

REWILDING YOUR LOCAL PARK

Background and introduction

Rewilding developed in America in the 1940's and an experiment in the Netherlands in the 1960's sparked interest in the UK in the 1980's, when the word rewilding was coined by Dave Foreman, a conservationist in America and one of the founders of the environmental activism group 'Earth First'. Frans Vera's book "*Grazing Ecology and Forest History*" was translated into English from Dutch in 2000 and in 2002 a landowner in England took the decision to rewild their farm, i.e. 1,295 hectares (3,200 acres) at Knepp in West Sussex. They recorded the changes and wrote a book, *WILDING. The return of nature to a British farm* by Isabella Tree, published in 2018. *Making Space for Nature* was published in 2010 and *Natural Choice* in 2011, which, promotes the rewilding of 6,000 hectares (23 square miles). 'Rewilding' entered the English dictionary in 2011. *Feral. Searching for Enchantment on the Frontiers of Rewilding* by George Monbiot was published in 2013 (reprinted as *Feral. Rewilding the land, the sea and human life*). The charity "Rewilding Britain" was launched in 2015 and aims to have returned 300,000 hectares (1,158 square miles, equivalent to the area of golf courses in Britain) to natural processes by 2030 and to one million hectares (4.5% of Great Britain) by 2120 (Tree 2018).

Rewilding has been promoted at a variety of scales, from the household garden to an entire landscape. Examples in the UK are few and far between, but include Abernethy Forest and Glenfeshie in Scotland, Cambrian Wildwood in Wales and Wild Ennerdale in the Lake District, as well as Knepp.

Elements of rewilding have also been incorporated into natural flood management schemes, sometimes called slow the flow initiatives such as Pontbren in Wales, Pickering in North Yorkshire, the Sussex Flow Initiative on the River Ouse, and the Stroud Sustainable Drainage Project in Somerset.

Rewilding means different things to different people and that can be challenging. The Wildlife Trusts believe that rewilding is an approach to restoring natural processes at a range of scales in a cost-effective way to help create a 'Nature Recovery Network'. Supporting wild places and wildlife to recover is key to the aim of rewilding.

Conserving wildlife in nature reserves and rewilding can be seen as a continuum. At one end, there is targeted management to maintain a specific habitat and/or species, at the other is an entirely natural system, or wilderness, where the habitats and species are self-managing. Rewilding can take place anywhere along the continuum, and rewilding aims to restore natural processes, where possible, to move gradually up the scale of wildness along the continuum. By adopting a step-wise approach to rewilding, it can apply anywhere including in urban areas and for those landowners and situations where a non-intervention approach is either impossible or undesirable.

It is also important to be clear on what rewilding is not. Rewilding is not about removing people and communities from the landscape to be replaced by woodland, grassland and/or wetland with herds of herbivores being hunted by predators. Sites in the process of being rewilded need managing, typically by wild animals (e.g. deer) or livestock (ideally rare breeds), which, in the absence of predators, need their populations to be surveyed /or monitored and probably controlled by human intervention. Only by standing back and letting nature take its course, combined with introduced grazing animals, did species such as Nightingale, Purple Emperor butterfly and Turtle Dove not only return to Knepp, but flourish.

These notes have been produced by The Wildlife Trust for Lancashire, Manchester and North Merseyside (the "Wildlife Trust") to serve as a guide to the following:

- A. Steps and options,

- B. What to think about/take account of,
- C. How to do it,
- D. Things to do, and
- E. What not to do.

Six things are common to all the habitats discussed below: bare ground, contamination/pollution, services and wayleaves, management including grazing, and invasive species.

1. Bare ground is created naturally through erosion, fire/lightning, wind blowing trees down, and by animals such as Badgers, Moles, Rabbits, Red Deer and Wild Boar. Bare ground is an important habitat for invertebrates, including solitary bees and wasps, and can provide opportunities for plants to germinate from seed. Just leave it where you can.
2. Since the industrial revolution, large areas of land and water have been mined, quarried and/or used for landfill. Chemicals have been disposed of in watercourses, or may have leached out onto the land. Some of these areas have been reworked and/or landscaped and areas used for grazing, recreation, nature conservation, and even redeveloped for housing and industry. Pollution released in the air can concentrate on land upwind of its prevailing direction. Incidents such as Chernobyl left land contaminated with radiation and there can be high levels of natural background radiation such as Radon. Other areas have been used for illegal dumping/fly-tipping and the type(s) of contamination/pollution is unknown. Do you have any mining legacy and/or contamination on, or underneath, your park that you need to take into consideration?
3. From gardens to national parks, there are likely to be services and wayleaves entering and/or leaving your property, from broadband/cable TV/internet, electricity cables, footpaths and bridleways, gas pipes, mains water, public rights of way, sewage, telephone lines and waste water etc. There may also be commoners who have rights to graze animals, take wood or peat from common land. Some areas of land and water, including wetland, woodland, saltmarsh and upland have angling, shooting or sporting rights held by a third party. The Environment Agency may have a right of access to an 8-metre wayleave along the bank of any main rivers.
4. In the wild, most habitats are grazed to some degree, either by wild mammals (mainly deer, but also by goats, ponies and Wild Boar in parts of the British Isles e.g. Dartmoor/Exmoor, the Forest of Dean and the New Forest), or livestock including rare breeds. Areas can also be grazed by hares, rabbits and flocks of geese and/or swans. However, grazing is not an option in most parks and urban greenspaces, hence you may need to consider mimicking the management of grazing animals: controlling tree regeneration and certain invasive plants, disturbing topsoil to stimulate germination, creating dead wood by shredding and ring-barking trees, dispersing seeds etc.
5. Diversity. A monoculture of one species is normally a product of agricultural and forestry practices, and doesn't occur naturally in the wild, although some specialised habitats, such as pioneer saltmarsh, young sand dunes, kelp forests, silted-up waterbodies, and very wet woodlands, can be dominated by just a few plant species. A variety of densities, heights, shapes, vegetation and wetness will create conditions that can support a greater range of species of fauna, flora and fungi.
6. Species that are described as invasive, i.e. take-over, run riot or get out of control, can be native or non-native, some of which are attractive and well known. There are over 100 Invasive non-native species (INNS) listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), for which it is an offence to allow them to spread into the wild. The schedule includes nearly 70 animals and over 40 plants. Some of the more well-known plants include Cotoneasters, Floating Pennywort, Giant Hogweed, Himalayan Balsam, Japanese Knotweed, New Zealand Pygmyweed, Parrot's-feather,

Montbretia, Rhododendron, Variegated Yellow Archangel, Virginia Creeper, Water Fern, Water Primrose and waterweeds etc. Native species that can be invasive include Bracken, Bulrush, Pendulous Sedge, rushes and Yellow Flag. If you decide which species you want, then you must control them, otherwise plants will colonise by natural regeneration/self-seeding and some may ‘take-over’, which you may, or may not, want. Note: there are now more species of non-native plants growing in the wild in the British Isles than there are native plants!

The guidance below presents information and guidance for how to rewild your local park or urban greenspace. Similar guidance is also available for rewilding your garden, an agricultural holding or estate, and larger areas including water catchments and wider landscapes such as an Area of Outstanding Natural Beauty (AONB) or National Park. **Each is illustrated with some local examples collated from Trust staff, projects, members, partners etc., to serve as examples of what can be done and/or that can be visited?** As the size of the area to be rewilded increases, so the range of options and opportunities increases.

HOW TO REWILD YOUR LOCAL PARK

- A. Steps and options.** Much guidance has been produced on wildlife gardening since the first books were published in the late 1970’s and mid-80’s, e.g. Wilson (1979), Baines (1985 & 1986) and Emery (1986). In 2006 the Royal Horticultural Society and The Wildlife Trusts teamed up to publish “Wildlife Gardening for Everyone” (Tait 2006) and most, if not all, options for gardens can be replicated in parks and urban greenspaces.

Step 1 is to determine the boundary of the area to be rewilded, followed by 2. what do you have (the “baseline”), 3. what do you want (the “destination”), 4. what it is for (aims and/or benefits), 5. what is/are the timescale(s), and 6. how do you get there? You may, or may not, want to consider indicators of success and/or failure, which can then be assessed periodically to determine whether or not your park is moving in the right, or wrong, direction. You may find the following table useful in your planning and preparation, and to use in measuring and reviewing progress along the way:

Steps:	Options:			
1. Area/site boundary	All/entire/full Majority/more than half Minority/less than half Partial/restricted/other			
2. Baseline habitats	Waterbodies & watercourses	Woodland	Lowland grassland &/or wetland	Other e.g. hedges
Baseline area or extent	?ha/?% ?km	?ha/?%	?ha/?%	?ha/?%
Baseline condition	Favourable Unfavourable Recovering Damaged Declining Destroyed	Favourable Unfavourable Recovering Damaged Declining Destroyed	Favourable Unfavourable Recovering Damaged Declining Destroyed	Favourable Unfavourable Recovering Damaged Declining Destroyed
3. Destination habitats	Waterbodies & watercourses	Woodland	Lowland grassland &/or wetland	Other(s)
Target area or extent	?ha/?% ?km	?ha/?%	?ha/?%	?ha/?%
Target condition	Favourable Recovering Reinstated Restored	Favourable Recovering Reinstated Restored	Favourable Recovering Reinstated Restored	Favourable Recovering Reinstated Restored
4. Aims/benefits	See 1-9 below	See 1-9 below	See 1-9 below	See 1-9 below

5. Timescale	e.g. 3-5 years	e.g. 10-50 years	e.g. 3-5 years	e.g. 10 years
6. How to get there	Non-intervention Limited intervention Active management	Non-intervention Limited intervention Active management	Non-intervention Limited intervention Active management	Non-intervention Limited intervention Active management
Indicators	Success/failure	Success/failure	Success/failure	Success/failure

The same steps for habitats in the table above can also be taken for species of fauna, flora and/or fungi. Why not create your own table for the species you would like to flourish and/or be controlled?

Most parks can accommodate some trees and shrubs (woodland or wildwood), a wildflower meadow (grassland or savannah) and wetland (pond or bog garden). Other habitats are possible, but the majority of parks probably do not have the option of having saltmarsh, sand dune, limestone pavement and/or moorland vegetation! Where habitats develop depends on a variety of factors including altitude, drainage, exposure, geology, rainfall and soil type etc. It is better to work with mother nature than against her.

The aims and benefits of rewilding your local park can include some, or all, of the following:

1. Aesthetic value (this can be subjective),
2. Enhancing biodiversity/nature/wildlife in general, or targeting particular species of fauna, flora and fungi. This can include the introduction or-re-introduction of species that have gone extinct locally or nationally.
3. Reducing noise and/or air pollution, including particulates such as dust, vehicle fumes etc.,
4. Capturing greenhouse gases (carbon dioxide and methane) from the atmosphere, which are held in vegetation and then transferred to the soil,
5. Absorbing and holding onto more water when it rains, which can reduce the risk of flooding, especially from surface water.
6. For food, natural medicines or other uses such as dyes and rope/string/twine. Many species of fauna, flora and fungi can be foraged, even in parks and urban greenspaces, and this can include honey.
7. Harvesting wood for use in crafts or a log burner etc.
8. Helping tackle the crisis of climate change and biodiversity loss.
9. For health and wellbeing.

In most cases, habitats in parks need a degree of management, unless you want to step back and let nature do what it wants. However, doing nothing may allow invasive non-native species (INNS) to spread from the park into the wild which, depending on the species, could be illegal. Options for managing land and water include non-intervention, limited involvement and active management. The degree, extent and timing of typical habitat management techniques such cutting vegetation to mimic grazing, has an impact on habitats and/or species. It is worth bearing in mind that, whatever management you choose to do, it will have adverse impacts on one hand and be beneficial on the other hand!

B. What to think about/take account of in rewilding your local park.

Whichever habitats you are wanting to create and/or develop in your local park, one of the first things to consider is how your park fits in with adjacent/neighbouring land, including water. It is normally better to have a park that compliments the adjacent/neighbouring land and water, where applicable, so that species can move through a wider area to encourage genetic diversity, population growth and expansion, rather than creating an island of habitat that bears no relationship to its surroundings. However, if there is no adjacent/neighbouring land or water, then creating an island that some wildlife can use, e.g. bees, birds,

butterflies and moths, dragonflies and damselflies, mammals, spiders and other invertebrates, is better than not rewilding your local park!

Living Landscapes - in 2006, The Wildlife Trusts launched the concept of ‘Living Landscapes’ – connecting isolated Wildlife Sites back together using corridors and creating stepping stones in between, see <https://www.wildlifetrusts.org/about-us/vision-and-mission/living-landscapes> . The Royal Society for the Protection of Birds (rspb) have a similar concept called **Futurescapes**, see <https://www.rspb.org.uk/our-work/conservation/landscape-scale-conservation/futurescapes/> .

Ecological networks - In 2010, Professor Sir John Lawton submitted “*Making Space for Nature: a review of England’s Wildlife Sites and Ecological Network*” to defra in 2010, the report emphasising the need for “more, bigger, better and joined”. Lawton’s report formed the basis of the government’s White Paper, *The Natural Choice* in 2011, which is still government policy. In 2012, the Lancashire Local Nature Partnership secured funding from Natural England to produce ecological network maps for the county. Maps of grassland and woodland ecological networks were produced in 2014 and are available c/o Lancashire Environment Record Network (LERN), based at the County Hall in Preston. Buglife published their B-Lines network for England in July 2020, see <https://www.buglife.org.uk/our-work/b-lines/> .

Sites – there are statutory and non-statutory sites of biological and/or geological importance in each county. For the presence of statutory sites see <https://magic.defra.gov.uk/MagicMap.aspx>, and for further details see <https://designatedsites.naturalengland.org.uk>. For non-statutory sites see ‘Local Sites’ at <http://mario.lancashire.gov.uk/agsmario/default.aspx>, and for further details contact the local record centre or the Wildlife Trust.

Habitats - sources of information include Phase 1 habitat surveys of Borough and/or Counties, Phase 2 habitat surveys (e.g. National Vegetation Classification), and habitats of principal importance in England. For details of Phase 1 and 2 habitat surveys contact the local record centre or the Wildlife Trust, and for habitats of principal importance in England see <https://magic.defra.gov.uk/MagicMap.aspx>.

Species - the following table presents actual and estimated numbers of native species of fauna, flora and fungi in the UK compared to numbers in the world (excluding bacteria, microbes, viruses and most marine species).

Taxonomic group	Nos. in the world	Nos. native to the UK	% of world species	% of UK species
Flowering plants & stoneworts	>250,000	1,500	0.6	3.00
Bryophytes	>14,000	1,000	7.1	2.00
Lichens	>17,000	1,500	8.8	3.00
Ferns	>12,000	80	0.7	0.16
Fungi	>70,000	15,000	21.4	29.96
Mammals	4,327	48	1.1	0.10
Breeding birds	9,881	390	3.9	0.78
Amphibians	>4,000	6	0.2	0.01
Reptiles	>6,500	6	0.1	0.01
Freshwater Fish	>8,500	38	0.5	0.08
Invertebrates	>1,290,000	30,500	2.4	60.92
Total (excluding marine)	1,686,208	50,068	3.0	

The table above reveals that the UK supports just 3% of species in the world (excluding bacteria, microbes, viruses and most marine species), yet it has over 21% of the fungi, nearly 9% of the lichens and over 7% of

the bryophytes (mosses and liverworts), compared to 3.9% of breeding birds and just 0.6% of the flowering plants. Hence, the UK is most significant for its fungi, lichens and bryophytes, which are often overlooked in ecological surveys and nature reserve management plans!

The table above also reveals that nearly 61% of species in the UK (excluding bacteria, microbes, viruses and most marine species), are invertebrates and almost 30% are fungi, with the other groups comprising around 9% collectively. This means that if you have recorded 135 flowering plants and 15 breeding bird species in your local park or greenspace, that the total number of species in the park is expected to be around 3,950!

Sources of information on species within a geographical area include your local records centre(s) and the National Biodiversity Network atlas, see <https://nbnatlas.org/>. Some species are noteworthy for one or more of the following reasons:

- Endemic to the British Isles, i.e. they don't occur naturally anywhere else in the world and their survival into the future rests in our hands,
- Threatened with, or Vulnerable to, extinction internationally and/or globally,
- Nationally Rare or Scarce in the British Isles,
- Listed in the NERC Act (2006) as being species of principal importance in England,
- Characteristic, constant, indicators or typical of noteworthy habitat types,
- Included in one or more species guidelines for the selection of statutory or non-statutory sites,
- Regionally or locally Rare or Scarce,
- Threatened with, or Vulnerable to, extinction regionally or locally,
- Invasive Non-native Species, especially those which have legal obligations.

Management - involves planning, organizing, leading or directing and controlling group of one or more people or animals or effort for the purpose of accomplishing a goal. Hence management should be planned and controlled and achieve something. It can be active, i.e. deliberately planned or allowed to happen, or passive, i.e. it happens but the landowner/manager is unaware or not bothered whether or not it happens. Doing nothing, or non-intervention, may be an option for some people, but it may not achieve what you want and may cause problems for the neighbours. See managing the habitat types below.

Legislation and other requirements - even though it's your local park, there is still legislation and other requirements that you need to be aware of, or comply with if applicable, including the following (in chronological order): Forestry Act 1967 (as amended), Plant Health Act 1967, Wildlife and Countryside Act 1981 (as amended), Environment Protection Act 1990, Deer Act 1991 (as amended), The Protection of Badgers Act 1992, The Wild Mammals Protection Act 1996, Hedgerow Regulations 1997, The Town and Country Planning (Trees) Regulation 1999, and The Countryside and Rights Of Way (CRoW) Act for England and Wales 2000. Note: this list is not definitive or comprehensive!

Rights of other people - whilst there are unlikely to be any common rights, or legal rights of other people, that apply to your park, most parks are open to public access, at least on foot and possibly bicycle. If specific groups and people have access to your park, e.g. for playing sports, annual events, communal facilities etc., then you should consider their needs and aspirations and adjust yours to suit theirs. If the access to areas of your park in order to carry out management is restricted, this may limit the size, shape or weight of the equipment that the park can be managed with, unless you can get the equipment in via another route or person's property.

C. How to do it. Having decided what you want, where and what it is for, you can plan where you want to have woodland, grassland and/or wetland, unless you are going to step back and let nature

take its course, with little or no active intervention from yourself, other than complying with legal and/or other requirements.

C1. Woodland. According to the Phase 1 habitat survey (JNCC 2010) "**Woodland** is defined as vegetation dominated by trees more than 5m high when mature, forming a distinct, although sometimes open, canopy" and if the cover of trees is less than 30% the area is defined as scattered trees. A tree is "A woody plant that commonly achieves a height of six metres (20 feet) on a single stem" (Mitchell 1978). However, if children were walking through a thicket of Elderberry, Hawthorn or willows, they would probably say that shrubs were trees and they were in a woodland.

To create woodland, you can either plant some trees and shrubs, or let them plant themselves by natural regeneration or self-seeding, i.e. by being blown in on the wind or brought by birds and mammals. But first you should take account of what trees and shrubs are already inside, and adjacent to, your park – which trees and shrubs, if any, do you want to keep? Which trees and shrubs, if any, do you want to remove or control? Having kept or removed the trees and shrubs already in the park, the next step is deciding what, if anything, you want to add to your woodland and why. Different species of trees and shrubs grow to different shapes and sizes and are used by different species of fauna, flora and fungi. Either you choose species that can be left to grow as tall and as wide as they can in the space available to them, or you will need to cut them back/prune them. Because native species have been in the British Isles since the English Channel was re-flooded after the ice age had finished retreating around 8,500 years ago, most native trees and shrubs support a greater diversity of fauna, flora and fungi than non-native species, which have been introduced since the 1600's, if not in the 20th Century. The species that depend upon the introduced trees and shrubs in their native countries have not been brought with them and/or would not survive our weather conditions!

Woodlands have five layers: the canopy and sub-canopy; the understorey; the field layer; the ground layer; and the underground layer, but most books focus only on the first three.

1. The top or highest layer is the canopy, which includes trees in the sub-canopy underneath that are capable of growing up into the canopy given the chance and space. Which species do you want as canopy trees? If you decide, then you must control them, otherwise trees will eventually create a canopy by natural regeneration/self-seeding.
2. The understorey sits below the canopy and is composed of trees and shrubs that are not capable of growing up into the canopy above. Which species do you want in the understorey? If you decide, then you must control them, otherwise trees and shrubs will eventually create an understorey by natural regeneration/self-seeding. Of the 97 native trees and shrubs in the British Isles, at least 53 occur in northwest England, i.e. Alder, Alder-buckthorn, Ash, Beech, two birches, Box, Buckthorn, two cherries, Crab Apple, Dog-rose, Dogwood, Elder, two elms, Field Maple, Gorse, two hawthorns, Hazel, Holly, Hornbeam, Juniper, two limes, two oaks, two poplars, Raspberry, Scot's Pine, Sea-buckthorn, four Sorbus's, Spindle, Wild Privet, 11 willows, two Viburnum's and Yew. The Lancastrian Whitebeam (*Sorbus lancastriensis*) is endemic to the British Isles and is only found in Cumbria and Lancashire. Some native trees, including Beech and Hornbeam, didn't make it this far north by natural regeneration and have been planted in Northern England.
3. The field layer is the vegetation rooted in the ground in between the soil and the understorey, which usually includes ferns, grasses, rushes, sedges and wood-rushes as well as typical woodland plants such as Bluebell, Bramble, Dog-violet, Dog's-mercury, Lesser Celandine, Primrose, Ramsons, Red Campion, Wood Anemone, Wood Avens, Wood-sorrel etc. Which species do you want in the field layer? If you decide, then you must control it, otherwise plants will eventually create a field layer by natural regeneration/self-seeding.

4. The ground layer is the vegetation growing on the soil itself and usually includes mosses and liverworts, but can also include lichens. These are attached to, but not rooted in, the soil.
5. The underground layer is the community of animals, fungal mycelia and micro-organisms that live within the soil, being largely unseen and un-noticed, except when the mycelia produce their fruiting bodies, known as mushrooms and toadstools, mainly in the spring and autumn.

The ground and underground layers are not normally created, but just develop by themselves, although sometimes certain species of fungi, usually edible species such as Chicken-of-the-woods, Oyster and Truffles, are introduced into the soil or dead wood. Which species do you want in the ground and underground layers? If you decide, then you must control them, otherwise some mosses, liverworts, animals and micro-organisms will arrive naturally.

At its simplest, there are five types of semi-natural woodland in the British Isles:

1. Broadleaved (10% or less conifer in the canopy),
2. Coniferous (10% or less broadleaved in the canopy),
3. Mixed (10-90% of either broadleaved or conifer in the canopy),
4. Scrub (dominated by native shrubs, usually less than five metres tall, such as Blackthorn, Bramble, Broom, Dog-rose, Gorse, Grey Willow, Hawthorn and Juniper, but it can support scattered trees). Scrub occurring on consolidated and flattened sand dunes is called Dune Scrub, and
5. Parkland with scattered trees (tree cover less than 30% and can be scattered over pasture (as in parkland) or other habitats).

However, there is a classification of habitat types in the British Isles called the National Vegetation Classification (NVC), which identifies and describes 18 woodland, five scrub and two underscrub communities (excluding coastal and mountain habitats), dominated by Grey Willow, Downy Birch, Bay Willow, Alder, Ash, Field Maple, Rowan, Common Oak, Sessile Oak, Beech, Yew woodland, Scot's Pine, Hawthorn, Blackthorn, Gorse, Bramble and Bracken, see Rodwell (1991). If you want to try and mimic or replicate one or more of the NVC woodland or scrub communities, you will need to know or understand your soil type(s) and underlying geology, altitude, aspect, exposure, hydrology etc. However, most parks won't be large enough to support a self-sustaining NVC woodland community.

Managing woodland. If you need, or want, to manage your woodland, trees and/or shrubs in the canopy and understorey can be selectively felled, thinned out or coppiced. Management will let more light in, whereas doing nothing is likely to make it darker, and both will result in changes to the field and ground layers. Woodland management is too complicated to go into detail here, but further details can be found in books by Agate (2002), Broad (1998), Emery (1986), Kirby (1992), Peterken (2008), Rackham (1976, 1980 and 2000) and Starr (2005).

There are at least four further things to consider in a woodland: Age, dead wood, tree holes and woody climbers (lianas).

1. The age of woodland can vary from recent (planted or self-sown) to that descended from the original wildwood that colonised the British Isles after the last ice age finished retreating some 10,000 year ago. Ancient woodland been wooded continuously since at least AD 1600 and includes ancient semi-natural woodland (ASNW), plantations on ancient woodland sites (PAWS), ancient wood pasture and historic parkland. The year 1600 is used because trees were not planted widely until later in the century and mature woodland shown on the first edition Ordnance Survey maps was likely to have been present in 1600. Ancient woodlands of two hectares and above are identified

in county ancient woodland inventories, but can be seen online at www.magic.defra.gov.uk. The age of trees can vary from recent (planted or self-sown) to ancient and veteran ages. Ancient and veteran trees can be individual trees or groups of trees within wood pastures, historic parkland, hedgerows, orchards, parks or other areas. They are often found outside ancient woodlands. All ancient trees are veteran trees, but not all veteran trees are ancient. A veteran tree may not be very old, but it has decay features, such as branch death and hollowing. Very few trees of any species become ancient and they are irreplaceable.

2. Studies in natural woodlands in Europe have shown that up to 50% of the timber is either dead or dying. Dead wood is one of the most important resources to benefit wildlife in woodland. It can be standing, leaning/hung-up or fallen, can be in wet, damp or dry conditions and can be in full sun, partial or full shade. Dead wood varies in size from large trunks down to small branches and can be of any of the woody species present in the woodland. Where you can, provide dead wood, both standing (where safe to do so) and fallen, ideally including big logs, piles of brash and anything in between.
3. Around a third of all woodland bird's nest in holes in old trees including owls, Robin, titmice and woodpeckers. Holes in trees form naturally and expand through use and weathering, but oaks, Ash and Beech only begin to provide rot-holes when they are around 100 years old, hence there is a shortage of holes in most woodlands, but you can provide artificial holes by putting up nest boxes of a variety of sizes and shapes. Bird and bat boxes are simply artificial holes in trees.
4. There are six woody climbers native to, or long-established, in the British Isles: Traveller's-joy, Grape-vine, Bittersweet, Honeysuckle, Common Ivy and Atlantic Ivy.

Invasive non-native species (INNS) that can be present in wooded areas include Himalayan Balsam, Japanese Knotweed, London-pride, Montbretia, Pick-a-back-plant, Rhododendron, Spanish/hybrid Bluebell, Variegated Yellow Archangel etc. If you decide which species you want, then you must control them, otherwise plants will colonise by natural regeneration/self-seeding and some may 'take-over', which you may, or may not, want.

C2. Grassland. Your park probably already has an area(s) of regularly and closely mown grassland or lawn, and some parks already have an area(s) of meadow and/or pasture. Both of these grassland types can be rewilded to a greater, or lesser, extent/degree. But first you should take account of what grasses and other vegetation are already inside, and adjacent to, your grassland – which species do you want to keep? Which species do you want to get rid of/remove or control? Having kept or removed the grasses and/or other vegetation already in your grassland, the next step is deciding what, if anything, you want to add to your grassland and why. Different species of grasses and other vegetation grow to different shapes and sizes and are used by different species of fauna, flora and fungi. As the name suggests, grassland is normally dominated by grasses, and there are over 70 species of grasses native to Lancashire. However, grassland or areas within a grassland, can also be dominated by bryophytes (mosses and liverworts), ferns, rushes, sedges, and/or wildflowers, as well as trees and/or shrubs.

At its simplest, there are four types of lowland grassland (excluding coastal and mountain communities) in the British Isles: acid, neutral, calcareous and marshy, but note that a park can support a combination of two or more types of grassland in patches or in different parts of the grassland.

1. Acid grassland occurs on a range of acid soils (pH less than 5.5), with the following species being indicative of acidic conditions when frequent or abundant: Wavy Hair-grass (*Deschampsia flexuosa*),

Mat-grass (*Nardus stricta*), Heath Rush (*Juncus squarrosus*), Heath Bedstraw (*Galium saxatile*), and Sheep's Sorrel (*Rumex acetosella*).

2. Neutral grassland encompasses a wide range of communities occurring on neutral soils (pH 5.5 to 7.0), with the following species being indicative of neutral conditions when frequent or abundant: Meadow Foxtail (*Alopecurus pratensis*), False Oat-grass (*Arrhenatherum elatius*), Crested Dog's-tail (*Cynosurus cristatus*), Cock's-foot (*Dactylis glomerata*), Tufted Hair-grass (*Deschampsia cespitosa*), Tall Fescue (*Schedonorus arundinaceus/Festuca arundinacea*) and Meadow Fescue (*Schedonorus pratensis/Festuca pratensis*).
3. Calcareous grasslands occur on calcareous soils (pH above 7.0), with the following species being indicative of calcareous conditions Tor-grass (*Brachypodium pinnatum*), Upright Brome (*Bromopsis erecta/Bromus erectus*), Crested Hair-grass (*Koeleria macrantha*), Meadow Oat-grass (*Helictochloa pratensis/Avenula pratensis*), Blue Moor-grass (*Sesleria caerulea/S.albicans*), Common Rock-rose (*Helianthemum nummularium*), Salad-burnet (*Poterium sanguisorba/Sanguisorba minor*) and Wild Thyme (*Thymus drucei/T.praecox*).
4. Marsh or marshy grassland includes certain Purple Moor-grass grasslands, grasslands with a high proportion of rushes, sedges or Meadowsweet, and wet meadows and pastures dominated by broadleaved herbs such as Marsh-marigold and valerian species, rather than grasses.

However, there is a classification of habitat types in the British Isles called the National Vegetation Classification (NVC), which identifies and describes 21 acid grasslands, 13 neutral grassland and 14 calcareous grassland communities (excluding coastal and mountain habitats), see Rodwell (1991, 1992 and 1995). If you want to try and mimic or replicate one or more of the NVC grassland communities, you will need to know or understand your soil type(s) and underlying geology, altitude, aspect, exposure, hydrology etc. However, most parks will not be diverse and/or large enough to support self-sustaining NVC grassland communities.

Grasslands have four layers: the 'upper' layer, the 'lower' layer, the ground layer and the underground layer, but most books focus only on the first two.

1. The upper layer comprises the tallest growing grasses and other plants such as Common Knapweed, Common Sorrel, Meadow Buttercup and Oxeye Daisy etc.
2. The lower layer comprises the shorter growing grasses and other plants such as clovers, Cowslip, Cuckooflower, Selfheal, speedwells and Yellow-rattle etc.
3. The ground layer is the vegetation growing on the soil itself and usually includes mosses and liverworts, but can also include lichens in some situations.
4. The underground layer is the community of animals, fungal mycelia and micro-organisms that live within the soil, being largely unseen and un-noticed, except when the mycelia produce their fruiting bodies, known as mushrooms and toadstools, mainly in the spring and autumn.

Which species do you want in the upper and lower layers? If you decide, then you must control them, otherwise the species already there, and those that seed in from outside, will compete for a place and space. The ground and underground layers are not normally created, but just develop by themselves. Unlike woodland, fungi are not normally introduced into grasslands. Which species do you want in the ground and underground layers? If you decide, then you must control them, otherwise some mosses, liverworts, animals and micro-organisms will arrive naturally.

To create grassland, you can either plant, or seed, some grasses and/or other vegetation, or let them plant themselves, which is called natural regeneration or self-seeding.

Managing your grassland. Areas of semi-natural or species-rich grassland, often called wildflower meadows, whether natural or created, are either cut, usually for hay and called meadows, or grazed and called pasture. In most parks, however, cutting is usually the only option. If the area is large enough, and produces a sufficient crop of hay, a local farmer may be prepared to cut, turn, bale and remove the hay for no charge. However, contamination with dog muck, various dog toys and/or litter, has been known to put farmers off, or discontinue the arrangement. Cutting the hay can also be done by contractors, normally for a fee, by park staff if they have the right equipment and/or by volunteers. If the hay is cut long, it needs to be removed and disposed of appropriately, otherwise it may form a thatch, see below. However, if the vegetation is flailed into short lengths, it can decay quickly and/or be recycled back into soil by earthworms and other invertebrates, without creating a thatch and affecting the species composition and/or diversity. Alternatively, the cut vegetation can be fed in the green to animals, dried and stored as hay, composted in an allotment, left to rot down somewhere, or taken to the local authority/Council garden waste recycling centre.

There are at least two further things to consider in a grassland: trees and shrubs, and thatch or litter layer.

1. Trees and shrubs will self-seed into grassland if it isn't managed by cutting and/or grazing, as described above. Having some trees and/or shrubs adjacent to, or within, a grassland is good for foraging, shelter and wildlife, and a variety of trees and shrubs is normally better than one or two species.
2. If grassland isn't managed for a year or more, the vegetation dies back and forms a layer of dead plant material, which is known as the litter-layer. As the litter layer build up it creates a roof, or thatch of dead vegetation (like reeds used to thatch a cottage), which can block out heat and sunlight out from the ground below and inhibit, or prevent, the germination and/or growth of some, not all, vegetation in the following spring and summer. However, the litter-layer supports a community of invertebrates and small mammals such as mice, shrews and voles. Furthermore, if all the vegetation was cut, the eggs and chrysalis of butterflies and moth would be removed, and there would be no standing stems for invertebrates to over-winter within. Hence, you may want to consider creating a balance between cutting some areas and leaving other areas uncut, the areas that are cut and uncut can change or move around from year to year in a rotation/cycle, or just randomly.

C3. Wetland. If your local park already has a formal or ornamental pond or bog garden, then you can rewild it to a greater, or lesser, extent/degree. But first you should take account of what animals and vegetation are already within, and adjacent to, your wetland – which species do you want to keep? Which species do you want to get rid of/remove or control? Having kept or removed the vegetation already in your wetland, the next step is deciding what, if anything, you want to add to your wetland and why. Different species of wetland plants grow to different shapes and sizes and are used by different species of fauna and fungi. As the name suggests, wetland is dominated either by open water (standing or flowing) and/or by vegetation that can survive, or flourishes, in boggy or wet environments, which can include bryophytes (mosses and liverworts), ferns, grasses, rushes, sedges, and/or wildflowers, as well as trees and/or shrubs.

At its simplest, there are at least seven types of lowland wetland (excluding coastal and upland communities) in the British Isles: bog, fen, flush, marginal, inundation, swamp and marsh (see marshy grassland above). However, most of these habitats aren't found in parks and many parks aren't big enough to support self-

sustaining examples, but you can have a pond and/or bog garden and the vegetation surrounding a pond can have marginal and inundation vegetation.

In the wild, peat bogs, which are often called Mosses or Mossland in northern England, can be dominated by Heather (*Calluna vulgaris*), Cross-leaved Heath (*Erica tetralix*), Cranberry (*Vaccinium oxycoccus*), Crowberry (*Empetrum nigrum*), Hare's-tail Cottongrass (*Eriophorum vaginatum*), Common Cottongrass (*Eriophorum angustifolium*) and Northern Deergrass (*Trichophorum cespitosum*) as well as several species of bog-moss (*Sphagnum* species), which are the main peat-forming plants. You can plant several of these species in a bog garden (the soil should be acidic or peaty - but don't bring in peat from a garden centre – be peat free), to which you can add other plants such as Marsh-marigold and Ragged-Robin.

Marginal vegetation includes the narrow strips of vegetation occurring on the (often steep) margins of lowland waterbodies and watercourses, where the water table is permanently high. The vegetation is typically open and includes plants such as aquatic forget-me-nots, Bulrush, Branched Bur-reed, Common Marsh-bedstraw, Common Reed, Fool's-watercress, Greater Pond-sedge, Lesser Water-parsnip, Reed Canary-grass, rushes, sweet-grasses, Watercress, water-dropworts, water-plantains and water-speedwells.

Inundation vegetation includes open and innately unstable communities periodically inundated with water, including on river beds and islands and the draw-down zone around ponds, lakes and reservoirs, and can include Bulbous Rush, bur-marigolds, Creeping Bent, knotgrasses, and Marsh Foxtail.

Swamp contains tall emergent vegetation typical of the transition between open water and exposed land. Swamps are generally in standing water for a large part of the year, but may occasionally be found on substrates that are seldom immersed, as in the later stages of succession to marshy grassland. Species composition varies according to the soil type and water chemistry, etc., and includes both mixed and single-species stands of bulrushes (*Typha* species), Common Reed, Reed Canary-grass, Reed Sweet-grass, and tall sedges such as Greater Tussock-sedge, Lesser Pond-sedge and Bottle Sedge.

Wetlands have four layers: the 'upper' layer, the 'lower' layer, the ground layer and the underground or underwater layer, but most books focus on the upper and underwater layers and ignore or pay little attention to the ground and underground layers.

1. The upper layer comprises the tallest growing grasses and other plants such as Bulrush, bur-reeds, Common Reed, Meadowsweet, Purple Loosestrife, Reed Canary-grass and Yellow Iris etc.
2. The lower layer comprises the shorter growing grasses and other plants such as Bugle, bur-marigolds, Common Fleabane, Cuckooflower, Marsh-marigold, marsh-orchids, Ragged-Robin and Water Mint etc.
3. The ground layer is the vegetation growing on the soil itself and usually includes mosses and liverworts, the most well-known being bog-moss or *Sphagnum*, of which there are many species, and star-moss (*Polytrichum* species).
4. The underground/water layer is the community of animals and micro-organisms that live within the silt/soil and/or water, being largely unseen and un-noticed, except for amphibians (frogs, newts and toads), fish, if present, and some surface-dwelling invertebrates such as pond-skaters and water-boatmen. Micro-organisms in water include plankton and water-mites.

Which species do you want in the upper and lower layers? If you decide, then you must control them, otherwise the species already there, and those that seed in from outside, will compete for a place and space.

Which species do you want in the ground and underground layers? If you decide, then you must control them, otherwise some mosses, liverworts, animals and micro-organisms will arrive naturally.

To create wetland, you can either plant, or seed, some wetland vegetation, or let them plant themselves, which is called natural regeneration or self-seeding. The ground and underground layers are not normally created, but just develop by themselves.

Managing your wetland. Either you choose species that can be left to grow as tall and as wide as they can in the space available to them, or you will need to manage the wetland to prevent it turning into wet woodland, which will happen over time through the wetland drying out and natural regeneration/self-seeding. In the wild, most wetlands are grazed, either by wild mammals - mainly deer in the British Isles, but also Bison, Elk, ponies and Water-buffalo in Europe. However, grazing is not an option in most parks, hence you may need to consider mimicking the management of grazing animals: removing tree regeneration and Brambles, controlling stands of tall vegetation such as Bulrushes and reeds, keeping the edges of a pond open etc.

If you want open water as well as vegetated areas, you will need to think about the balance, proportion or ratio, between open water and vegetation. This balance can have two aspects: firstly, that between open water and floating vegetation such as water-lilies, duckweeds, pondweeds, Water-soldier, waterweeds etc., and secondly between open water with/without floating vegetation and vegetation in silt/soil or shallow water growing around the edge of open water.

Trees and shrubs will self-seed into wetland if it isn't managed by cutting and/or grazing, as described above. However, having some trees and/or shrubs adjacent to, or within, a wetland is good for wildlife.

There are at least two further things to consider in a pond or wetland: fish and water.

1. If you have one or more ponds and you want fish in one or more of the ponds, then you will probably have to introduce them, although fish eggs can be transported between waterbodies by birds. Is the pond large enough to support a population of one or more fish species? Is it deep enough not to freeze all the way to the bottom in a cold winter, which would kill the fish. Do you need to protect your fish from predation by local cats and birds such as Grey Heron which can fly down to ponds in parks?
2. Does your park get enough water (quantity) and is the water clean and not polluted (quality)? This is most relevant if you are creating a pond and/or bog garden. If you need more water can you divert rainwater from a nearby roof, or roofs, or one or more water butts? In some parks it may be possible to divert a watercourse (e.g. ditch or stream) to top up a pond, bog garden or other wetland, but you may need to check first with the adjacent landowner(s), local authority and/or the Environment Agency.

Further details about wetland management can be found in books by Brooks and Agate (2001), Fryer (1991), Greenhalgh (2008), Holmes and Raven (2014), Macan and Worthington (1951), Owen *et al* (2005) and Ward *et al* (1994).

D. Things to do.

D1. Determine whether or not you have any Ancient Woodland, Limestone Pavement, Local Sites (biological and/or geological), SSSIs, Scheduled Monuments and Ancient or Veteran Trees, within or adjacent to your park, and if so, liaise with the relevant organisation and advisor(s).

- D2. Contact the County Wildlife Trust(s), rspb, buglife and/or Local Records Centre(s) to determine the presence of Living Landscapes, Futurescapes, B-Lines, and/or ecological networks including corridors and 'stepping stones', within or adjacent to your park.
- D3. Take into account the six common themes outlined in the introduction.
- D4. Create/develop habitats that link your park to adjacent/neighbouring land and water, where applicable.
- D5. Allow existing trees to grow to their natural size and age, where safe to do so.
- D6. Plant tree species that can grow to full size in the space available.
- D7. Provide dead wood, both standing (where safe to do so) and fallen, ideally including big logs, piles of brash and anything in between.
- D8. Leave flowers to set seed and let the heads decay naturally over the winter.
- D9. Leave plant stems standing over the winter as hollow stems, together with nooks and crannies, can support a large range of invertebrates.
- D10. Put up a variety of bird nesting boxes, as well as a bat box or two. Don't forget sparrow and swift boxes if buildings and the environment are suitable.
- D11. Have a pond or bog garden if you can, otherwise provide water for birds to bathe in and animals to drink.
- D12. Leave, or create, gaps in boundaries so animals such as Hedgehogs can get in and out.
- D13. Leave suitable food out for birds and mammals such as Hedgehogs – why not put up a webcam to see what is visiting your park?
- D14. Allow nettles to grow as that is where butterflies such as Comma, Painted Lady, Red Admiral and Small Tortoiseshell lay their eggs.
- D15. Allow climbers to ascend boundaries, buildings and/or internal fences, structures or walls.
- D16. Include plants that produce scent at night, e.g. Honeysuckle and Night-scented Stock, as they attract and are pollinated by moths.
- D17. Comply with relevant legislation and other requirements.
- D18. Be peat free and help conserve peat bogs in Britain, Ireland, Europe and Russia, both for their unique fauna, flora and fungi, but also so they can continue to be carbon sinks, sequestering carbon dioxide from the atmosphere.
- D19. Avoid or stop using artificial chemicals in the park.
- D20. If you and/or local residents have cats, and they hunt amphibians, birds, mammals and/or reptiles, encourage the owners to fit a bell on their collars.

E. What not to do.

E1. Ignore the presence of statutory and non-statutory sites, Living Landscapes, Futurescapes, B-Lines, ecological networks, corridors, stepping stones and ancient or veteran trees.

E2. Ignore the six common themes outlined in the introduction.

E3. Create an island of habitat that bears no relationship to other habitats in the surroundings, although creating an island is better than not rewilding any of your local parks and urban greenspaces!

E4. Plant trees too close to buildings if the roots could cause damage to any foundations, water pipes etc.

E5. Plant tree species that would grow to too big for the space available.

E6. Remove all the dead wood.

E7. Deadhead everything and cut down all the tall plant stems.

E8. Introduce invasive non-native species, e.g. Spanish Bluebell/hybrids, Pick-a-back-plant and Variegated Yellow-archangel into wooded areas; New Zealand Pygmyweed and Parrot's-feather into a pond or wetland area.

E9. Disregard or contravene relevant legislation and other requirements.

E10. Use artificial chemicals in the park, including slug pellets, ant powder, pesticides and herbicides/weedkiller.

E11. Use peat.

E12. Light a bonfire or burn a pile of brash without checking that it isn't being used by nesting birds (in spring and summer) or hibernating mammals such as hedgehogs (autumn to spring).

E13. Not fit a bell to cat's collars if the cats hunt amphibians, birds, mammals and/or reptiles.

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