Annex 1 - Detailed Specification. England Urban Habitat Maps – Expansion of mapped areas.

Background to Natural England.

Our remit

Natural England is the government’s advisor on the natural environment. We provide practical advice, grounded in science, on how best to safeguard England’s natural wealth for the benefit of everyone.

Our remit is to ensure sustainable stewardship of the land and sea so that people and nature can thrive. It is our responsibility to see that England’s rich natural environment can adapt and survive intact for future generations to enjoy.

NERC Act

Natural England was formally established on 01 October 2006 following the successful passage of the [Natural Environment and Rural Communities (NERC) Act 2006](http://www.opsi.gov.uk/acts/acts2006/ukpga_20060016_en_1) through Parliament. We are an independent statutory Non-Departmental Public Body.

The NERC Act sets out Natural England's purpose: to ensure that the natural environment is conserved, enhanced and managed for the benefit of present and future generations, thereby contributing to sustainable development.

The Act states that this purpose includes:
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* promoting nature conservation and protecting biodiversity
* conserving and enhancing the landscape
* securing the provision and improvement of facilities for the study, understanding and enjoyment of the natural environment
* promoting access to the countryside, open spaces and encouraging open air recreation
* contributing in other ways to social and economic wellbeing through management of the natural environment.

You can [read more about what we do](https://www.gov.uk/government/organisations/natural-england/about) on GOV.UK.

England Green Infrastructure Mapping Database - Urban Habitat and Naturalness Mapping – Expansion.

Project reference - UHM (E).

Background.

The England Green Infrastructure Mapping database is a part of the England Green Infrastructure Standards Framework and is being delivered as part of the Natural Capital and Ecosystems Assessment Programme

The current version of the England Green Infrastructure Mapping can be viewed via the link below. Please note that this does not include any of the existing (Phase 1) Urban Habitat and Naturalness mapping.

[Home (naturalengland.org.uk)](https://eur03.safelinks.protection.outlook.com/?url=https%3A%2F%2Fclicks.eventbrite.com%2Ff%2Fa%2FB_lhmLe6lSzEykzJa0id7g~~%2FAAQxAQA~%2FRgRjk2ROP0RLaHR0cHM6Ly9kZXNpZ25hdGVkc2l0ZXMubmF0dXJhbGVuZ2xhbmQub3JnLnVrL0dyZWVuSW5mcmFzdHJ1Y3R1cmUvSG9tZS5hc3B4VwNzcGNCCmGyzjCyYSIWXadSIW1hcnRpbi5tb3NzQG5hdHVyYWxlbmdsYW5kLm9yZy51a1gEAAAAAA~~&data=05%7C01%7CMartin.Moss%40naturalengland.org.uk%7C160138e94e8e43b0c07408dad38ce2d7%7C770a245002274c6290c74e38537f1102%7C0%7C0%7C638054899321484718%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=aN0BFX6dI2E03vTyi3So%2Boj9CgIWmLrVQTUphCSn0E4%3D&reserved=0)

Information about the Natural Capital and Ecosystems Assessment Programme can be found via the link below.

[Natural Capital and Ecosystem Assessment Programme - GOV.UK (www.gov.uk)](https://www.gov.uk/government/publications/natural-capital-and-ecosystem-assessment-programme/natural-capital-and-ecosystem-assessment-programme)



The overall purpose of the England Green Infrastructure Mapping Database is to provide England level data to support a range of planning, strategy and resource targeting processes to help and designed to help deliver the England Green Infrastructure Standards framework.

Project scope and overview.

An Earth Observation based approach to developing Urban Habitat and Naturalness Maps was developed during a pilot phase in 2021/22 and further refined during three trial phases between 2022/23 and 2024/25.

During 2024/25, the resulting data and method were technically reviewed by Axion Solutions, and a limited stakeholder engagement exercise was run to gain feedback on the outputs from the pilots and trialling phases.

A simplified image file of the Broad Urban Habitat data is included in the [Green Infrastructure Map](https://designatedsites.naturalengland.org.uk/GreenInfrastructure/Map.aspx). However the data is not open and a sample of the data (for initial reference purposes) can only be made available to the successful contractor under PSGA Contractor License at the start of the contract.

Because the method has developed over a 4 year period and involved a pilot (3 cities) and three trial phases, in addition to a stakeholder feedback exercise and technical review, the existing mapping includes differences relating to developments as they were made.

As a result of the feedback and review, some final adjustments have been developed to the Urban Habitat Mapping Method (these are set out in annex 5) and Natural England are running a sister contract to this one to finalise the method and apply to bring all current data into the same format.

The amended method will be an output of the sister contract and actual work to undertake this contract will only start once this amended method is available. This is anticipated for July 2025.

The amendments are however fairly minor and the processing method in Trimble eCognition is not likely to change substantially although amendments will affect exactly how the source data will be processed within the main software (Trimble eCognition) used to generate the Urban Habitat Maps.

The existing User Guide for map production is attached as Annex 2 with Annexes 3 and 4 setting out some minor ruleset additions derived from trial phases of mapping and Annex 5 setting out the amendments arising from the Stakeholder exercise. Combining these additions and amendments will create the final method iteration that will be applied in this contract. Annexes 2, 3, 4 and 5 are included for reference.

A short overview document of the Urban Habitat Mapping process is also included as annex 6.

Submitted quotes will need to confirm that they will follow the final amended method, once supplied; (subject to any changes agreed with the project steering group) and that they are able in terms of technical skills and capacity to deliver Urban Habitat Mapsfor the listed locations below.

Timetable.

The project is anticipated to begin in early July 2025 September 2024 with a target outputs delivery date of 27th February 2026. A detailed timeline is set out in the Request for Quote.

Requirement

The areas of interest for mapping are set out in the two lists below. There are a “Core” set of areas and an “Additional” set.

The submitted quote should provide costs for the Core and Additional lists SEPAREATELY and for each listed location with a given specific cost

Defining the Areas of Interest.

A location name is given for each Area of Interest that identifies the main urban area of interest.

Shape files for the Areas of Interest are provided with the Request for Quate documentation.

The areas have been determined by combining all the Built Up Areas (from the Ordnance Survey Built Up Areas dataset) for the urban area that are contiguous and buffering the outer Built Up Area edge by 1 km (to map the urban edge but avoid mapping large rural areas as the method is not designed to work in rural landscapes).

Any satellite Built Up Areas that appear within or partially within the main 1 km buffer have been buffered themselves and mapped in whole as part of the overall Area of Interest.

The tables below lists the Core and Additional Areas of Interest with some rough estimates on likely size of area in square kilometres. These areas aa just a guide and may be different to those actually mapped once the Areas of Interest have been delineated using the approach set out above. However, the overall size of the areas to be mapped is likely to be near the total area identified.

Core Areas of Interest.

|  |  |
| --- | --- |
| Area of Interest | Area of provided AoI shapefile. |
| Blackpool (and contiguous Built up Areas with 1 km buffer) | 137 |
| Doncaster and Barnsley (Core Built up Areas only with 1 km buffer) | 64 and 52 (116) |
| Lincoln (Contiguous Built Up Areas and 1 km buffer) | 90 |
| South Midlands Towns (Core built up areas of Bedford, Luton and Milton Keynes with contiguous Built Up Areas and 1 km buffer) | 71, 107 and 154 = 332 |
| Peterborough (and contiguous Built up Areas) | 87 |
| Norwich (City and contiguous Built up Areas) | 94 |
| Reading (City and 1 km buffer) | 90 |
| Thanet (Birchington, Westgate, Margate, Ramsgate and Broadstairs) (Administrative area and 1km buffer) | 163 |
| Brighton and Hove (administrative area and 1 km buffer) | 139 |
| Southampton and Portsmouth (inc contiguous administrative areas and 1 km buffer) | 308 |
| Bournemouth, Christchurch and Poole (Administrative area and 1 km buffer) | 257 |
| Bristol (City and contiguous Built up Areas with 1 km buffer) | 233 |
| Torbay (Administrative area and 1 km buffer) | 170 |
| Cornish Towns (Core urban areas of Camborne, Redruth and Portreat / Hayle with 1 km buffers) | 50 (Redruth, Camborne 42, and Portreath 8), 17 (Hayle), (Total = 67) |
|  |  |
| Total | 2283 |

Additional Areas of Interest.

|  |  |
| --- | --- |
| Area of Interest | Extents of AoI in provided shapefile (sqkm). |
| Carlisle (Core urban area contiguous Built Up Areas with 1km buffer) | 63 |
| Preston and Chorley (Core urban areas of contiguous Built Up Areas with 1 km buffer) | 153 |
| Hull (Contiguous Built up Areas with 1 km buffer) | 161 |
| Scunthorpe and Grimsby (Core Built up Areas of contiguous Built Up Areas with 1 km Buffer) | 70 (Scunthorpe) and 74 (Grimsby) Total = 144 |
| Oxford (Core city with contiguous Built up Areas and 1 km buffer) | 88 |
| Southend, Castle Point and Basildon (Administrative areas with 1 km buffer) | 242 |
| Swindon (Administrative area with 1 km buffer) | 316 |
|  |  |
| Total | 1167 |

Commercial software usage.

Please note that the method requires the use of some commercial software. **Costs/licenses associated with the use of these software should be included in the prices as eligible project costs. Please cost use of commercial software separately for the Core and Additional Areas.**

Please see section 2 of the User Guide (Annex 2) for notes on software requirements.

Costs associated with licenses should be included as part of the project costs and identified clearly in the quote.

The two commercial software requirements are;

1. LASTools [commercial]

Download: <https://rapidlasso.com/lastools/>

 LASTools is used to merge the EA LiDAR tiles into single files. A free version of the software exists for smaller areas, but artefacts are voluntarily introduced at larger scales when used without a commercial license. Any software that allows LAZ tile merging could be used as an alternative.

2. Trimble eCognition 10.3 [commercial]

Download: <https://geospatial.trimble.com/ecognition-download>

This is the main software used for the urban habitat and Naturalness mapping workflow and we are not aware of any alternative that is currently available. Licenses need to be purchased, although a free trial version is available for initial testing and training. The official UK provider for Trimble eCognition software licenses is Korec: https://www.korecgroup.com/.

There are two types of eCognition license: Developer and Server. Developer licenses allow ruleset modifications and at least one is required for initial threshold setting. The Server licenses allow tiling of larger areas for more efficient parallel batch processing. It is advised to purchase as many Server licenses as can be supported by the user’s computing power and budget.

eCognition licenses can be renewed monthly and offer flexibility. Users should consider preparing their datasets and performing initial tests before purchasing Server license for efficient use of the license during the rental period.

Tasks.

Task 1a – Apply agreed amended mapping approach to the listed areas of Core Areas of Interest.

Task 1b – Apply the agreed amended mapping approach to the list of Additional Areas of Interest.

Task 1b will be subject to confirmation at start of contract and is dependent on a decision once full project costs are known.

Only Urban Habitat Maps will be required as the Naturalness element of the method is still developmental. No Naturalness or Combined Factor Naturalness maps will be required and this part of the method should be ignored.

Task 2 – Accuracy Assessments and Data Confidence Overlay Map.

Confusion matrices should be used to assess the accuracy of the Detailed Urban Habitat Maps and the pe3rcent accuracies derived should be used to create an overlay for the Detailed Habitat Maps showing confidence level for each APGB date tile.

Task 2 – Create a short technical report detailing any issues or problems encountered in data processing to deliver task 1.

Issues will be any minor amendments that were required due to new situations or circumstances that required some modification to the overall mapping method.

Problems are any events that created processing problems (relating to issues within the data etc) that were encountered during processing and record outcomes either as steps taken to resolve or remaining problems that could not be resolved and which data / date tiles are known to be affected.

**Outputs.**

Deliver the spatial data outputs in GIS format compatible with ArcGIS Pro (see data requirements set out in Annex 7) for the following outputs;

1. Urban Habitat Broad Classification Maps for the listed target areas in tiles aligned with the Ordnance Survey National grid and in 5 x 5 Square kilometres tile sizes.

2. Urban Habitat Detailed Classification Maps for the listed target areas in tiles aligned with the Ordnance Survey National Grid and of 5 x 5 square kilometres (same tile area as for Broad Classification).

3. Accuracy assessments (Confusion matrices) for each APGB date tile for both the Broad and Detailed Urban Habitat Maps along with Data Confidence Overlay maps for each APGB tile.

4. A short technical report detailing any amendments applied or problems encountered during processing.

4. Data requirements.

Required data inputs are listed in Section 3 of Annex 2. Please note that data that is not Open Government License will be provided to the successful contractor under PSGA Contractor License terms and conditions once the contract is live.

Required data outputs. Data should be provided in accordance with the requirements set out in the Data Standard (Annex 7).

Sustainability

Natural England protects and improves the environment and is committed to reducing the sustainability impacts of its activities directly and through its supply chains. We expect the Contractor to share this commitment and adopt a sound, proactive sustainable approach in keeping with the 25 yr environmental plan/our commitments compliant with all applicable legislation. This includes understanding and reducing direct and indirect sustainability impacts and realising opportunities, including but not restricted to; resilience to climate change, reducing greenhouse gas emissions, water use and quality, biosecurity, resource efficiency and waste, reducing the risk of pollution, biodiversity, modern slavery and equality, diversity & inclusion, negative community impacts.

As a delivery partner, the successful contractor is expected to pursue sustainability in their operations, thereby ensuring the Contracting Authority is not contracting with a supplier whose operational outputs run contrary to the Contracting Authority’s objectives. The successful contractor will need to approach the project with a focus on the entire life cycle of the project.

Outputs and Contract Management

Martin Moss will be the Natural England Contract Manager for this project.

A Project Steering Group of Natural England and successful contractor representatives will be established at start of contract to oversee project delivery. It is anticipated project progress meetings will be held monthly (by Teams) from the initial project inception meeting.

All meetings will be online via Teams.