developed in a fairly uniform elongated block adjacent to the shoreline that is 3.7 km long and between 500-600 m wide at the widest section. The extent of saltmarsh tapers off at both the northern and southern ends of the saltmarsh. The upper boundary is marked by a tall berm along most of the shoreline that divides the saltmarsh from adjacent low-lying farmland. This farmland has developed in previously reclaimed saltmarsh behind the berm, which is now drained and improved. Drains on the landward side of the berm occasionally contain elements of brackish vegetation but there is no development of saltmarsh. Some Twitch-dominated vegetation has developed along the base of the berm in places. This zone also contains species such as Sow-Thistle (*Sonchus* sp.), Sea Beet (*Beta maritima*) and Curled Dock (*Rumex crispus*).

The saltmarsh displays excellent zonation with extensive generally flat ASM extending seawards from the berm. Cover of Common Cordgrass (*Spartina anglica*) increases towards the seawards end and there is extensive development of large patches of *Spartina* sward/ASM mosaic and *Spartina* sward. Common Cordgrass has spread into the established saltmarsh. Of note there are locations where young and pioneer ASM is developing seaward of *Spartina* sward. Seaward of this established saltmarsh there is a band of *Salicornia* flats that extends along most of the marsh and extends seaward for up to 70 m. The saltmarsh has developed adjacent to intertidal sandflats. The mud content of the intertidal flats decreases towards the southern end. The creek network is also very well developed with some major creeks flowing from the interior to the northern and southern ends of the saltmarsh.

The northern end of this marsh contains some typical zonation at both sides of the mouth of the River Fane, with extensive swards of *Spartina* sward developed seaward of a relatively narrow band of ASM. There is some development of brackish stands of Sea Club-rush at the landward side of the marsh at the southern end of the site.

The majority of this saltmarsh is grazed by sheep. Small parts have been fenced off and are not grazed. It should be noted that this saltmarsh has grown extensively since it was surveyed during the drawing of the 2nd edition 6 inch maps. The saltmarsh has more than doubled in width and tripled in size since this period. Most of the saltmarsh has only developed in the past 200 years. The berm was constructed in the 19th century and post-dates the drawing of the OSI 1st edition 6 inch map. There are indications of continued

accretion along the seaward side of the marsh with the development of relatively extensive *Salicornia* flats and pioneer ASM towards the southern end. The saltmarsh is likely to grow further south in the future.

Dundalk marsh

This sub-site is probably the largest single unit of saltmarsh in the country. The saltmarsh extends from north of Blackrock Town to the main estuary channel in Dundalk Harbour. It is under 4 km long and over 1 km wide in the widest section. Its structure is similar to that of Castlebellingham Marsh. This saltmarsh is also dominated by ASM with extensive patches of *Spartina* sward and *Spartina* sward/ASM mosaic towards the seaward boundary. A narrow band of *Salicornia* flats is found along the seaward side of the more established saltmarsh and further seaward there are scattered clumps of Common Cordgrass spreading on the adjacent mud and sandflats.

The marsh has developed on a quite flat plain with a gentle seaward slope. The zonation and creek structure within the marsh is particularly well-developed with some very wide and deep creeks draining the marsh. There are several mounds within the marsh that are likely to be man-made and are covered by mainly Twitch-dominated grassland and contain other species such as Spear-leaved Orache (*Atriplex prostrata*), Sea Beet and Red Fescue (*Festuca rubra*).

The landward boundary of the main marsh is marked by a tall berm that separates the marsh from adjacent low-lying farmland. There is some urban development adjacent to the marsh at the northern end of the site. There is some development of brackish vegetation in large drainage channels behind the berm at the northern end of the site. A long band of Twitch-dominated grassland (CM2) has developed at the base of the berm and is quite extensive in places, being up to 70 m wide. The saltmarsh has also extended south to Blackrock Town, which has been developed on a rocky outcrop. The upper boundary is characterised by the more natural shoreline in this area and there is some minor development of Common Reed (*Phragmites australis*) stands along the upper boundary.

Like the Castlebellingham Marsh, this marsh has also grown extensively since it was surveyed during the drawing of the 2nd edition 6 inch maps. The saltmarsh has more than doubled in width and tripled in size since this period. The construction of the landward berm pre-dates the drawing of the OSI 1st edition 6 inch map. The more established sections of this saltmarsh are also likely to be much older compared to the other sub-sites. This marsh is also still accreting and there is extensive pioneer marsh towards the southern end of the marsh and along most of the seaward boundary.

Castletown Estuary

This saltmarsh is the most typical estuarine saltmarsh in the site, being found within the Castletown River estuary. Much of this saltmarsh is also relatively young and has only developed in the past 200 years. Its development is related to reclamation works mainly on the north side of the estuary and the construction of a railway bridge and embankment to carry the Dundalk to Carlingford Railway. The railway bridge/embankment was constructed across the largest area of established saltmarsh in the estuary. The railway is now dismantled and this embankment and bridge now carries the main Belfast-Dundalk road.

The current saltmarsh is found east of this bridge. Saltmarsh to the west of the bridge in the estuary has been infilled by a large landfill site. Most of the saltmarsh has developed in part of the estuary that is quite sheltered by a breakwater further east and behind old seawall along the main river channel that was constructed to maintain navigation to Dundalk port, which is located on the south side of the estuary. This saltmarsh is quite fragmented and divided into several portions. It is a mosaic of ASM, *Spartina* swards, ASM/*Spartina* sward mosaic and scattered clumps of Common Cordgrass spreading on the soft mudflats. The saltmarsh fragments are separated by deep channels with very soft and treacherous mud. Some of the mudflats around the west side of the breakwater contains frequent Common Cordgrass seedlings and is an indication that this species is spreading in this area. Some of this saltmarsh is relic marsh that was present before the development of the railway embankment and seawall but most of the marsh post-dates these developments.

Further east of the main breakwater there is extensive development of *Spartina* swards with complex creek topography. These swards extend eastwards to the mouth of the Ballymascanlan Estuary. There are some small patches of ASM along the upper saltmarsh boundary and adjacent to the berm that marks the upper boundary. The berm divides the saltmarsh from adjacent wet grassland and extends westwards to the main road. There is some brackish influence behind the berm, probably in areas where one-way sluices have probably become partially stuck open. There is some ASM and brackish marsh development in the formerly reclaimed wet grassland behind the berm. Original saltmarsh drainage channels are still present in this area.

Bellurgan-Jenkinstown

This saltmarsh is found along the northern shoreline of Dundalk Bay. It has developed adjacent to a fairly open part of the shoreline. This is a relatively young saltmarsh and most of the marsh has only developed since the drawing of the OSI 2nd edition six inch map. The saltmarsh is dominated by *Spartina* swards and there is an extensive zone of mudflats with scattered clumps of Common Cordgrass seaward of the more established sward. It is not known if the development of the marsh pre-dated colonisation by Common Cordgrass. However, this is the likeliest scenario and colonisation by common Cordgrass is likely to have

further promoted the expansion of this marsh. Common Cordgrass seems to be spreading vigorously on the mudflats in this area. It should also be noted that there is some development of ASM at the seaward edge of the *Spartina* sward in places, which is an indicator of quite rapid habitat succession probably related to accretion along the estuarine channel.

Further landward there is some development of patches of ASM and ASM/*Spartina* mosaic. Much of the ASM has some element of Common Cordgrass cover. There is an extensive patch of *Salicornia* flats at the eastern end of the main section where a large drainage creek flows into the bay. A narrow band of ASM vegetation continues eastward, where it peters out along the shoreline.

There is some development of brackish marsh along the upper boundary of this marsh, represented by stands of Sea Club-rush. This zone also contains Sea Aster (*Aster tripolium*), Creeping Bentgrass (*Agrostis stolonifera*), Red Fescue and Spear-leaved Orache (*Atriplex prostrata*). Some of the upper boundary is marked by the old railway embankment with some low-lying pasture occurring between the embankment and the saltmarsh in places along the site.

Table 3.1. Area of saltmarsh habitats mapped at Dundalk.

EU Code	Habitat	Area (ha)
H1310	*Salicornia* and other annuals colonizing mud and sand	34.84
H1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	330.15
H1410	Mediterranean salt meadows (Juncetalia maritimi)	0.04
non-Annex	*Spartina* swards	163.01
	Total	**528.04**

*note that saltmarsh habitat may continue outside the mapped area.

3.2 *Salicornia* and other annuals colonizing mud and sand (H1310)

This habitat is particularly well-developed and widely distributed at this site. The overall extent of *Salicornia* flats at this site ranks it second in sites surveyed during the SMP project, with only the *Salicornia* flats found at North Bull Island being greater in extent. It is characterised by a band of usually dense cover of Glasswort (*Salicornia europaea* agg.) with few other saltmarsh species. It may also contain small amounts of Common Saltmarsh-grass (*Puccinellia martima*), Lax-flowered Sea Lavender (*Limonium humile*), Annual Sea-blite (*Suaeda maritima*) and Greater Sea-spurrey (*Spergularia media*). The cover of Common Cordgrass is variable within this habitat. It is generally less than 5% but may reach 40% in places.

Salicornia flats are found typically at the seaward side of the more established marsh including ASM and *Spartina* sward and also seaward of pioneer ASM. It has developed on an

accretion ramp, which has developed along the Dundalk and Castlebellingham Marshes. An almost continuous band of this habitat is found along both these marshes and it varies in width, though it is generally 20-30m wide but can be up to 70m wide. This zone is almost continuous along the Castlebellingham Marsh but is fragmented along the Dundalk Marsh. The cover of Glasswort becomes sparser further seaward.

Zonation between *Salicornia* flats and adjacent pioneer ASM is particularly well-developed as much of the Dundalk and Castlebellingham saltmarshes have developed on a very gentle slope. A distinction was made between pioneer ASM, which also contains frequent or abundant Glasswort cover, and *Salicornia* flats with the frequent cover of Common Saltmarsh-grass and other species such as Lax-flowered Sea Lavender within pioneer ASM. *Salicornia* flats are the most seaward saltmarsh zone found along the Castlebellingham Marsh. However there are scattered clumps of Common Cordgrass through this habitat and also seaward of the *Salicornia* flats along the Dundalk Marshes. Common Cordgrass is generally between 1-5% in cover within this habitat and seems to be spreading within the *Salicornia* flats in places, particularly at the southern end of both the Castlebellingham and Dundalk Marshes.

Several patches of *Spartina* sward/*Salicornia* flats mosaic have been mapped around the site. This mosaic can be at the northern end of Dundalk Marsh and at the southern end adjacent to Blackrock. It contains clumps of Common Cordgrass with 20-50% cover interspersed on mud vegetated by Glasswort. This habitat type is similar in places to the *Salicornia* flats at North Bull Island.

3.3 Atlantic salt meadows (H1330)

This habitat is particularly well-developed at this site. The Dundalk Marsh and Castlebellingham Marsh probably represent the most complex development of saltmarsh drainage channels in Ireland and this is related to there size. Both marshes contain some very large saltmarsh creeks and a complex creek network. Salt pans are also well developed on both these marshes in the mid and mid-upper zones.

Zonation within this habitat is also very well developing in both these marshes, generally because they have developed as a linear band along the shoreline on a very gentle seaward slope. The upper zone is poorly developed in the southern part of the Castlebellingham marsh and this is probably as a result of the former reclamation and construction of a berm in the past, which probably enclosed much of the upper saltmarsh zone in places. The Dundalk Marsh displays a full range of typical saltmarsh zones from upper to mid to low and then to pioneer vegetation.

Pioneer vegetation is particularly well-developed at this site. The seaward edge of the Castlebellingham and Dundalk Marshes contain zones with occasional or frequent cover of Common Saltmarsh-grass, Sea Purslane (*Atriplex portulacoides*), Lax-flowered Sea

Lavender, Annual Sea-blite, and Common Cordgrass spreading onto bare mud. The bare mud component of the ground cover is high and sometimes abundant. This zone also contains frequent or abundant cover of Glasswort with a further zonation seaward to *Salicornia* flats. The pioneer zone is located seaward of *Spartina* swards, ASM/*Spartina* sward mosaic and established ASM on the Dundalk and Castlebellingham marshes. The cover of Common Cordgrass gradually breaks up and then the vegetation develops into the pioneer zone. The pioneer zone also extends up some of the main creeks within the Castlebellingham and Dundalk Marshes.

The low zone is characterised by dense cover of Sea Purslane that is dominant in places. This species forms a dense cover of woody scrub about 0.3-0.4 m high. This zone dominates large areas of the Castlebellingham Marsh and is an indication of the relatively young age of the southern section of this marsh where it extends almost to the landward berm. It is also a prominent part of the Dundalk Marsh and is well represented in the Bellurgan-Jenkinstown Marsh and Castletown River Estuary marsh. It also extends along the banks of the larger creeks where they extend into the upper zones. Other species present include Common Saltmarsh-grass, Glasswort, Common Scurvy-grass (*Cochlearia officinalis*), Sea Aster, Lax-flowered Sea Lavender and clumps of Common Cordgrass. The cover of Common Cordgrass varies between 1-10%. This zone may grade into the mixed ASM/*Spartina* sward mosaic where there is greater cover of Common Cordgrass. Some sections of the lower zone have a tussocky topography.

Common Saltmarsh-grass may dominate in lower zone along some pans in the mid marsh zone but this vegetation community is not a prominent part of the lower zone around the site. This community does develop along the shoreline at the northern end of the Castlebellingham Marsh near the mouth of the River Fane and there is much less cover of Sea Purslane in this area.

The mid marsh zone is characterised by a typical low sward dominated by Sea Plantain (*Plantago maritima*) and Sea Pink (*Armeria maritima*). There is a gradual reduction of cover of Sea Purslane along the upper section of the lower zone and into this zone where it becomes an occasional part of the vegetation. Other species present include Lax-flowered Sea Lavender, Sea Aster, Sea Arrow-grass (*Triglochin maritimum*), Glasswort, Red Fescue and Common Saltmarsh-grass. This zone also contains large shallow salt pans that form a complex mosaic. Common Cordgrass is present in this zone but is generally confined to scattered clumps mainly in salt pans with cover generally about 1% but sometimes up to 5%. The surface topography in this zone is quite flat. Lax-flowered Sea Lavender is not frequent in the grazed parts of the Castlebellingham Marsh whereas it is more prominent within the other ungrazed marshes.

Further landward, there are increased cover of higher platforms dominated by Red Fescue and Saltmarsh Rush (*Juncus gerardii*). Red Fescue becomes dominant towards the upper boundary of the northern end of the Castlebellingham and all of the Dundalk Marshes. This

zone also contains Sea Milkwort (*Glaux maritima*), Common Scurvygrass, and small amounts of Sea Purslane. The sward height in this zone is high in the ungrazed marshes and is about 0.3m high in general. Both these marshes contain areas in the mid-upper zones and the upper zones where the surface topography is quite irregular with frequent hummocks and hollows. The height difference between these hummocks and hollows may be as much as 0.5m and affect the zonation and plant community structure of the vegetation. The hummocks are covered with Red Fescue while the hollows are vegetated by Sea Purslane or Sea Plantain in places. There are some areas where the mounds are dominated by Creeping Bentgrass (*Agrostis stolonifera*) and also contain White Clover (*Trifolium repens*), Distant Sedge (*Carex distans*), Autumn Hawkbit (*Leontodon autumnalis*) and Spear-leaved Orache. Sea Club-rush also appears in some of the hollows in the northern end of the Castlebellingham Marsh. Common Cordgrass clumps are distributed back to the landward boundary but its cover in this zone is quite low (< 1%). There is some further zonation to Twitch-dominated vegetation at the upper saltmarsh boundary.

Some other ASM communities are present at various locations around the site that are characterised by other less typical species. One such zone includes some Wild Celery (*Apium graveolens*) and this is found at the northern end of the Castlebellingham Marsh in association with Red Fescue, Sea Aster, Sea Plantain and some Twitch. Some Hard-grass (*Parapholis strigosa*) was also noted in the upper zone in this area where the saltmarsh has developed on a steeper shoreline.

Some of the upper ASM zone of the Bellurgan-Jenkinstown Marsh is represented by a band or rank vegetation dominated by Red Fescue and Creeping Bent and containing frequent Sea Club-rush. This vegetation type also contains Sea Aster and Spear-leaved Orache. Much of the ASM in this marsh contains Common Cordgrass and the lower zone is dominated by Common Saltmarsh-grass and Common Cordgrass, and also containing Sea Aster, Annual Sea-blite, Sea Plantain and Sea Milkwort. Sea Purslane is less prominent.

The extent of ASM/*Spartina* sward mosaics at Dundalk Bay is also significant. These areas are represented by frequent cover of both Sea Purslane and Common Cordgrass and the cover of both species in these areas may vary significantly where one or the other becomes dominant. Other species present include Common Saltmarsh-grass, Sea Aster, Sea Milkwort, Sea Plantain, and Lax-flowered Sea Lavender.

3.4 Mediterranean salt meadows (H1410)

There are only several small patches of MSM at this site. One patch is found in the Castletown Estuary marsh and two small patches are found adjacent to Blackrock along the upper boundary in the Dundalk Marsh. Both patches are characterised by frequent cover of Sea Rush. Red Fescue is also abundant in this vegetation type and there is a smaller amount of Creeping Bent, Saltmarsh Rush, Sea Aster, Spear-leaved Orache and Sea Plantain. Common Reed is also present in the MSM found along the Blackrock shore. The

MSM in the Castletown Estuary marsh has developed around several small pans. However the other patches are too small to contain any typical saltmarsh structure.

3.5 *Spartina* swards

There has been extensive development of *Spartina* swards at this site. The largest areas are found in the Castletown Estuary and in the Bellurgan-Jenkinstown Marsh. Smaller patches are found within the Dundalk and Castlebellingham Marshes. Scattered clumps of Common Cordgrass mapped as *Spartina* clump/mudflat mosaics are also found seaward of the established sward in the Dundalk Marsh and the Bellurgan-Jenkinstown Marsh. One notable aspect of the *Spartina* swards at this site is that much of the sward has developed in previously established marsh rather than on adjacent bare mudflats. This is mainly seen in the Dundalk and Castlebellingham Marshes. There is no significant development of typical dense *Spartina* swards along the seaward side of the Castlebellingham Marsh. Much of the *Spartina* sward in the Castletown Estuary and in the Bellurgan-Jenkinstown Marshes has developed on previously unvegetated mudflats.

There is also extensive development of ASM/*Spartina* sward mosaics at this site. These can be seen in all the sub-sites. Most of these mosaics are likely to have developed with the colonisation of established saltmarsh by Common Cordgrass. They are characterised by Common Cordgrass with frequent Sea Purslane and Common Saltmarsh-grass. Other species present includes Sea Aster, Annual Sea-blite and Glasswort. The cover of Common Cordgrass can vary considerably and be quite spare in places within these mosaics. There may also be small patches that would be more accurately classified as *Spartina* sward within these areas. The variable cover of Common Cordgrass made mapping and characterisation of these mosaic areas and areas of *Spartina* sward quite difficult.

There are also some small areas where there seems to have been some natural succession of *Spartina* sward to communities with increased cover of Sea Purslane and other lower marsh ASM species. The colonisation of these other species has created areas of ASM/*Spartina* sward and patches of pure ASM in places where there has been previously no established saltmarsh. This type of succession can be seen east of the breakwater in the Castletown Estuary Marsh and along portions of the seaward side of the Bellurgan-Jenkinstown Marsh.

Some dieback of Common Cordgrass was noted along the seaward side of the Bellurgan-Jenkinstown Marshes in places. However, the extent of *Spartina* swards also seems to be increasing in places with frequent scattered clumps spreading over the adjacent mudflats at various locations.

4 IMPACTS AND ACTIVITIES

This large site is affected by several impacts and activities, which would be expected in such a large site that extends over a considerable area (Table 4.1). Most of the Castlebellingham marsh is grazed by sheep (140). Some minor poaching along creeks was noted. Grazing levels are not intensive and increases towards the northern end. However, there was still plenty of foliage available. The livestock have created tracks in places (501). There is no grazing of the Castletown Estuary marsh. A small section of both the Dundalk Marsh and Bellurgan-Jenkinstown marsh has been fenced off and is grazed by cattle.

Recreational activities within the marshes are quite limited. There are some tracks used by walkers along the landward side of the Dundalk Marsh (622). Another recreational activity which is common in the southern part of the site is shooting. The local gun-club, however, have noted that uninvited shooters regularly visit this site with little regard for the number of wildfowl that are bagged. Wheel ruts (623) were noted at one access point onto Dundalk Marsh.

A small infilled area was noted along the northern Blackrock shoreline. This infilling (803) has occurred adjacent to some development on the shoreline and spoil has spread onto the saltmarsh to disturb a very minor area. There has also been some dumping of spoil (803) at the edge of the saltmarsh at the north end of the Dundalk Marsh adjacent to newly built housing estate. This dumping is probably related to this development but has only affected a small area (0.001 ha). Infilling has also been carried out along part of the Bellurgan-Jenkinstown Marsh. This infilling has affected about 0.2ha of ASM and 0.2ha of *Spartina* sward.

Common Cordgrass is present at this site and is an invasive species of saltmarsh and mudflats (954). It is not known when this species was planted in, or colonised this bay. However, it has been known in the estuary since 1960 (Nairn 1986). Carrothers (1960) noted that the spread of Common Cordgrass into Dundalk Bay to the north of this site was thought to be natural. This species created large areas of *Spartina* sward and extensive areas of ASM/*Spartina* sward. The impact of its presence in these mosaic areas is assessed as moderately negative. One notable aspect of the Castlebellingham and Dundalk Marshes is that Common Cordgrass has mainly spread into the established saltmarsh to form these habitats rather than mainly spreading on the adjacent mudflats. It has also formed extensive swards on the mudflats within the Castletown Estuary.

This species is still colonising bare mudflats adjacent to the Bellurgan-Jenkinstown Marsh, mudflats seaward of the Dundalk Marshes, particularly at the northern and southern ends of the marsh and at the southern end of the Castlebellingham Marsh where the sediment becomes muddier. It is also spreading on the soft intertidal mud between the more established saltmarsh fragments within the Castletown Estuary. Common Cordgrass forms extensive fringes around these fragments within this estuary. The cover of *Spartina* sward is

likely to increase in the future at the expense of the lower ASM, *Salicornia* flats and adjacent mud and sandflats.

One notable aspect of the spread of Common Cordgrass at this site is that both ASM and *Salicornia* flats can be found seaward of dense *Spartina* swards. This is an unusual zonation and *Spartina* swards usually form the most seaward saltmarsh community. This may be one indication of the dynamic nature of the Dundalk Bay marshes and the fact that they are still accreting and allowing pioneer ASM and *Salicornia* flats to develop seaward of *Spartina* sward. This can be seen along the seaward edge of the Dundalk and Castlebellingham Marshes. It may also be an indication that the *Spartina* sward is still developing and has not established yet along the seaward edge of the marsh.

ASM has probably developed along the seaward side of parts of the Bellurgan-Jenkinstown Marsh after the development of *Spartina* sward. This is one example of habitat succession from *Spartina* sward to ASM and is seem in other estuaries where there is accretion, raising the height of the edges of the *Spartina* sward to allow invasion by Sea Purslane and Common Saltmarsh-grass. Another example of this succession is east of the breakwater in the Castletown Estuary marsh. There was very little established saltmarsh in this area prior to the development of the *Spartina* sward.

There are extensive areas of the lower saltmarsh in both the Castlebellingham and Dundalk Marshes that contain some element of Common Cordgrass. These areas were difficult to map and where Common Cordgrass became frequent (> 40% cover) the saltmarsh was mapped as an ASM/*Spartina* sward mosaic. The cover of Common Cordgrass can vary within these areas and there are frequent areas with lower or higher cover of this species. The *Spartina* sward also contains areas where there is some development of ASM vegetation.

A comparison of the OSI 2000 and 2005 aerial photo series shows that Common Cordgrass has spread significantly on the mudflats at several locations during this period. It is difficult to assess if Common Cordgrass has spread significantly at the expense of ASM or *Salicornia* flats within the current monitoring period due to the lack of accurate baseline data. There is likely to have been some spread of this species within this period, especially as there is some much pioneer vegetation along the seaward edge of the marsh. However, this colonisation is unlikely to have been greater than 10% so the spread of Common Cordgrass is not considered as a negative indicator to fail monitoring stops during this monitoring period.

This site has been significantly modified by reclamation and the construction of berms in the past. Berms have been built along the upper boundary of the Castlebellingham, Dundalk and Castletown Estuary marshes and former saltmarsh behind these berms was reclaimed. The construction of these berms may have led to the development of the current saltmarsh seaward of the berms in places. The construction of a seawall and railway embankment has also lead to the development of saltmarsh in the Castletown Estuary marsh. These impacts are not assessed as they occurred prior to the current monitoring period.

There are few indications of erosion (900) around the site. Erosional features can be seen along the seaward side of some parts of the Castlebellingham Marsh where low mud platforms are vegetated by dense Glasswort and are divided by unvegetated bare intertidal channels. The edges of these platforms are eroded. Some of this saltmarsh is likely to be vulnerable to storm erosion as the site is quite open.

There are much more frequent indications of accretion at the site (910). The saltmarsh has expanded significantly in the past 100 years with the Castlebellingham and Dundalk Marshes more than doubling in width in places. The Bellurgan-Jenkinstown Marsh has also developed during this period, although a large part of this development was as a result of the colonisation of Common Cordgrass. The are frequent indictors of accretion along the seaward edge of the Castlebellingham and Dundalk Marshes with development of pioneer ASM and *Salicornia* flats on an accretion ramp along the seaward edge of the established saltmarsh. Both these marshes are expanding at there southern ends. A comparison of the 1995, 2000 and 2005 OSI aerial photo series does not show any significant saltmarsh expansion during this period, although this is mainly due to the fact that the seaward edge of the marsh is not very distinctive on these aerial photos. Accretion is assessed as positive impact on a portion of the ASM and the *Salicornia* flats.

Impacts and activities around the site are mainly related to farming (100, 102, 120, 140) and to urbanisation around Dundalk and at Blackrock (401). There are scattered dwellings around the site in the rural sections (403). These activities have had no measurable impact at this site.

Table 4.1. Intensity of various activities on saltmarsh habitats at Dundalk.

EU Habitat Code	Activity code	Intensity	Impact	Area affected (ha)	Location of activity
1310	900	C	0	15.00	Inside
1310	910	C	+1	34.84	Inside
1310	954	B	-1	34.84	Inside
1330	140	C	0	110.00	Inside
1330	230	C	0	150.00	Inside
1330	501	C	0	1.00	Inside
1330	803	A	-2	0.2	Inside
1330	900	C	0	30.00	Inside
1330	910	C	+1	30.00	Inside
1330	954	B	-1	80.00	Inside

[1] EU codes as per Interpretation Manual.
[2] Description of activity codes are found in Appendix III, Summary Report 2007-2008.
[3] Intensity of the influence of an activity is rated as A = high, B = medium, C = low influence and D unknown.
[4] Impact is rated as –2 = irreparable negative influence, -1 = reparable negative influence, 0 = neutral, +1= natural positive influence and +2 = strongly managed positive influence.
[5] Location of activity: Inside = activities recorded within and directly impacting the saltmarsh habitat, outside = activities recorded outside but adjacent to saltmarsh habitat that are impacting the saltmarsh habitat.

5 CONSERVATION STATUS

5.1 Overall Conservation Status

The conservation status of a site is assessed on the condition of the site and on baseline information. The main source of baseline information for this site is the NHA survey, the 1995, 2000 and 2005 OSI aerial photo series. The baseline information from the NHA survey is generally limited to some descriptions of saltmarsh habitat and does not record the specific condition of the saltmarsh during the survey at this site.

Dundalk saltmarshes contain some notable features of conservation interest. The actual size of these saltmarshes is notable and includes the largest single unit of saltmarsh mapped during the SMP survey. The marshes also contain well-developed examples of saltmarsh zonation and saltmarsh drainage structure. There has been significant growth of the saltmarsh in the past 100 years and this is related to continued accretion. Pioneer saltmarsh communities including *Salicornia* flats are well-represented and this is one indicator that accretion is continuing. The extent of *Salicornia* flats is also significant and represents the second largest overall area of habitat mapped during the SMP project. There is likely to be further growth of this saltmarsh in the future. Much of the saltmarsh has only developed in the past 100 years and is at a relatively young stage of development. The site has been modified in the past by reclamation, construction of the berms, construction of the seawalls and railway embankment in the Castletown Estuary and the use of the estuary as a landfill.

The overall conservation status of this site is *unfavourable-inadequate* (Table 5.1). This is mainly due to the presence of Common Cordgrass within the *Salicornia* flats habitat, which has the potential to spread in the future to reduce the extent of this habitat. Common Cordgrass is also a prominent part of the site and formed a significant area of *Spartina* sward and ASM/*Spartina* sward, mainly at the expense of ASM. However, there is no evidence that this occurred during the current monitoring period (mainly due to the absence of accurate baseline data). There are few other significantly negative impacts affecting this site. A minor amount of habitat has been damaged or destroyed by infilling and dumping of spoil along the upper saltmarsh boundary. Some of the saltmarsh is grazed but not intensively.

Nearly all of the saltmarsh is found within Dundalk Bay cSAC. A NPWS management plan is available for this cSAC.

Table 5.1. Conservation status of Annex I saltmarsh habitats at Dundalk.

Habitat	**EU Conservation Status Assessment**			
	Favourable	**Unfavourable - Inadequate**	**Unfavourable - Bad**	**Overall EU conservation status assessment**
Salicornia flats (H1310)	Extent	Structure and functions Future prospects		Unfavourable - Inadequate
Atlantic salt meadows (H1330)	Extent Structure and functions Future prospects			Favourable
Mediterranean salt meadows (H1410)	Extent Structure and functions, Future prospects			Favourable

5.2 *Salicornia* and other annuals colonizing mud and sand (H1310)

5.2.1 Extent

The extent of the habitat is assessed as *favourable*. There is no detailed information about the previous extent of this habitat. There is a significant area of this habitat present at the site that represents the second largest area mapped during the SMP project. There are no indications that there has been any significant loss of habitat due to natural erosion during the current monitoring period. There are indications of accretion and growth of the saltmarshes in Dundalk Bay and there is a positive indicator for extent of this habitat.

Salicornia flats may have been more extensive in the past in the Castletown Estuary and the Bellurgan-Jenkinstown Marshes, which both now contain substantial areas of *Spartina* sward.

However, there is no detailed information about the previous distribution of this habitat at these locations.

Common Cordgrass is present in this habitat and there are some indications that it is spreading at several locations around the site. However there are no indications that it has spread significantly within the current monitoring period to reduce the extent of this habitat.

5.2.2 Habitat structure and functions

The habitat structure and functions of this habitat are assessed as *unfavourable-inadequate*. Eighteen monitoring stops were carried out in this habitat and one stop failed. Most attributes for this habitat reached their targets. The failure of one stop was related to the spread of Common Cordgrass in one section, which was thought to have colonised significantly in one section.

Much of the *Salicornia* flats are found along the seaward side of the more established saltmarsh. It forms a natural part of the saltmarsh zonation. Most of this habitat contains scattered clumps of Common Cordgrass, which varies in cover. There are several small areas mapped as a mosaic of *Salicornia* flats and *Spartina* sward where there are more frequent scattered clumps of Common Cordgrass within the *Salicornia* flats habitat. There are indications that this species is spreading, although there is no evidence that its cover and increased significantly (> 10% during the current monitoring period). The overall impact of its spread on species composition is assessed as neutral, mainly due to the lack of accurate baseline data.

5.2.3 Future prospects

The future prospects of this habitat are assessed as *unfavourable-inadequate*. This assessment assumes that the current management activities and level of impacts such as the spread of Common Cordgrass continue in the near future. *Salicornia* flats are likely to be vulnerable to further colonisation by Common Cordgrass in the future and may limit their extent. However, much of the *Salicornia* flats are likely to persist as long as there is continued accretion. Common Cordgrass has been present at this site for about 50 years but has not completely established along the edge of the Castlebellingham and Dundalk Marshes. The high sandy content of the sediment adjacent to the saltmarsh may be one factor that will limit the spread of Common Cordgrass in this zone and keep some of the zone open to maintain *Salicornia* flats cover.

5.3 Atlantic salt meadows (H1330)

5.3.1 Extent

The extent of the habitat is assessed as *favourable*. There is a significant area of this habitat present at the site that represents the largest overall area mapped during the SMP project. There are no indications that there has been any significant loss of habitat due to natural erosion, reclamation or infilling during the current monitoring period. There has been a small

amount of infilling and dumping of spoil around the site. However, this only represents < 0.001% of the overall ASM area at the site. There is a substantial amount of pioneer saltmarsh at the site and this is a positive indictor for extent. The saltmarsh has grown significantly during the past 100 years and this trend is likely to continue.

Common Cordgrass has formed significant areas of *Spartina* sward and ASM/*Spartina* sward mosaic within the former established ASM. However the impact on extent is assessed as neutral due to the lack of evidence that it has spread significantly during the current monitoring period.

5.3.2 Habitat structure and functions

The habitat structure and functions of this habitat are assessed as *favourable*. Seventy-two monitoring stops were carried out in this habitat and one stop failed. All of the attributes required for favourable conservation status generally reached their targets. This stop failed due to the dominance of Common Cordgrass, although no assessment could be made of the potential spread of Common Cordgrass at this point during the current monitoring period, so it can be ignored. There is substantial cover of Common Cordgrass within the ASM forming patches of *Spartina* sward and ASM/*Spartina* sward mosaic, but there are no indications that it has spread significantly during the current monitoring period (mainly due to lack of baseline data). The impact of its spread on species composition is assessed as neutral, mainly due to the lack of accurate baseline data. There are few other negatively impacting activities affecting this habitat. Some of the saltmarsh is grazed but not intensively.

The structure and functions of the ASM at this site are extremely well-developed. The Dundalk and Castlebellingham Marshes contain some of the best examples of saltmarsh zonation and the development of saltmarsh drainage features in Ireland. All the main vegetation zones are well-represented. There is a substantial area of pioneer ASM at this site, which is a positive indicator and also an indicator of accretion. The sward height varies across the site and depends on the saltmarsh community.

5.3.3 Future prospects

The future prospects of this habitat are assessed as *favourable*. This assessment assumes that the current management activities and level of impacts such as grazing continue in the near future. There are few impacts that are significantly negatively affecting the ASM at this site. Only part of the marsh is grazed and this activity is not causing any significant damage. Minor areas around the site have been infilled but the overall damage is minor in relation to the whole of the site. The continued spread of Common Cordgrass is likely to be the most significant impact. This species has already spread into the ASM and formed substantial areas of *Spartina* sward and ASM/*Spartina* sward mosaic. There are areas of the ASM, particularly in the pioneer ASM, that are vulnerable to further spread of this invasive species. However the sandy nature of much of the sediment along the two main saltmarshes may mean that dense *Spartina* sward does not become established.

There are areas where there has been some natural succession of *Spartina* sward to ASM/*Spartina* sward mosaic. This is likely to continue in the future and increase the extent of ASM. Continued accretion along the saltmarsh is also likely to be a positive indicator for the future prospects of this habitat. This saltmarsh has grown significantly in the past 100 years and is likely to increase in extent in the future.

5.4 Mediterranean salt meadows (H1410)

5.4.1 Extent

The extent of the habitat is assessed as *favourable*. There are no indications that there has been any significant loss of habitat due to natural erosion or land-use changes during the current monitoring period. There is only a very small area of MSM found at this site. The MSM is not affected by any of the infilling at this site in the past.

5.4.2 Habitat structure and functions

The habitat structure and functions of this habitat are assessed as *favourable*. One monitoring stop was carried out in this habitat and it passed. The MSM is in good condition and is not affected by any negatively impacting activities. The species assemblage is typical of this habitat. There are natural transitions from this habitat to brackish Reed beds.

5.4.3 Future prospects

The future prospects of this habitat are assessed as *favourable*. This assessment assumes that the current management activities and level of impacts continue in the near future. There are no damaging activities affecting this habitat significantly

6 MANAGEMENT RECOMMENDATIONS

There are no specific management recommendations for this site.

7 REFERENCES

Carrothers, E.N. (1960). *Spartina townsendii* H & J Groves in counties Louth and Down. *Irish Naturalists' Journal*, **13**, 188.

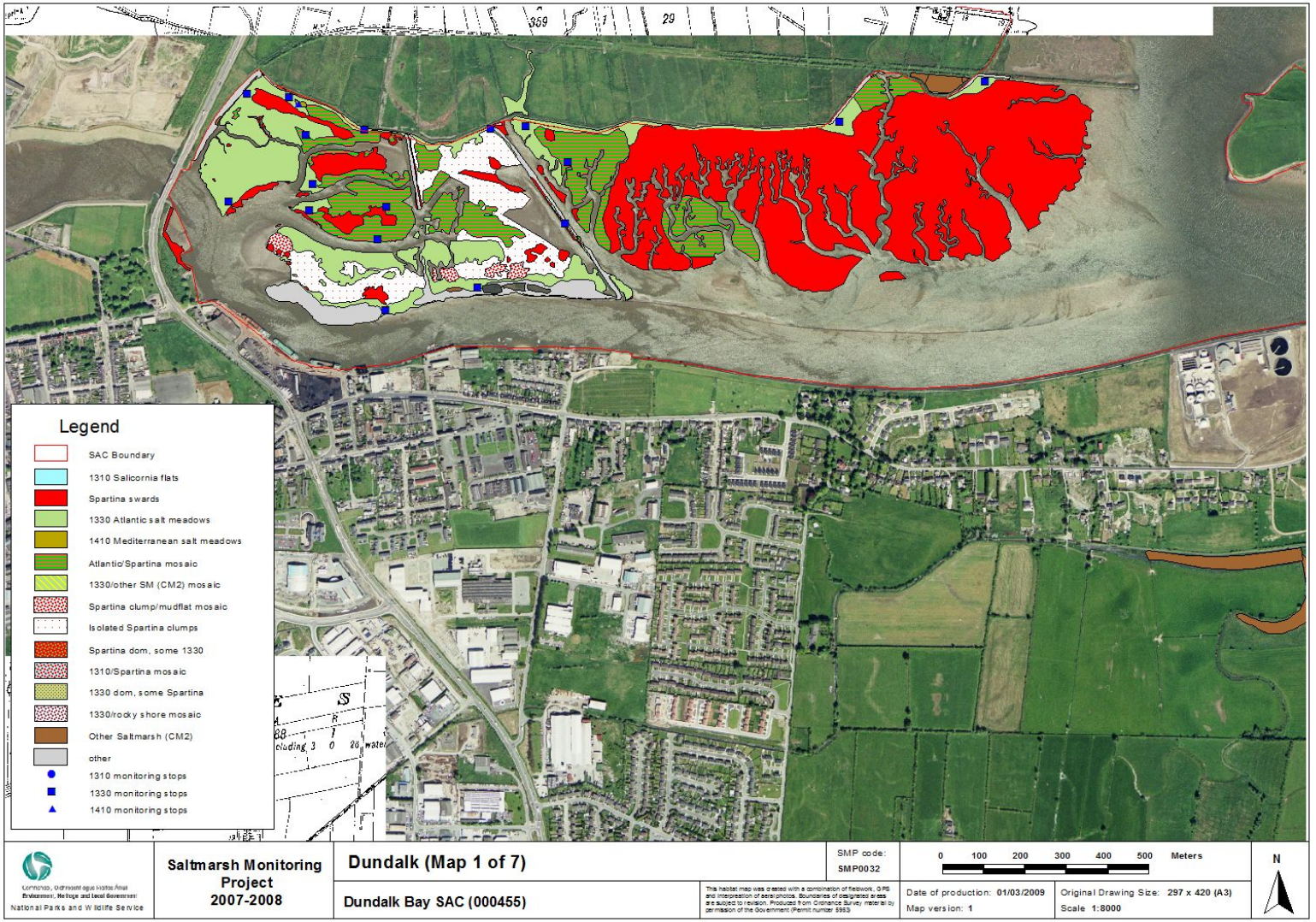
Curtis, T.G.C.F. and Sheehy-Skeffington, M.J. (1998). The saltmarshes of Ireland: An inventory and account of their geographical variation. *Biology and Environment: Proceedings of the Royal Irish Academy* **98B**, 87-104.

MPSU (?). *Management Plan for Dundalk Bay cSAC*. Government of Ireland.

Nairn, R.G.W. (1986). *Spartina anglica* in Ireland and its potential impact on wildfowl and waders – a review. *Irish Birds*. **3**, 215-258.

Table 8.1 Areas of SMP habitats mapped using GIS.

Habitat code SM	SM habitat description	Mapped Area (ha)	Area (ha)			
			H1310	H1330	H1410	*Spartina* swards
1	1310 *Salicornia* flats	34.667	34.667			
2	*Spartina* swards	122.5				122.5
3	1330 Atlantic salt meadow	299.679		299.679		
4	1410 Mediterranean salt meadow	0.044			0.044	
6	ASM/*Spartina* mosaic	57.127		28.564		28.564
7	1330/other SM (CM2) mosaic	0.151		0.076		
9	Other (non saltmarsh)	14.366				
10	*Spartina* clump/mudflat mosaic (50/50)	19.093				9.547
11	Isolated *Spartina* clumps on mud (5%)	61.85				1.237
14	*Spartina* sward dominated, with some ASM	0.993				0.993
15	1310/*Spartina* mosaic	0.336	0.168			0.168
16	ASM dominated with some *Spartina*	1.821		1.821		
18	Other SM (CM2)	12.011				
19	1330/rocky shore mosaic	0.026				
	Total	**624.664**	**34.835**	**330.152**	**0.044**	**163.00**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Spartina swards
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1410 Mediterranean salt meadows
Atlantic/Spartina mosaic
1330/other SM (CM2) mosaic
Spartina clump/mudflat mosaic
Isolated Spartina clumps
Spartina dom, some 1330
1310/Spartina mosaic
1330 dom, some Spartina
1330/rocky shore mosaic
Other Saltmarsh (CM2)
other
1310 monitoring stops
1330 monitoring stops
1410 monitoring stops
Saltmarsh Monitoring Project 2007-2008
Dundalk (Map 1 of 7)
Dundalk Bay SAC (000455)
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Date of production: 01/03/2009
Map version: 1
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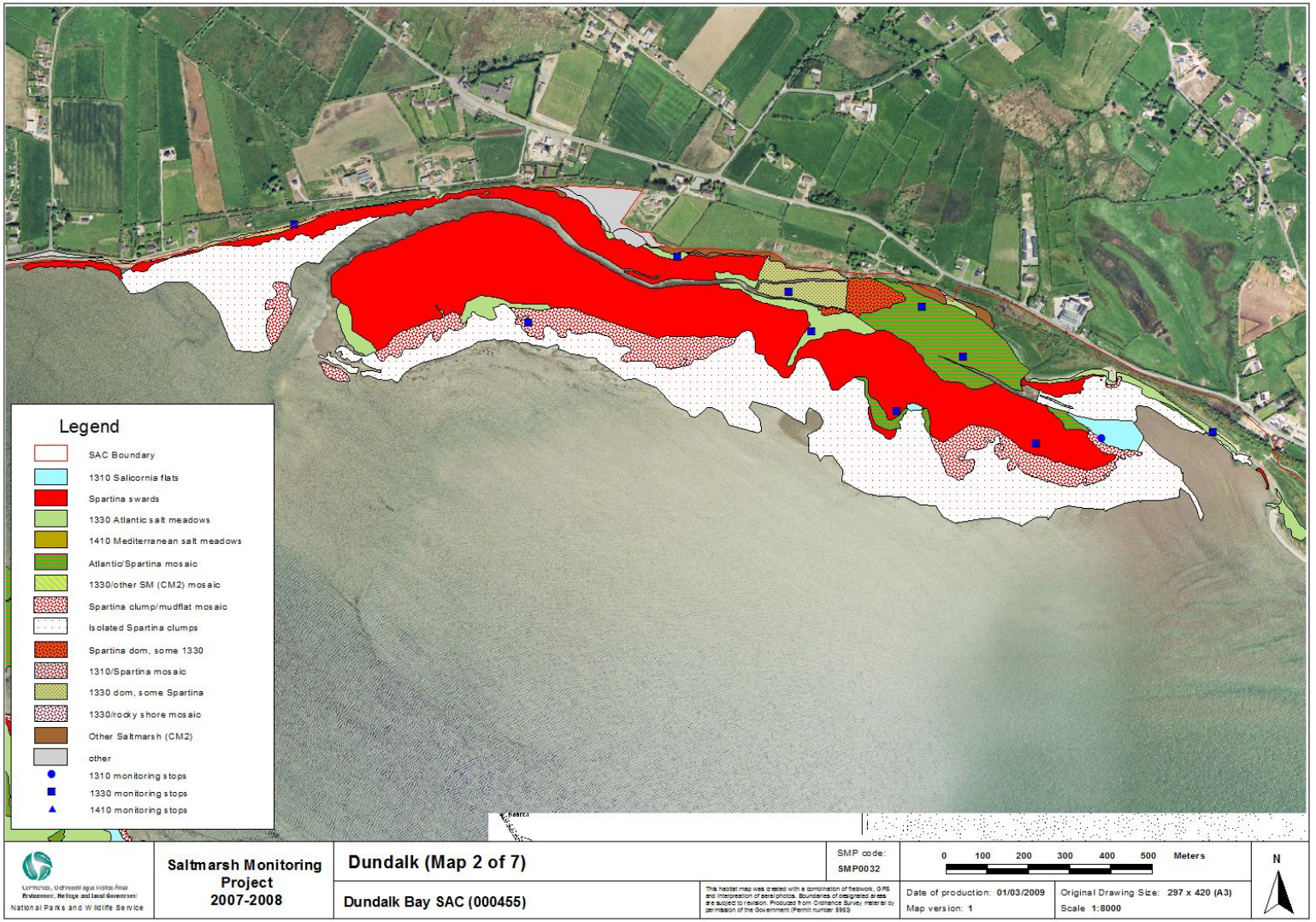
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1330 dom, some Spartina
1330/rocky shore mosaic
Other Saltmarsh (CM2)
other
1310 monitoring stops
1330 monitoring stops
1410 monitoring stops
Saltmarsh Monitoring Project 2007-2008
Dundalk (Map 2 of 7)
SMP code: SMP0032
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Dundalk Bay SAC (000455)
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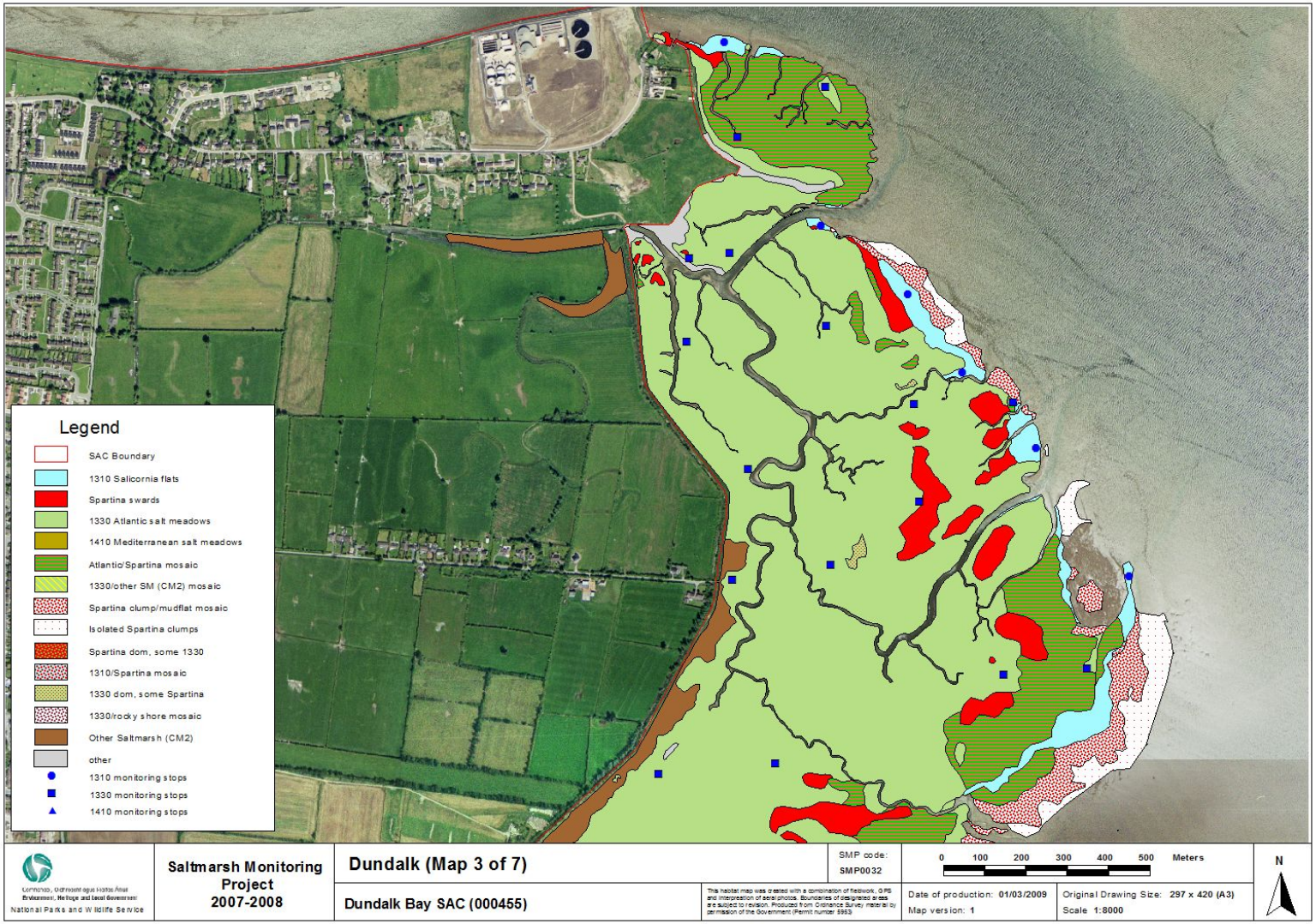
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1330 dom, some Spartina
1330/rocky shore mosaic
Other Saltmarsh (CM2)
other
1310 monitoring stops
1330 monitoring stops
1410 monitoring stops
Saltmarsh Monitoring Project 2007-2008
Dundalk (Map 3 of 7)
SMP code: SMP0032
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Dundalk Bay SAC (000455)
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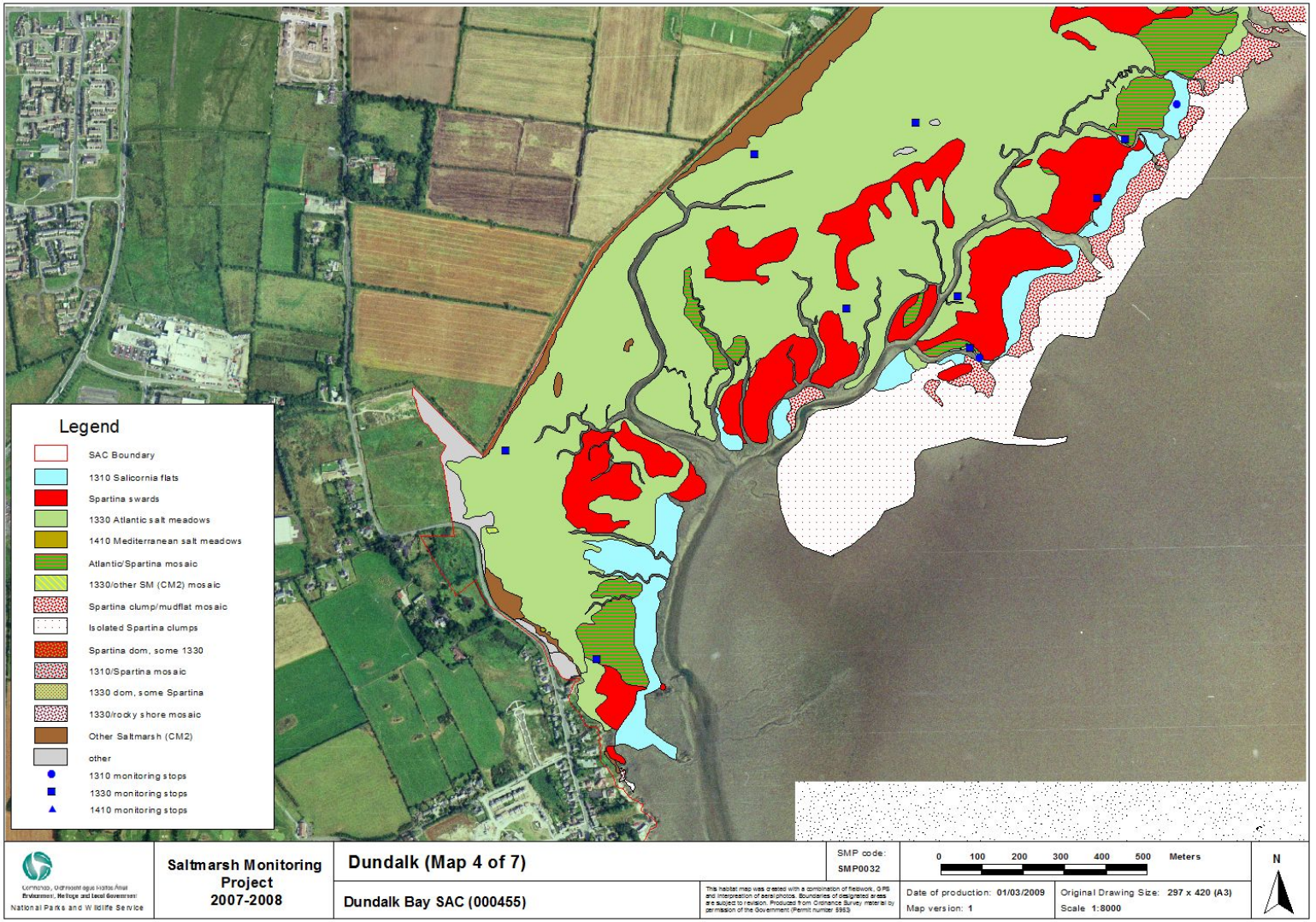
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Spartina dom, some 1330
1310/Spartina mosaic
1330 dom, some Spartina
1330/rocky shore mosaic
Other Saltmarsh (CM2)
other
1310 monitoring stops
1330 monitoring stops
1410 monitoring stops
Saltmarsh Monitoring Project 2007-2008
Dundalk (Map 4 of 7)
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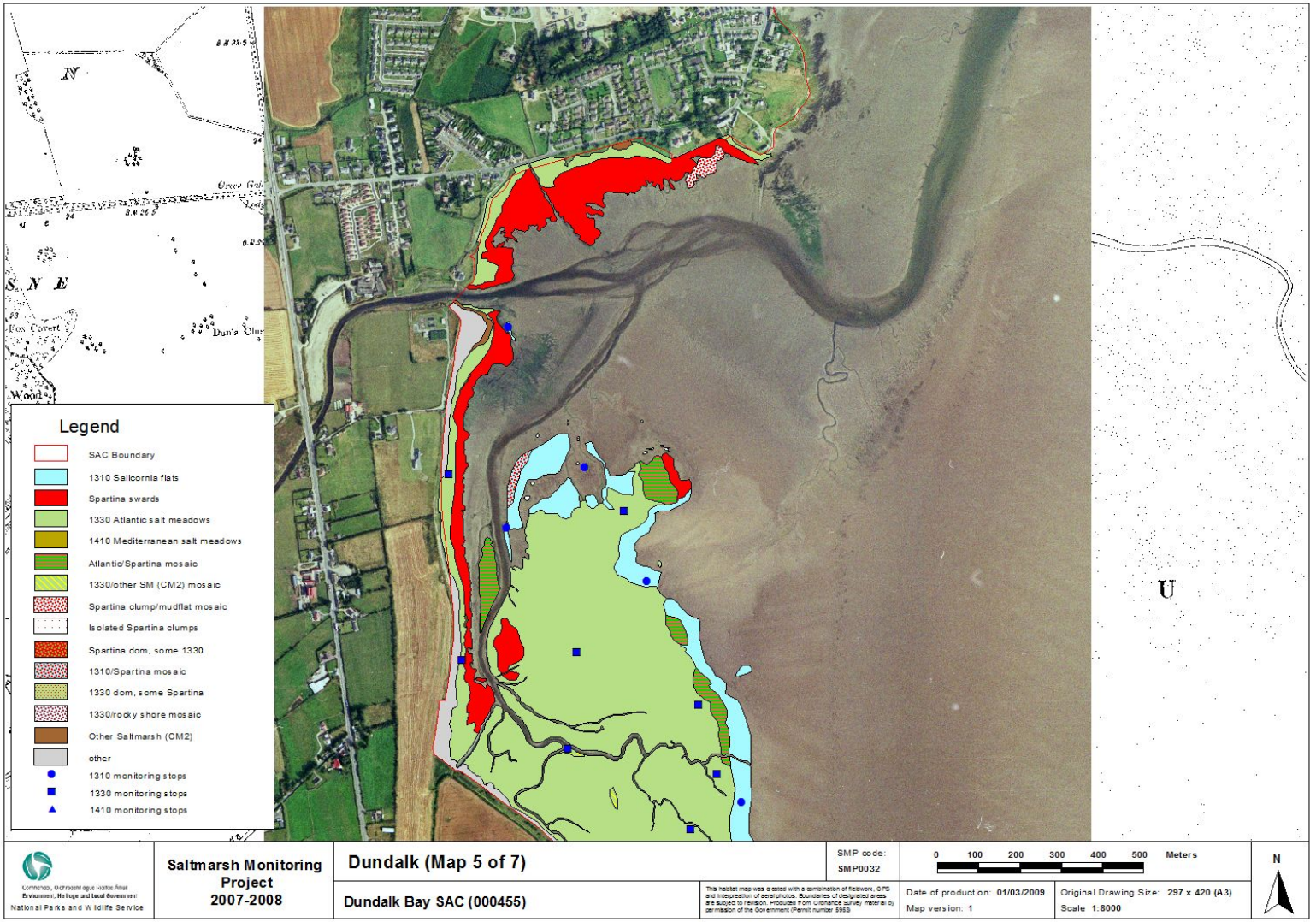
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Spartina clump/mudflat mosaic
Isolated Spartina clumps
Spartina dom, some 1330
1310/Spartina mosaic
1330 dom, some Spartina
1330/rocky shore mosaic
Other Saltmarsh (CM2)
other
1310 monitoring stops
1330 monitoring stops
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Fox Covert
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Saltmarsh Monitoring Project 2007-2008
Dundalk (Map 5 of 7)
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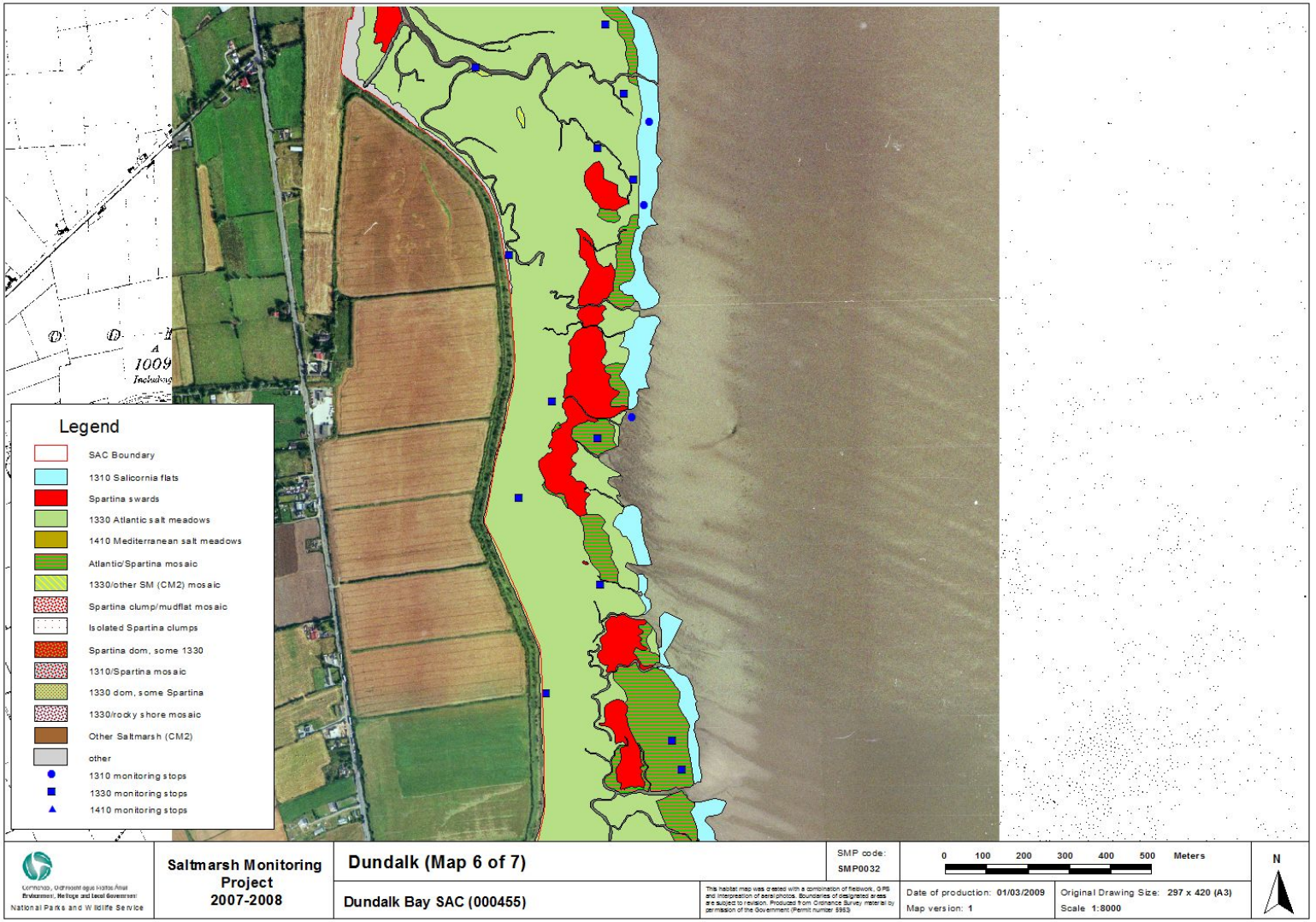
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Spartina dom, some 1330
1310/Spartina mosaic
1330 dom, some Spartina
1330/rocky shore mosaic
Other Saltmarsh (CM2)
other
1310 monitoring stops
1330 monitoring stops
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Dundalk (Map 6 of 7)
Dundalk Bay SAC (000455)
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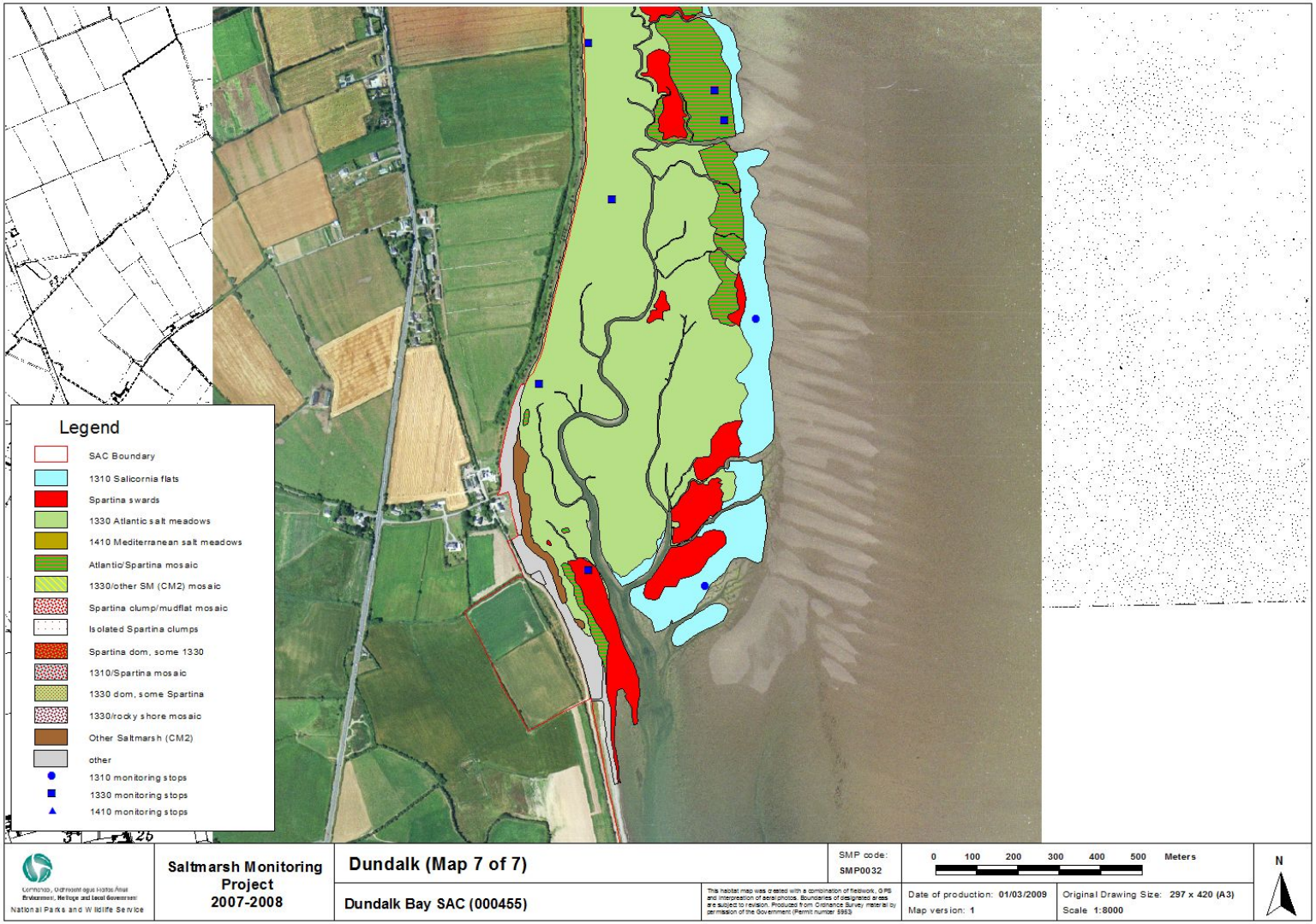
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Other Saltmarsh (CM2)
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1310 monitoring stops
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Dundalk (Map 7 of 7)
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