

The two most serious challenges facing humanity are Climate Change and Loss of Biodiversity: indeed these define the epoch of the Anthropocene, and have led the Cambridge academic and writer Robert Macfarlane (<https://emergencemagazine.org/story/speaking-the-anthropocene/?fbclid=IwAR0hvZcOozGhpA2BJNqi85O-y814cW3CTLYCk0QEvNJAFEK3sEqyMDjgcwk>) to emphasise how words and the way they are used with precision has great significance in any discussion.

*'And that good naming might be political, it might be the refusal to describe the natural world as "the environment," which I don't do any longer. I find that to be a problematically chilly and alienating term. I tend to use the phrase "living world" or "natural world," and not to talk about "climate change" but to talk about "climate breakdown." These are small acts of renaming, which have considerable political encodings and consequences.'*

Inevitably these two things are intimately connected and function equally on both Global and Local scales and need to be addressed at both of these levels. They raise conflicting perceptions of exploitation versus protection and restoration of the environment, which run throughout human history (<https://www.environmentalscience.org/conservation>) and become evident in perspectives on this particular application at Cleve Hill.

The overwhelming evidence for human-induced Climate Change coupled with the pressures and demands humanity places on the environment and resources has led to over 100 UK Councils and Government declaring a Climate Emergency, and accelerating actions to curb emissions of Carbon Dioxide with the target to become Carbon-neutral by 2050. These initiatives inevitably impinge on our individual ways of life and 'free will' and imply radical changes necessary across our whole culture and outlook that go beyond any arbitrary limits set in time. Generation of energy by renewable means clearly is a vital part of this, but as David Mackay says in 'Sustainable Energy - without hot air' ([https://www.withouthotair.com/c27/page\\_213.shtml](https://www.withouthotair.com/c27/page_213.shtml)):

*'Perhaps you will conclude that a viable plan has to involve less power consumption per capita.'*

The case for generating Solar derived energy is a strong one but not at the expense of wider viewpoints and nor at the expense of places that have very significant present and potential ecological and environmental value long into the future.

Efficient and effective ways of capturing Carbon into the landscape is a vital component in this vision, globally, nationally and locally. This, after all, is the very history of life on earth; specifically the evolution of photosynthesis and the rise of plants. A study by the Royal Society ([https://royalsociety.org/-/media/Royal\\_Society\\_Content/policy/publications/2001/9996.pdf?fbclid=IwAR2VSrCiZ0IAAt7ncV2uMwdti7t-9d5NWrfMvwIMP56wRmw4Uxhrsil1vil](https://royalsociety.org/-/media/Royal_Society_Content/policy/publications/2001/9996.pdf?fbclid=IwAR2VSrCiZ0IAAt7ncV2uMwdti7t-9d5NWrfMvwIMP56wRmw4Uxhrsil1vil))

concludes that Carbon sequestration into the landscape is a highly significant part of the 2050 targets:

*'It is estimated that terrestrial vegetation and soils are absorbing around 40% of current human CO<sub>2</sub> emissions. The magnitude of this 'natural' land carbon sink (which is currently being stimulated by recovery from natural disturbance and fertilisation from atmospheric CO<sub>2</sub> and nitrogen) is estimated at approximately 3.2+1.6 PgC y/1 although there is considerable uncertainty associated with this estimate. Using figures published by the IPCC, we estimate that changes in agricultural and forestry practices and slowing deforestation could enhance this by a maximum of 2 PgC y/1 by the year 2050. Managed land carbon sinks could therefore potentially meet 25% of the reductions in CO<sub>2</sub> projected to be required globally by 2050 to avoid large increases in temperature. However this would require considerable political will and there is little potential for increasing the land carbon sink thereafter.'*

(Not-with-standing these conclusions, and taking into account the fact that the generation of decision-makers now will not be present in 2050 to observe the results - as a Swedish schoolgirl so presciently tells us - history, science and philosophy prove that the natural world of vegetation has an innate capacity for repair and homeostasis in the face of severe disruption <https://www.scientificamerican.com/article/plants-versus-photovoltaics-at-capturing-sunlight/>:

*'Of course, plants also have another significant advantage—a bad photosynthetic cell can repair itself; in fact, that's part of its normal operation. No artificial system yet devised—super-efficient or otherwise—can heal itself.'*)

More recently this reference (<https://www.sciencedirect.com/science/article/pii/S0167880908001321>) concludes that, for Europe:

*'If land use remains unchanged, carbon sequestration rates are expected to decrease by 4% in 2030 relative to 2000. LUC causes an additional sequestration rate decrease in the A2 scenario of 2% in 2030. In the other three scenarios, sequestration rate increases by 9–16% in 2030 relative to 2000. In 2030, the terrestrial biosphere in the EU is expected to sequester between 90 and 111 Tg C year/1. This is 6.5–8% of the projected anthropogenic emissions. In the B2 scenario, the highest sequestration rate increase is expected (15 Tg C year/1). Clear differences are found in the spatial distribution of sinks and sources between the scenarios, **illustrating that land use is an important factor in future carbon sequestration changes that cannot be ignored.**'*

Wetlands and saltmarsh are amongst the natural ecologies with the potential for most significant and efficient sequestering of Carbon over protracted time-scales because of the ways vegetation accumulates and degrades under conditions of regular and persistent inundation. As a corollary such areas can also raise land levels as a consequence, in concert with sea level change, and act to absorb tidal surges and provide significant protection of vulnerable places from flooding. In a recent address on UK Climate Change (<https://www.gov.uk/government/speeches/michael-gove-speech-on-uk-climate-change-projections>) the then Secretary of State for the environment, Michael Gove MP, makes specific reference to ‘natural flood defences’, citing the example of Medmerry in West Sussex where the Environment Agency has realigned the coast:

*‘But as the risk of flooding and coastal erosion increases, we need a new long-term approach. Government will publish a long term policy statement next year, and the Environment Agency will issue a new 50-year strategy, also next year. I believe these should explore new philosophies around flood and coast management.’*

At the Steart Marshes in Somerset the Environment Agency have collaborated with WWT to create one of the UKs largest new wetland reserves, very well described visually in the video online in this reference (<https://www.wwt.org.uk/wetland-centres/steart-marshes>), and which resonates in tone with the future projections described below for the North Kent Marshes and coastline, and specifically Nagden and Graveney Marshes.

*‘Wetlands are amazing for wildlife, but they can also do a lot of great stuff for people. The more reasons we can give people to love wetlands, the more chances we’ll get to create, restore and protect them. Steart Marshes is WWT’s first big Working Wetland. It’s home to a vast array of wildlife and it’s a place that people love to visit. But as well as that, it’s locking away carbon from the atmosphere that would otherwise contribute to climate change. The development of new saltmarsh is a rare opportunity so WWT is supporting academic research to measure how much carbon is absorbed. Steart Marshes was once arable farmland and it continues to be farmed with livestock by local graziers who are able to market saltmarsh lamb and beef for a premium because its flavour is valued by food lovers. The tidal creeks that run across Steart Marshes shelter fish fry. The fish attract herons and egrets but they are also from commercially important species such as sea bass.’*

In the specific context of Faversham and the North Kent Marshes coastal squeeze caused by historic reclamation of intertidal habitat increases the vulnerability of the town to serious flooding, likely to be exacerbated by future sea level rise and increased climatic extremes resulting from Climate Change. And this coincides with accelerating pressures of development elsewhere that exploit the surrounding landscape of the town in unprecedented ways. These pressures, and the Solar proposal at Cleve Hill, can be as much a part of the problems we face as they are potential solutions:

*(‘...the trend of the remorseless financialisation of the British, and indeed global, economy, creating an environment in which what is produced becomes less important than the leverage it enables for profit maximisation and securitisation’*

<https://www4.shu.ac.uk/research/cresr/sites/shu.ac.uk/files/profits-before-volume-housebuilders-crisis-housing-supply.pdf>)

The risks of flooding into Faversham and the surrounding region are very real and increasingly unpredictable (the National Flood Risk assessments for Faversham and the surrounding area are mapped here: [https://www.kent.gov.uk/data/assets/pdf\\_file/0010/71668/Flood-risk-to-communities-in-Swale.pdf](https://www.kent.gov.uk/data/assets/pdf_file/0010/71668/Flood-risk-to-communities-in-Swale.pdf)), and could undoubtedly be prevented or ameliorated by appropriate realignment of the sea walls and generation of new saltmarsh within shorter time scales rather than longer, along with the added and highly significant benefits both of capturing and sequestering Carbon efficiently and effectively over the long term and satisfying Habitat Directives in a place directly adjacent to already Internationally recognised sites of distinct ecological importance. The pictures below, taken at a particularly high tide in June 2017, but in otherwise equable climatic conditions, show how close sea level reaches under such circumstances to the footpath on the sea wall alongside Oare Creek.

The third picture shows that the land to the left of the sea wall is significantly lower than the water level in Oare Creek and a tidal surge under these conditions would undoubtedly lead to serious flooding here and into the town.





The high environmental/ecological value of the North Kent Marshes, Swale and Faversham Creek is a unique feature of the town and its history and has led to proposals to extend areas of environmental protection and reclamation into the Nagden and Graveney Marshes, both for the benefit of wildlife and ecology, recreation and amenity but also as a means to lessen risks of flooding into the town and as an important balance to developmental pressures elsewhere. The Green Cluster Studies - Faversham Creek Technical Report (March 2008, <http://www.tgkp.org/content/Reports/faversham-creek-technical-report-1265039502.pdf>) stated:

*Faversham has a dramatic landscape setting on the edge of the windswept north Kent marshes. Faversham Creek and its tributary, Oare Creek, are the focus for routes and views onto the marshes immediately to the north of the town. To the west, the Oare Marshes stretch along the shore of the Swale to Conyer and beyond while to the east, the Nagden, Cleve and Graveney Marshes continue as far as Whitstable. These flat, exposed coastal landscapes are part grazing marsh - part arable land but the cumulative effect of ongoing land purchase and potential future land management enhancements at Cleve Marshes (related to the London Array offshore windfarm), Seasalter and the Oare Marshes Nature Reserve will generate a planned transformation from arable farmland to ecologically valuable grazing marsh. The area is already a mecca for ornithologists but, once these large scale land management projects are complete, the combined area of grazing marsh and wetlands surrounding Faversham and on the Isle of Sheppey will rival the Camargue!*

And:

*The major development in the cluster is due to the proposed London Array offshore windfarm, which will have on-shore substation at Cleve Hill Farm to the north east of Faversham. This development is likely to provide the impetus for a large scale land management project on the surrounding marshes. This project, which is expected to be led by Kent Wildlife Trust, would transform the character, quality and biodiversity value of the marshes to the north east of the town. Adjacent to the Cleve Marshes site, a partnership between the RSPB, Swale Borough Council, Canterbury City Council and Natural England is leading another ambitious land management project which will transform the future management of the Graveney and Seasalter Marshes so that these areas too become grazing marshes and the perfect habitat for waders. To the west, there is a long term aspiration for the expansion of Kent Wildlife Trust's Oare Marshes Nature Reserve by means of enhanced habitat management and land purchase or management agreements between the existing reserve and Conyer Creek.*

And:

*Transformation of a vast area of the north Kent Marshes from farmland to grazing marsh and high quality inter-tidal habitat - and its ongoing management as nature reserves managed by Kent Wildlife Trust (Cleve Marshes) and the RSPB (Seasalter Levels), where the restoration of existing grazing marsh is already underway. The combined area of Cleve Marshes and the Seasalter Levels is significant in biodiversity and landscape terms and there may be future opportunities to extend and enhance the Oare Marshes Nature Reserve and possibly to reopen the Harty Ferry link to the Isle of Sheppey. **There may also be scope for a significant and potentially valuable salt marsh restoration project at Nagden Marsh, one of the very few places in the area where it is possible to create intertidal habitat without negatively affecting internationally important freshwater grazing marsh.** Together these projects offer huge potential for enhanced public accessibility, interpretation and education. Faversham will benefit from a unique specialist 'green tourism' attraction and there may be potential to develop town centre based interpretation which expands on these themes.*

Over a decade ago, then, Key Stakeholders - including the Environment Agency, Swale Borough Council, Kent County Council, Faversham Town Council and local Parish Councils, Medway Ports, Kent Wildlife Trust, RSPB, Natural England, Groundwork Kent & Medway, Faversham Enterprise Partnership Ltd, The Cambria Trust, London Array Limited, and Hollowshore Cruising Club - had combined vision for Faversham, capitalising on its unique history, geography and situation, and diametrically at odds with the present proposals for a Solar Array to the north-east of the town.

Within the Infrastructure Planning Inspectorate Consultation

([https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010085/EN010085-000531-Cleve%20Hill%20LTD%20-%20SoCG%20between%20App%20and%20EA\\_Redacted.pdf?fbclid=IwAR0YCjr\\_CSH8jo5fYwT3EKr8c6tIIOhdvxEWlwdzR0vo\\_ICMZiCeQm\\_c8UE](https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010085/EN010085-000531-Cleve%20Hill%20LTD%20-%20SoCG%20between%20App%20and%20EA_Redacted.pdf?fbclid=IwAR0YCjr_CSH8jo5fYwT3EKr8c6tIIOhdvxEWlwdzR0vo_ICMZiCeQm_c8UE))

the Environment Agency have explicitly stated, in confirmation of the above Green Cluster

Studies - Faversham Creek Technical Report:

*"If the solar park was not being proposed, we would seek to carry out managed realignment at Cleve Hill in the near future (5-10 years hence)" and **"Our analysis of sites through MEASS, as well as predecessor strategies, highlights Cleve Hill as one of the top- ranking sites for managed realignment in the area, expected to yield around 200ha of intertidal habitat towards our requirements. It is one of eight sites which have been considered as suitable for creating intertidal habitat, all of which are needed to meet our 535ha obligation."***

**The question arises of the inherent dangers of delaying the proposed plans for coastal realignment for another 40-50 years (and with uncertainty beyond that because of land-take and intervening uncontrolled commercial transfers of ownership and responsibility), and thereby preventing the very significant sequestration of Carbon by such means as contribution to the 2050 Carbon Zero target.**

## **'Natural England Research Report NERR043**

**Carbon storage by habitat: Review of the evidence of the impacts of management decisions and condition of carbon stores and sources'** emphasises the very high value of saltmarsh to sequester Carbon:

*3.1 The National Ecosystem Assessment (2011) indicated that carbon sequestration rates are high in saltmarsh, sand dunes and machair as a result of rapid soil development or sediment accumulation; but total area of these habitats is low. Sand dunes on the west coast of the UK store 0.58 to 0.73 t C /ha/yr , while saltmarsh is estimated to store 0.64 to 2.19 t C/ha/yr (Cannell and others, 1999). The conservative estimate of carbon stocks in coastal margin habitats is at least 6.8 Mt C.*

(In the reference provided in Table 6 saltmarsh is estimated to sequester 210 g Carbon/m<sup>2</sup>/year)

These figures imply that 200 hectares of regenerating saltmarsh/intertidal habitat at Cleve Hill could have the capacity to sequester between 128 - 438 tonnes of Carbon per year, which is equivalent to capturing 469 - 1606 tonnes of CO<sub>2</sub> per year from the atmosphere. Contrary to the limited lifetime of a Solar Array, Carbon sequestration by developing saltmarsh in this way will be ongoing into perpetuity in concert with vegetation growth, sea level rise and corresponding land level rise, providing the 'natural flood defences' described by Michael Gove in an earlier reference.

The figures given above compare closely to those quoted by the World Bank in the paper 'Mitigating Climate Change through Restoration and Management of Coastal Wetlands and Near-shore Marine Ecosystems - Challenges and Opportunities' (<https://openknowledge.worldbank.org/bitstream/handle/10986/18318/605780REPLACEM10of0Coastal0Wetlands.pdf>). Table 2 gives Carbon sequestration potential for saltmarsh of 50 - 250 tC/km<sup>2</sup>/yr, equivalent to 183 - 917 tCO<sub>2</sub>e/km<sup>2</sup>/yr (1 km<sup>2</sup> = 100 hectares)



A second Research Report prepared by Natural England looks specifically at the challenges of Climate Change in North Kent - and emphasises the 'sense of place' and history of the region, '**Natural England Research Report NERR052**

**Assessing the potential consequences of climate change for England's landscapes: North Kent.'**

*4.29 The North Kent coast contains stunning shorelines, tranquil marshland wilderness and a fascinating maritime heritage. The marshes are a distinctive, exposed, flat landscape of pasture and arable land. Agricultural land predominates, with grassland dominating. The estuarial and coastal landscapes are also very rich in wildlife. The North Kent marshes convey a strong sense of space, remoteness and quietness, a special quality in the South East of England. The wide open spaces and big skies convey a special character. The landscape of the Medway Marshes has also long been associated with industrial use, in contrast to the Swale Marshes that have a predominantly agricultural and particularly tranquil, unspoilt character. The landscape of the Isle of Sheppey has a particularly distinctive character as a result of its coastal island situation. A sense of remoteness is accentuated by the physical separation of the island from the mainland by the Swale. This is coupled with a sense of exposure which results from the lack of shelter and elevated, coastal position, this atmosphere can be both invigorating and bleak, depending upon weather conditions (Jacobs Babbie, 2004).*

The ecological value of the coastline and marshes is explicitly stated:

*4.44 The Thames, Medway and Swale estuaries and the North Kent Marshes are recognised as one of the most important natural wetlands in northern Europe providing recreational resources as well as invaluable natural flood protection for London. They support mammals such as seals, globally important numbers of breeding and wintering birds, as well as rare plants and insects, and large parts are internationally protected. The marshes are popular places for the enjoyment of nature due to their big open skies providing exceptional panoramic views, a sense of remoteness and spectacular wildlife.*

Coastal squeeze means that existing and limited saltmarsh is highly vulnerable to degradation from rising sea level:

*4.104 Salt marsh and mudflats are highly vulnerable to rising sea level and the associated increase in wave energy, leading to erosion of the seaward edge. Sediments that would naturally be deposited further up shore can also be prevented from doing so where coastal defences are in place. Habitat can be lost as it becomes „squeezed“ between rising sea levels and static defences. Salt marsh, like other intertidal areas, dissipates wave energy, thus reducing the risk of damage to sea defences and low lying areas. Given the importance of salt marsh to the ecological functioning of the coast, and to flood management, this habitat needs to be incorporated into plans for coastal realignment using existing areas of undeveloped land adjacent to the coast. Mudflats are also vulnerable to coastal squeeze and increased erosion which is likely to be exacerbated as coastal communities respond to climate change. The Thames Estuary 2100 Catchment Habitat Management Plan (Environment Agency 2008) assesses the current location of intertidal habitats and projects changes over the next 100 years. Due to coastal squeeze, salt marsh is largely projected to suffer loss of extent at the expense of expanding mudflats as the sea level rises and the habitat rolls back. The mudflats in the Medway and Swale estuaries are projected to expand in general due to the presence of numerous small islands, whereas the mudflats in the Thames Estuary will decrease (Environment Agency 2008).*

The value of coastal habitats for Carbon sequestration is high, even though such places are relatively limited in extent and continuously threatened by loss to land-take and development <https://www.sciencedirect.com/science/article/pii/S0272771413005143?via%3Dihub>:

*Changes in value of the carbon sequestration service of coastal habitats are then projected for 2000–2060 under two scenarios, the maintenance of the current state of the habitat and the continuation of current trends of habitat loss. If coastal habitats are maintained at their current extent, their sequestration capacity over the period 2000–2060 is valued to be in the region of £1 billion UK sterling (3.5% discount rate). However, if current trends of habitat loss continue, the capacity of the coastal habitats both to sequester and store CO<sub>2</sub> will be significantly reduced, with a reduction in value of around £0.25 billion UK sterling (2000–2060; 3.5% discount rate). If loss-trends due to sea level rise or land reclamation worsen, this loss in value will be greater. This case study provides valuable site specific information, but also highlights global issues regarding the quantification and valuation of carbon sequestration and storage.*

The effectiveness of wetlands at storing carbon is attested by the proportion of carbon storage within wetland soils, which is estimated to range from 20 to 30% of the global soil carbon reservoir, compared to the distribution of wetlands on the Earth's surface, estimated at 5–8% [https://www.researchgate.net/profile/Hans\\_Brix/publication/235618623\\_Wetlands\\_carbon\\_and\\_climate\\_change/links/0deec5332fe1255123000000.pdf](https://www.researchgate.net/profile/Hans_Brix/publication/235618623_Wetlands_carbon_and_climate_change/links/0deec5332fe1255123000000.pdf). Importantly these authors conclude that:

*We demonstrate that almost all wetlands are net radiative sinks when balancing carbon sequestration and methane emissions and conclude that wetlands can be created and restored to provide C sequestration and other ecosystem services without great concern of creating net radiative sources on the climate due to methane emissions.*

Further to this the RAMSAR International Treaty, which specifically applies to coastline immediately adjacent to and ecologically intimately connected with the Nagden and Graveney Marshes, requires a need for ‘more informed, timely decisions and more effective, concerted actions to conserve and sustainably use intertidal mudflats and saltmarshes...’. This quote is taken from the abstract of the paper <https://www.ncbi.nlm.nih.gov/pubmed/23669560>, which begins by stating:

*The adoption of the Convention on Wetlands of International Importance in Ramsar, Iran in 1971 committed the UK to conserve and sustainably use intertidal mudflats and saltmarshes for the benefit of present and future generations. Through consideration of their importance and value, current status, the characteristics, causes and consequences of their loss, and the associated responses to loss, this paper reviews the UK progress towards the conservation and sustainable use of intertidal mudflats and saltmarshes. Uncertainties in their current status and trends make it difficult to assess the overall net change in extent across the UK. However, it is apparent that losses due to erosion continue to exceed gains from intertidal mudflat and saltmarsh reparation (IMSR) schemes in south-east and southern England.*

A seminal paper on the saltmarshes of Essex and North Kent was written by Fiona Burd in 1992 ([http://archive.jncc.gov.uk/pdf/Pubs92\\_Saltmarshes\\_of\\_Essex\\_&\\_North\\_Kent\\_1973-1988\\_PRINT.pdf](http://archive.jncc.gov.uk/pdf/Pubs92_Saltmarshes_of_Essex_&_North_Kent_1973-1988_PRINT.pdf)).

This concludes that the saltmarshes are undoubtedly experiencing erosion due to sea level rise and that saltmarsh to the seaward of sea defences provides an important contribution to the stability of the sea walls. Furthermore:

*An important element highlighted by work in the Mississippi Delta is that there is a delay of several decades before the response of the ecosystem to sea-level rise becomes evident, but the rate of response may accelerate with time. **It is therefore important that any action to prevent future catastrophic consequences of sea-level rise should be taken sooner rather than later.***

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The Cleve Hill proposals therefore threaten the future and integrity of the town of Faversham whilst contributing nothing to this future locally and preventing the acknowledged policy of the Environment Agency and others, stated over a previous decade or more, to carry out Managed Realignment of the coastal defences within a short timescale; thereby extending valuable and rare saltmarsh and wetlands, satisfying Habitat Directives, ameliorating increasing risks of flooding into the town and surrounding area, and enabling more natural and ongoing ecological response to rising sea level. The excessive scale and demands of the Cleve Hill Solar proposal mirror other proposals for development around the town that would change its character out of all recognition in the forthcoming 40 - 50 years, place intense demands on unprepared and insufficient infrastructure and illustrate the triumph of globalism over localism at a time when 'sense of place' becomes the defining principle of democratic progress and philosophy.

At the final analysis Climate Change disturbs the integrity and ability of the natural environment to adapt and re-equilibrate to new parameters induced by man-made emissions. Understanding, monitoring and utilising these natural processes of adaptation and re-equilibration have primary importance when they can contribute to the the UK Government's avowed 25-year plan to leave our environment in a better state than we found it <https://www.gov.uk/government/publications/25-year-environment-plan>.

When it can be shown (in 1994) that 609.77km<sup>2</sup> of secondary land-take is devoted to car parking and the motor car and virtually none of this degraded and tarmac covered 'brownfield' has been utilised for Solar Arrays <https://www.eco-logica.co.uk/pdf/CPRELandTake.pdf?fbclid=IwAR19wnP0TvqjbZFn49WynOd7D4iYxvJy1ixov4n4f3FpMNcWrKRfQ9e01ZE>; that 'Generally Nordic countries have the highest market penetration rate of heat pumps. In particular, Norway has the highest share of heat pumps proportion with more than one third of all household equipped with a heat pump. 95% of new heating systems are heat pumps. The UK is at the other end of the scale with heat pumps representing less than 1% of new heating systems' [https://www.london.gov.uk/sites/default/files/low\\_carbon\\_heat\\_-\\_heat\\_pumps\\_in\\_london\\_.pdf](https://www.london.gov.uk/sites/default/files/low_carbon_heat_-_heat_pumps_in_london_.pdf); that a research paper on large scale Lithium Battery energy storage raises questions about potential safety, the sourcing of raw materials (and human/environmental costs of so doing) and effective lifetime of installations, the comparative values of centralised and dispersed solar and energy storage, whilst discussing future technologies and accepting the need for renewables [https://www.researchgate.net/publication/327835323\\_On-grid\\_batteries\\_for\\_large-scale\\_energy\\_storage\\_Challenges\\_and\\_opportunities\\_for\\_policy\\_and\\_technology](https://www.researchgate.net/publication/327835323_On-grid_batteries_for_large-scale_energy_storage_Challenges_and_opportunities_for_policy_and_technology); that there are valid future concerns about such a burgeoning and supposedly 'green' technology as solar arrays reach the end of their lives <https://www.theverge.com/2018/10/25/18018820/solar-panel-waste-chemicals-energy-environment-recycling>; and that it is individuals rather than commerce and Government that truly drive environmental protection and restoration against innate inertia and vested interests (as perfectly illustrated by the Carrifran Project in the Southern Uplands of Scotland <http://www.carrifran.org.uk> , "where one tree survives, with our help, a million trees will grow") - **then the equation becomes more complex and equivocal.** As Professor Aubrey Manning says in his Foreword to the book describing the Carrifran Project (an example of re-wilding underpinned by rigorous science and application and collective action, and which stands as an exemplar for all such initiatives):

*'This is part of the 'world of wounds' to which Aldo Leopold refers... implying that scientists are only too aware of the wounds unnoticed by other people. However, Leopold is wrong to blame science. The blame should fall on society - all of us who have failed to recognise the wounds or have preferred to ignore them'*

At the end of the day the health of the environment and ecology of those places where we live might fairly be expressed by the poetry of the Marsh Harrier criss-crossing that habitat where it lands to make its nest, and the quality of the wider landscape in which it raises its young, beautifully captured in this video <https://www.youtube.com/watch?v=ldBJ0ZLN57c> (Marsh Harrier at RSPB Minsmere).

*To put the marsh harrier population in context, although the population has increased since 1990s this is one of the UK's rarer breeding birds with a population of circa 361 pairs. This puts it scarcer than another iconic bird of prey the Golden Eagle with a breeding population of c 508 pairs. And much rarer than the introduced Red kite with a population of c 1600 pairs in the summer.* ([https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010085/EN010085-000996-Bob%20Gomes%20-%20Written%20Summary%20\(OFH%20\).pdf](https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010085/EN010085-000996-Bob%20Gomes%20-%20Written%20Summary%20(OFH%20).pdf))

(On the subject of this bird that in many ways defines the landscape of the North Kent Marshes I would add this reference from a close study of its habitats and breeding success, and ongoing recovery in numbers [https://www.iccs.org.uk/wp-content/uploads/2011/10/Bennett\\_Ch Charles\\_ConSci\\_2014.pdf](https://www.iccs.org.uk/wp-content/uploads/2011/10/Bennett_Ch Charles_ConSci_2014.pdf), which concludes:

*'In terms of management, it is clear that wetlands are the most important habitat for the majority of the population and threats of wetland drainage and degradation is still topical (Millennium Ecosystem Assessment, 2005). Managing wetland drainage and degradation may be considered a priority for not just the Marsh Harrier, but for wider environmental and ecosystem functions. In parallel, agricultural habitats may also be considered an important habitat that should be included in the management strategy of this recovering species.' --- 'Taking a precautionary approach to protect natural habitats is a sensible strategy as there are still many uncertainties associated with climate change, especially in agricultural landscapes.'*

The latter day value of Kentish populations of this bird are shown in Figure 2 and raise considerable unanswered questions about the impact of such profound changes and inherent uncertainty in its range and habitat as would be imposed by the Cleve Hill Solar proposal)



**Sheppey Wildlife**

22 July at 22:10 · 🌐



A Sheppey Marsh Harrier.

