ARCADIS Design & Consultancy for natural and built assets

REALISING THE GREEN VISION

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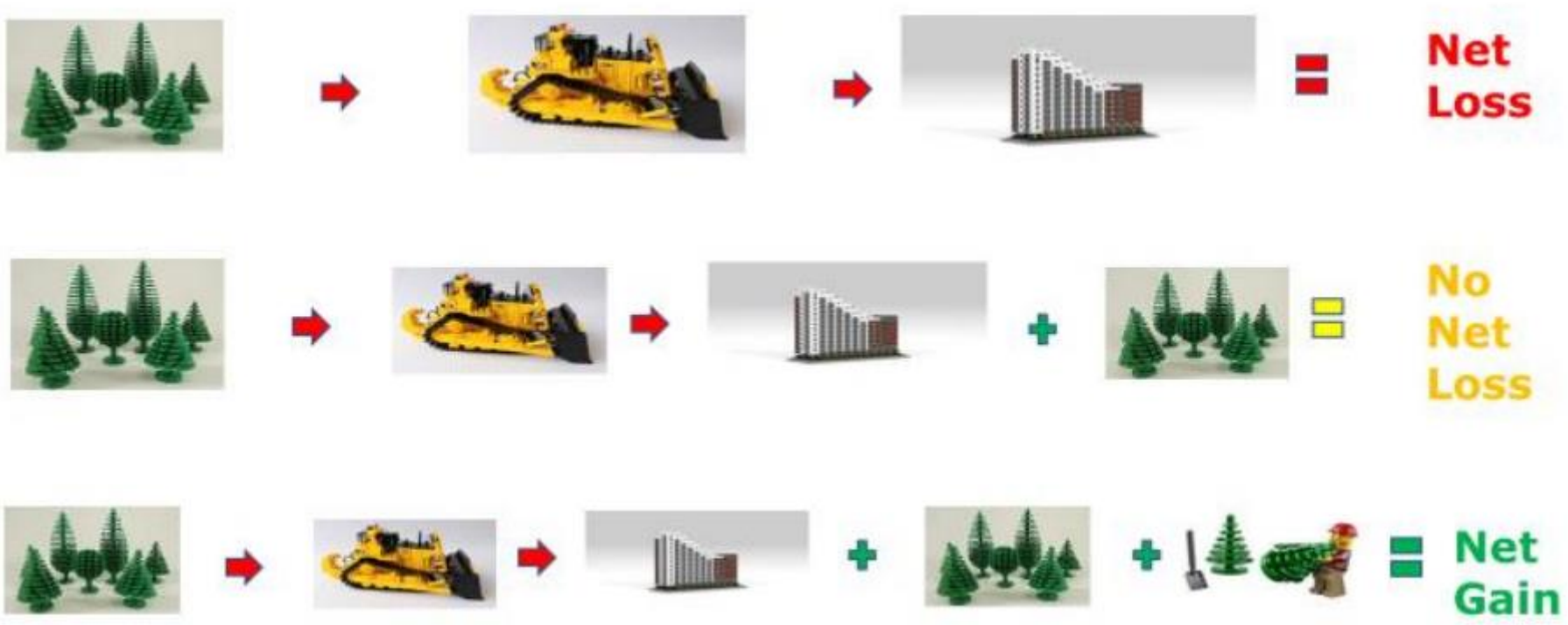
CONTENT

- Introduction to Biodiversity Net Gain (BNG)
- BNG Feasibility and Strategy: Case study – Yorkshire Water
- Delivering BNG and Environmental Net Gain (ENG): Case study – Northstowe Ecotown Offsetting, Setchel Fen

Biodiversity Net Gain – The Basics



Biodiversity post development — Baseline Biodiversity = Biodiversity net gain/loss

Biodiversity Net Gain – the Principles

Principle 1. Apply the Mitigation Hierarchy

Principle 2. Avoid losing biodiversity that cannot be offset by gains elsewhere

Principle 3. Be inclusive and equitable

Principle 4. Address risks

Principle 5. Make a measurable Net Gain contribution

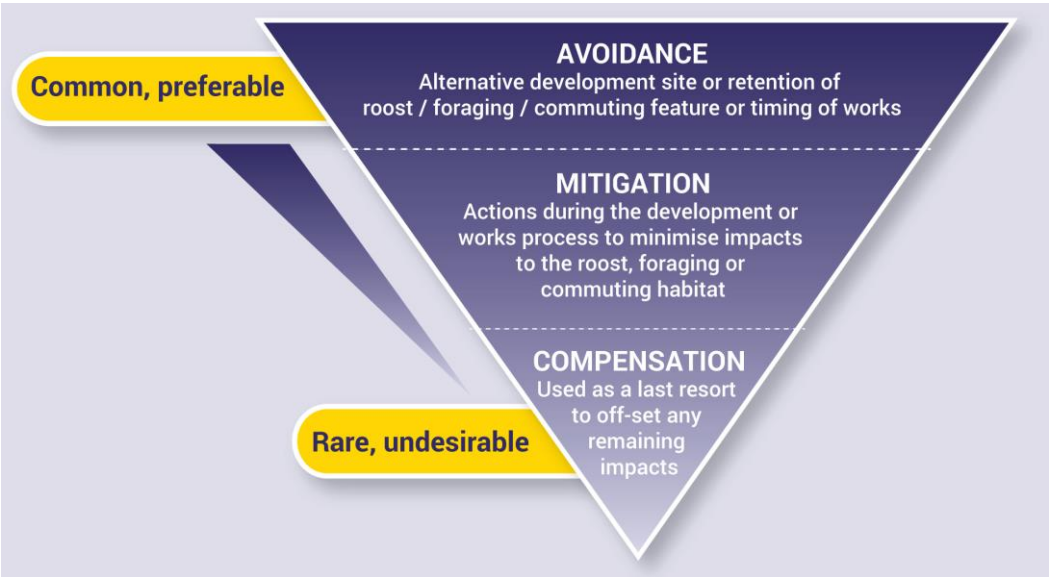
Principle 6. Achieve the best outcomes for biodiversity

Principle 7. Be additional

Principle 8. Create a Net Gain legacy

Principle 9. Optimise sustainability

Principle 10. Be transparent



CIEEM Chartered Institute of Ecology and Environmental Management

IEMA

ciria

WHAT IT DOES, AND DOES NOT DO…

- Totality of habitats before and after assessed
- Cannot assess irreplaceable habitats, such as ancient woodland
- Not accountancy
- Design BNG for nature first, before metrics
- Do not design BNG based on numbers
- Don’t achieve net gain but forget ecosystem service or ecological function
- Can’t combine linear and spatial units
- Doesn’t greenwash other issues or considerations

CALCULATING A BIODIVERSITY UNIT

- **Area habitats:**
  - Distinctiveness X
  - Area (ha) X
  - Condition X
  - Strategic X
  - Connectivity

= Biodiversity Units

- **Linear habitats:**
  - Distinctiveness X
  - Length (m) X
  - Condition X
  - Strategic X
  - Connectivity

= Biodiversity Units

COLLECTING DATA

1. Habitat distinctiveness
2. Condition data – this is based on a set of ‘criteria’ with pass or fail

Condition Table **Lake Habitat Types**

Habitat Description

- This covers all water bodies over 2 ha in area. Expert judgement should be used to decide if a water body between 1 and 2 ha area is assessed as a pond or as a lake.

Condition Assessment Criteria

The Freshwater Biological Association ‘Habitat Naturalness Assessment’ is used to assess the condition of lakes. The average naturalness assessment scores for a lake are then converted into scores condition scores for use in biodiversity metric 2.0 (see below).

Details of the methodology for assessing naturalness of lakes are available at: http://priorityhab.wpengine.com/contribute/. The key documents are:

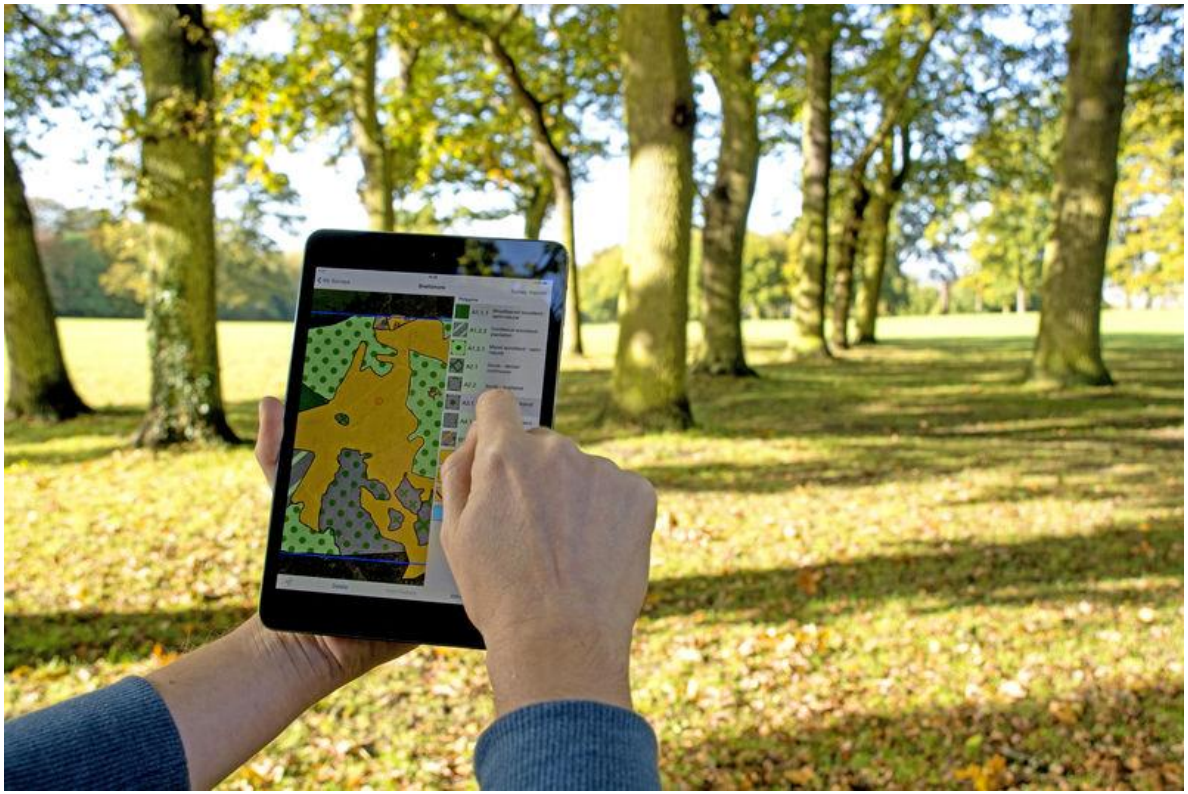
- Lake naturalness assessment – guidance document (PDF)
- Annex I – Printable lake naturalness survey form to use in field (PDF)
- Annex II – Physical naturalness photographs (PDF)
- Annex III – Hydrological naturalness photographs (PDF)
- Annex IV – Chemical naturalness photographs (PDF)
- Annex V – Plant functional group photographs (PDF)
- Annex VI – Further species recording (PDF)

The following criteria indicate the characteristics of a good quality lake.

1. Are of good water quality and contain a range of features characteristic of that waterbody type.
2. There should be no obvious sign of pollution or of inappropriate quality of the water supply.
3. The water body should be set within a semi-natural habitat.
4. Clear water is dominated by plants (and the water is not turbid or green).
5. A marginal fringe of emergent vegetation is present.
6. A range of submerged and floating leaved plants is present.
7. The fish community comprises a range of suitable species if the water body is large enough to support them. Being absent from Ponds.
8. There is no artificial drainage impacting on water bodies, or lowering of the waterbody, which would include outfalls that have been deepened and widened.
9. The water level and its management should be appropriate throughout the year for the waterbody type.

[For Aquifer-fed, naturally fluctuating water bodies (mainly fluctuating meres in Norfolk) water depth varies from 6 m in some cases to complete drying out for a period of time. Characterised by strikingly obvious concentric zones of vegetation in these lakes, especially when they are in their dry phase. Water chickweed and common nettle are typical of the damp centre of Breckland mere basins, with a broad band of reed canary-grass at a slightly higher level. Pondweeds and stoneworts are present during wet phases.]

Condition	Average ‘Habitat Naturalness Assessment’ class	Score
Good	1 Natural	3



UNDERSTANDING DISTINCTIVENESS

- Distinctiveness is informed by species richness, rarity and the degree to which a habitat supports species rarely found in other habitats.
- Distinctiveness scores are pre-set – using simple rules and expert judgement

Habitat	Distinctivness category
Grassland - Bracken	Medium
Grassland - Floodplain Wetland Mosaic (CFGM)	High
Grassland - Lowland calcareous grassland	High
Grassland - Lowland dry acid grassland	V.High
Grassland - Lowland meadows	V.High
Grassland - Modified grassland	Low
Grassland - Other lowland acid grassland	Medium
Grassland - Other neutral grassland	Medium
Grassland - Tall herb communities	High
Grassland - Upland acid grassland	Medium
Grassland - Upland calcareous grassland	High
Grassland - Upland hay meadows	V.High

UNDERSTANDING DISTINCTIVENESS

Condition Table **Grassland Habitat Types**

Habitat Description

- Includes both agricultural, recreational, amenity, road verges and semi-natural grassland types including Priority Habitat Grasslands on all soil types.
- Will be dominated by grassland species with very little (if any) dwarf shrub, wetland or wooded species within the sward.
- Will exist above and below the level of enclosure at all altitudes.

Condition Assessment Criteria

1. The area is clearly and easily recognisable as a good example of this type of habitat and there is little difference between what is described in the relevant habitat classifications and what is visible on site.
2. The appearance and composition of the vegetation on site should very closely match the characteristics for the specific Priority Habitat [i.e as described by either the Phase 1 Habitat Classification or the UK Habitat Classification], with species typical of the habitat representing a significant majority of the vegetation.
3. Wildflowers, sedges and indicator species for the specific Priority grassland habitat are very clearly and easily visible throughout the sward and occur at high densities in high frequency. See relevant Habitat Classification for details of indicator species for specific habitat.
4. Undesirable species and physical damage is below 5% cover.
5. Cover of bare ground greater than 10% (including localised areas, for example, rabbit warrens).
6. Cover of bracken less than 20% and cover of scrub and bramble less than 5%.

- Assess each criteria as either PASS or FAIL
- Notes at end of table provide further guidance

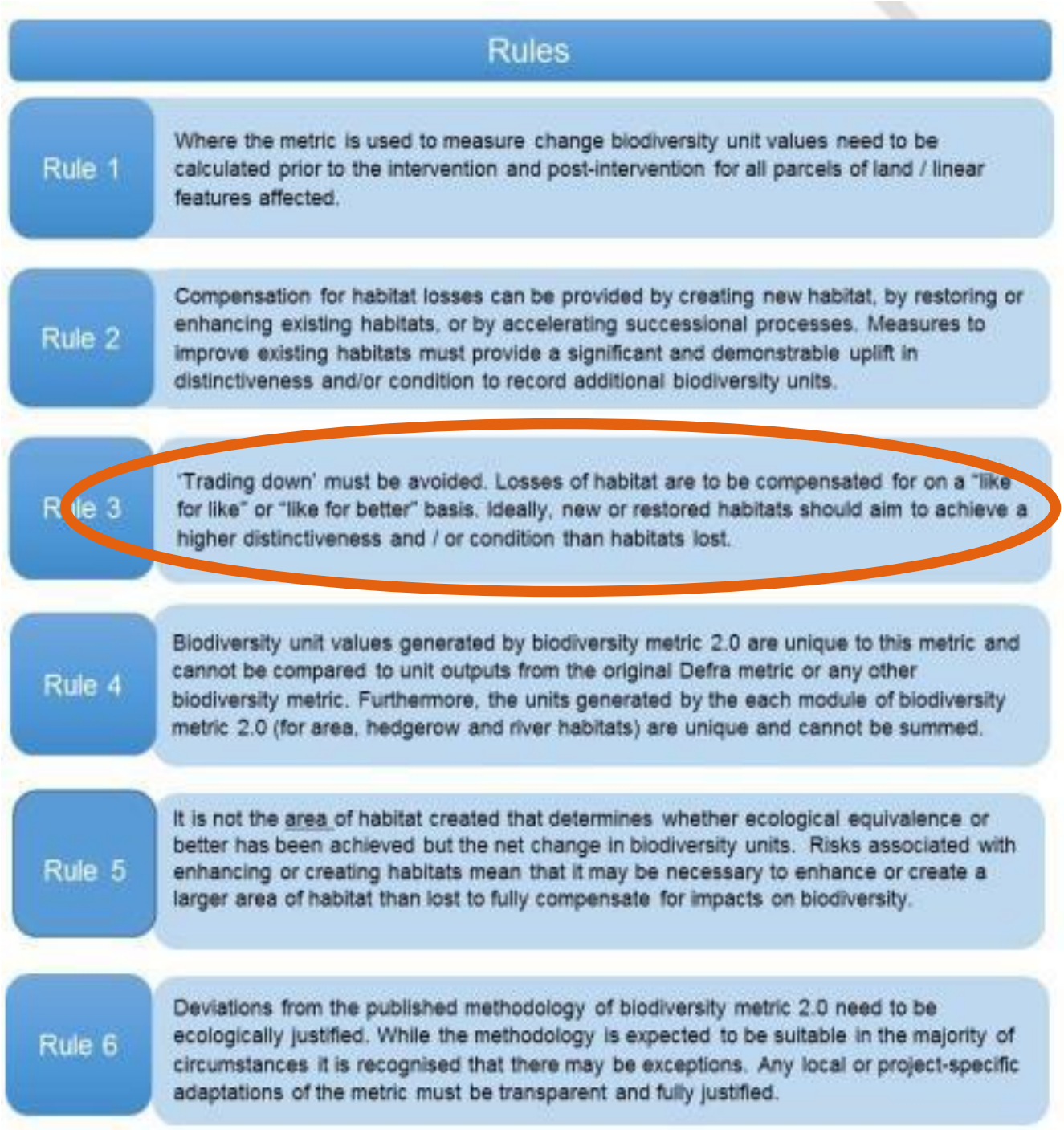
Undesirable species:

- creeping thistle *Cirsium arvense*, spear thistle *Cirsium vulgare*, curled dock *Rumex crispus*, broad-leaved dock *Rumex otusifolius*, common ragwort *Senecio jacobea*, common nettle *Urtica dioica*, creeping buttercup *Ranunculus repens*, white clover *Trifolium repens*, cow parsley *Anthriscus sylvestris*, marsh thistle *Cirsium palustre* and marsh ragwort *Senecio aquaticus*.

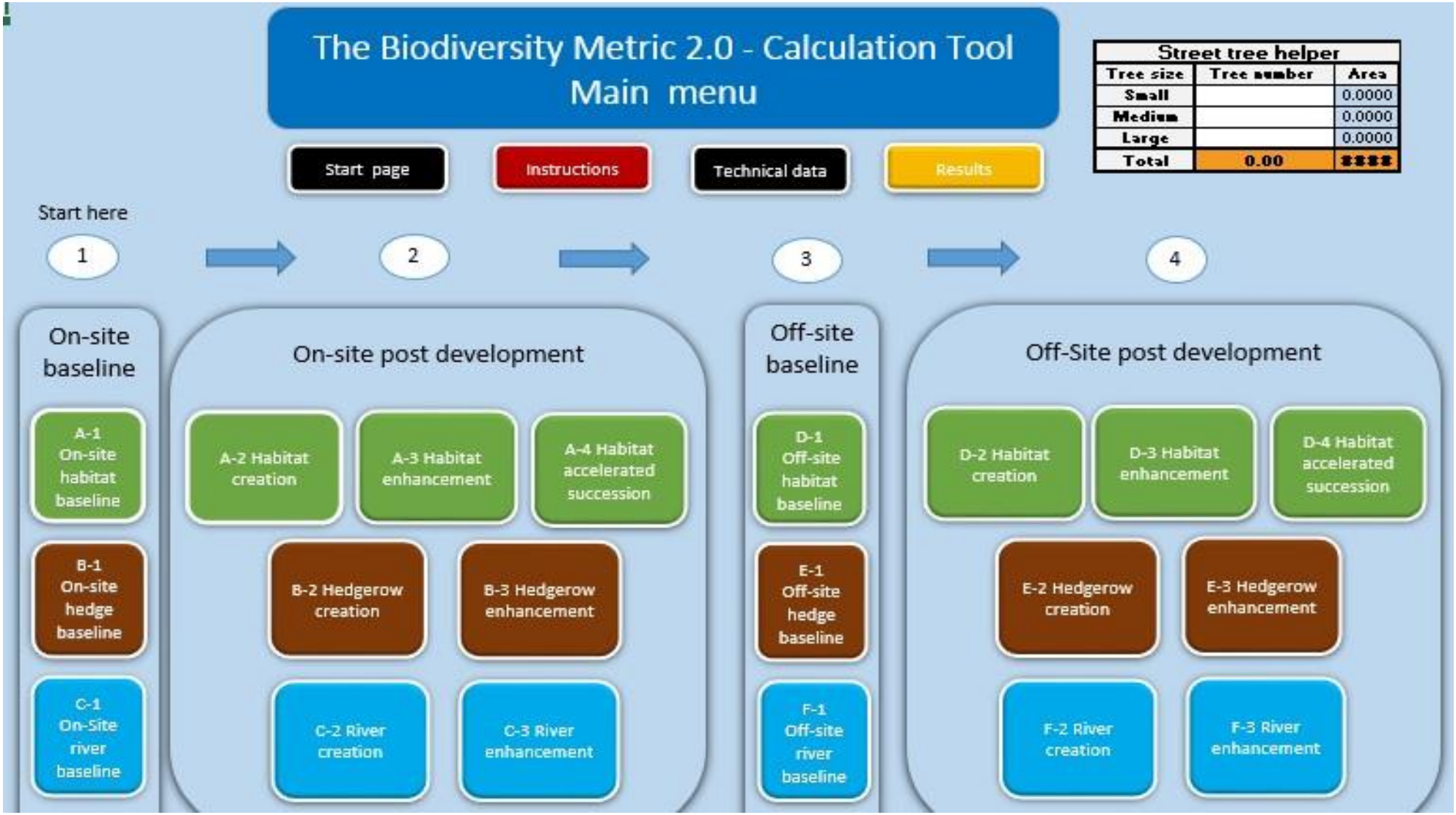
Notes

- Physical damage to the vegetation from: excessive poaching, damage from machinery use or storage, or any other damaging management activities.

USING THE TOOL…THE RULES



THE TOOL



CURRENT / FUTURE METRIC DEVELOPMENTS…

- Connectivity scores set at low currently
- Updated tool due in Spring 2021 – Biodiversity Metric 3.0?

FEASIBILITY AND STRATEGY: CASE STUDY – YORKSHIRE WATER

- YW aspiration to achieve Biodiversity Net Gain (BNG) during its Asset Management Period of 2020-2025
- 10% requirement in upcoming Environment Bill
- Carry out retrospective BNG assessments on historic YW developments

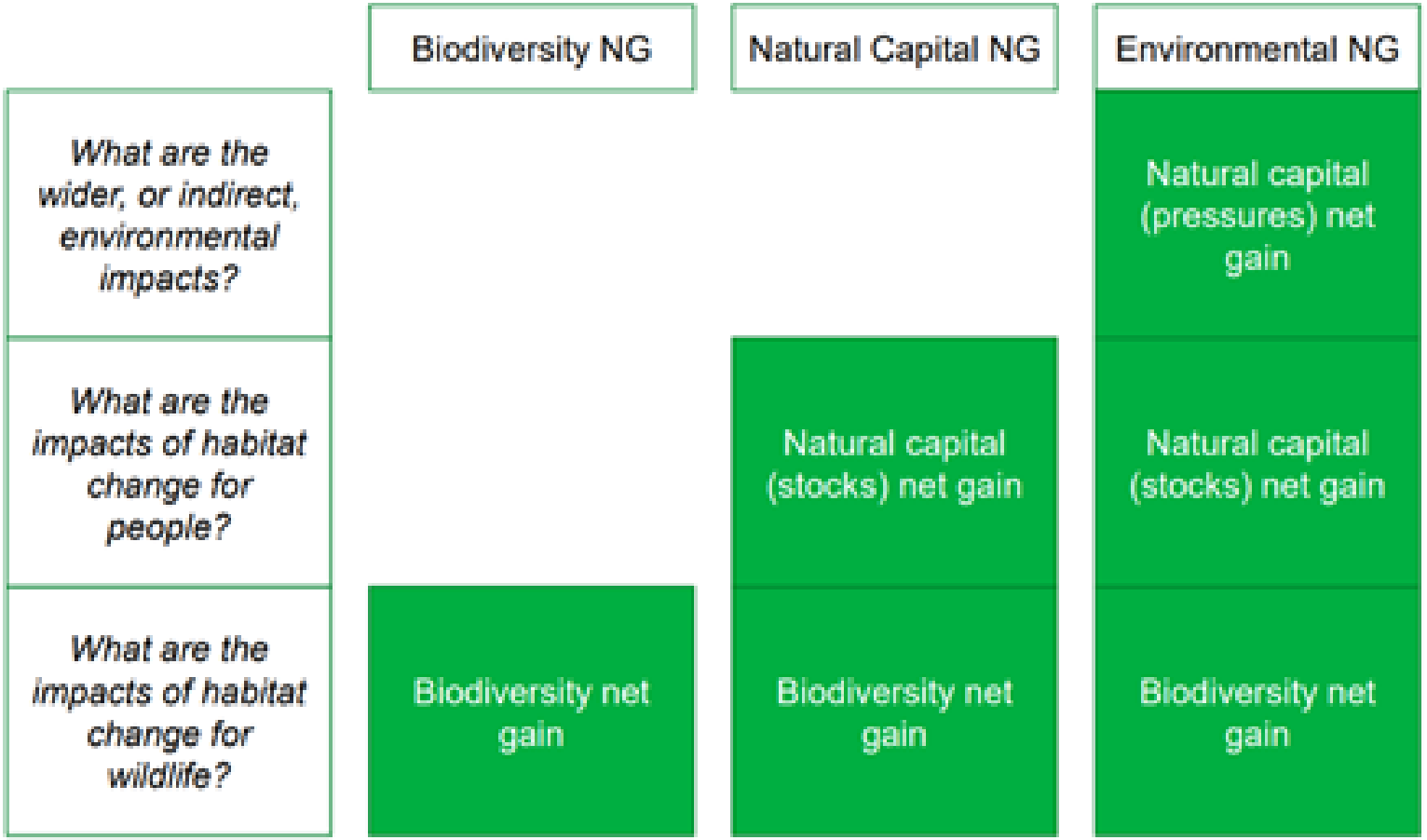
FEASIBILITY AND STRATEGY: CASE STUDY – YORKSHIRE WATER

- Potential commercial, governance and legal requirements to achieve BNG
  - Difficult to achieve post-hoc
  - Consider from beginning – e.g. what are key habitats to retain, avoiding trading down
  - Typically achievable on-site with consideration at the outset

ACHIEVING BIODIVERSITY NET GAIN

- Potential commercial, governance and legal requirements to achieve BNG
  - Tweak data collection and reporting framework maximise benefits and ensure consistency
    - E.g. invasive species and expanded guidance in some areas to cover legal compliance
    - Contribute or delivering existing YW CSR/PR 19 mandated goals
  - Ensuring consistency for YW between suppliers (SMEs)
  - Additional costs?
  - Management plans and monitoring key
  - Speaking to right people at the right time
  - Funding opportunities
  - Environmental Net Gain coming?

ACHIEVING ENVIRONMENTAL NET GAIN



[1] Embedding Environmental net gain Defra at the CIEEM 2019 Spring Conference
https://cieem.net/wp-content/uploads/2019/04/1.-Max-Heaver.pdf

DRIVERS AND MECHANISMS FOR ENG

- Legislation
  - Environment Bill - Mandatory 10% BNG
  - Agriculture Bill - ELMS
  - Environment Wales Act (2016)
  - Wellbeing of Future Generations Act (2015)
  - Social Value Act (2012)
- Policy
  - The National Planning Policy Framework (NPPF, 2019)
  - Intend to Publication London Plan (2020) Urban Greening Factor
- Strategy
  - 25 Year Environment Plan 2018
  - United Nation's Sustainable Development Goals
  - Local Action Plans

DRIVERS AND MECHANISMS FOR ENG

- Funding and co-delivery opportunities
  - The Woodland Carbon Fund
  - Countryside Stewardship Scheme Environmental Stewardship - ELS and HLS and later ELMS
  - The Environment Agency Grant in Aid
  - English Woodland Grants Scheme
  - Water utility companies watershed protection
  - Nature partnerships
  - Carbon tax credits
  - Corporate natural capital accounts and purchase of natural capital credits
  - Biodiversity offsetting

DELIVERING BNG AND ENG IN THE PROJECT LIFE CYCLE

Implement maintenance, management and monitoring and feedback into the LEMP as required, carrying lessons learned forward into future projects. Cultural embedding of any plans requiring engagement and action

Identify your most valuable assets, engage with your stakeholders, identify your goals, targets and metrics, map your benefits to your stakeholders. Develop a strategy

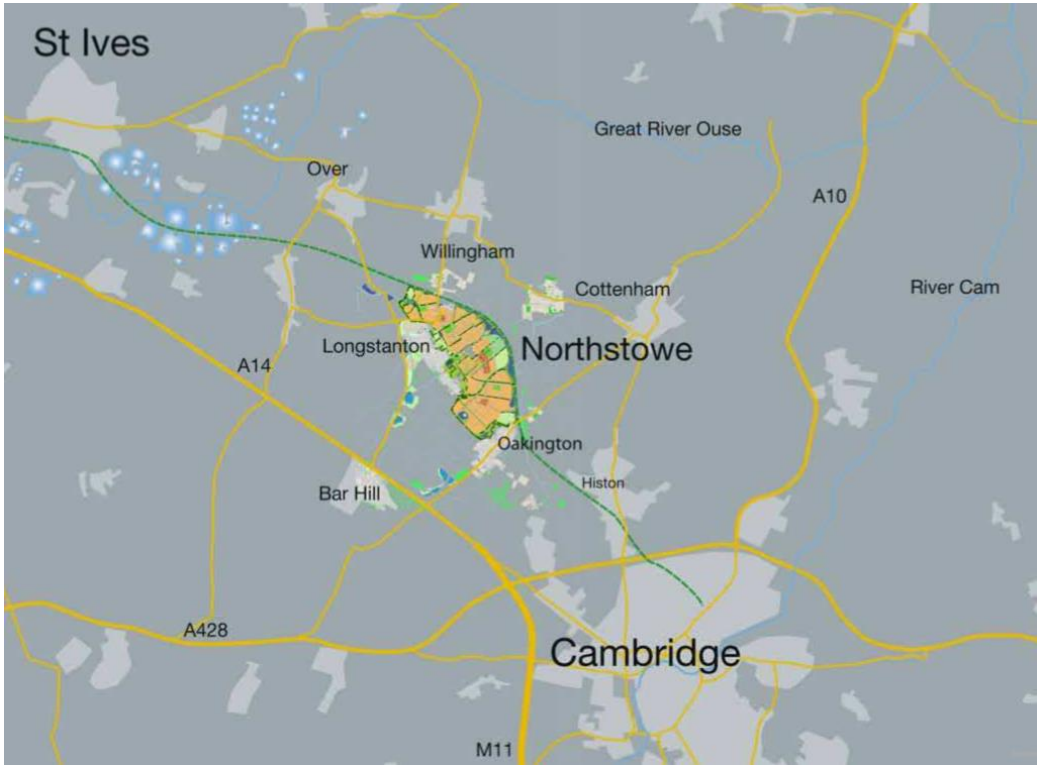
Understand constraints, identify potential opportunities to maximise your wider environmental benefits, consider a high-level cost / benefit to ensure feasibility, start turning strategy into action

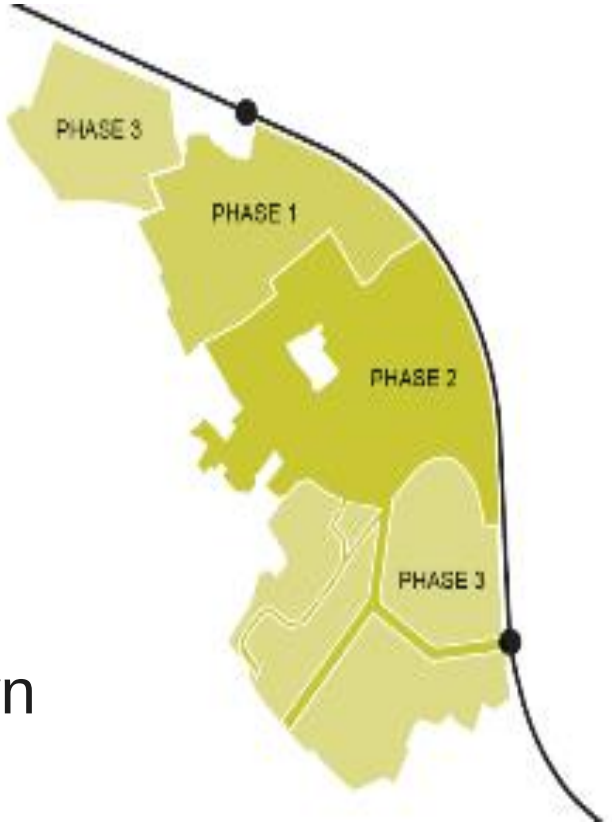
Development of detailed design/ strategy, with clear embedded targets and KPIs, update BAP if required, write detailed LEMP, secure long-term funding mechanism, handover to contractors/ client

Consider producing an ecosystem service impact assessment at an appropriate scale. Apply BM 2.0, and chosen ENG method, amend the design to maximise the benefits value, write outline LEMP, consider the funding mechanism for maintaining GI and offsetting if required, provide a robust and clear consent submission to be delivered in reserved matters or conditioned. Consider using a project specific Action Plan such as a BAP to message and capture requirements. Identify who needs to action and when

CASE STUDY – NORTHSTOWE ECOTOWN

Homes England





- Phase 3 (A and B) 5,500 home Ecotown just north of Cambridgeshire HE commitment to 15% BNG

CASE STUDY – NORTHSTOWE ECOTOWN

Homes England

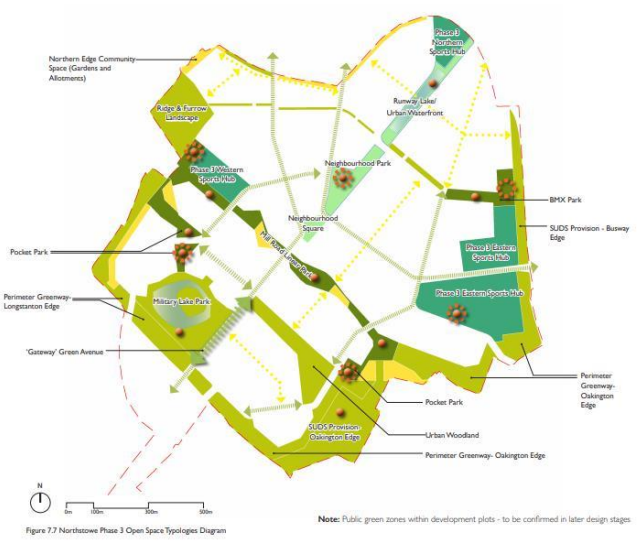


Figure 7.7 Northstowe Phase 3 Open Space Typologies Diagram

Note: Public green zones within development plots - to be confirmed in later design stages

- On site biodiversity maximised via multifunctional GI

CASE STUDY – NORTHSTOWE ECOTOWN

- Based on Countryside Stewardship Scheme but has been aligned with ELMS requirements TBC

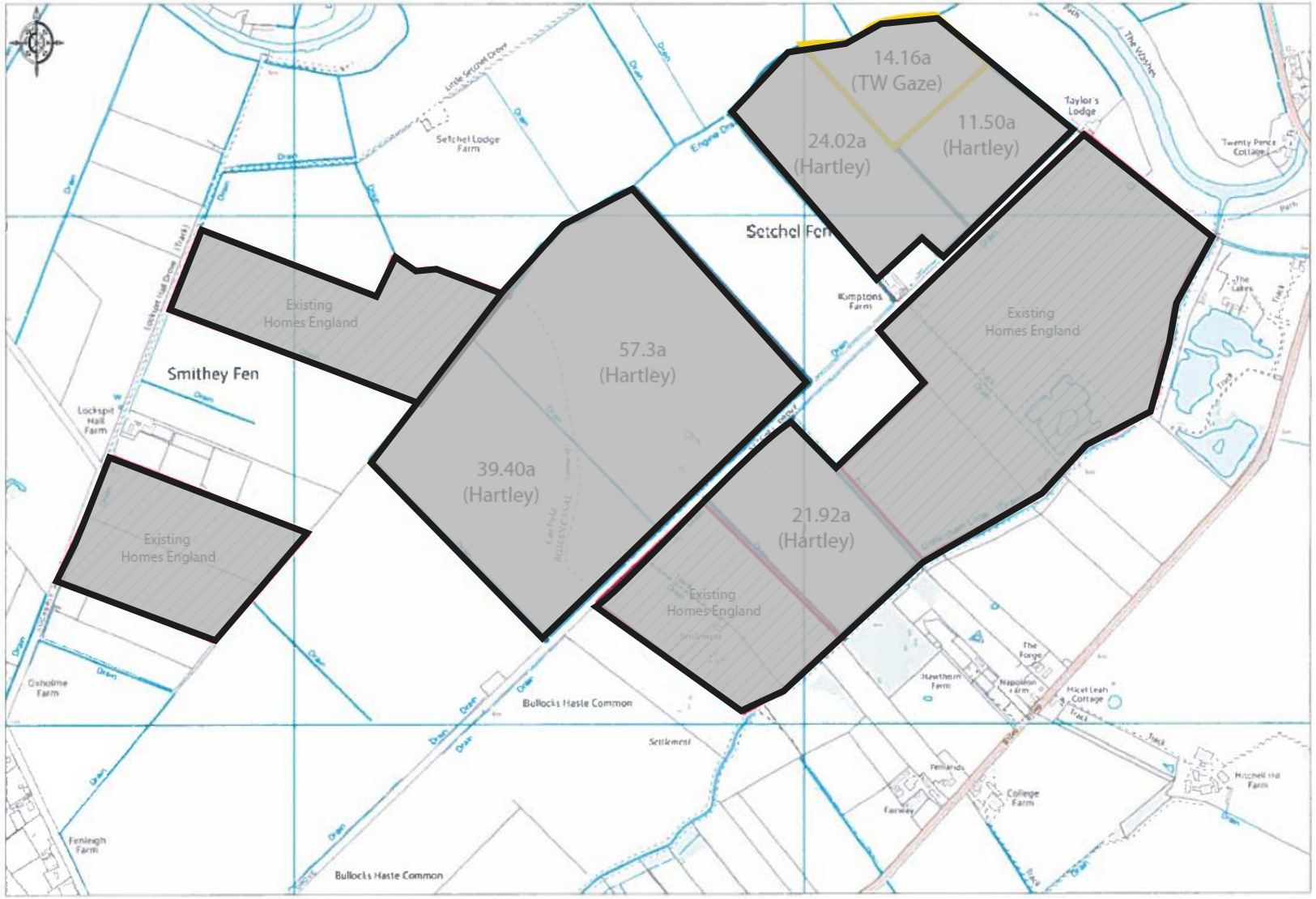
DELIVERING BNG AND ENG: CASE STUDY – NORTHSTOWE ECOTOWN

Homes England

- Objectives
  - Farmland bird mitigation (from the EcIA)
  - Deliver the required biodiversity units to secure 15% Biodiversity Net Gain (voluntary stakeholder supported commitment)
  - Revenue support via Countryside Stewardship
  - Maximise Environmental Net Gain
  - Remain a working farm

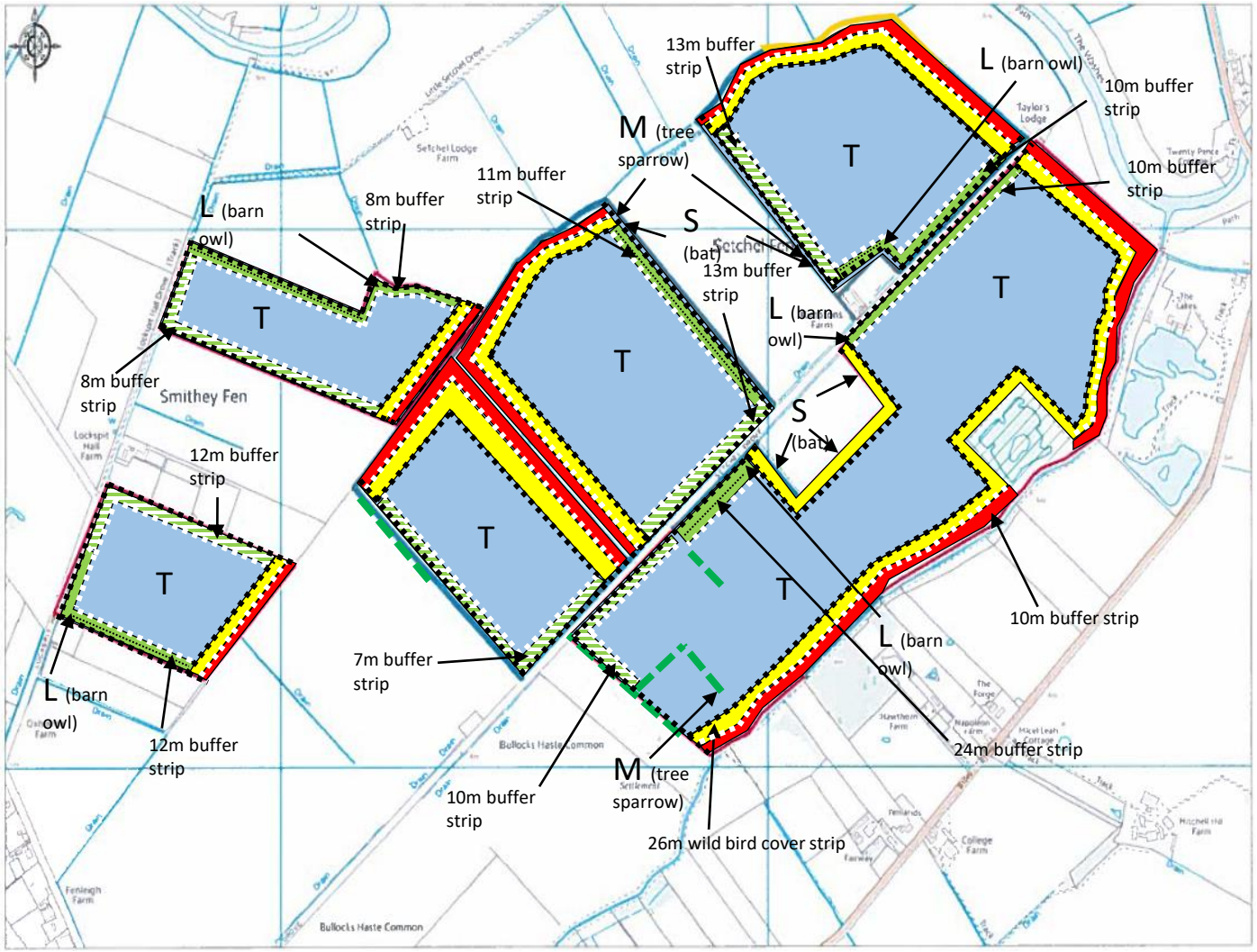
OFFSETTING AREA

Homes England



OFFSETTING AREA

Homes England



- SW11: Riparian management strip
- AB9: Winter bird food
- GS4: Legume and herb-rich swards
- AB8: Flower-rich margins and plots
- AB1: Nectar flower mix
- Permanent fence (FG1)
- Other fencing
- Retained hedgerows
- BN11: Planting new hedges
- AB3: Beetle banks (4m)
- S — WB1: Small wildlife box
- M — WB2: Medium wildlife box
- L — WB3: Large wildlife box
- T — LV7: Livestock trough

NATURAL CAPITAL – NATURAL CAPITAL PLANNING TOOL – SITE 3A

Natural Capital Impact of Northstowe - Phase 3a

Average per-hectare score over 25 years

Ecosystem Services	Max Possible	Natural Capital Impact Score	Min Possible	Natural Capital Net-Gains
1. Harvested Products	+1	-170	-240	No
2. Biodiversity	+443	-5	-57	No
3. Aesthetic Values	+217	+6	-183	Yes
4. Recreation	+400	+91	+0	Yes
5. Water Quality Regulation	+109	-27	-124	No
6. Flood Risk Regulation	+276	-7	-24	No
7. Air Quality Regulation	+94	-13	-59	No
8. Local Climate Regulation	+293	-51	-184	No
9. Global Climate Regulation	+405	-52	-95	No
Natural Capital Net-Gains (number of services achieving net-gain)				2 /9

NATURAL CAPITAL – NATURAL CAPITAL PLANNING TOOL – OFFSETTING SITE

Natural Capital Impact of Northstowe - Phase 3a Offsetting Site

Average per-hectare score over 25 years

Ecosystem Services	Max Possible	Natural Capital Impact Score	Min Possible	Natural Capital Net-Gains
1. Harvested Products	+4	-10	-400	No
2. Biodiversity	+457	+155	-43	Yes
3. Aesthetic Values	+67	+33	-33	Yes
4. Recreation	+100	+0	+0	No
5. Water Quality Regulation	+166	+98	-83	Yes
6. Flood Risk Regulation	+95	+0	-5	Yes
7. Air Quality Regulation	+60	+1	-30	Yes
8. Local Climate Regulation	+171	+2	-86	Yes
9. Global Climate Regulation	+451	+1	-49	Yes
Natural Capital Net-Gains (number of services achieving net-gain)				7 /9

NATURAL CAPITAL – NATURAL CAPITAL PLANNING TOOL – SITE 3A +OFFSETTING SITE

Natural Capital Impact of Northstowe - Phase 3a

Average per-hectare score over 25 years

Ecosystem Services	Max Possible	Natural Capital Impact Score	Min Possible	Natural Capital Net-Gains
1. Harvested Products	+2	-132	-277	No
2. Biodiversity	+446	+33	-54	Yes
3. Aesthetic Values	+182	+12	-148	Yes
4. Recreation	+330	+70	+0	Yes
5. Water Quality Regulation	+122	+3	-114	Yes
6. Flood Risk Regulation	+233	-6	-20	No
7. Air Quality Regulation	+86	-10	-52	No
8. Local Climate Regulation	+264	-38	-161	No
9. Global Climate Regulation	+416	-40	-84	No
Natural Capital Net-Gains (number of services achieving net-gain)				4 /9

SUMMARY – HOW TO MAXIMISE ENG

- Plan from the beginning
- Engage multiple stakeholders, look for co delivery and funding opportunities
- Underpinned by quality design maximising multifunctional benefits
- Ensure that you are aligned with key goals and strategies to maximise these benefits for clients and for funding opportunities/ future proofing
- Think about funding and legacy in advance
- Design practical management and monitoring plans so that these are achievable
- It’s never too late!