Validation Network Project Saltmarshes

In 1998, the statutory nature conservation agencies, including English Nature, presented a framework for monitoring on designated sites. The outline framework is published as A Statement on Common Standards in Monitoring. The aim for each site is to maintain it in favourable condition, and condition is assessed on a set of key features of interest for the broad habitats within each site. New guidance on Common Standards Monitoring has been published (Joint Nature Conservation Committee 2004) which now forms the standard approach to monitoring statutorily designated sites.

The results of this regular monitoring against set targets enables management practices on these sites to be appraised and revised if required. Monitoring across a range of sites with similar habitats also allows some determination of the condition of the habitat resource as a whole, feeding into regional and national targets such as those identified within the UK Biodiversity Action Plan. This strategic monitoring forms the Validation Network Project, the aims of which are to validate condition monitoring, to establish control sites against which changes in interest features can be assessed, and to contribute to understanding the drivers of change in individual habitat types.

This report presents the results and conclusions of the analyses of data collected for saltmarsh sites within England, undertaken as part of the Validation Network project.

What was done

Four saltmarsh sites within England were selected for the monitoring. These were: the Humber Estuary, Morecambe Bay, Chichester Harbour and The Wash. The first three are enclosed estuarine systems while the Wash is a more open intertidal system.

Datasets collected for each area included the standard Condition Assessment field survey for saltmarsh vegetation, quadrat-based data on composition and cover, and a range of measured variables also at the quadrat scale (For example vegetation height, bare mud, height +/- mean high water level). In addition, a range of variables were assessed at the plot

scale (For example evidence of erosion and disturbance).

Analyses of these data took four approaches: comparison of qualitative and quantitative datasets; assessment of botanical communities in saltmarsh zones using NVC classification; assessment of the significance of measured variables in differentiating favourable and unfavourable plots; multivariate analysis of vegetation community data.

Results and conclusions

The comparison of qualitative and quantitative methodologies indicated that in general the rapid (qualitative) assessment was more likely to record attributes as favourable than

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the detailed (quantitative) assessment within all estuary systems, with the majority of plots experiencing some disagreement between condition utilising the two approaches.

The relatively quantitative approach to vegetation assessment facilitated accurate and detailed recording of botanical information which enables an objective assessment of botanical composition and community types to be made. Disagreements in condition in respect of this attribute occurred with abundances of indicator species often being recorded as favourable using the qualitative and unfavourable using the quantitative method.

Determining zonation was often difficult on the basis of quantitative assessment as the botanical composition of a quadrat did not necessarily reflect the zone in which it was deemed to occur for example, where accretional ramps with pioneer communities are present higher up the saltmarsh. In particular the presence of such features is not always apparent where the physical structure of the saltmarsh is complicated, for example incorporating spits, creeks or pans.

Analysis of botanical data revealed discrepancies between the perceived botanical communities recorded during qualitative survey, and the actual communities recorded from quadrat recording. Disagreement between condition assessment of the two methods was particularly pronounced in respect of botanical composition, and this is considered likely to be influenced by unintentional recording bias using the qualitative method, which relies on surveyor-selected rather than random selection of recording points.

Analysis of whole plot and whole site environmental data produced very few meaningful correlations. However the sample sizes for analysis were small and restricted robust analysis of data and the outputs of data analysis may not reflect the true relationships within the data.

The use of multivariate analysis for analysing saltmarsh habitats is more complicated and often less effective than for habitats comprising fewer and more similar communities. The

outputs of any analysis must be considered on a zone by zone basis if meaningful interpretation is to be made. Environmental factors, particularly height of the substrate compared to mean high-water level, are clearly of huge importance in driving differences in saltmarsh communities. Other factors associated with grazing pressure and erosion appear to be locally important at a number of sites, although secondary to the main driver.

Discussion

The CSM methodology requires saltmarsh zones to be determined as a pre-requisite to monitoring. However, determining zonation was often difficult on the basis of quantitative assessment as the grid references provided to indicate zonation often did not provide sufficient information to enable the zones in which individual quadrats were located to be determined, as the botanical composition of a quadrat does not necessarily reflect the zone in which it occurs, for example where accretional ramps with pioneer communities are present higher up the saltmarsh. In particular, the presence of such features is not always apparent where the physical structure of the saltmarsh is complicated, for example incorporating spits, creeks or pans.

Some attributes which are negative indicators include physical drivers of change other than the height of substrate +/- mean high-water level. Locally, these may be the indicators of severe pressure and causes of change due to, for example overgrazing and coastal squeeze. Currently, these are only noted during the field visit or from other sources but should be considered under a more quantitative recording exercise.

The current CSM guidance, when applied to saltmarsh habitats is of value in defining the status of individual SSSI units in respect of the variables recorded. However, the overall functional unit of the saltmarsh system is typically at the broader estuary level. Saltmarsh systems are dynamically locally unstable and are likely to be naturally more prone to variations in their extent, structure and function than terrestrial habitats such as broad-leaved woodland. Therefore it is particularly important when considering condition assessment that

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assessment is made of the overall functionality of the saltmarsh system at an estuary level. In particular an overall assessment of attributes such as extent, physical structure and vegetation structure across all units within each SSSI should form an intrinsic part of the condition assessment process.

Recommendations
The current CSM guidance, when applied to saltmarsh habitats is of value in defining the status of individual SSSI units in respect of the variables recorded. However, the overall functional unit of the saltmarsh system is typically at the broader estuary level. Saltmarsh systems are dynamically locally unstable and are likely to be naturally more prone to variations in their extent, structure and function than terrestrial habitats such as broad-leaved woodland. Therefore it is particularly important when considering condition assessment that assessment is made of the overall functionality of the saltmarsh system at an estuary level. In particular an overall assessment of attributes such as extent, physical structure and vegetation structure across all units within each SSSI should form an intrinsic part of the condition assessment process.

The implications of one failed attribute are that the feature is unfavourable-even if different assessments come up with different failed attributes. This has implications for deciding on a remedy but should be seen as a trigger for checking that the feature is in unfavourable condition by re-visiting the assessment overall and supplementing with other information. Zonation seems to be an issue and there is a need to identify and record this. This will be critical if the same areas are being revisited in future to look for change. It is possible that using remote sensing applications such as CASI can help with this.

Environmental factors, particularly height of the substrate compared to mean high-water level, are clearly of huge importance in driving differences in saltmarsh communities. Other factors associated with grazing pressure and erosion appear to be locally important at a number of sites, although secondary to the main driver. Currently, evidence of these negative attributes are recorded non-quantitatively during

a monitoring visit. A more quantitative assessment under CSM should be considered.

CSM should be able to be applied at a system level-there is merit in looking into this and developing some additional guidance using the Estuary guidance URL: **www.jncc.gov.uk/PDF/CSM_marine_estuaries.pdf**.

Natural England's viewpoint
Natural England's condition assessment methodologies have been developed by specialists in association with the JNCC. They are designed to be of sufficient detail to detect key indicators of favourable and unfavourable condition while at the same time also sufficiently robust to provide an accurate assessment of overall condition. It is still important, however, that condition assessment methodologies are regularly reviewed and quality assured and this report is part of that process for saltmarsh guidance.

Selected references
BEALEY, C. & COX, J. (2004). Validation Network Project: A Pilot Study. *English Nature Research Reports*, No. 596.

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Further information
For the full details of the research covered by this information note see Natural England Research Report NERR020 - *Validation Network Project Saltmarshes.*