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# Water Framework Directive (WFD) saltmarsh monitoring

**Operational instruction 200\_07 Issued** 12/11/2014

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| This document is for staff at level 2 capability and above of the data and information management activity in the Environmental Monitoring technical development framework. |

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| What’s this document about? | This operational instruction explains how to:   * carry out saltmarsh plant surveys; * collect field data for ground truthing surveys of aerial photography.   It includes detail on:   * the preparation required for field work * what records must be taken during the surveys. |

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| Who does this apply to? | Environment Agency staff and external contractors undertaking saltmarsh surveys for WFD purposes:  Environmental Monitoring (Sample & Collection) teams  Environmental Monitoring (Analysis & Reporting) teams  Regional marine teams responsible for ecological surveys in estuaries |

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## Introduction

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| WFD assessment | The Water Framework Directive (WFD) requires the ecological status of saltmarshes to be assessed.  To achieve this assessment the following three criteria are used:   * extent of saltmarsh * zonation of plant communities within the saltmarsh: pioneer, mid-low, upper, *Spartina* and reed bed * species diversity of saltmarsh plants |

#### Overview of surveys

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| Field surveys | Field surveys satisfy the species diversity assessment requirement of WFD and also form the ground truthing requirement for interpretation of aerial photography. The field survey data informs photo-interpreters on the zones within a saltmarsh (through the plant communities identified) and the diversity of the saltmarsh (through the number of species found) and their relative abundance. |

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| Aerial surveys | Aerial photography surveys provide information on the extent and zonation of saltmarshes.  For all but the smallest saltmarshes, an aerial survey is likely to be required to determine the extent of the overall marsh and its major communities.  Imagery needs to be taken in daylight, at low water, preferably on a spring tide, in order to capture the full extent of the saltmarsh and reveal the creek system. |

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| Timing of surveys | Both field and aerial surveys are carried out between 1st June and 30th September, when saltmarshes are most developed.  Field surveys and aerial surveys do not have to be co-incident, but the closer the ground survey is to the aerial survey the easier it is for the photo interpreters to identify the saltmarsh features.  The ground survey should be at a similar time of year to the aerial survey but may be 1 year before or 1 year after, in exceptional circumstances. |

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| Pressure | The key pressure being assessed is that of morphological alteration to the saltmarsh. |

#### Changing data needs

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| Baseline dataset | During the first River Basin Management Plan (RBMP) cycle surveillance waterbodies containing saltmarsh have been, in the majority of cases, surveyed twice. These surveys form the baseline dataset on which to assess any change to the saltmarsh.  Following the completion of two full baseline saltmarsh surveys a photo-interpretation map will be published, along with documentation of the spread of species.  The baseline surveys provide the foundation for the vegetation profile of the saltmarsh and will act as a baseline indicator of diversity within the waterbody. |

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| Reduced transect protocol | Once the baseline dataset for each saltmarsh is complete further surveys can follow the reduced transect protocol.  Reduced transect surveys will be needed once in every six year WFD reporting cycle for surveillance waterbodies. |

## Health and safety requirements

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| Generic risk assessments (GRA) | It is expected all staff involved in this work are familiar with the appropriate generic risk assessments and associated H&S documents.  See Related documents. |

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| ! Important | Saltmarshes can be a hazardous environment and particular care must be taken when traversing.  Surveyors must be familiar with the risks and hazards associated with surveying in intertidal areas, refer to Related documents. |

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| E-learning course | It is expected all surveyors have competed the [Understanding Tides and Tide tables e-learning course](http://intranet.ea.gov/knowledge/training/selflearning/default.aspx). |

#### Managing risk

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| Dynamic risk assessment (DRA) | You must carry out a dynamic risk assessment (DRA) on arrival at your saltmarsh.  Carry out further DRA’s whenever conditions change, including conditions underfoot or weather conditions. |

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| Site specific risk assessment | You must have site specific risk assessments for each transect in the saltmarsh. For new transects, each risk assessment must be drafted in advance of the survey and completed on site as required. |

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| Monitoring site information system (MSIS) | MSIS is the national database which stores site location, access and health and safety details for all marine ecology monitoring sites and stations, see related documents.  You must check MSIS for marine station and site specific information before surveying and ensure the database is kept up to date with any new information. |

#### Getting on, off and moving around the saltmarsh

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| Safe access and egress | **! Important** Before setting out onto the saltmarsh, **all** surveyors must confirm the route and direction that should be taken to safely exit the marsh. This is vital should conditions change and visibility become reduced.  Surveys should be carried out during daylight on a falling tide, even if there is a known and tested safe egress route off the saltmarsh during all states of tide.  During your planning you must take into account inundation of creeks and gullies, see below. Innundation of creeks and gullies can significantly increase the time required to leave the saltmarsh.  During the survey **all** surveyors must maintain an awareness of the tidal state.  Always know your access and egress points and have them programmed into your global positioning system (GPS). |

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| Creeks and gullies | Creeks and gullies can start very small, becoming wider and deeper as they travel seaward.  Innundation of creeks and gullies can significantly increase the time required to leave the saltmarsh. Narrow creeks and gullies  * These can be hidden by vegetation cover. Always make use of your walking pole to test the ground ahead of you. * Take particular care to test the ground before crossing a narrow creek or gully. Cross one person at a time.  Larger creeks and gullies  * These should be avoided. * Good planning of your survey using recent aerial photographs will help you avoid larger creeks and gullies. |

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| Working with boats | Consider accessing the marsh by boat if this provides a safer means of reaching the site. If you need to carry out the survey from a boat, make sure you are familiar with the generic risk assessments. See Related documents. |

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| Specialist equipment | Specialist equipment such as mudders may be of benefit when walking through soft sediments.  Walking poles should also be carried. Refer to equipment list. |

## Competency requirements for field surveyors

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| Lead surveyor | The key competencies included here are essential for lead surveyors. |

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| Plant identification | Lead surveyors should be competent in identifying all plants on the WFD saltmarsh species list. However, identification should not be seen as limited to this list and additional species should be identified where possible. |

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| Pre-planning and detailed survey skills | Lead surveyors should always plan surveys in advance to ensure a safe survey method and exit route off the marsh.  You should adapt survey plans as necessary according to the conditions on the day of the survey. |

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| Use of global positioning system (GPS) | You should be competent in the use of your GPS device and understand the sources of error and bias associated with the techniques that you use. Ensure that your GPS has position average functionality and waypoint projection options (see [Mapping marine plants for WFD](http://intranet/ams_document_library/2007/201_250/202_07.doc) for further guidance). |

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| Technical development framework | Novice or developing surveyors should refer to the technical development framework programme, see related documents, for further guidance on how to gain the necessary competencies to deliver a successful saltmarsh survey and become lead surveyors. |

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| Environ-mental monitoring | View the Marine Ecology Monitoring CD (contact [Helpdesk Services](mailto:processhelpdesk@environment-agency.gov.uk) for a copy) and complete the assessment. |

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| Community of practice | The online CoP contains key information on ecology monitoring and saltmarsh surveys.  See related documents on how to register and access the CoP. |

## Planning and delivering saltmarsh surveys

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| Delivering surveys | Saltmarsh surveys are completed through a combination of the stages listed below. Not all stages are needed for all saltmarshes.  Please note, there are two possible species data gathering surveys described below, items 2 and 3. They differ in the number of transects required. This difference depends on whether two full surveys, or sets of data, have already been collected. | |
| Stage | Description |
| 1 | Pre-planning for field surveys |
| 2 | Delivering baseline species surveys |
| 3 | Delivering reduced transect surveys |
| 4 | Ground truthing of aerial data training points |
| 5 | Aerial surveys |

#### Pre-planning for field surveys

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| Survey season | The survey window is between 1st June and 30th September. Surveyors should aim to survey when saltmarsh plants are at their most floristic.  In some parts of the UK it may be appropriate to survey earlier in the summer. Contact [Helpdesk Services](mailto:processhelpdesk@environment-agency.gov.uk) if you need to survey before 1st June. |

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| Permissions and licences | It is essential you obtain any permissions needed to access the saltmarsh and carry out the survey from the appropriate authorities.  Contact your local FRB team for guidance on any special permits and licences you may need to carry out these surveys.  Licences or permissions may take time to obtain. You should allow for this when planning your surveys. |

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| Tide times | Saltmarsh surveys should be carried out on a falling tide during daylight. |

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| Plan your route | Always ensure that a safe route is taken. Know your access and egress points and have them programmed into your GPS should fog or visibility be a potential issue. |  |

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| Plan your transects | Transect locations should be planned using OS maps, recent aerial photographs and previous saltmarsh survey access information. Check MSIS for marine station or site specific details.  Past transect routes that have been found to be safe should be examined prior to each survey.  If during your pre-planning you decide that the surveys cannot be completed as described in this instruction, contact [Helpdesk Services](mailto:processhelpdesk@environment-agency.gov.uk) for advice. |

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| Species list | Collate a list of previously identified species from your saltmarsh and take it with you on the survey. |

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| Invasive, non-native species | Invasive, non-native species occur in the marine environment. Ensure you comply with the check, clean, dry campaign. See related documents. |

#### Delivering baseline species surveys

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| Transect locations and intervals for waterbodies with less than two complete surveys | For waterbodies with less than two complete surveys, transects will be spaced between 500 and 1000 metres apart, or greater depending on the size of saltmarsh in the waterbody.  Contact the Marine Monitoring Service if you need advice on the transect plan for your saltmarsh. |

#### Delivering reduced transect surveys

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| Improved efficiency in data collection | Following the completion of two baseline surveys in a saltmarsh a reduced number of transects can be surveyed in the future.  This protocol will be used to assess the diversity of the saltmarsh using the minimum number of transects.  Only transects considered to be most representative of the species diversity of the saltmarsh need to be surveyed. This will generally result in reduced transect numbers for medium and large saltmarshes. |

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| Analysis of baseline dataset to determine reduced transects | The two baseline surveys provide the foundation for the vegetation profile of the waterbody and will act as a baseline indicator of diversity.  Marine monitoring service webinar saved in the CoP provides more detail on how to emloythis technique.  A photointerpretation map with relatively adequate confidence will be released by Marine Monitoring Service, along with appropriate formal documentation of the spread of species.  The number of transects undertaken should be based on the number of transects necessary to comfortably satisfy those species found on the baseline survey that are also in the WFD saltmarsh species list.  This will require consulting two key lists during surveys to determine if all species in the WFD saltmarsh species list found previously have been met. The two lists are:   * The list of species previously found in the saltmarsh. * WFD saltmarsh species list. This list is used for the WFD species diversity assessment.   Further guidance is contained in the saltmarsh webinar, stored in the CoP. |

#### Ground truthing to supplement reduced transect surveys

The reduced transect approach introduced in 2013 requires additional cross checking with previous species diversity lists.

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| Additional ground truthing | The reduced transect protocol may need further ground truthing to minimise uncertainty in the aerial photos. This is because some portions of the aerial photos are difficult to interpret and cannot be confidently assigned to a vegetation type.  Geomatics Group will indicate, prior to the survey season, which points within a saltmarsh require more ground truthing.  Field data will then be collected from these points and used to fine tune, or train, the saltmarsh dataset. This improves the data quality and our confidence in the final outputs from the saltmarsh classification.  These data points are unlikely to lie on previously surveyed transects. |

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| ArcGIS files | Geomatics will produce ArcGIS shape files for saltmarshes within each region showing the location of designated points needing additional ground truthing.  These files should be used when pre-planning the field surveys. Careful attention must be paid to the boundary of each polygon shown in the shape files, as it is important the field data are collected well within it. |

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| Field survey method for additional ground truthing | Field surveyors visit the designated points to collect data and record a description of the community.  **! Note** This fieldwork does not involve full transect surveys. | | |
| Task | Description |
| 1 | identify and record the top four species with an abundance scoring using a quadrat |
| 2 | take two photographs:   * one of the quadrat, or area assessed, make sure there are no shadows in your photograph. * take a second photograph, obliquely across the marsh facing seaward |
| 3 | record a description of the dominant community or mosaic structure |
| 4 | record the GPS point accurately. |
| 5 | label the photographs appropriately to indicate which data point they refer to |
| 6 | return your data in a spreadsheet, with photos to Geomatics |

#### Aerial surveys

Aerial monitoring programmes are delivered by the Environment Agency, including the Geomatics Group and Local Authorities for coastal monitoring and other purposes. The imagery from the flight programme is used where appropriate for saltmarsh assessment.

## Summary of survey methods

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| Field survey | Field surveys are carried out along transects. Species and their percentage abundance are recorded in two 4m2 quadrats (2m x 2m), at sites along a transect line.  The percentage cover of species within each quadrat indicates the plant community.  The boundary or extent, of the saltmarsh is also confirmed during the field survey. |

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| Aerial survey | Aerial photos are used for two purposes:   * pre-planning of field surveys. Recent saltmarsh imagery is available for every region. Maps with imagery can be obtained from Geomatics Group or your regional FCRM team. * photo interpretation of saltmarsh extent and zonation for classification. Aerial photos gathered during 2006-2012 have been used by Geomatics Group to determine zonation. Saltmarsh aerial photos will be gathered in England under the Regional Coastal Monitoring Programme (RCMP). |

## Field survey requirements

#### Useful definitions

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| Create a route between two points | Creating a static line between two waypoints on a GPS to form a straight and unmoveable line on screen to follow when carrying out transect surveys. |

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| Major community | A dominant community of an area. It may have smaller scale ‘minor’ communities within it.  For example, there may be *Atriplex* along creek edges, but beyond the edges the major expanse is of a *Puccinellia* dominated community – the major community. |

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| Minor community | A smaller scale change in community type found within a major community type. For example *Atriplex* along creek edges or grasses on elevated mounds. |

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| Position fix average | Fixing a point on a GPS, based on multiple point recordings over a set period of time. |

#### Using GPS

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| ! Important | Do not use the ‘Go to’ function on the GPS to deliver your survey as this can result in meandering transects. |

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| GPS protocol for transects with historic data | To carry out a precise transect, Create a route between two points on your GPS to produce a straight line between the start and the end waypoints of a transect.  To do this, enter the start and end waypoints from the historic transect into the GPS and then create a route to follow that joins the two points. With this information, the GPS can display a line for you to keep to that will help you to walk the transect as accurately and efficiently as possible. |

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| GPS protocol for new transects | As above, but determine the start and end point of the transect by studying the aerial imagery provided by Geomatics/FCRM. Then select an appropriate location for the transect encompassing as many mMajor community as possible while avoiding Larger creeks and gullies.  Keeping to a programmed line will avoid the risk of meandering, which can occur when following directions to a bearing or when the ‘Go to’ GPS function is relied upon. Take care to look out for hazards and deviate around these |

#### Transect locations

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| Planning and orientation of transects | Transects must:   * be placed primarily to address health and safety issues such as avoiding large creeks and gullies. * cover the saltmarsh from the landward to seaward extent. During the field survey though you can work in either direction: seaward-landward or landward-seaward. * be placed to cross over the areas of the marsh which encompass the most communities. In some cases this will be perpendicular to the coastline, see Figure 1, but not always. It is acceptable to produce transects which zig-zag across the marsh. |

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| Areas of *Phragmites* | Do not place transects in areas of saltmarsh consisting solely of *Phragmites.*  Establish an adjacent GPS species diversity position fix (or projected waypoint) to mark the location of the *Phragmites* stand. |

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| Figure 1 | Example of where you might place transects (white lines), approximately every 500 metres (green lines) along a marsh, avoiding large creeks, but capturing as many plant communities as possible. |



#### Data collection along a transect

For field data requirements, there are four categories of information that need to be recorded along the transect. The methodology for each of the categories in this list is described below.

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|  | Category of information | What is required |
| 1 | The most landward and seaward saltmarsh points | GPS position average fix, target notes |
| 2 | Major community transition points | GPS position average fix, target notes |
| 3 | Quadrat sample sites in major communities[[1]](#endnote-2) | GPS position average fix, quadrat data, target notes, photo facing seaward |
| 4 | Species diversity information additional to the quadrat | GPS fix, target notes |

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| Landward (upper zone) and seaward points | The landward and seaward saltmarsh points represent the maximum extent of the saltmarsh at either end of the transect. These positions mark the top of the upper zone landward and the end of the saltmarsh seaward for each transect. |

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| Action in the upper zone | The upper zone demarcation is represented by either:   * presence of a man-made barrier, such as the foot of a seawall, * or,the transition from saltmarsh plants to terrestrial plants.   A transition to terrestrial plants should be marked at the position at which saltmarsh plants become less than 5% of the predominantly terrestrial community. Use a quadrat to help you estimate the percentage cover if necessary. |

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| Action at the seaward end | The final point of the transect, at the seaward end, is where the saltmarsh vegetation cover has become so sparse it covers less than 5%. This is the pioneer zone.  **! Important** Only mark and record the edge of the pioneer zone *in situ* where it is safe to do so. Take a projected position in circumstances where it is unsafe to work to the end point of the marsh using a range finder. |

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| When a quadrat sample is needed | A quadrat sample is needed when there is a major community change.  A sample would not be needed when, for example, a *Spartina* dominant community occurs with localised *Atriplex* lining the creeks.In this situation, only the large-scale *Spartina* community would be sampled. The community changes at the smaller scale, *Atriplex,* would be noted and a GPS position fix taken. |

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| Defining major community transitions | When plant communities have changed distinctly from the previously sampled community, consider this a major community transition point to sample.  Every major community along a transect line should be sampled. If you are uncertain as to whether an area is a distinct community, carry out a quadrat sample anyway, as it is better to have gathered too much data than not enough. |

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| Marking a transition point | It can be difficult to judge where to mark the transition point between major communities due to the fuzziness of community transitions.  A ‘best guess’ of the midpoint of the transition is acceptable and will aid in the mapping of the vegetation.  If the mosaic nature of the marsh means that changes are consistently taking place, then one GPS position average fix, along with a target note describing the consistent changes, will suffice.  Example of marking a transition point:Where a homogenous area of *Atriplex* dominated saltmarsh fades into a *Spartina* dominated saltmarsh. |

#### Data collection from quadrats

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| Placing the quadrat | Quadrats should be placed well within the distinct community; not at the edge of the transition zone.  Where the major community forms only a very thin band of saltmarsh, it is acknowledged that distinguishing between minor and major communities along a transect may not be exact and requires judgement on the part of the surveyor.  Discussion with other experienced surveyors is valuable in such situations. Your decision should focus on ensuring the full diversity of the marsh will be captured. |

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| Quadrat sampling methodology | Surveyors should have the list of species encountered in previous surveys. With this list in mind, there should be a strong awareness of the potential for bias in its use.  You should only identify to the level to which you are confident. Specimens should be taken back for further ID if necessary.  For transects with historic data, take the quadrat sample in the general location as it was taken previously (this could be pre-programmed into the GPS or shown on printed imagery.)  Move well into the distinct community and then take the quadrat sample.  The total percentage, abundance within the quadrat can be greater than 100%. This happens where the plant community is canopied. For example, *Bostrychia scorpioides* is often found at the base of *Atriplex portulacoides.* |

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| Step | Action |
| 1 | Assess two 4m2 replicate quadrats at each site, see Figure 2. |
| 2 | Mark out each quadrat area and assess each in turn.  Mark out the 4m2 quadrat area using poles or tape measures. Good collapsible poles for surveying purposes are available from survey suppliers.  For consistency, number the replicates in the order shown in Figure 2. |
| 3 | Take a GPS Position fix average for at least one minute.  When taking position fixes, place the GPS on the ground, away from obstructions including your own body so that as many satellites as possible can be picked up and the accuracy of the fix maximised.  Facing seaward, take the position fix at the bottom left hand corner of the quadrat, as shown in Figure 2.  No position fixes are required for the second, replicate quadrat. |
| 4 | The second, replicate quadrat is placed 5 m to the left of the edge of the first quadrat.  When entering data into Biosys, the NGR for quadrat 1will be also used for quadrat. |
| 5 | Record each species present and its percentage cover to the nearest 5%.  Any result less than 5% should be recorded as 1%.  Any result less than 1% recorded as P. |
| 6 | Take at least one digital photograph of the quadrat and log this for future reference and quality assurance. Always take photos facing seaward. Ensure there are no shadows in your photograph. |
| 7 | To aid the photo-interpreter and maximise the site position accuracy, any additional positional information will have value.  For example, in the notes section of the [field recording sheet](http://intranet/ams_document_library/2007/151_200/200_07_SD01.doc):  Q1 at waypoint X is positioned 5 metres south west of large creek.  Other features of reference include:   * distinct areas of vegetation cover, for example *Spartina* clumps, * man-made features such as a sea wall.   Repeat for every site. |
| 8 | **! Important** Only visit the low marsh if it is safe to do so. If it is not safe describe the site using binoculars.  Use a range-finder to calculate the co-ordinates of the projected position. Record that the position was not fixed and is only a cursory point. |
| Figure 2 | Representation of the position of quadrats at a sample site on the transect and the position from which to make a GPS fix. | | |
|  | saltmarsh quad design 2011 | | |

#### Species data collection outside quadrats

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| Species diversity recording outside of quadrat | As you walk along each transect, record any additional taxa which have not occurred in the quadrats sampled so far. This information will be stored as additional species information as directed in the [393\_07 BIOSYS data entry guide – marine techniques](http://intranet/ams_document_library/2007/351_400/393_07.doc) |

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| Identifying plants | If you are unsure of the identification of any plant encountered in your survey, take photographs and make notes of the plant’s position on the saltmarsh.  Take a sample of the plant, if it is plentiful and place in a labelled plastic bag. Return the specimen to the lab and seek advice from a botanist if required. |

#### Pressure information

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| Recording pressure data(Negative indicators) | It is important to record any evidence of negative indicators. These data also support the requirements of the Habitats Directive.  Negative indicators include:   * banks * walls * grazing * vehicle track damage * bare areas due to trampling * artificial drainage channels * turf cutting * evidence of accretion or erosion * *Spartina anglica* swaths * *Enteromorpha* mats * Signs of pollution |

#### Analysis of data

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| How we use the data | The diversity of the saltmarsh will be assessed from the species information gathered during your field survey.  The WFD index will specifically use those species listed in the WFD saltmarsh species list.  Geomatics Group will use the data collected to help determine the zonation and extent of each saltmarsh from the aerial photography.  The plant communities in each quadrat will be derived from the species and percentage cover records. These will be used to help map the pioneer, mid-low and upper zones of the marsh.  The zone areas will be calculated and an assessment made on zone proportions.  The majority of information required to interpret the aerial imagery will be extracted from the data input into Biosys. |

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| National vegetation classification scheme (NVC) | The National Vegetation Classification (NVC) scheme may be referenced for plant community identification, however the zone mapping approach is a simpler classification system. |

#### Record keeping

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| Prompt data entry | Transfer all data records from your field sheets and lab notes into Biosys within 48 hours of completing the surveys. See [393\_07 BIOSYS data entry guide – marine techniques](http://intranet/ams_document_library/2007/351_400/393_07.doc) for guidance on data entry.  Update site details, including relevant photos in MSIS. |

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| Retention of field sheets and audit of Biosys data | Field sheets and any lab notes should be retained until an audit of data entry is complete.  Data audit reports are available in BOXI. Contact [Helpdesk Services](mailto:processhelpdesk@environment-agency.gov.uk) for further guidance. |

## Equipment list

|  |  |
| --- | --- |
|  | These are the key items required to carrying out a saltmarsh survey. This list is not exhaustive and should be used alongside the list in the [13\_07 Intertidal soft sediment instruction, see related documents.](http://ams-documents.ea.gov/2007/001_050/13_07.doc) |
|  | * standard lifejacket * differential GPS * compass * digital camera * spare batteries * whistle * mobile telephone * Ordance survey (OS) map * print of aerial imagery (laminated or in plastic sleeve) * plant ID guides * tape measure/poles for marking out quadrats * saltmarsh field recording sheets * weatherwriter * range-finder– useful for projected distances |

## WFD saltmarsh species list

|  |  |
| --- | --- |
| **Species list** | |
|  |  |
| Agrostis stolonifera | Lotus corniculatus |
| Alopecurus bulbosus | Oenanthe crocata |
| Apium graveolens | Oenanthe lachenalii |
| Armeria maritime | Parapholis strigosa |
| Artemisia maritime | Phragmites australis |
| Aster tripolium | Plantago coronopus |
| Atriplex littoralis | Plantago maritima |
| Atriplex portulacoides | Potentilla anserina |
| Atriplex prostrate | Puccinellia distans (S) |
| Beta vulgaris ssp. Maritime | Puccinellia maritima |
| Blysmus rufus (N) | Ruppia maritima |
| Bolboschoenus maritimus | Salicornia europaea agg\_ |
| Bostrychia scorpioides | Sarcocornia perennis (S) |
| Carex distans (N) | Schoenoplectus tabernaemontani |
| Carex extensa | Sonchus arvensis (N) |
| Carex otrubae | Spartina (anglica/townsendii) |
| Cochlearia anglica | Spartina maritima (S) |
| Cochlearia officinalis | Spergularia marina |
| Eleocharis parvula | Spergularia media |
| Eleocharis uliglumis | Suaeda maritima |
| Elytrigia atherica | Suaeda vera |
| Elytrigia repens | Trifolium fragiferum |
| Festuca rubra | Trifolium repens |
| Glaux maritime | Trifolium squamosum (S)\* |
| Inula crithmoides (S)\* | Triglochin maritima |
| Iris pseudacorus | Tripleurospermum maritimum |
| Juncus articulatus | Zostera marina |
| Juncus bufonius | Zostera noltii |
| Juncus effuses |  |
| Juncus gerardii |  |
| Juncus maritimus |  |
| Leontodon autumnalis |  |
| Limonium binervosum |  |
| Limonium humile |  |
| Limonium vulgare |  |
|  |  |

The North-South UK geographic divide is a coarse delineation across the North Bristol Channel and The Wash.

|  |  |
| --- | --- |
| (N) | Found in North divide |
| (S) | Found in South divide |
| \* | Commonly extends in some cases beyond the North-South divide |

## Related documents

|  |  |
| --- | --- |
| Generic risk assessments | * [07\_10 Generic risk assessment- Field work in rural locations](http://ams.ea.gov/ams_root/2010/01_50/07_10.doc) * [426\_05 Working in or near water](http://eatolssprn01.prodds.ntnl/qpm/user/identification) * [193\_06 Generic risk assessment- Intertidal soft sediment work](http://ams.ea.gov/ams_root/2010/01_50/07_10.doc) * [06\_10 Boatwork risk assessment](http://ams.ea.gov/ams_root/2010/01_50/06_10.doc) |

|  |  |
| --- | --- |
| Health and safety | * [14\_10 Selecting using and maintaining lifejackets instruction](http://intranet.ea.gov/handlers/GetDocumentById.ashx?id=7425) * [13\_07 Intertidal soft sediment work instruction](http://intranet/ams_document_library/2007/001_050/13_07.doc) * [732\_06 Working in or near water instruction](http://intranet.ea.gov/ams_document_library/2006/701_750/732_06.pdf) * [718\_06 Lone and remote working](http://ams.ea.gov/ams_root/2006/701_750/718_06.pdf) * [725\_06 Rural fieldwork](http://ams.ea.gov/ams_root/2006/701_750/725_06.pdf) |

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| --- | --- |
| Data management | * [481\_10 MSIS user guide](http://ams.ea.gov/ams_root/2010/451_500/481_10.doc) * [393\_07 BIOSYS data entry guide – marine techniques](http://intranet/ams_document_library/2007/351_400/393_07.doc) * [206\_06 BIOSYS data entry guide - data quality](mailto:http://ams.ea.gov/ams_root/2006/201_250/206_06.doc) |

|  |  |
| --- | --- |
| E-learning courses | * [T11 Understanding tides and tide tables](https://www.ea-training.org/apps/ocd/flyer.php?id=214) * [E73 Environmental Monitoring;](https://www.ea-training.org/apps/ocd/index.php) |

|  |  |
| --- | --- |
| Technical reference material | * [202\_07 Mapping marine plants for Water Framework Directive (WFD)](http://intranet/ams_document_library/2007/201_250/202_07.doc) * Marine Ecology Monitoring CD. Copies of this CD will be held by your local teams (A&R and S&C). For extra copies please contact [Helpdesk Services.](mailto:processhelpdesk@environment-agency.gov.uk) |

|  |  |
| --- | --- |
| Technical development programme | * [Saltmarsh-data collection](http://intranet.ea.gov/static/documents/People/15_Data_info_mgmt-saltmarsh.doc) |

|  |  |
| --- | --- |
| Community of Practice | * To access the CoP for the first time, you will need to register: In the Easinet, search for the Communities of practice.   Enter the community called [Environmental Monitoring- Marine 2. Data Collection/Saltmarsh/training tools](https://www.ea-training.org/apps/canvas/view.php?id=181). Here you will find information previously held on the O:Drive. |

1. Sward height may still possibly be required for certain SAC waterbodies to satisfy Conservation Agency reporting requirements. Please liaise with your regional marine contact to confirm this. [↑](#endnote-ref-2)