CORNISH HEDGES AND THE CLIMATE CRISIS

Cornish hedges are capable of storing considerably more CO_2 than the area of land they occupy.

Replacing Britain's lost hedges is the obvious way, along with tree-planting along town and city streets, to reintroduce the equivalent of extensive forests into the ecosystem, while continuing to use the land for food production and housing. The Cornish hedge can have even more potential than the English hedgerow, unless the latter is allowed to grow naturally rather than trimmed or laid, and allowed a margin along each side. Undisturbed grassland is a prime carbon sink, as is deep and flourishing moss. The bank element of the Cornish hedge, overgrown with grasses, wild herbs and mosses, makes up as great an area again as the bushes and trees on top, on the same narrow footprint of land. The whole hedge can boast the combined neutralising virtues of woodland, pasture and peat bog, and is worth perhaps three times its base area of any single landscape element.

21st Century Cornish hedges.

Historically Cornish hedges have developed with the centuries, with sometimes radical alteration in the layout and appearance in the landscape. From the jigsaw puzzle of tiny Bronze Age enclosures for hand cultivation, to the infiltration of the English open-field and strip system in the Middle Ages and the enclosure of common lands, and from the Post-Medieval patchwork of enlarged fields with straightened boundaries to modern day hedge removal, each age has imposed new demands.

Now a lot of chickens have come home to roost, and the 21st century demands that we repair the errors and exploitations of the recent past to ensure our own future. It is time for the landscape to change again, and meet the planet's urgent needs.

Typical Cornish field hedge gives shade, shelter, flood prevention and carbon capture for the future.

Meeting extremes with hedges.

Cornish hedges are uniquely designed to protect the land from the effects of extremes of climate. Their massive banks are essential to stop the downhill flow of run-off from heavy rain and the erosion and sliding drift of soil, either wet or dry. With their earth core and capillary action they absorb and hold a lot of water, and due to the stone cladding and naturally luxuriant green cover they conserve it during drought. They shelter land, homes, highways, livestock and crops from violent gales at all seasons, and provide refuge for wildlife from environmental stress. [Cornish Hedges Library Wildlife and the Cornish Hedge.]

Cornish hedges prevent flooding.

A mossy Cornish hedge absorbs rainfall and stores carbon.

Cornwall has always been a place of heavy rainfall. Its solidly built hedges are capable of holding back a huge volume of water along their uphill side, so it seeps slowly into the ground instead of flowing downhill on the surface causing soil erosion and flooding. Large-scale hedge removal in recent decades, coupled with inappropriate use of land unsuited to arable cultivation, has caused widespread problems of local flooding, mud on the roads, silting of water-courses and loss of soil from uphill slopes. In just one example, the removal of nearly all the internal hedges from a small farm in West Cornwall caused a mud slide overnight of avalanche proportions which completely buried an antique granite stile and the last local presence of the marsh fritillary butterfly and the heath spotted orchid.

As an ideal response to climate change, long-shaped fields should be created, in pattern somewhat like the terraces retaining water for rice paddy-fields, with more length of hedges running along the contours than across them. Ploughing with the furrows running up and down the hill presumably came in with the earlier tractors which had no cabs or anti-roll bars and were always in danger of rolling right over on steep slopes, unlike a horse which works more easily across the hill than up and down it. Ploughing up and downhill shoots rainwater straight down every furrow, and makes hedges along the contour more than ever necessary to dam it up before it gathers too much volume or takes too much soil with it.

Gateways should be sited preferentially at the end of the field, across the contour, to avoid funnelling water downhill. The steeper the hill, the narrower the fields need to be, with a close enough sequence of hedges across the downhill slope to hold back excess rainfall and keep the soil in place. Obviously it has been more profitable in the short term to remove hedges and make fields to match massive modern machinery, but in today's climate, literally, the priorities are changing. Land too steep for a conventional modern tractor to plough comfortably should not be ploughed. It should be kept, as traditionally in Cornwall and other hilly areas of Britain, as permanent pasture for livestock, or returned to nature as a carbon sink.

Trees allowed to grow naturally on Cornish hedges oxygenate and cool the atmosphere, capture carbon and combat climate change.

Action for change in promoting hedge-building.

The government needs to recognise the huge and vital role of hedges in combating climate change and coping with its immediate effects, and budget for funding farmers and land-owners to launch a concerted programme of reinstatement. Hedge mileage needs to be vastly increased, more than replacing the many thousands of miles of Cornish hedges and English hedgerows removed in the last 60 years. Hedgerows should be created with a bank and ditch, to assist flood prevention.

To get the stone and rab for the extensive Cornish hedge building programme needed, small local quarries can be opened with a limited life and extent. When afterwards abandoned, they make a picturesque and valuable wildlife habitat. Similarly the tradition of digging small local rab pits for the subsoil hedge filling should be revived. Rab is essential in building hedges for climate change, being cooler, more water-retentive and more stable under volatile or extreme temperatures than the topsoil which is often wrongly used in current hedge-building.

Where hedges have more recently been removed they are likely to have been buried in a trench along their original line, and the stone can be dug up and re-used.

In more sheltered areas new Cornish hedges should be built with extra width to allow large broadleaved trees to be planted along the top. Sycamore, inter-planted with native species such as oak, hawthorn, hazel, elder and holly, is the ideal fast-growing and thrive-anywhere tree for the purpose, capturing carbon quickly and helping to support many wildlife species. Hedges harbour a much greater diversity of life than blocks of woodland, and by giving shelter, soil stability and habitat for farming-friendly predator species they can enhance, not prohibit, other use of the land.

Climate-friendly hedge trimming and maintenance.

To protect the structure from torrential rain and burning sun, and to maintain their carbon-holding properties, Cornish hedges must be only minimally trimmed. Gorse, thorn, bramble and any other woody growth should be removed from the stone face during winter using a scythe-action cutter, leaving the soft green growth of grass and wild flowers rooted between the stones untouched. This herbal growth on the hedgebank dies back and regenerates naturally in season and must never be trimmed. Making the single cut to trim 8 - 12 inches (20 - 30 cm) away from the stone face protects most of this green growth from damage. Hedges must never be trimmed at all between the end of February and the end of October, but only in the winter months. Only on very wet land it might be necessary to trim during October before the ground becomes too boggy for access. As the year-round heat in the sunshine increases this may, unfortunately, become less of a problem.

The flail type of hedge trimmer cannot be used to maintain Cornish hedges under climate change, as it severely damages the essential damp-conserving and carbon-fixing green growth. The action and after-effects of the flail disrupt, degrade and alter the natural growth and function of the hedge and ruin its stonework, destroying its diversity and leaving the structure vulnerable to dehydration in hot weather and collapse under heavy rain.

These sad flail-slaughtered hedges show how NOT to do it. The climate crisis demands an end to the flail type of trimmer and a return to allowing normal growth on the hedge by correct maintenance.

The hedge should never be trimmed across the top, as bushes and trees must be allowed to grow up. Selective and sustainable coppicing and pruning of hedge trees and bushes maintains them, the harvest of their rich resource of wood becoming valuable for use in many ways to replace plastics and fossil fuels. Sycamore, disliked by some for its propensity to grow like a weed, is a handsome tree and under climate change its vice becomes a virtue - the most valuable tree for urgent action to mitigate climate damage. It grows very fast, is extremely coppicing-friendly, and as a bonus produces a useful smooth-grained wood that makes many environmentally beneficial artefacts and also burns well as logs. So far it has also appeared less vulnerable to disease than elm, oak or ash.

CLIMATE CRISIS AND BIODIVERSITY ACTION

THESE SUGGESTIONS FOR INCREASING OUR CHANCES OF SURVIVAL REPRESENT THE EXPERIENCE-BASED PERSONAL OPINIONS OF THE CORNISH HEDGES LIBRARY AUTHORS AND ARE FREE OF BIAS OR COMMERCIAL INTEREST.

For the future of our "green and pleasant land" hedges and pasture combat climate damage.

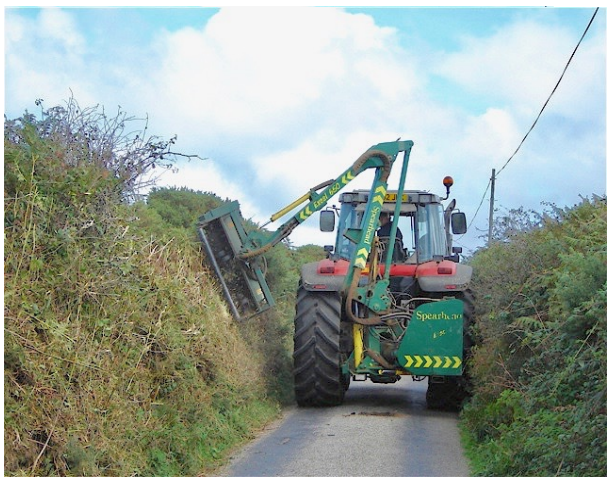
The thousands of miles of Cornish hedges and English hedgerows removed in the last 60 years should be replaced. Hedges store carbon, substantially prevent run-off and flooding (English hedgerows need a bank with a ditch) and are an effective way to get billions of trees and bushes back into the ecosystem. **This action is urgent**. It takes 7-10 years for a tree to make sufficient size to be of real use and to be reasonably sure of surviving the stress of weather extremes, and once severe drought conditions set in, a dustbowl situation is created so newly planted hedges will not survive to grow.

Long-shaped fields should be created with more length of hedges running along the contour than across, with gateways sited preferentially across the contour to avoid funnelling water downhill.

New hedge banks can be built with the extra width to allow large deciduous trees to be planted along the top. Sycamore, inter-planted with native species such as oak, hawthorn, hazel, elder and holly, is the ideal fast-growing and thrive-anywhere broad-leaved tree for the purpose, capturing carbon quickly and helping to support many wildlife species. Hedges harbour a much greater diversity of life than blocks of woodland, and give shelter, soil stability and habitat for farming-friendly predator species.

Hedges should never be trimmed across the top, so bushes and trees are allowed to grow up. Selective and sustainable coppicing and pruning of hedge trees and bushes maintains them, and the harvest of their wood meets many purposes to replace plastics and fossil fuels. Sycamore for example is odour-free and is traditionally used for kitchenware, eg a return to wooden chopping-boards to replace plastic or glass. Like other hedge-top trees it burns well as logs and the sticks make good kindling.

All hedge-flails, strimmers and rotary mowers need to be decommissioned and scrapped, using instead clean-cutting scythe-action blades such as the finger-bar trimmer. **This is the single most decisive action in restoring floral, insect and bird life.** [See Cornish Hedges Library The Life and Death of a Flailed Cornish Hedge.]



Use of the flail-mower since 1972 has been a cumulative disaster for the historically unique and once species-rich Cornish hedges.

All trimming has to cease between the end of February and the end of October, excepting blind junctions and visibility points on roads. A selective winter trim of woody growth on hedge sides, field margins and verges allows wild flowers to grow and ripen to cast their seed. The trimmer must never touch the grass and wildflower plants on the hedge sides. This will allow flail-decimated invertebrate populations and floral species to recover. Alternate sides of the hedge should be trimmed in different years. Never trim horizontally across the top of a Cornish hedge.

Historically Cornish hedges have been exported to distant parts of the globe along with the tin and copper miners who emigrated to foreign mining fields. This may seem an outrageous suggestion, but why not export them now to other parts of the British Isles? Those parts where enough stone is available could acquire the extra benefit of excellent flood prevention and the outstanding biodiversity hosting of the classic Cornish hedge. It seems rather selfish for Cornwall alone to enjoy it.

Besides taking to building Cornish hedges wherever suitable, the principle of the hedge or hedgerow as undisturbed green growth could profitably be extended to other climate-restoring measures, such as creating green roofs on all suitable buildings. If every flat or moderately sloping roof in Britain, from industrial estates to small sheds, were covered with turf and wild flowers it would replace millions of acres of carbon-holding wildlife habitat without using a single extra inch of land.

One garden-room roof, for instance, measuring 12ft 6in by 15ft (roughly 20 square metres) is equivalent to 3-4 metres length of Cornish hedgebank or $20m^2$ of permanent flower meadow. A flat roof at least replaces the area of ground it covers, while a pitched roof more than compensates for this.

Green roofs support a wide and diverse population of native species, absorb rainfall and reduce run-off, and give excellent insulation to the building. The roof may need strengthening to take the weight. Some roofs may need watering occasionally but well repay this input. As long as they are not trimmed and are allowed to seed every year they will, like the bank element of a Cornish hedge, normally regrow after drought.

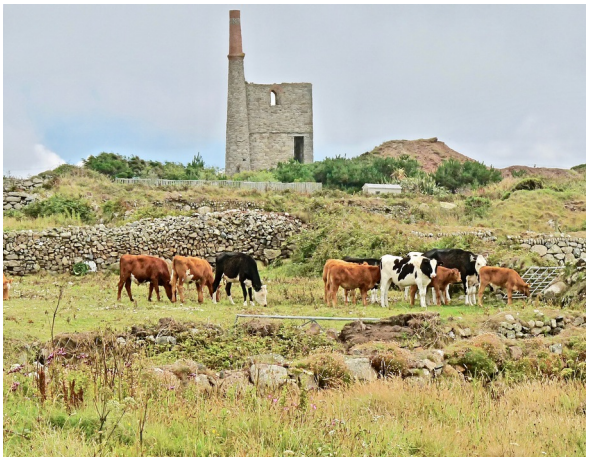
On all development sites both urban and rural, whether industrial, commercial or residential, hedges or hedgerows according to the local style should be included as a matter of course in the layout both as boundaries and as dividing features within the development, meeting requirements for environmental, biodiversity and geological factors. [See CHL Cornish Hedges on Development and Housing Sites.]

In addition to hedges and green roofs, perennial plants, shrubs and trees should be grown wherever possible. Green growth gives off negative ions to help combat the unhealthy imbalance of positives produced by the modern lifestyle. Trees planted along the streets, amounting to billions nationwide, would have the additional benefit of shading the street users from intense sun, and, like a hedge, a row of trees absorbs much rainfall. In streets too narrow for trees, a hedge can be planted instead between pavement and road, which would provide the oxygenating effect of green growth and effectively absorb run-off.

This can also be achieved by planting hedges instead of trees in certain places in town where tree roots might interfere with drains or foundations. Walls can be replaced with hedges, and tarmac and solid paving on car parks, forecourts, driveways, loading bays, patios etc, and even in many side-streets, can be replaced with honeycomb slabs or where appropriate crazy paving (breaking up the removed tarmac or concrete into pieces roughly 12 inches across and re-using saves materials and costs). Set with a roughly 40/60 mix of topsoil and fine gravel, or with subsoil, it allows green growth and through drainage to absorb run-off. Many of these areas such as car parks can be surrounded by a good substantial hedge and covered with a canopy roof of turf or solar panels, a win-win proposition for the sheltered and shaded motorist and car and for the landscape screening, as well as the benefit of green use of a vast existing acreage of land in car parks nationwide, without encroaching on farmland.

Hedge removal has not been only a rural problem. In towns too, thousands of miles of garden and street-side hedges were grubbed out in favour of walls and fences by the generations since the 1960s who were educationally divorced from nature and not enamoured of the idea of clipping privet and sweeping up leaves (NB. You don't always need to.) To stem global warming and prevent flooding, it makes sense to replace hedges universally, in city, town, village and countryside, both as boundaries and within the plots. Even in a small garden, hedges can be planted or scaled-down Cornish hedges can be built to divide the area. With a permanent planting of suitable wild or garden flower species these make a charming feature, and being undisturbed should act over time as a mini carbon sink. Outside of Cornwall, local stone or even bricks can be used to similar effect.

Historically, hedges and livestock have been interdependent, and in Britain's closely-hedged and pastoral landscape appeared to produce a good environmental balance. Modern industrial farming methods have disrupted this, but the harm is unlikely to be resolved by giving up eating meat, eggs or dairy products. It seems generally accepted that vegan diets, in demanding colossal acreages for the monoculture of protein substitutes, are likely to cause environmentally harmful effects world-wide, from both the land use and the food miles, unless everyone grows all their own food in the back garden with an organic no-till system. Permanent pasture, free-range livestock, organic manures and rotational crops, along with their protective network of hedges, are an essential natural part of biodiversity, carbon capture, flood prevention and soil health.



Livestock is essential to the health of the planet and to sane use of poor agricultural ground like Cornwall's mining areas.

Returning to grass-fed-for-life outdoor British meat, and paying more for it if necessary by eating it less often and saving on other shopping items - for instance all those less than necessary things that come in plastic packets and bottles - would help to ensure the continuance of environmentally beneficial mixed farming and the hedges essential to biodiversity and climate health.

In support of this there should be a ban on all live exports for slaughter. Properly regulated and inspected local abattoirs need to be reinstated for local consumption of locally-reared meat, minimising animal travel stress and food miles. Rabbit culled from the hedges is a non-polluting minor source of local meat and provides cruelty-free natural furs to replace environmentally-harmful fake fur. Controlled allowing and culling of wild deer likewise provides environmental benefits, good meat and deerskin products.

A return to natural materials, to replace man-made fabrics and plastics which are highly polluting and non-compostable, would help to maintain our healthy mixed farming hedged landscape. Wood, clay, wicker, natural plant fibres, leather, hides and legal furs, sheepskin, wool, feathers, horn and bone, etc, can all be responsibly produced in eco-friendly systems, some indeed harvested from the hedges themselves. Any extra cost is offset by the fact that with care natural materials last longer in good condition than man-made substances - it can be for many lifetimes - and are usually repairable.

Historically, small hedged plots have been successfully used for hand-raising of food to supplement the national farm produce. Nowadays this would have the added advantage of eliminating excessive food miles on many fruits, salads and vegetables including those that are less suited to commercial production, as well as on more mainstream items such as apples, pulses, poultry and pork. Voluntary co-operatives in towns and villages could raise food this way by using available gardens and existing small plots and holdings, perhaps with the addition of a new national allotment scheme. Everyone contributes - those who allow the use of their land, those who donate money for plants, seeds, livestock and poultry, and those who do the voluntary labour. Even small gardens, each growing one item at a time and taking part in an annual crop

Sheep use poor land and give rich returns for climate health, including wonderful wool in place of planet-damaging man-made fibres. The undisturbed land and hedges are a prime trap for carbon and methane.

Tiny plot sheltered by hedges raises enough vegetables and salads in season for a daily helping around the year.

rotation with the others could produce enough of a remarkable range of fruit, vegetables and cut flowers for reasonable self-sufficiency. Everyone would benefit by sharing the fresh, healthy produce, and the planet would benefit by the organic system and elimination of food and flower miles. This plan would take a minimal circle of land within and immediately around each village and town, incidentally contributing to more hedge-planting, and leaving the wider countryside to feed the cities - and even cities have gardens and allotments. Britain famously Dug for Victory in its gardens for the war effort, and can do it again in the battle for the planet.

It would help this effort if we stopped putting the clocks back for the winter. Keeping British Summer Time all the year round has been shown [Garnsey, 2007] to reduce energy costs and save millions of tons of CO_2, and to reduce deaths and serious injuries in road accidents (morning accidents may be slightly raised but evening accidents are more substantially reduced), while also having a beneficial effect on general health. It gives that precious extra hour of daylight after work to get outdoors and potter in the garden.

A return to a healthy amount of manual labour towards the climate effort such as gardening, hedging and ditching, along with small local power sources such as direct-drive wind and water-mills, and including horse and human power would hugely ease the national energy burden and reduce pollution. Human hands, arms and legs are a great source of saving electricity and fuel, and a horse will do many jobs more economically in both monetary and emission terms than an engine. A horse will, for instance, comfortably turn a turbine to generate electricity at minimal cost with complete reliability and efficiency in all weathers, without compromising the horse's welfare and without making a blot on the landscape, burying gigantic blocks of concrete in sensitive environments or endangering birds. A sensible return to the horse in these days of recognition of animal welfare would be another valuable adjunct to improving soil health and the necessary retention and replacement of hedges and permanent pasture. Horses have long been our finest allies in empowering climate-friendly progress, and turning again to them in this hour of need would save our wonderful national breeds such as the Clydesdale, the Suffolk Punch and the Dales pony from the brink of extinction.

Governments and big business have to act, but it is down to every one of us to make responsible choices, consume less, create no waste, and neutralise our own environmental footprint. Most of us can at least allow our hedges and gardens, if we have them, to grow more freely. Re-thinking priorities and redirecting effort eases environmental pressures, saves energy and releases resources for more essential purposes. As a prime target, easing the neurotic tidiness and hyper-cleanliness culture would massively reduce plastics and pollution and give wildlife and human health a chance to recover. We can help our farmers, manufacturing companies and corporate bodies to change to environmentally acceptable activities and productions, by reorganising personal spending to boycott harmful processes and products, cut out unnecessary expenditure and allow for paying the extra amount, if necessary, for enjoying ethical services and goods and locally-raised food.

The power of concerted small actions is mighty. The wrong ones have brought the health of the planet into crisis, in the pursuit of convenience, profit and the flawed policy of 'economic growth'. It's up to us to support instead a balanced and environmentally sustainable economy, both in our own lifestyle and in our country as a whole. Together we can reverse the damage, and still have fun doing it.

To take an active part in helping local wildlife in the face of change, see the voluntary action detailed in Restoring Biodiversity in Cornish Hedges on this website.