

PROFORMA FOR WATER FRAMEWORK DIRECTIVE UK Classification Tool Sign Off

The purpose of this proforma is to summarise:

- the key attributes of a classification tool;
- identify whether they have been signed off by the UKTAG task Teams; and
- identify any implications for future adoption.

This will be used to facilitate decisions regarding the adoption of the tool for the first round of River Basin Planning.

1. Project Details

Classification Tool	Macroalgae - Rocky Shore Reduced Species List
Project Reference Number/s	EMC/WP16/041& 051
Sponsor (task team/agency/project)	Marine Plants Task Team/EA, CEFAS, SEPA, FRS, EHS, DARDNI, Marine Institute, EPA /MTT
Water category	Transitional and Coastal Waters
Biological element	Macroalgae
Pressures	General (e.g. Nutrient, toxic substances and disturbance)

2. Criteria for assessing WFD classification tools (with respect to future tool adoption)

Classification Tool Criteria	Response	Date Signed off
a)Has a project Executive Summary been prepared- see Section 6	Yes	
b)Does the tool include boundary conditions that comply with the normative definition class boundaries?	Yes	
c)List the metrics/sub elements described in the normative definitions which have been covered by the project.	Composition & disturbances sensitive taxa (= taxa diversity)	
cii)List the metrics/sub elements described in the normative definitions which have not been covered by the project.	Cover & abundance (not appropriate for Rocky shore, but in Opportunistic Macroalgae Tool)	
d)Has the project produced a reference based 5 class status classification system?	Yes	
e)Can each class boundary be expressed as an EQR?	Yes	
f)Does the method produce a probability of class? Describe the class confidence features of the tool.	Yes (under development)	
g) Does the method have a written sampling protocol that describes temporal and spatial requirements?	Yes	
h)Does the method conform with CEN standards where applicable? If so provide CEN method reference number.	Yes General quality assurance of biological and ecological assessment in aquatic environments EN 14996	
i)Does the method comply with agency Health & Safety requirements? Identify issues.	Yes	
j)Can the method be applied across ROI/NI ecoregions	Yes	
k)Are there alternative methods for the same biological element? If so what are they?	Yes but respond to different pressures: Opportunistic algae tool & Fucoiid Extent	
l)Is it a pressure sensitive tool or an indicator of general disturbance?	General Disturbance	
m)Has a classification algorithm been developed- see Section 4.	Yes	
n)How were reference conditions derived? (expert opinion, pressure threshold limits, best available sites, hindcasting, other Member States, etc.)	A combination of best available sites and expert judgement	
o)Has a protocol for applying the tool to HM/AWBs been produced?	No, but it may be possible to change in threshold values for HM/AWBs	
p)Date when tool will be available for pilot use	2006	

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Classification Tool Criteria	Response	Date Signed off										
q) Date when tool will be available for river basin planning classification.	2007											
r) Have the tool boundaries been inter-calibrated, and if so in which GIG.	Yes, North East Atlantic GIG											
s) If the boundaries have not been inter-calibrated, when is it planned that they will be.	N/A											
t) Does the method include Quality Assurance procedures. Describe: <ul style="list-style-type: none"> • Training Requirements • Surveyor Accreditation/reaccreditation • Site resurvey/Identification Checks • Procedures for voucher specimen collection and submission to recognised authority • Identify acceptable level of sampler variation. 	Yes, Training Course, Ring test through NMBAQC Potential for method witnessing											
u) Describe water body status assessment using the method. Identify the % of water bodies in each class. Describe test data set. Has a status assessment map been produced, attach if available.	<table border="1"> <tr> <td>H</td> <td>G</td> <td>M</td> <td>P</td> <td>B</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> 2006 Survey data, results not yet available No	H	G	M	P	B						
H	G	M	P	B								

3. Identify information system requirements associated with running classifications, data storage and access.

Describe the information/data that will be required to run classifications e.g. biological, supporting element and other predictive variables.		
Classification Tool Criteria	Response	Date Signed off
In all cases describe the alpha-numeric properties of the input fields that are required to make classifications. This include taxa dictionaries, predictive variables etc.		
Biological Data <ul style="list-style-type: none"> ▪ Identify the biological data that is required to make classifications, e.g. level of taxonomic enumeration. ▪ Which taxa dictionary will be used? ▪ Has the taxa dictionary been approved by agencies and the Natural History Museum. ▪ Define alpha-numeric features. 	Presence/Absence: Macro algae to species level (reduced species list available) Genus and Species level information, not species level for all taxa, this is indicated on sampling sheets Marine Plants Task Team Macroalgae expert list. Incorporated into UNICORN and then to Biosys for England and Wales. England and Wales: EA & Natural History Museum Presence/Absence of Taxa	
Supporting Element Data <ul style="list-style-type: none"> • Identify the supporting element data that are required to make classifications, and specify their alpha-numeric properties. 	Shore description	

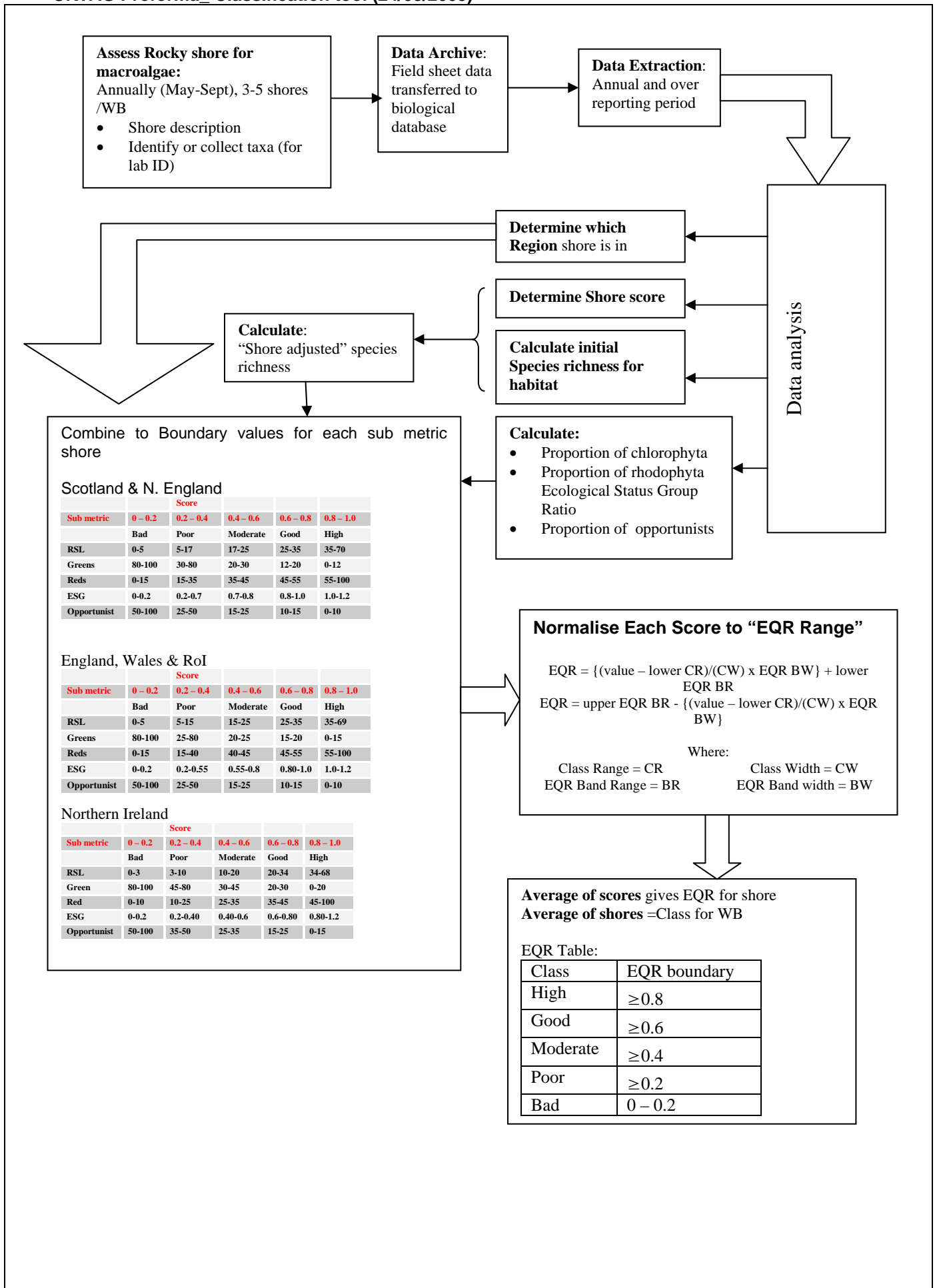
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<p>Predictive Input Variables What predictive map/field determinants are required to make classification assessments, e.g. altitude, river width, etc.</p> <ul style="list-style-type: none"> • Where input variables need to be derived or extracted from other media e.g. maps, GIS etc., describe the procedure for securing this data. • Identify how input fields should be calculated/derived? • What is the frequency that these variables need to be calculated? E.g. each time an assessment is made or once during a river basin plan. • Is there input field commonality with other classification tool projects? Identify these projects. 	<p>Water body, Typology, Site name and location (Grid Reference for centre point of shore), sampling date</p> <p>GIS Maps and EA BIOSYS database (England and Wales) & Excel sheets</p> <p>Analysis required each time assessment is carried out and at least twice per River Basin Planning Cycle</p> <p>Yes – the other TW biological quality elements; phytoplankton, macro-algae, angiosperms & benthic invertebrates require water body and typology information.</p>	
<p>Programming Requirements</p> <ul style="list-style-type: none"> • What is the algorithm programming language supplied from the contractor, e.g. it may simply be written in Excel. 	<p>Currently in excel, for England and Wales some parts translated into EA Biosys database.</p>	

Provide a flow chart describing the classification process, including the algorithm and the alpha-numeric properties of input fields.

Annotated Flow Chart- This box should be expanded as required.

See Reduced Species List (Rocky Shore) Flow Chart on next page



Assess Rocky shore for macroalgae:
 Annually (May-Sept), 3-5 shores /WB

- Shore description
- Identify or collect taxa (for lab ID)

Data Archive:
 Field sheet data transferred to biological database

Data Extraction:
 Annual and over reporting period

Data analysis

Determine which Region shore is in

Determine Shore score

Calculate initial Species richness for habitat

Calculate:
 "Shore adjusted" species richness

Calculate:

- Proportion of chlorophyta
- Proportion of rhodophyta
- Ecological Status Group Ratio
- Proportion of opportunists

Combine to Boundary values for each sub metric shore

Scotland & N. England

Sub metric	Score				
	0 - 0.2	0.2 - 0.4	0.4 - 0.6	0.6 - 0.8	0.8 - 1.0
	Bad	Poor	Moderate	Good	High
RSL	0-5	5-17	17-25	25-35	35-70
Greens	80-100	30-80	20-30	12-20	0-12
Reds	0-15	15-35	35-45	45-55	55-100
ESG	0-0.2	0.2-0.7	0.7-0.8	0.8-1.0	1.0-1.2
Opportunist	50-100	25-50	15-25	10-15	0-10

England, Wales & RoI

Sub metric	Score				
	0 - 0.2	0.2 - 0.4	0.4 - 0.6	0.6 - 0.8	0.8 - 1.0
	Bad	Poor	Moderate	Good	High
RSL	0-5	5-15	15-25	25-35	35-69
Greens	80-100	25-80	20-25	15-20	0-15
Reds	0-15	15-40	40-45	45-55	55-100
ESG	0-0.2	0.2-0.55	0.55-0.8	0.80-1.0	1.0-1.2
Opportunist	50-100	25-50	15-25	10-15	0-10

Northern Ireland

Sub metric	Score				
	0 - 0.2	0.2 - 0.4	0.4 - 0.6	0.6 - 0.8	0.8 - 1.0
	Bad	Poor	Moderate	Good	High
RSL	0-3	3-10	10-20	20-34	34-68
Green	80-100	45-80	30-45	20-30	0-20
Red	0-10	10-25	25-35	35-45	45-100
ESG	0-0.2	0.2-0.40	0.40-0.6	0.6-0.80	0.80-1.2
Opportunist	50-100	35-50	25-35	15-25	0-15

Normalise Each Score to "EQR Range"

$$EQR = \{(value - lower CR)/(CW) \times EQR BW\} + lower EQR BR$$

$$EQR = upper EQR BR - \{(value - lower CR)/(CW) \times EQR BW\}$$

Where:
 Class Range = CR Class Width = CW
 EQR Band Range = BR EQR Band width = BW

Average of scores gives EQR for shore
Average of shores = Class for WB

EQR Table:

Class	EQR boundary
High	≥0.8
Good	≥0.6
Moderate	≥0.4
Poor	≥0.2
Bad	0 - 0.2

4. Adoption and use of classification tools (completed by Task Teams/Agencies)

Adoption by Task Team	Yes/No	Notes on level of adoption
RTT/LTT/MTT	Yes	MTT

Other agencies/organisations – comments (also include member organisations of Task Teams)	
Countryside Council for Wales	Corresponding MPTT Member, MTT Member
Natural England	Corresponding MPTT Member, MTT Member
Scottish Natural Heritage	Corresponding MPTT and MTT Member
CEFAS	MPTT and MTT Member
FRS	MPTT and MTT Member

Adoption by environment agencies	Yes/No	Notes on level of adoption (advice may be provided by Task Team)
England and Wales	Yes	MPTT, MTT
Scotland	Yes	MPTT, MTT
Northern Ireland	Yes	MPTT, MTT
Ecoregion 17/Republic of Ireland (marine ecoregion 1)	Yes	MPTT, MTT

Adoption by UK TAG	Yes/No	Notes on level of adoption
UKTAG		

5. Project Executive Summary- *Insert project Executive Summary*

The UK and Rol Marine Plants Task team have developed a suit of measures to fulfil the normative definitions of the WFD TraC rocky shore macroalgae as part of the Macroalgal Biological Element.

The basic indices are:

- Shore description
- Species richness
- Proportion of chlorophyta (green seaweed's)
- Proportion of rhodophyta (red seaweed's)
- Ecological Status Group Ratio – ESG ratio indicates shift from a pristine state (EGS1 – late successional or perennials) to a degraded state (ESG2 – opportunistic or annuals)
- Proportion of opportunists

All of these are field descriptions and / or identifications from collected samples

Work started on development of a WFD compliant system in 2001 utilising academic and regulatory experts from UK and Republic of Ireland organisations.

The Water Framework Directive (WFD) suggests using abundance and species composition of intertidal seaweed communities for ecological quality classification of rocky seashores, however there are two difficulties with this. According to WFD all sensitive species should be present on a shore. Firstly there is no accepted list of sensitive seaweed species and those, which may be sensitive in one location, may not be so in another. Second, natural successions can result in very large abundance changes of common species, e.g. from almost completely fuccoid-dominated shores to almost totally barnacle-dominated shores, without any change in ecological quality. Studies have shown that numerical species richness, not the list of actual species present, is broadly constant in the absence of disturbance. The ephemeral species, possibly the sensitive members of the community, change regularly in such a way as to conserve species richness. It is proposed that species richness on a defined length of shore be used as a criterion of ecological quality. A database of species found on over 300 shores in the British Isles, under strictly controlled sampling conditions, has given ranges of values of species richness to be expected and has allowed for

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variations in these values due to sub-habitat variability, wave exposure and turbidity to be factored in. A major problem in applying such a tool is the lack of expertise of many workers in critical identification of seaweed species. A reduced species list has been extracted from the database using species commonly present and identifiable with reasonable certainty. A numerical index of ecological quality was developed based on scores for various aspects of the physical nature of the habitat combined with a score for species richness which may be based on the reduced species list three regional lists are used:

- Scotland and Northern England
- England/Wales and RoI
- Northern Ireland

The scoring system also uses further aspects of community structure, such as ecological status groups and the proportions of rhodophyta, chlorophyta and opportunist species.

Members of the North East Atlantic Geographical Intercalibration Group (NEAGIG) Marine Plants Expert group have agreed intercalibration for Northern and Southern Europe where the basic principles behind this tool are being used.

