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To: Environment and Transport Cabinet Committee - 18 March 2021

Subject: Nature-based Solutions to Climate Change

Classification: Unrestricted

Past Pathway of report: Draft report presented to Kent Environment Strategy Cross Party Members Group on 26th January 2021

Future Pathway of report: n/a

Electoral Division: All – countywide

Summary: This report summarises the findings of an overarching assessment of opportunities for nature-based solutions in Kent and the potential benefits these present the county. It also notes the next steps in developing a countywide approach for nature-based solutions to climate change in Kent.

Recommendation(s):

The Cabinet Committee is asked to note the report.

1. Background to nature-based solutions

1.1 Nature-based solutions are actions that work with and enhance nature to address societal challenges, such as climate change, water security, air quality and human health. The concept has been formed in the knowledge that healthy and natural ecosystems, under appropriate management, produce a diverse range of functions including those focused on mitigating and adapting to climate change. Examples of such nature-based solutions include:

- Expanding woodlands and hedgerows to sequester carbon dioxide and improve soil quality and stability.
- Restoring and protecting wetlands to secure and regulate water supplies and protect communities and infrastructure from floods.
- Bringing nature into cities with green roofs and walls and urban trees and parks, to moderate impacts of heatwaves, capture rainfall and abate pollution; and also deliver positive impacts for mental and physical health.
- Protecting and restoring coastal habitats to protect communities and infrastructure from storm surges and erosion.

1.2 Nature-based solutions not only enable increased carbon sequestration¹ but can contribute to reducing flood and drought risk, enabling urban area cooling and improving water, air and soil quality; all whilst improving the quality, extent and quantity of our biodiversity. With human health and wellbeing so intrinsically

¹ Carbon sequestration is the process of capturing and storing atmospheric carbon dioxide. It is one method of reducing the amount of carbon dioxide in the atmosphere to mitigate or reduce global climate change.

linked to the natural environment, societal benefits can also be realised by increasing multifunctional and quality green space and wild areas. In addition, economic benefits can be attained, through associated exploitation and management activities such as the production of timber products or increased land productivity.

- 1.3 In short, adopting a multi-benefit approach of nature-based solutions in Kent could provide the county with a response to some of the challenges of climate change and simultaneously provide an opportunity to recover the health of our biodiversity too. If appropriately planned, nature-based solutions could also underpin health and wellbeing improvements and support communities living in areas of deprivation within the county, through better access to nature; and could provide new and additional economic opportunities, including employment and skills development.
- 1.4 The County Council has a stated aim of planting 1.5 million new trees in Kent. However, with a wealth of varied habitats offering nature-based solutions within the county, greater potential and quicker gains may be at our disposal if we choose to widen our work beyond woodland restoration and enhancement.
- 1.5 In 2020, Kent County Council started work to inform a strategic approach for how we invest in our natural capital² to deliver nature-based solutions to climate change and to achieve the wider ecological and societal benefits. To understand what opportunities may be presented by Kent's landscape, work was commissioned in the latter part of the year to provide a strategic, high level overview of the nature-based solutions that are available to Kent, based on our most extensive broad habitat types.
- 1.6 This work assessed what nature-based solutions these specific habitats may provide and the associated challenges and socio-economic benefits. Based on this, the study considered the opportunities for the short, medium and long term and made recommendations for next steps.
- 1.7 This report summarises the main findings of that commission and outlines how work will be progressed towards developing a framework for nature-based solutions to climate change in Kent.

2. Opportunities for nature-based solutions in Kent

- 2.1 The following section details the potential opportunities for nature-based solutions for each of the broad habitat types, identified by the commission. Reference is made to the fact there are challenges to realising these opportunities – these challenges are discussed in section 3 of the report.
- 2.2 **Woodland** is the most abundant semi-natural habitat identified within Kent, with broadleaved, mixed and yew woodland covering 11% of the county. Woodland's greatest potential function, unsurprisingly, is carbon sequestration with broadleaved woodlands appearing to offer the best potential. Further to this, woodland also offers improvements to soil quality, air quality and biodiversity and

² The sum of our ecosystems, providing us with food, clean air and water, wildlife, energy, wood, recreation and protection from hazards.

a reduction in surface water flooding. **Hedgerows** offer the same potential services.

- 2.3 Active woodland management³ presents the best quick win opportunity for this habitat, with woodland expansion, corridor creation and natural regeneration⁴ also presenting opportunities but with greater challenges to realising these. Woodland expansion and corridor creation present the greatest socio-economic benefits within this habitat group.
- 2.4 Grasslands are often overlooked as an option for carbon sequestration despite the fact that **species-rich grasslands** are reliable stores, provided they are correctly managed for diversity to provide optimum soil conditions. Although Kent has a large grassland resource, actual biodiverse grass habitats are not quite so abundant in the county but still present a notable opportunity. In addition to carbon capture, biodiverse grassland offers soil quality improvements, flood risk reduction and increased biodiversity. In respect of the latter, biodiverse grassland is a particularly important habitat for pollinators.
- 2.5 Grassland restoration, grassland protection and road verge naturalisation present the best quick win opportunities. Delivering biodiverse grasslands through rewilding presents opportunities, too, but there are greater challenges to realising these. Grassland restoration and protection present the greatest socio-economic benefits.
- 2.6 Although research is lacking on the carbon storage of **inland wetlands and waterways**, work by the Kent Wildlife Trust suggests that our wet grassland may have the potential to store more carbon than neutral grassland⁵, indicating a carbon storage benefit of allowing these habitats to return in floodplains along rivers. These habitats also provide important flood water management and water resource management benefits. With much wetland lost, any improvements or increases to this habitat also present biodiversity benefits to the many species that rely on them.
- 2.7 Retention and protection of wetlands and waterways present the best quick win opportunities for this type of habitat. Restoration presents medium term opportunities and re-creation the long-term opportunities, but there are greater challenges to realising both of these. Re-creation of wetlands and retaining/protecting inland wetlands present the greatest socio-economic benefits.
- 2.8 **Coastal wetlands and marine** habitats can provide important carbon sequestering properties. Estimates suggest that globally the rate of carbon sequestration in coastal wetlands is greater than in all of the terrestrial forests combined. Coastal habitats also provide an important natural sea defence mechanism, creating 'soft' defences against sea storm events.

³ Without some form of management woodlands can become dark, over-shaded and dominated by big mature trees without any variation in structure, age or cover; this reduces their function and the breadth of biodiversity they can support. Woodlands are actively managed for a number of reasons – it can be to maximise the yield of economically important products such as timber, for conservation and biodiversity and/or for recreational access.

⁴ Allowing trees to grow from the natural seed bank in the ground, as opposed to planting; this approach encourage trees that are native to the local area, re-establishes and extends ancient and existing woodland and forests and promotes resilience.

⁵ Typically enclosed and usually more intensively managed grassland occurring on neutral soils; hay meadows will typically fall within this category.

- 2.9 Saltmarshes appear to offer the greatest known coastal carbon sequestration potential in Kent, however there may be further opportunities within the marine and estuary environments. Marine vegetation, such as kelp forests, play an important role in the carbon cycle but kelp is not sufficiently found off the Kent coast to present a feasible option; and currently too little is known about Kent's marine vegetation to fully understand what other potential may exist. Estuaries are highly productive habitats that accumulate both marine and terrestrial organic carbon through both their subtidal and intertidal sediments; therefore, estuarine expansion could provide additional carbon storing opportunities.
- 2.10 Retention and protection present the best quick win opportunities for coastal wetland and marine habitats; there are good socio-economic benefits across the breadth of coastal habitat opportunities.
- 2.11 Employing nature-based solutions in the **built environment** presents a number of opportunities to address some of the environmental issues in urban areas alongside carbon sequestration, in particular air quality, temperature, flood risk and depleted biodiversity.
- 2.12 The built environment presents the greatest number of short-term gains, including green walls and roofs, urban green space, road verges and street trees. Urban green space and sustainable drainage systems (SUDS) have greater challenges. Urban green space and green roofs present the greatest socio-economic benefits.
- 2.13 A summary of the nature-based solutions, against timescales and opportunity assessments (benefits and challenges) is presented in the table in Appendix 1 (taken from the draft report *Natural Solutions to Climate Change in Kent, draft V02, January 2021*).

3. Challenges to nature-based solutions

- 3.1 Many of the challenges to nature-based solutions are common across all the different habitats types, albeit to different degrees.
- 3.2 A consistently common challenge is that of land availability, often coupled with the need to secure the buy-in of the agricultural or landowner/management sector. Many of the interventions to deliver nature-based solutions also require intensive, and often costly, management and this can be difficult to justify when it is not easy to quantify the benefits of the natural functions provided. However, when delivering multiple benefits, it can be easier to demonstrate a return for the investment. Further, the Government's future Environment Land Management scheme approach of 'public money for public goods', may provide an opportunity for landowners and land managers to secure that investment and address land availability issues.
- 3.3 Introducing nature-based solutions is also not necessarily a win-win, with the potential for habitat trading – that being the loss of one habitat to enable the creation of another. In addition, one solution may exacerbate an impact – for instance woodlands can reduce the amount of water infiltration into the ground and therefore reduce the amount of water recharged to the water table. Coupled

with an increase in evapotranspiration⁶, drought effects could be increased. Such unintended consequences illustrate the importance of the right nature-based intervention in the right place. Nature-based solutions may also be threatened themselves by climate change – coastal squeeze⁷, drought conditions, storms and diseases may all negatively impact the habitats established to provide mitigation and adaptation.

- 3.4 Nature-based solutions is an emerging approach – there are still many research and knowledge gaps, in particular on the carbon storage potential of specific habitats. Further to this, whilst we have a good understanding of our terrestrial habitats, in Kent there is a lack of knowledge in respect of the extent of our marine habitats and submerged vegetation.
- 3.5 Within the urban environment, making space for these nature-based solutions might, in certain locations, be in competition with the need for housing and other infrastructure and therefore strong and creative urban planning is required. Further there is the financial burden of management of any installed green infrastructure.
- 3.6 Finally there is the time required for the establishment of the habitat and for it to become “fully functioning”. It is because of this that retention, protection and enhancement of our existing habitats offer the best immediate (and in some case medium-term) opportunities.

4. Taking forward the development of a framework for nature-based solutions to climate change

- 4.1 Nature-based solutions present an opportunity for us to tackle some of the county’s climate change and ecological challenges, whilst delivering wider socio-economic benefits. The following outlines how we might begin to develop a framework for this in Kent.

Delivery through partnership

- 4.2 As a result of the commission, we now have a better understanding of the potential for nature-based solutions in the county but Kent County Council cannot develop this agenda in isolation. Whilst the Council’s estate presents opportunities, wider joined up thinking and partnership working will enable bigger and better gains for the county.
- 4.3 Existing partnership approaches, such as the Kent Nature Partnership, Kent Climate Change Network and the Kent and Medway Environment Group (which supports delivery of the Kent Environment Strategy) will be used to take forward a number of work streams to further nature-based solutions in Kent. All of the below work will require continual stakeholder engagement.

Use of existing and emerging policy and other instruments to support nature-based solutions in Kent

⁶ The sum of water evaporation and transpiration from a surface area to the atmosphere. Evaporation accounts for the movement of water to the air from sources such as the soil, tree and plant canopy and water bodies.

⁷ The loss of natural habitats or deterioration of their quality arising from man-made structures or actions, preventing the landward transgression of those habitats that would otherwise naturally occur in response to sea level rise in conjunction with other coastal processes. Coastal squeeze affects habitat on the seaward side of existing structures.

- 4.4 One of the first actions required is to protect and restore the natural resources we already have and ensure that priority areas are protected from other interventions that may prevent the realisation of opportunities in the future.
- 4.5 The Environment Bill introduces a requirement for a county-scale Local Nature Recovery Strategy (LNRS). It is not yet confirmed who will be responsible for the delivery of these strategies, nor the timetable for their development, but it is understood it will likely fall to upper tier authorities and development will commence this year. Development will be done in partnership with a broad range of stakeholders, including government agencies, local planning authorities, nature conservation bodies and landowners.
- 4.6 This strategy will map not only national conservation sites but also other areas which are, or could become, of particular importance for biodiversity. The county strategy will also be expected to state biodiversity priorities, including opportunities for recovering or enhancing biodiversity. It is expected that local planning authorities will use Kent's Local Nature Recovery Strategy to inform planning decisions and direct the mandatory biodiversity net gain investments. Therefore, in the first instance, the Local Nature Recovery Strategy will be used to protect and restore our key sites for biodiversity and the ecosystem services (including nature-based solutions) that they provide.
- 4.7 However the Local Nature Recovery Strategy will not only identify areas of importance for biodiversity but also for other environmental benefits in order to better align efforts and as such will be expected to consider opportunities for, for example, carbon sequestration, flood management and water quality improvements. Therefore, the Kent Local Nature Recovery Strategy should ideally identify where:
- Habitats already providing nature-based solutions should be retained and protected.
 - Improvements will enhance the nature-based solutions delivered.
- 4.8 As such, the Local Nature Recovery Strategy, as it emerges over the coming year, could begin to provide the strategic framework for nature-based solutions for Kent.
- 4.9 We also need to consider how not only the Local Nature Recovery Strategy might support nature-based solutions in Kent but also how the forthcoming requirement for Biodiversity Net Gain⁸ in developments and the Environment Land Management scheme⁹ can be used to enable the investment required to deliver such benefits.

⁸ Biodiversity Net Gain is an approach to development that leaves biodiversity in a better state than before; the Environment Bill will introduce a mandatory requirement (expected in 2021/2022) for development to demonstrate a minimum of 10% increase of biodiversity. Where this gain is not possible on site or cannot be delivered locally, there will be the option to pay a "cash tariff" to offset the net gain requirement (the mechanism for securing this to be determined but likely through S016/CIL).

⁹ The Environment Land Management (ELM) scheme (due to be fully rolled out by the end of 2024) will replace the funding schemes currently available under the Common Agricultural Policy (CAP). Founded on the principle of 'public money for public goods', the Environment Land Management (ELM) scheme will see farmers and other land managers paid for work that enhances the environment and delivers public goods, such as clean air and water, thriving plants and wildlife, protection from environmental hazards and reduction of or adaptation to climate change.

Better understanding of where existing and additional opportunities exist in county

- 4.10 The initial nature-based solutions assessment provides a strategic, high level overview of the opportunities for the county but does not map these spatially. Therefore, an early task will be to undertake stakeholder engagement with organisations such as Kent Wildlife Trust, Woodland Trust, RSPB and the environmental agencies to identify the immediate nature-based solution opportunities and priorities within the county. Using the challenges and socio-economic frameworks provided by the report, these opportunities can potentially be assessed in terms of short, medium and long term deliverability.
- 4.11 We should also assess our own estate and consider its efficiency in terms of delivering nature-based solutions; and what interventions may be required to increase the productivity in this regard.
- 4.12 Once we know where nature-based solutions already exist and have identified how to enhance and better manage these, attention should then be turned to where new opportunities could be realised. This could include:
- Engagement with landowners to determine opportunities for provision of land to support nature-based solutions; and to identify where agricultural land is considered “unproductive” but which may be appropriate for nature-based solutions as an alternative land use.
 - Better understanding of topographical elements to identify where nature-based solutions may best be directed to deliver certain benefits.
 - Identification of areas of historic habitat loss where reinstatement would enable the associated nature-based solutions to be realised again.
- 4.13 This information will feed into the development of the aforementioned Local Nature Recovery Strategy for Kent.

Address knowledge gaps

- 4.14 The report identifies a number of research gaps for nature-based solutions, including:
- Knowledge on how trees and woodland will respond to climate change impacts.
 - Understanding of the role, if any, of non-native tree species and plants in response to a changing climate.
 - Available research on the carbon storage abilities of different grassland habitats.
 - Knowledge of the state/quality of grassland habitats in Kent and therefore the areas with highest carbon storage potential.
 - Understanding of the carbon storage and sequestration potential of inland wetlands.
 - Security of knowledge that confirms there is not sufficient kelp off the coastline of Kent to make this a viable “blue” carbon store.
 - Better understanding of the diversity and extent of Kent’s marine vegetation and its potential role as a “blue” carbon store.
 - Knowledge on the quality of soils across Kent.

- 4.15 To address all the research gaps is not within the gift nor resources of Kent County Council. In consultation with partners, we will consider what research is critical to us developing the framework for nature-based solutions to climate change and we will work with Kent's academic institutions and other partners to address these knowledge gaps. Likely, in the first instance, this will be prioritised in enhancing knowledge specific to Kent and focussed on the nature-based solutions determined to offer the greatest potential and/or the quickest wins.

5. Policy framework

- 5.1 This work will help to provide the strategic direction required to deliver Kent County Council's Interim Strategic Plan priority action of "*Deliver on our commitment to plant a tree for every person in Kent, which totals just over 1.5 million, and enhance other natural assets which increase the storage of carbon, support the recovery of the county's wildlife and benefit residents*".
- 5.2 The Plan also supports the Kent Environment Strategy's priority to tackle climate change and conserve and enhance the quality and supply of the county of Kent's natural resources and assets.

6. Financial implications

- 6.1 At this stage no financial implications of a framework for nature-based solutions have been identified, save the resources required to develop it. These largely relate to staff time and these are already identified within existing revenue budgets.
- 6.2 In respect of the Local Nature Recovery Strategy, Defra have stated that new burdens as a result of the Environment Bill will be funded and therefore should responsibility fall to Kent County Council as the upper tier authority, we would anticipate there to be resources to support its development.
- 6.3 As noted in section 5, the framework development will consider how Biodiversity Net Gain and the Environment Land Management scheme can be used to enable the investment required to nature-based solutions in the future. This will also consider other grants that may be available, including those to support tree planting commitments.

7. Legal implications

- 7.1 No legal implications relating to this work programme have been identified.

8. Equalities implications

- 8.1 An Equality Impact Assessment (EqIA) is not required at this stage of the work. An assessment will be undertaken in respect of the Local Nature Recovery Strategy, when drafted; and likewise of any other strategy/frameworks/action plan developed in due course.

9. Other corporate implications

- 9.1 No other corporate implications have been identified.

10. Recommendation(s):

The Cabinet Committee is asked to note the report.

11. Background Documents

Natural Solutions to Climate Change in Kent, February 2021 (Buro Happold). This report will be made available on the Kent County Council website in due course; in the meantime, should a copy be required please contact Elizabeth Milne (contact details below).

Appendix 1: Summary of nature-based solutions for Kent

12. Contact details

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