Project Working Group:

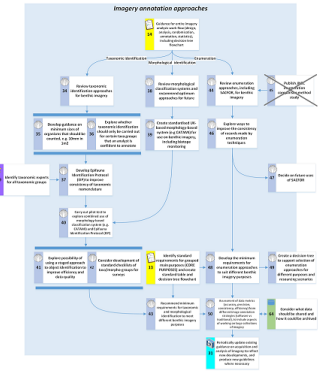
Benthic Imagery Workflow Guidance

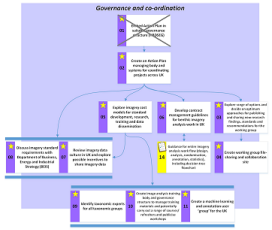
Leads – Ross Bullimore (Cefas), Mike Fraser (Natural England, Environment Agency) & Nicola Foster (University of Plymouth)

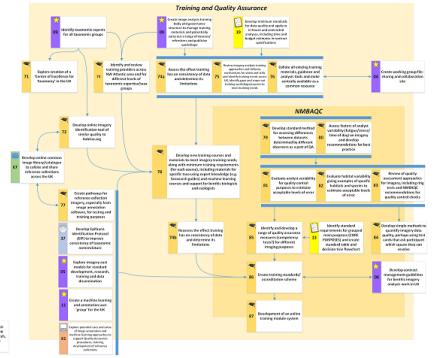
Collaboration & Steering group participants – Expressions of interest:

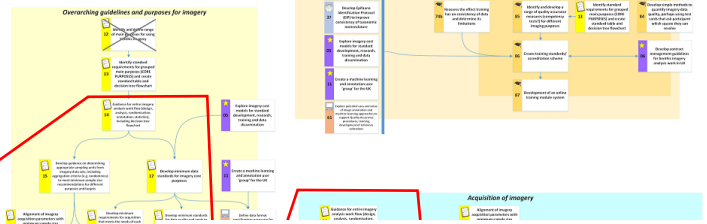
UoP – Kerry Howell, Emma Sheehan, Jamie Davies, SEPA, Envision, NOC – Brian Bett & Jen Durden, PMSL, Eastern IFCA, Seastar Survey, Guardline, JNCC

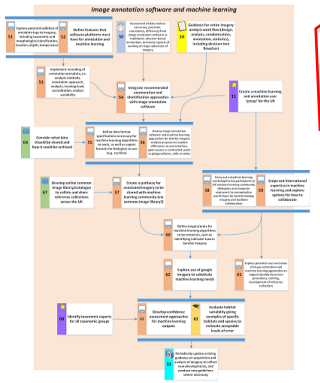
Benthic Imagery Workflow Guidance

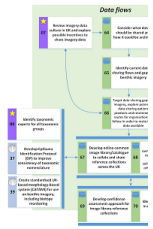


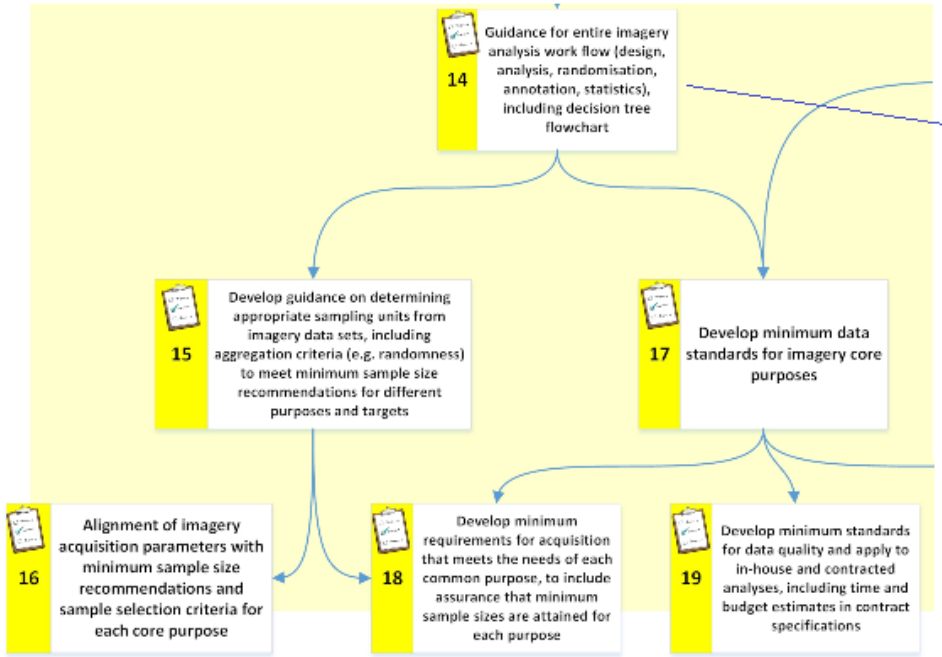


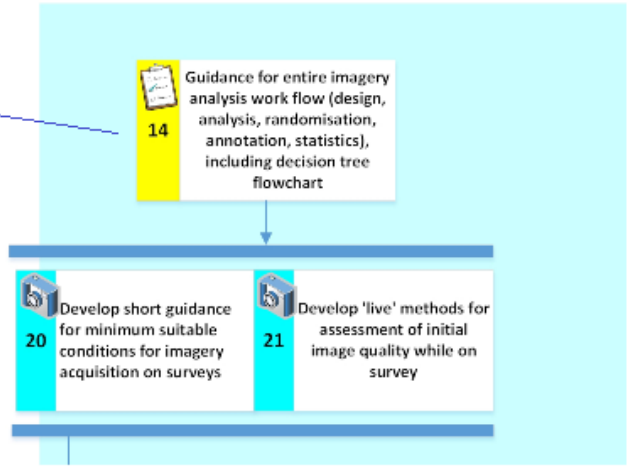












Overarching guidelines and purposes for imagery	**Benthic imagery workflow guidance**	**14**	**Guidance for entire imagery analysis work flow (design, analysis, randomisation, annotation, statistics), including decision tree flowchart**	Action	Annotation order of imagery randomised in procedures	**H**
Overarching guidelines and purposes for imagery	**Benthic imagery workflow guidance**	**15**	**Develop guidance on determining appropriate sampling units from imagery data sets, including aggregation criteria (e.g. randomness) to meet minimum sample size recommendations for different purposes and targets**	Project	Sampling unit guidance	**M**
Overarching guidelines and purposes for imagery	**Benthic imagery workflow guidance**	**16**	**Alignment of imagery acquisition parameters with minimum sample size recommendations and sample selection criteria for each core purpose**	Multiple projects	Acquisition practices aligned with sample size and selection recommendations	**H**
Overarching guidelines and purposes for imagery	**Benthic imagery workflow guidance**	**18**	**Develop minimum requirements for acquisition that meets the needs of each common purpose, to include assurance that minimum sample sizes are attained for each purpose**	Multiple projects	Minimum acquisition standards for standard purposes	**M**
Acquisition of imagery	**Benthic imagery workflow guidance**	**20**	**Develop short guidance for minimum suitable conditions for imagery acquisition on surveys**	Project	Minimum suitable conditions for imagery acquisition on survey	**M**
Acquisition of imagery	**Benthic imagery workflow guidance**	**21**	**Develop 'live' methods for assessment of initial image quality while on survey**	Project	Enhanced on-survey QA and QC of imagery	**M**

Benthic Imagery Workflow Guidance

CICAM Delivery Action Plan

Develop imagery monitoring objectives

WS1. Imagery acquisition
- Optimum acquisition protocols for monitoring data
- Operational and set-up guidance for camera systems
- Ensuring a sufficient sample size

WS2. Image selection
- Assigning utility categories based on monitoring objectives
- Filtering images by quality, Field of View & Viewable Area
- Raw image processing

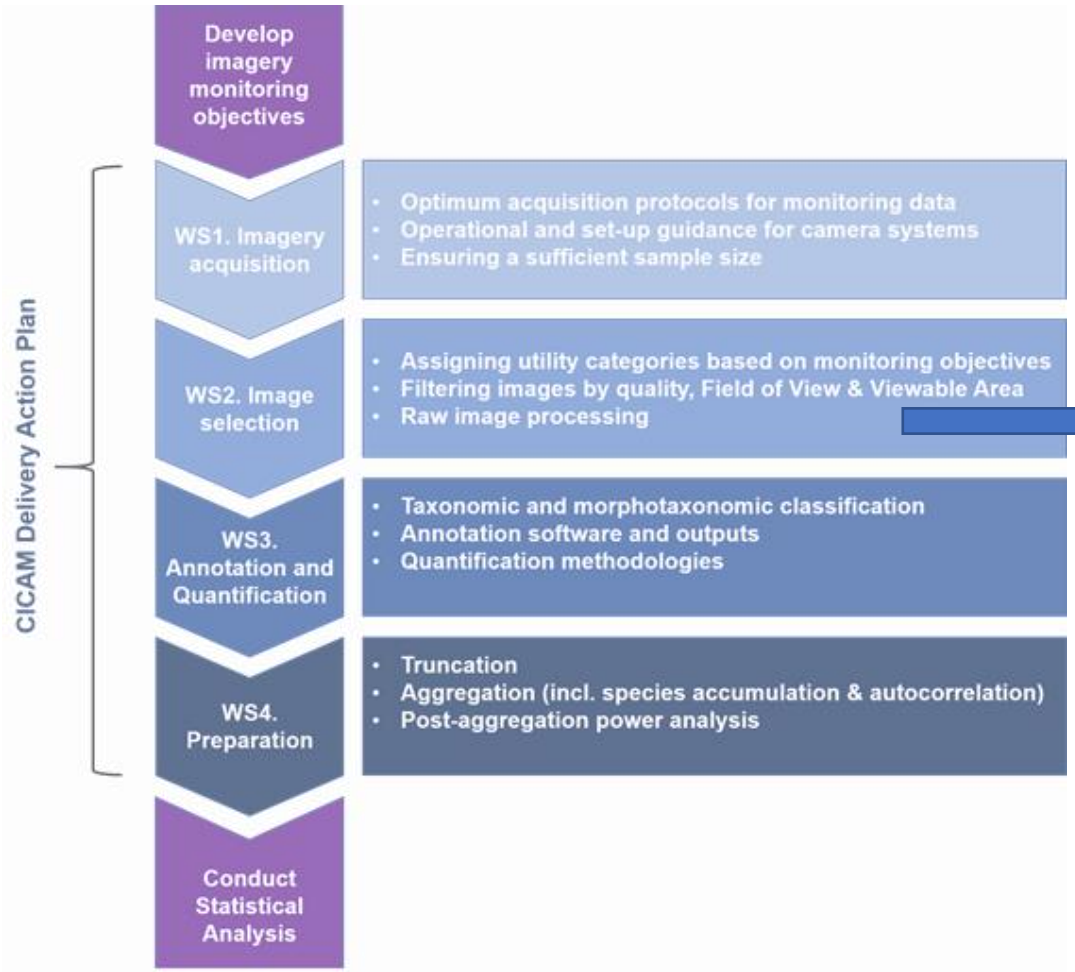
WS3. Annotation and Quantification
- Taxonomic and morphotaxonomic classification
- Annotation software and outputs
- Quantification methodologies

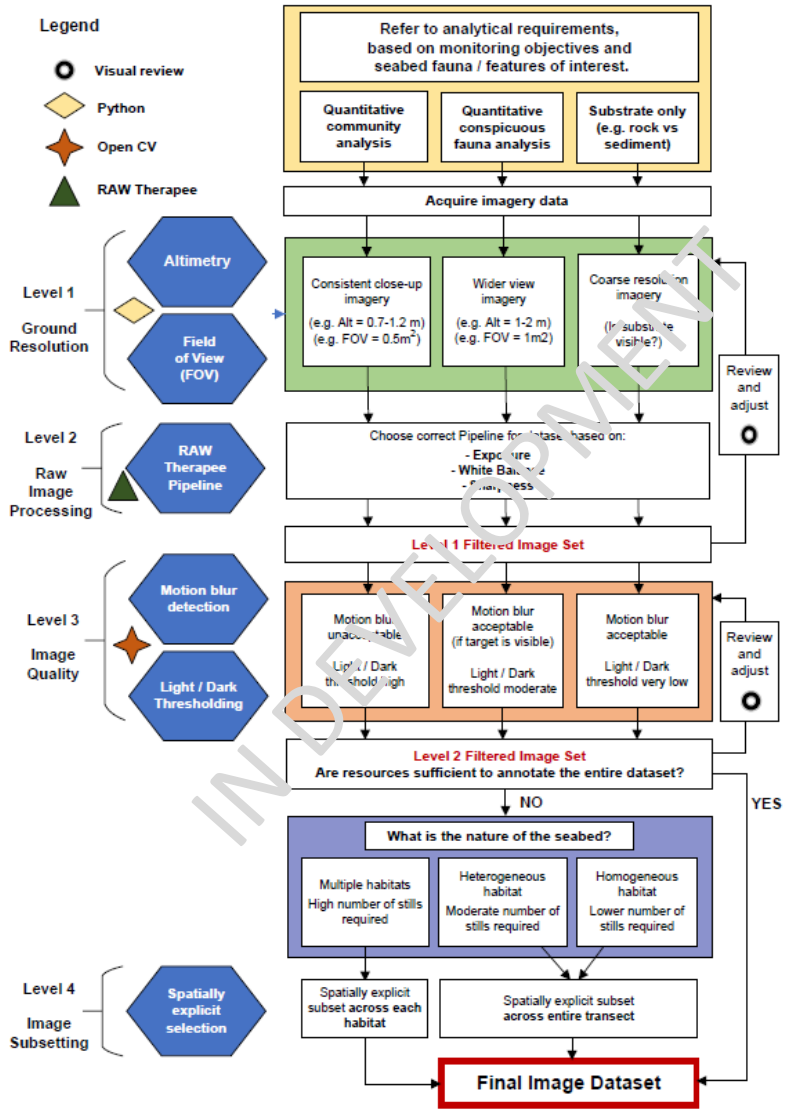
WS4. Preparation
- Truncation
- Aggregation (incl. species accumulation & autocorrelation)
- Post-aggregation power analysis

Conduct Statistical Analysis

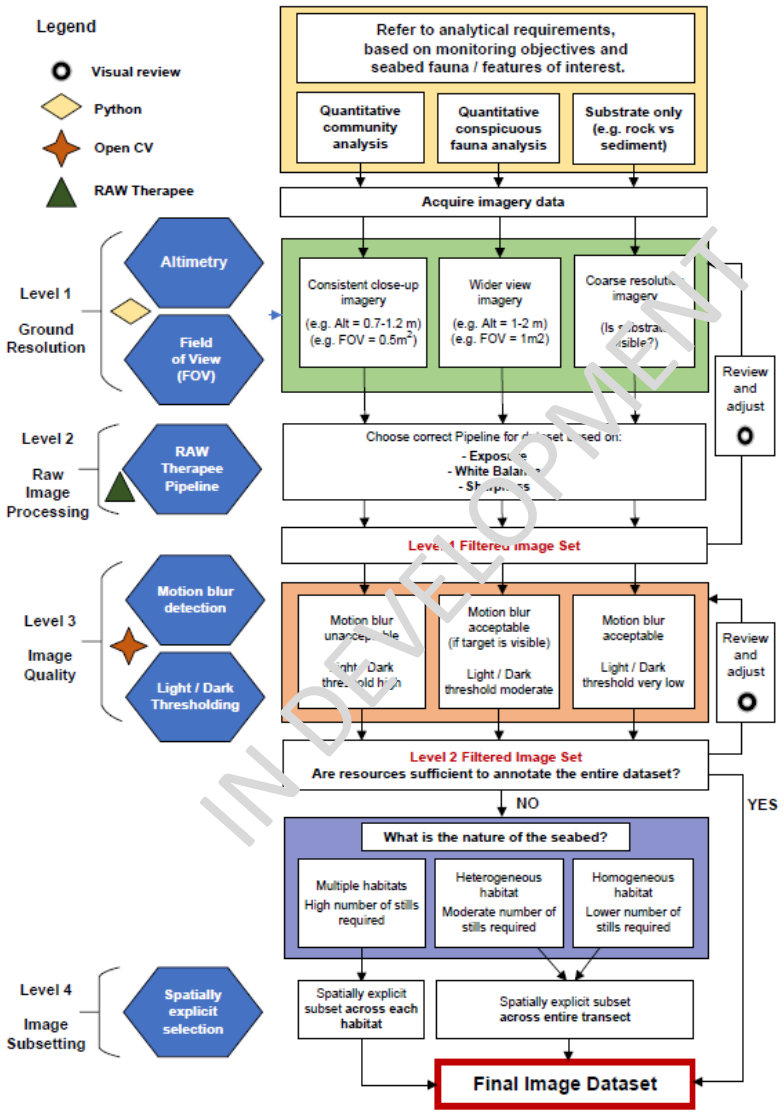
14	**Guidance for entire imagery analysis work flow (design, analysis, randomisation, annotation, statistics), including decision tree flowchart**
15	**Develop guidance on determining appropriate sampling units from imagery data sets, including aggregation criteria (e.g. randomness) to meet minimum sample size recommendations for different purposes and targets**
16	**Alignment of imagery acquisition parameters with minimum sample size recommendations and sample selection criteria for each core purpose**
18	**Develop minimum requirements for acquisition that meets the needs of each common purpose, to include assurance that minimum sample sizes are attained for each purpose**
20	**Develop short guidance for minimum suitable conditions for imagery acquisition on surveys**
21	**Develop 'live' methods for assessment of initial image quality while on survey**

Benthic Imagery Workflow Guidance





Benthic Imagery Workflow Guidance



PWG(s)!

14	**Guidance for entire imagery analysis work flow (design, analysis, randomisation, annotation, statistics), including decision tree flowchart**
15	**Develop guidance on determining appropriate sampling units from imagery data sets, including aggregation criteria (e.g. randomness) to meet minimum sample size recommendations for different purposes and targets**
16	**Alignment of imagery acquisition parameters with minimum sample size recommendations and sample selection criteria for each core purpose**
18	**Develop minimum requirements for acquisition that meets the needs of each common purpose, to include assurance that minimum sample sizes are attained for each purpose**
20	**Develop short guidance for minimum suitable conditions for imagery acquisition on surveys**
21	**Develop 'live' methods for assessment of initial image quality while on survey**