

LEVENMOUTH HABITAT TOOLKIT

A practical guide for communities
to improve biodiversity in Levenmouth



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Introduction

Green space has always been beneficial for health and well-being but since the Covid-19 pandemic, the importance of access to local green spaces has taken on even greater significance. The time spent outside of our homes has proven more precious than before knowing that it had to be limited. Visiting public parks and green spaces is a safe and convenient way to meet friends and family outdoors, to enjoy being in nature and to stay active. With travel restrictions often limiting movement to local areas, it is a good opportunity to re-discover green spaces in your immediate vicinity.

The River Leven valley in Levenmouth has been a vital resource for locals with plenty of space for social distancing, observing wildlife and staying active. There have been more sightings of deer than usual and more birds - or at least more silence in which to hear them. All age groups have been spending time within the valley during the pandemic which has perhaps created a greater appreciation for the river valley than before.



The Habitat Toolkit was created as part of the Connectivity Project to encourage the communities of Levenmouth to get involved in the stewardship and maintenance of the green spaces within the River Leven valley. It is a practical guide which identifies five habitat types within the river valley and the autonomous actions that communities can take to improve the ecology of each habitat. It is intended as a call to action and a starting point for discussions between landowners, Fife Council, other Leven Project partners, community groups and local residents of Levenmouth.

The Habitat Toolkit should be read in conjunction with the River Leven Park Concept Design Masterplan Report and Engagement Report. Both are available to view at:

<https://www.theleven.org/resources/>

Habitat # 1 | Grasslands

Areas of close mown amenity grassland are poor for biodiversity as they have a low number of different types of plants. How can we improve these areas for wildlife and people? As locals you will be aware how people use the area and this will be a good guide to where the potential is for habitat enhancement

There are **three key steps** to consider before changing amenity grassland to a flower rich meadow. This chapter takes you through the process of achieving that.

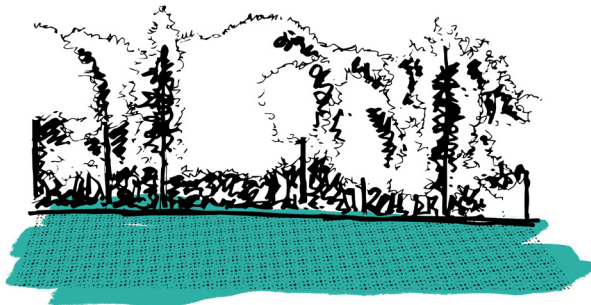
STEP 1.

First thing to do is to go on site and take a look around and see which kind of habitat the grassland is next to.

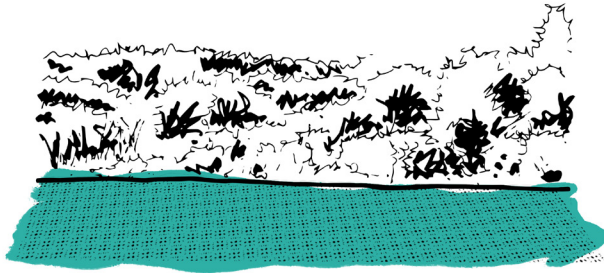
Q. Is the grassland adjacent to woodland?

A. If yes then this area is more suited to expanding the woodland. [see Habitat #2 on page 20]

Bigger is better when it comes to woods. Also woodland edge is really important so the best option is to increase the area of woodland and create a broad wavy woodland edge. The insects, birds and bats will love it!



Amenity grassland adjacent to woodland



Amenity grassland adjacent to scrub

Q. Is the grassland adjacent to areas of scrub?

A. If yes then this area would be suitable for changing to a mix of rough grassland and scrub vegetation. [see Habitat #3 on page 32]

Mixed scrub whether dense thickets or scattered through rough grassland is a really important habitat. Best option is to expand areas of mixed grassland and scrub and create thickets of scrub – great for nesting birds. For scrub creation – see Habitat # 3 on page 32.

Q. Is the grassland not adjacent to areas of woodland and scrub?

A. If yes then this area would be more suited to changing to a mix of flower rich meadow (it could also be used for a densely planted tiny forest, see page 28).

If your grassland is not associated with other habitats then the next question is what are the options for creating flower rich grassland which will benefit pollinators and other invertebrates, create safe homes for small mammals and act as a feeding station for birds and bats?

The answer lies in the soil!

Steps 2 and 3 cover the following questions:

- **How fertile is the soil?**
- **What kind of drainage is present on site?**

STEP 2.

The existing mix of plant species in the grassland will give some clues about the soil and is a good indication of how fertile the site is. This can be a guide as to how successful changes in management are likely to be.

Soil testing can be done to assess the key soil nutrients which will define success or failure. The upper limit for Phosphorus (P) is 10 ppm and for Potassium (K) is 120 ppm. The relationship between vegetation, soil composition and nutrient status is complex but the most important thing to know is that without significant interventions on high fertility soils any attempts to create flower rich areas are likely to end in failure with areas dominated by competitive grasses lacking in wild flowers or areas dominated by thistles, ragwort and docks¹. Low fertility soils are really only a problem if you are working with novel substrates such as in post-industrial areas where there aren't enough nutrients in the soil - this is not the case for amenity grassland areas.

To get an idea of how fertile the site is count the number of different plants excluding grasses which are growing in a 1 metre square plot. If you can find five or more different species in the grassland then the chances are wildflowers are able to compete with grasses and you have something to work with!

Examples of common non-grass species found in amenity grassland (mown grass)



1. White clover



2. Dandelion



3. Yarrow



4. Daisy



5. Slender speedwell



6. Self heal



7. Meadow buttercup



8. Common mouse-ear

STEP 3.

Next, look out for these species at the base of slopes or on compacted ground which indicate damp conditions:



1. Cuckoo flower



2. Silverweed



3. Amphibious bistort



4. Creeping bent (grass)



5. Marsh foxtail (grass)



6. Soft rush

1 Thistles, ragwort and docks are of high wildlife value with hundreds of invertebrate species associated with them and offering seed resources for birds like goldfinches. They are often seen as indicative of neglect but these tall ruderal species are actually of high wildlife value.

If these are present then you have the potential to stop mowing and augment this damp grassland habitat by growing on and plug planting these species which are tolerant of damp conditions:



1. *Greater birdsfoot trefoil*



2. *Ragged robin*



3. *Marsh woundwort*



4. *Devilsbit scabious*



5. *Sneezewort*



6. *Meadowsweet*

PLANTING TIP

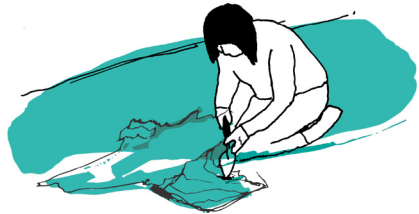
Planting in September is recommended as the soil is still warm and it gives the plugs a good opportunity to establish before they start to grow in the following spring.

PLANTING PLUGS FOR MEADOW RESTORATION

Step 1. Source cells of the species noted, making sure that the roots are coming through the bottom of the tray (approx 5-7 plants needed per square metre)



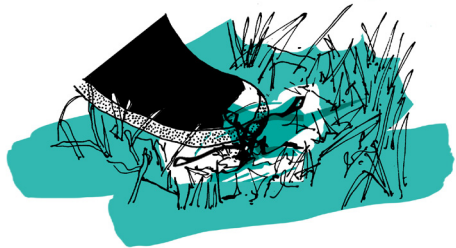
Step 2. Dig holes with a hand trowel with double the amount of space of the rootball (allow a distance of 20cm between each hole)



Step 3. Twist or tease apart the rootball of the plug prior to planting. It can be pot-bound, and this encourages root growth. Firmly press the plant into the hole, making sure there is contact with the roots at the bottom of the plant and the soil at the bottom of the hole and fill the sides with the dug soil



Step 4. Firmly press down with your foot the soil around the plant taking care not to step on it



Step 5. Generously water each plant with a watering can or hose



GRASSLAND CREATION

If it looks like you have a reasonable collection of wildflowers already in the grassland and it is not damp or seasonally waterlogged then your three options are:

1. STOP any mowing over the summer with a late autumn and an early spring cut with removal of cuttings. This will allow the flowers already in the grass to flower and set seed. Depending on what flowers come up you might want to add some wildflower plugs after the first couple of years. See the following page for species which are tolerant of mowing.

NB This will require cooperation with the Local Authority grass cutting contractors and some more specialist equipment if the cuttings are to be removed.

2. STOP any mowing altogether and allow tussocky grassland with existing wild flowers to develop. Tussocky grassland contains clumps and tufts of grasses as opposed to flat lawns.

3. OPTION 2 + Augment with wildflower plugs (see page 11) grown from locally collected wildflower seed² or seed bought from Scotia Seeds or buy wildflower plugs from suppliers who grow only from native seed and do not use chemicals at any stage during production.

2 See how to collect wildflower seeds on page 16-17

Grassland species to augment the existing species mix on neutral grassland (intensively managed grasses occurring on neutral soils):

Species tolerant of mowing:



1. *Autumn hawkbit*



2. *Betony*



3. *Bird's foot trefoil*



4. *Common cat's-ear*



5. *Cowslip*



6. *Devil's bit scabious*



7. *Lady's bedstraw*



8. *Meadow buttercup*



9. *Self heal*



10. *Yarrow*



11. *Burnet saxifrage*

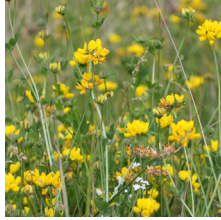


12. *Common sorrel*

Species suitable for un-mown tussocky grassland:



1. *Autumn hawkbit*



2. *Bird's foot trefoil*



3. *Cowslip*



4. *Common knapweed*



5. *Greater knapweed*



6. *Lady's bedstraw*



7. *Meadow buttercup*



8. *Meadow cranesbill*



9. *Oxeye daisy*



10. *Selfheal*



11. *Wild carrot*



12. *Yarrow*



13. *Yellow rattle*



14. *Tufted vetch*



15. *Meadow vetchling*



16. *Bush vetch*

ANOTHER LITTLE TRICK

Yellow rattle is a plant which parasitizes grasses and slows their growth. If you have an area of grassland suitable for temporary or permanent reduction of mowing then fresh yellow rattle seed can be added in the autumn into newly cut amenity grassland raked to create bare patches and the seed trampled in.

'BRING IN THE MACHINES' – A RADICAL CHANGE

If your area of grassland has a very low number of wildflowers growing and is bright green suggesting high nutrient levels and if you still want to create flower rich areas then a more radical intervention is required – removal of the existing turf (either with a turf cutter or with spades) and removing the topsoil to a depth of around 10 cm. The topsoil can be used for food growing projects and the sub soil can then be rotovated, a seed bed prepared and a Scotia Seeds meadow mix sown, trampled or rolled in and left to germinate. Note that wildflower seed does not like to be buried and requires light and heat to germinate.





Seeds and pods of common vetch Vicia sativa

FURTHER READING

<https://www.growwilduk.com/wildflowers/how-grow-wildflowers/seed-saving>

http://brahmsonline.kew.org/Content/Projects/msbp/resources/Training/English_kppcont_035653_A-field-manual-for-seed-collectors.pdf

COLLECTING WILDFLOWER SEED

There are over 180 different wild plants including trees and shrubs growing in the River Leven valley. This offers great opportunities for local seed collection to create new areas of wildlife rich habitat. Plants grown from local seed will be well adapted to the locality so you can guarantee that if planted in the right place they will establish well. Seed collection is an activity for all the family and this is how to go about it:

- It is best if during the spring and summer you explore the area and note the flowers which you would like to grow and remember exactly where they are. Vegetation changes dramatically during the growing season and it can be difficult to find your target plants in the tangle of vegetation which has developed.
- Find out who owns the land where you want to collect, explain that you want to collect seeds to grow on locally and get the landowner's permission
- Organise seed collection during warm, dry weather so that the seeds are dry when you harvest
- Take scissors or a Swiss army knife and most important - a hand lens - and take the time to have a proper look at these wondrous things called seeds
- Collect mature, dry seeds which are likely to be brown/black and will easily detach from the parent plant. Keep them in either cloth or brown paper bags and label with date of collection and plant species. Collect the whole seed head ready for processing at home
- Only take a small proportion of the seeds available and never over 20% or what you can see
- Collect from a number of different plants of the same species to maximise genetic diversity
- Just collect what you need
- Spread out the seeds on newspaper when you get home so that they dry properly and to remove any insects which have sneaked in
- If the individual seeds are in seed heads you need to separate them out and remove seeds from pods so that you can store individual seeds in labelled paper envelopes
- If you are keeping the seeds until the following season store in a cool dry place with a pack of silica gel or - even better - sow in the autumn when they would naturally fall from the parent plant.

WHAT WILL IT LOOK LIKE IF LEFT UNMAINTAINED?

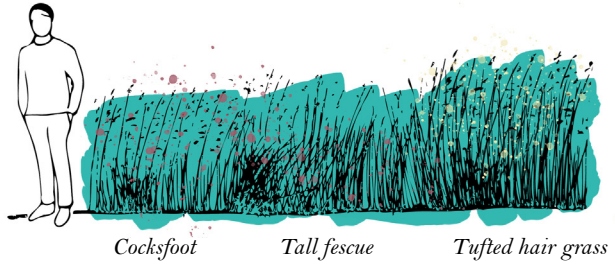
YEAR 1

*Wildflower meadow**



YEAR 5

Tussocky grassland



YEAR 10

Scattered scrub



* A wildflower meadow can be maintained as such through an annual cut and lift in late summer/autumn when the flowers have set seed

INSPIRATION – *Examples of flower rich meadows in Fife.*



1. Lielorwan Meadow



2. Fleecefaulds Meadow



3. Ravenscraig Park, Kirkcaldy



4. Cotlands Park, Kennoway

Habitat # 2 | Woodlands

Not just trees in the ground...woods are so much more. To be really quality woodland habitat they need to be **BIG**. Then there is structure – complex is good with multiple layers starting from the canopy, made up of the tallest species, an understorey and a lower shrub layer both with plenty of structural complexity (including climbers like honeysuckle) and finally a field layer with shade tolerant specialist woodland plants including ferns, bluebells and wood anemone.

Dead wood is a key woodland habitat feature. There are a huge number of invertebrates associated with decaying timber many of which are rare and declining.

There is plenty of scope to expand the areas of woodland within the River Leven valley. The following chapter outlines where would be the best sites to make a start, what species would be most appropriate and how you can create the best woodland habitat for wildlife – and people!



Example of complex woodland structure

We have established that woods need to be big. So building on and connecting up existing woodland fragments is a good place to start. Then consider what tree species would be best to establish. This is dependent on the following site ground conditions:

- 1 Free draining** open ground = **Deciduous woodland**
 - 2 Wet ground** at the base of slopes and areas susceptible to **temporary flooding** = **Wet woodland**
 - 3 Restructuring woodland on post-industrial ground** = **Pioneer woodland**
-

1 FREE DRAINING OPEN GROUND

If the ground is free draining it is likely to be an excellent condition for growing trees and creating the woodlands of the future. Think about a matrix of the native Scottish pedunculate oak (*Quercus petraea*) with ash (see guidance from the Scottish Wildlife Trust on preventing ash dieback <https://staging.scottishwildlifetrust.org.uk/news/trust-calls-for-5-point-plan-to-halt-killer-tree-disease/>) towards the bottom of the slope in slightly flushed areas. The oak and ash will form the canopy in the future with a shrub layer of shade tolerant holly plus gean or wild cherry, rowan, elder, hazel, silver birch on any particularly free draining areas and downy birch and willows at the base of slopes in damper conditions. Then add in climbers like honeysuckle and dog rose.

PLANTING TIP

Try to plan for an extensive woodland edge with no straight lines! This will result in quality feeding for bats and birds with shelter no matter which direction the wind is coming from.

SUITABLE LOCATIONS



Large areas of amenity grassland hold excellent potential to extend the river valley woodland



This area is also well suited to the creation of new woodland edges

NATIVE SCOTTISH SPECIES MATRIX

CANOPY LAYER

*Sessile oak**Ash**Scots Pine**Aspen*

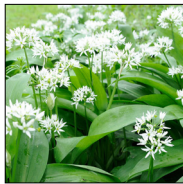
UNDERSTOREY LAYER

*Holly**Gean**Hawthorn**Rowan**Elder**Hazel**Silver birch**Downy birch (damp ground)*

SHRUB LAYER

*Honeysuckle**Dog rose**Bittersweet**Crab apple*

FIELD LAYER

*Native bluebell**Wood sanicle**Enchanter's nightshade**Wood anemone**Wild garlic**Scaly male fern**Lady fern**Broad buckler fern*

Then address the two other elements of woodland which can also be included in your plan, the **field layer** and **dead wood**.

The first is the **field layer**. The specialist plant species highlighted on page 23 are tolerant of shade, will thrive in woodland soil and would all be suitable. Once shade has become established it is possible to introduce these species either as plants or even as seeds. If the conditions are right, i.e. there is sufficient shade to keep out more competitive plant species and the soil is suitable, the seeds will germinate and establish successfully.

All of these plants can be grown from locally collected seeds or seeds sourced from Scotia Seeds (<http://www.scotiaseeds.co.uk/>) and although a bit more technical, ferns can be grown from spores – try it out at home: <https://ebps.org.uk/ferns/growing/spore-exchange/growing-ferns-spores-basic-practical-guide/>

Scotia Seeds is the only Scottish supplier of wildflower seed of local origin and provenance.

PLANTING TIP

Avoid use of peat-based compost when growing plants from seed. There is no point in destroying one habitat – peatbogs – to create another! Alternatives include bark, wood fibre, coir or bracken and green compost.

A NOTE ON SCOTS PINE

Scots pine in Scotland grows on free draining glacial sands and gravels, rocky slopes and the top of mounds. It is a light demanding pioneer species which thrives on low fertility soils. Soils in the Leven valley are predominantly mineral gleys and brown earths. Mineral gleys are naturally covered in moorland or blanket bog, rough grazing or forestry plantation and brown earths are suitable for broadleaf woodland where oak and ash would be the major native species forming the canopy rather than Scots pine in this part of Scotland. However pine could be included in the planting plan on any areas of raw free draining soils. Perhaps within the woodland which is currently poplar and sycamore by the Bawbee Bridge (see page 27) which is a very disturbed site and the raw substrate might just suit a group of pine. Or post-industrial areas which are free draining in nature.

DEAD WOOD

The second key element of woodland is **dead wood**. This comes in a whole variety of forms, each of which supports its own distinctive assemblage of invertebrates. It includes whole trunks standing or lying on the woodland floor, twigs, branches, rot holes and can be in the shade or in the sun. The best habitats are dead wood comprising native broadleaved trees which are large, long lived and decay slowly. So when you plant an oak it will live for several hundred years and then form a critically important dead wood habitat. If trees have to come out for safety then cut at height leaving the trunk to rot slowly and provide for bats, birds and insects. If branches have to be cut back retain them whole and stack or scatter on the woodland floor. Don't be tempted to chip!

2 WET GROUND AT THE BASE OF SLOPES AND AREAS SUSCEPTIBLE TO TEMPORARY FLOODING

The following tree species are tolerant of flooding and could be introduced in small numbers to diversify the swamp adjacent to the Burn Mill Dam which is currently dominated by reed canary grass.



Alder



Aspen



Bay willow



Purple willow



Grey willow



LOCATION MAP



3 RESTRUCTURING WOODLAND ON POST-INDUSTRIAL GROUND

Plantation woodland to the east of the Sewage Treatment Works (STW) is dominated by non native poplar and sycamore. The trees have been planted on a previous industrial site with evidence of an old bottle dump currently being actively dug.

This area could be converted to native species over a period of time with removal of the poplars and sycamore and planting silver birch as a pioneer species to start the process of woodland soil regeneration. Once birch are established and improving soil conditions, other species of trees such as oak and ash can be introduced.

This is a key project which could be initiated as a community-led programme.



LOCATION MAP

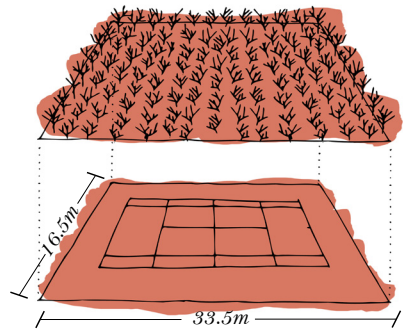


OR CREATE YOUR OWN TINY FOREST

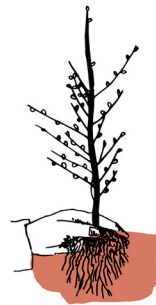
Though stated at the start of the chapter that woods need to be big to be fully effective, there is another option: tiny forests. A tiny forest is a dense, rapid growing native woodland about the size of a tennis court with a planted mix of many native species, suitable to the particular site conditions.

There are many benefits associated with the creation of tiny forests, from mitigating the effects of the climate emergency through carbon capture to bringing people closer to nature and encouraging education and awareness. Furthermore, tiny forests are incredible for wildlife, providing food sources and habitats for many species.

Step 1. First, you need to source an area of, ideally, free draining open ground the size of a tennis court to create an effective tiny forest = 33.5m x 16.5m. See page 22 for suggested locations.



Step 2. Then you need to source approximately 600 native saplings. See page 31 for details of how to source free trees from the Woodland Trust and from Earthwatch Europe.



PLANTING TIP

The best time to plant is during the dormant season from November to February, avoiding wet and frozen ground.

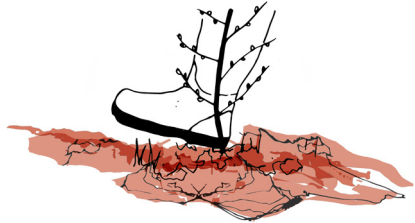
Step 3. Now you're ready to plant, but do not plant if the ground is frozen or waterlogged. Find a suitable position for each plant bearing in mind ultimate height and spread at maturity. Bare rooted plants can be 'notch' planted using the following easy steps. Begin by inserting the blade of a spade into the ground, push it away from you and then bring it back towards you. Remove the spade and you'll see you have created a notch in the ground.



Step 4. Place the plant roots within the notch and shake to ensure that all the roots are pointing downwards.



Step 5. Use your heel to firm the soil around the plant in the notch to remove any air pockets.



Step 6. Give the plants a good watering.

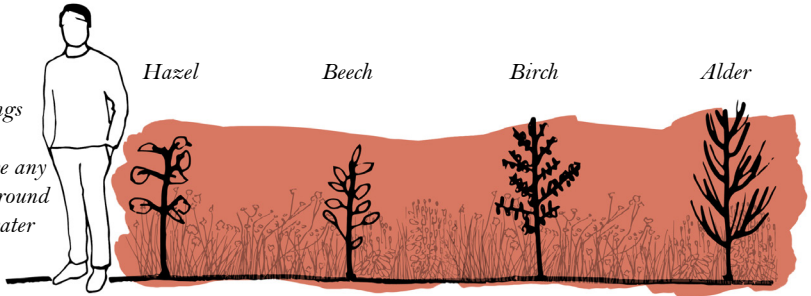


A TINY FOREST WILL GROW TO BE SELF-SUSTAINING AFTER 3 YEARS

YEAR 1

0.8m high saplings

Regularly remove any grass growing around the plants and water regularly.



YEAR 2

1.2-1.5m high trees

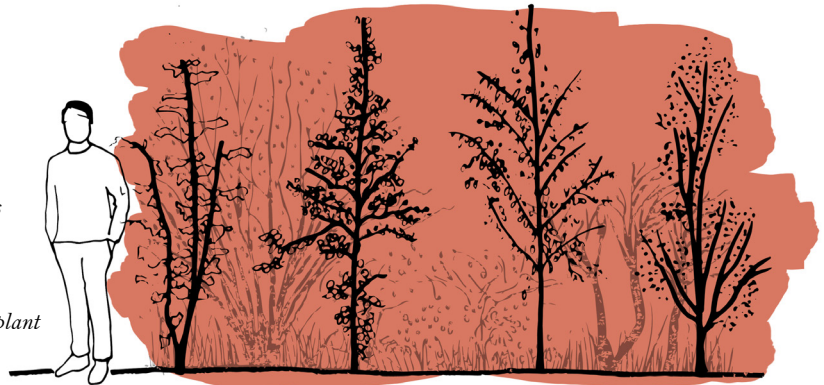
Continue to regularly weed around the plants and regularly water the trees.



YEAR 3

2-2.5m high trees

The tiny forest can attract over 500 animal and plant species within the first 3 years.



INSPIRATION – Resources for more information about tiny forests



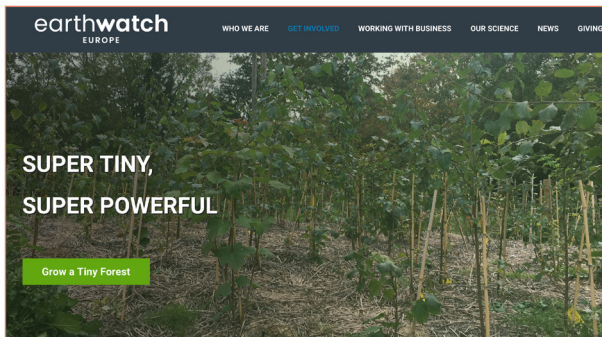
Find out about the UK's first tiny forest in Witney, Oxfordshire.

<https://theecologist.org/2020/mar/11/first-tiny-forest-being-planted-uk>



Source free trees for schools and communities from the Woodland Trust.

<https://www.woodlandtrust.org.uk/plant-trees/schools-and-communities/>



More information about tiny forests and source of funding.

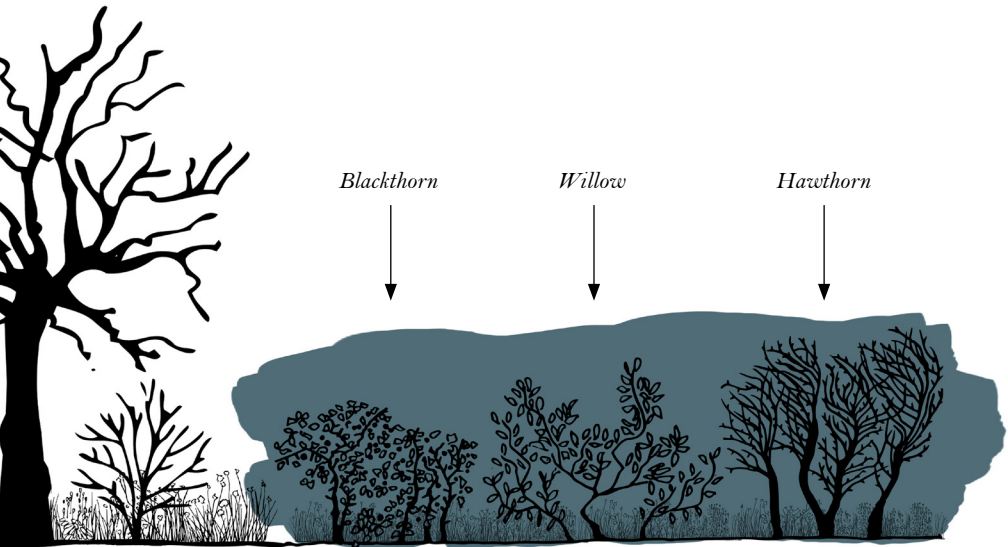
<https://earthwatch.org.uk/get-involved/tiny-forests>

Habitat # 3 | Scrub

Scrub is an extremely valuable habitat and one on which many species of insect, small mammals and birds depend. It is a natural component of woodland edge habitat and grassland where there may be a few scattered shrubs or dense thickets. The most common species include hawthorn, blackthorn and several species of willows mostly on wetter ground.

Scrub and trees will naturally colonise grasslands if regular cutting is discontinued. This can happen quickly where there are good sources of seed nearby and open areas where seed can germinate and become established. It can also be a very slow process if there are no close seed sources and where the grassland becomes a tussocky matt which is difficult for seeds to penetrate and establish successfully.

This is where there are opportunities for action.



Example of scrub vegetation adjacent to woodland edge

STEP 1.

The first thing to do is to identify areas within the river valley which are currently managed as amenity grassland and where a decision has been made to stop cutting. Alternatively find areas of tall grass where this has already happened and where the grassland comprises a small number of tall grass species and not much else. The introduction of scrub here will make a big contribution to local wildlife.

STEP 2.

How to establish scrub? There are two options:

1. Buy in plants from a local supplier who uses no chemicals at any stage during production and who uses only seed of local origin and provenance. This means that the plants will be well adapted to local conditions, to local wildlife and will enrich the existing landscape.
 2. Collect seed and grow plants on your own, as part of a community group or as part of a school project.
-

STEP 1.

Identify suitable areas to establish scrub.



LOCATION MAP



SUITABLE AREAS TO ESTABLISH SCRUB



Extensive area of amenity mown and unmanaged species poor grassland where scrub is slowly encroaching with potential for diversification.



Potential for scrub planting at the base of the slope by the fence where the vegetation is dominated by Yorkshire fog grass. The top of the slope in the foreground is more flower rich so more beneficial to leave unplanted.



The slope on the west side of the Sewage Treatment Works (STW) shows an area dominated by Yorkshire fog grass and nettles and thistle at the base of the slope. This would be ideal for creating an area of mixed scrub – some scattered and some dense thickets to create an area of tall neutral grassland with scrub – great for wildlife.



This area on the south side of the STW is species rich with more rank grassland areas to the left at the base of the slope on the fenced boundary of the STW.



Tall neutral grassland to the west of the STW with scattered scrub, mixed grasses, clover and creeping thistle. This area to the west of the STW is structurally good. There is potential here to diversify the grassland which is species poor by the addition of vetch type plants which are scrambling wildflowers capable of competing in these conditions. Tall grassland like this is essential habitat for moths whose caterpillars feed on grasses. In turn this feeds birds and bats.

GRASSLAND UNSUITABLE FOR ESTABLISHING SCRUB

Areas with fine leaved grasses and wildflowers should not be planted up with scrub. Orchids such as the Northern marsh orchid are good indicators of conditions which have not been improved for agriculture and soil with low fertility which allows a wider range of species to co-exist.

If you spot any of the wildflowers illustrated below then the grassy area is unsuitable for planting scrub.



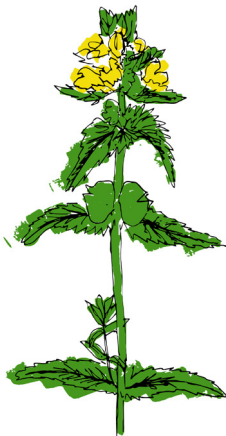
Common catsear



Velvet bent



Northern marsh orchid



Yellow rattle



Red clover



Ribwort plantain

SUITABLE SPECIES TO INTRODUCE AS SCATTERED SCRUB

The following species are all suitable to introduce as scattered individual shrubs and as densely planted thickets:



Goat willow - aka pussy willow – early spring flowers offering pollen and nectar to recently emerged insects grows in drier areas



Grey willow - similar to goat willow with narrower leaves and grows in damper sites.



Hazel – leaves eaten by caterpillars and produces hazel nuts when established



Hawthorn – its May blossom and thorny stems give good protection for nesting birds



Blackthorn – one of the first to flower in the Spring and when established produces sloe berries



Dog rose – scrambles over other scrub with pink and white flowers offering nectar for insects and rosehips for wintering blackbirds, redwings and warwings.

INSPIRATION – *Great examples of scrub habitats in Fife.*



1. Cullaloe Reservoir



2. Lochore Meadows Country Park



3. River Leven valley west of
Sewage Treatment Works



4. Kilminning Coast

STEP 2.

Option 1 - buy in plants from a local supplier or

Option 2 - grow new scrub plants from seed.

Small scale tree and scrub growing can be done in containers outdoors.

There is huge variation in the type of seeds that trees produce and they can be roughly divided into 5 types - all of which need different treatments to germinate:

Fleshy



This includes rosehips, rowan, hawthorn and wild cherry (pictured). After collection remove any soft flesh from the fruits.

Nutty



Hazel nuts (pictured) and oak acorns can be planted immediately after collection. Just score the top of the nut to aid germination.

Winged



Ash (pictured) and elm seeds should be separated out from bunches and twigs removed ready for sowing.

Pods



The two most likely species are broom and gorse (pictured). Detailed instructions are available at: <https://treegrowing.tcv.org.uk/grow/tree-recipes/gorse>

Cones



This includes alder, Scot's pine (pictured), downy and silver birch. Put the cones in a large paper bag in a dry, warm place and the seeds will naturally fall out ready for sowing.

GENERAL GUIDANCE FOR ALL SPECIES

Step 1

An ideal compost mix would be equal volumes of an organic material e.g. peat-free compost or leaf mould, and a coarse medium like grit or coarse sand thoroughly mixed. Don't be tempted to use soil as it will be too wet and the seeds will rot.



Step 2

Plant at the same depth as the width of the seed.



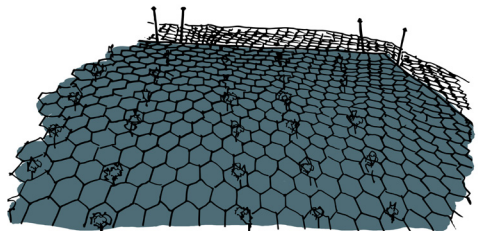
Step 3

Store outside and make sure the pots don't dry out or get water-logged. No need for watering in the winter but check and ensure damp - not wet - from Spring onwards.



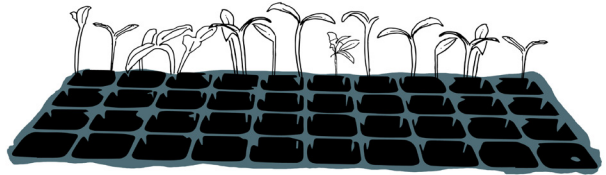
Step 4

Cover with chicken wire to prevent squirrels and birds from helping themselves.



Step 5

Look out for green shoots the following spring



Step 6

Plant out when big enough to compete – 1 or 2 years in the pot



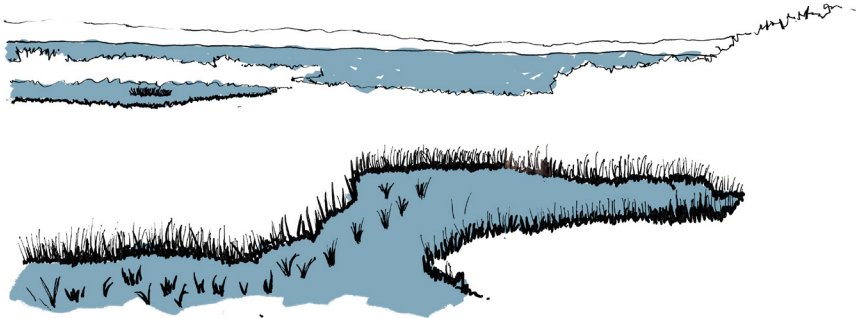
PLANTING TIPS

- For all seed types minimise storage time but make sure to keep the seeds cool
- Try to mimic nature in terms of the seed arriving on the ground so plant your seeds as soon as possible after collection and processing
- Be prepared to wait...ash will take 2 years to germinate!
- Planting should take place during the dormant season after the first frost from around November to February.

Habitat # 4 | Wetlands

This chapter covers ponds and surrounding wetlands where water collects all year round or at least seasonally. Wetlands are the most effective carbon sinks on earth, one of the world's most biodiverse habitats and they can also protect us from extreme weather events such as floods.

Ponds are brilliant wildlife habitats and just to prove it here are some of the invertebrate and plant species recorded during a recent survey in the Leven valley.



Example of wetland habitat

INVERTEBRATES IN THE LEVEN VALLEY



Freshwater beetles including the most dramatic great diving beetle. The adult great diving beetles (see left) are around 3 cm long and the larvae can be up to 5 cm long with long sickle shaped mandibles used to catch pretty much anything that moves including small fish. These beetles are good fliers and can emerge from the water and colonise new freshwater habitat.



Freshwater shrimps which are crustaceans related to sand hoppers found on the beach and which feed on dead plant and animal material doing an excellent clean up job.



Pond snails will be seen in most ponds where they glide around feeding on plants and algae which they scrape with their rasp like tongue. Snails can't fly ... so this is an example of colonisation on the backs - or feet - of birds.



Great water boatman which are technically bugs with piercing, sucking mouthparts and which can be seen actively swimming with their hairy back legs and feeding by sucking up plant material.

Pond skaters (see left) are fast moving predators rowing across the water surface with their middle legs and grabbing prey with their front legs.

WETLAND PLANTS IN THE LEVEN VALLEY

Ponds and surrounding wetlands also support a whole range of plants in different zones including the swampy zone where reed canary grass (*Phalaris arundinacea*) and reedmace (*Typha latifolia*) are dominant with the pink and cream flowered great willowherb (*Epilobium hirsutum*). Aquatic plants rooted in the mud at the base of the pond with leaves spread out over the surface like broad leaved pondweed (*Potamogeton natans*), the starworts (*Callitriche* species) which are sometimes rooted and sometimes free floating and the duckweeds (*Elodea* species) which are tiny and float on the surface sometimes forming a dense bright green carpet.



Reed canary grass



Reed mace



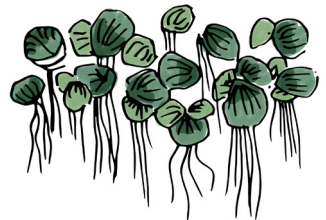
Great willowherb



Broad leaved pondweed



Starwort



Duckweed

WETLAND PROJECTS

The River Leven Habitat Species Management Plan (HSMP) produced by ECOS Countryside Services in June 2020 identifies a series of wetland intervention projects which include the creation of new ponds and the restoration of existing ponds.

The seven interventions illustrated below highlight projects recommended for implementation in the HSMP. Furthermore, the report also recommended that as a priority **two new ponds** should be created within the marshy grassland habitat area north of the river (identified as habitat B5 in the Phase 1 Habitat Survey).

FH1 - Restore pond

FH2 - Diversify swamp

FH6 - Create new pond on wet carr (wet woodland dominated by shrubs instead of trees)

FH8 - Create new pond on wet carr

FH10 - Re-excavate pond adjacent to Kirkland Dam

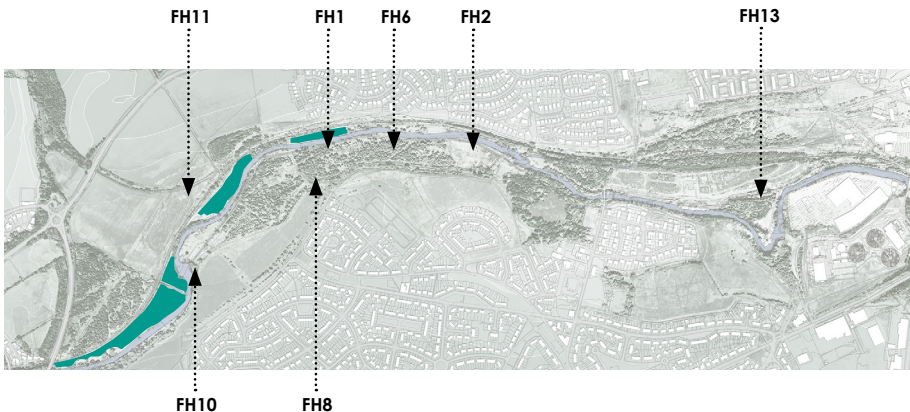
FH11 - Create new pond for pond dipping

FH13 - Re-excavate pond in the Dam Wood

LOCATION MAP



B5 - Marshy grassland



SITE PHOTOS



FH1 - Ditch

Project: Restore pond



FH10 - Litter pond

Project: Re-excavate pond



FH2 - Swamp

Project: Diversify vegetation



FH11 - Bulrush pond

Project: Create new pond for dipping



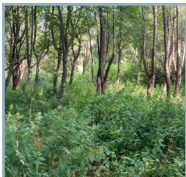
FH6 - Ditch

Project: Create new pond on wet carr



FH13 - Eastern pond

Project: Re-excavate pond



FH8 - Small wood flush

Project: Create new pond on wet carr

The Freshwater Habitats Trust provides excellent detailed guidance on new pond creation: https://freshwaterhabitats.org.uk/wp-content/uploads/2013/09/Amphibians-_Common-Toad-Great-Crested-Newt-and-Grass-Snake_-new-logo.pdf

Frogs, toads and newts over winter in frost free areas under cover where they enter months of reduced activity. Most species will move several hundred metres from their breeding ponds in search of suitable terrestrial habitats. As well as creating breeding and surrounding feeding habitat make sure there are suitable frost free sites for overwintering amphibians with piles of leaves, loose soil into which they can dig, areas of long grass and other dense scrub or vegetation and rocks and branches for further protection.

DIVERSIFICATION OF THE SWAMP

The diversification of the swamp which is currently dominated by a single species - reed canary grass - could be enhanced by making and adding seed bombs.

This is a key project which could be initiated as a community-led programme and is particularly suitable for local schools.

PLANTING TIPS

- Wetland plant seeds could be collected locally (include flowering plants and sedges) or a wetland species mix can be sourced from Scotia Seeds
- Use only native species found in Fife.



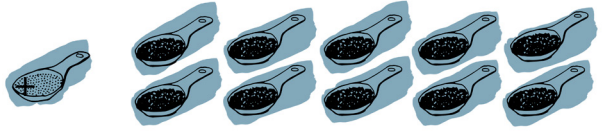
LOCATION MAP



HOW TO MAKE SEED BOMBS

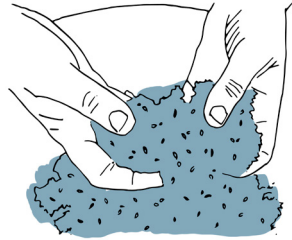
Step 1

Take 1 cup of
wetland plant seeds
+ 10 cups of clay
rich soil



Step 2

Thoroughly mix the
seeds with the soil.



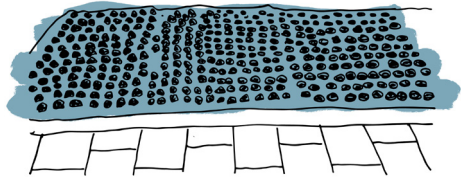
Step 3

Add water; knead together
and shape into balls.



Step 4

Leave to dry in the sun.



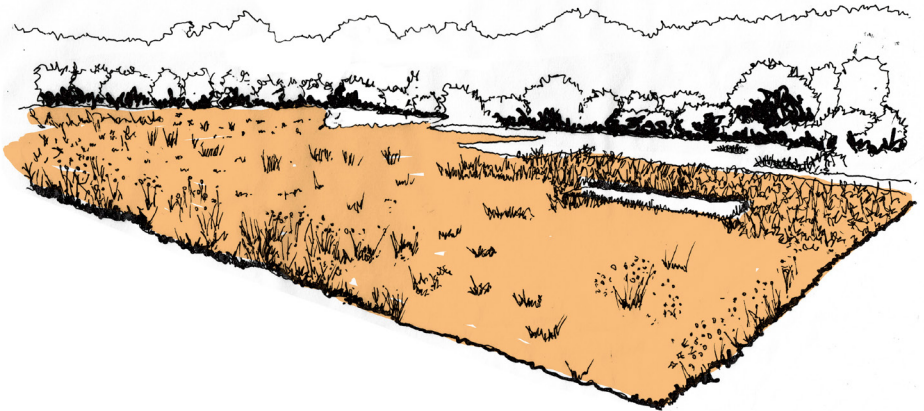
Step 5

Throw them into the swamp
from the path.



Habitat # 5 | Open Mosaic Habitat on Previously Developed Land

This chapter focuses on two areas within the river park classified as vacant and derelict land: the area known locally as 'the creosote site,' a vacant site adjacent to the river and the docks area, derelict site of the former Methil power station located at the estuary.



The 'creosote site' with regenerating woodland/scrub species such as Silver Birch, Willow, Broom and Buddleia and colonising wildflower species such as Coltsfoot, Wild Strawberry, Lupin and Rosebay Willowherb

OPEN MOSAIC HABITAT

Some key vacant and derelict sites have been designated as Open Mosaic Habitat which is a UK Biodiversity Action Plan habitat in recognition of its importance particularly for invertebrates. You can find a detailed description here:

<https://data.jncc.gov.uk/data/a81bf2a7-b637-4497-a8be-03bd50d4290d/UKBAP-BAPHabitats-40-OMH-2010.pdf>

Buglife – the charity which focuses on invertebrates – has an excellent guide to identifying open mosaic habitat which you can see here:

<https://cdn.buglife.org.uk/2020/01/Identifying-open-mosaic-habitat.pdf>

Open mosaic habitat on previously developed land (OMHPDL) consists of a patchwork of bare, previously disturbed ground and stands of vegetation.

Although OMHPDL is associated with brownfield sites, only a small proportion of former industrial sites support good examples of this priority habitat.

WHAT TO LOOK OUT FOR

The following are key features of open mosaic habitat which you could look out for at the Creosote site and at the docks to make your own assessment:

- Bare ground
- Species rich grassland
- Tall ruderal plants
- Scrub
- Shelter
- South facing slopes and banks (of soil and/or rubble)
- Seasonal ponds and damp areas



The 'Creosote' site

LOCATION MAP



The docks site (former power station)

THE CREOSOTE SITE – PLANT SPECIES TO LOOK OUT FOR



1. *Birch*



2. *Broom*



3. *Buddleia*



4. *Bramble*



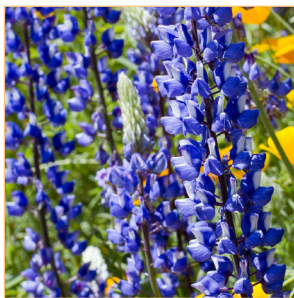
5. *Dandelion*



6. *Coltsfoot*



7. *Rosebay willowherb*

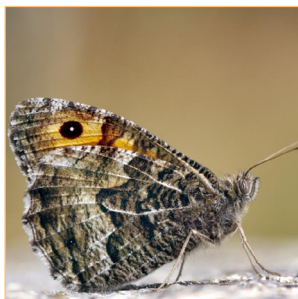


8. *Lupin*

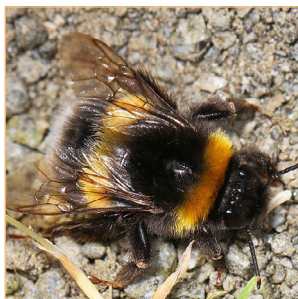


9. *Wild strawberry*

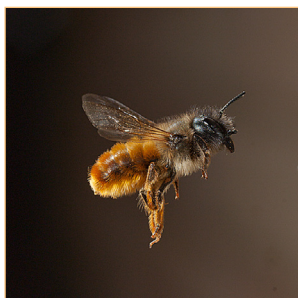
KEY SPECIES TO LOOK OUT FOR AT THE CREOSOTE SITE



*Grayling butterflies love post-industrial sites where they can find dry and well-drained soils with sparse vegetation and plenty of bare ground in open positions to warm up in the sun. You will see the adults with their distinctive looping, gliding flight on the wing from July to September. Their caterpillars feed on grasses including sheep's-fescue *Festuca ovina* and red fescue *F. rubra*.*



Bumblebees find wildflowers and early flowering shrubs like willow, blackthorn and hawthorn providing nectar and pollen throughout the active season. Small mammals are also likely to be present on these sites and their burrows provide nesting and overwintering sites for queen bumblebees.



Solitary bees need bare ground often sloping and south facing to create their nesting burrows. Check areas of sunny, sloping bare ground in the summer to look for colonies of solitary bees digging out and provisioning their tunnel nest sites.

THE DOCKS SITE – PLANT SPECIES TO LOOK OUT FOR



1. *Alder*



2. *Yarrow*



3. *Birdsfoot trefoil*



4. *Gorse*



5. *Grey willow*



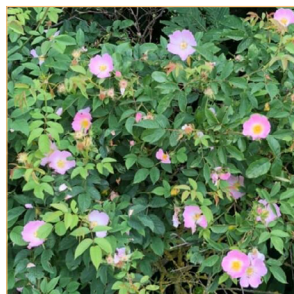
6. *Thistle*



7. *White poplar*



8. *Sea buckthorn*



9. *Dog rose*



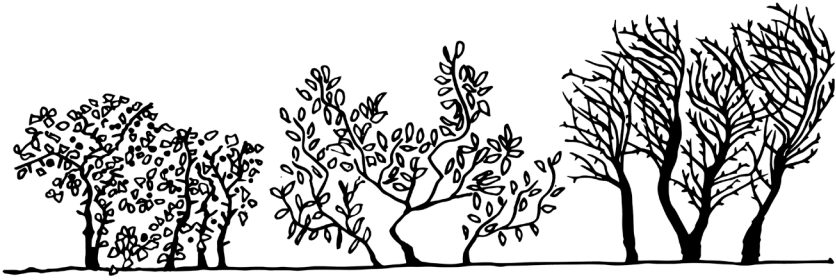
Mixed native broadleaf woodland skirting the periphery of the docks site

Summary

The River Leven corridor and the habitats within and surrounding it are already incredibly rich in biodiversity, supporting a vast array of invertebrates, flora and fauna whilst also providing a valuable haven for human activity. This toolkit has been created as part of the River Park project to initiate discussions with local residents and provide opportunities for the community to become involved in the stewardship of this unique landscape.

The regeneration of the train line, the upgrading of bridges and the installation of an accessible for all active travel network will see more human presence within the river valley. It is therefore essential that the habitats identified in this toolkit are protected and enhanced both during and after the construction process to maintain the delicate equilibrium between humans and wildlife.





Ultimately, the ambition of the River Park project is to upgrade the facilities within the corridor to provide quality public spaces for the community to enjoy. Involving the community in the creation (and where possible, maintenance) of these spaces is a fundamental objective of the project, with numerous opportunities for education, knowledge and practical skills-based sharing.

We want you to get involved!

Keep a lookout on <https://theeven.org> for updates on the project and how the community can play an active role in the formation of the River Park.



