

APPENDIX B - Lincolnshire Wildlife Trust - Biodiversity enhancement schemes

**Proposed verge restoration sequence:**

1. Initial desk study to identify biodiversity opportunity including identification of any stretches that hold nature conservation designations (SSSIs, LWSs). Acid and lime-rich soils would offer better potential.
2. Follow up field survey to assess current grassland quality based on diversity of indicator plant species
3. For stretches of notable grassland quality, take an approach that enhances the grassland through appropriate native wildflower planting and improved vegetation management – e.g. carefully regulated cut and collect regimes.
4. For stretches of grassland that hold no notable conservation value consider the following two options:

**Option A (using herbicide – limited benefits):**

1. Ensure an appropriate cut and clear management regime is planned for the verge for at least the next 3 years.
2. Spray off a central strip c.1m in width which is away from a hedgerow base and also clear of a pull-over zone or zone affected by road salt. Use a systemic broad spectrum herbicide when the vegetation is green and growing.
3. Return to spray off regrowth a month later within the same strip which will come from the weed seed bank lying dormant in the soil.
4. After you have removed the surface growth and depleted the weed seed bank, you can sow a wildflower and meadow grass seed mixture which is made up of 20% wildflower seed and 80% (non-invasive) grass seed by weight. Do not disturb the soil surface (as this will activate buried, dormant weed seeds) and simply tread/roll sown seed into the surface. Ensure at least UK provenance or ideally regional provenance of seed from a reputable supplier. To accelerate the establishment of wildflowers you may have the resources to plant pot sized plants that have been propagated from local, native seed before over-sowing.
5. The cutting (with a collector mower) has to be every month in 'year 1' to top annual weeds and to give the advantage to the developing perennial grasses and wildflowers. From 'year 2' onwards, cutting and clearing can be just 2-3 times per year and timed to allow the flower displays you want e.g. avoid March to May for Cowslip. Perennials will regrow if cut and can produce a second late summer flush of colour following a May cut. A cut in May need only be undertaken if the soil is fertile and grasses are vigorous and tall-growing. Cutting and collecting cuttings in October is also important to leave a short turf over winter which allows for seedlings of wildflowers to germinate in the following spring and prevents grass from dominating.
6. For visibility splays use a flowering lawn mix which contains species which will re-flower between cuts spaced by just 6-8 weeks.
7. Monitor the establishment of the restoration strip over the next few years. With favourable cut and clear management the introduced species should establish well and spread outwards from this strip across the verge in favourable stretches as the more vigorous species either side become less competitive. If grasses dominate and growth remains high, introduce a May

cut in addition to a late summer/ autumn cut(s). After several years on thinner, free draining soils the fertility should decrease and the May cut can be skipped. This will benefit invertebrates.

8. Consider planting pot (not plug) plants sparsely (e.g. 1 per 5m) of more sensitive grassland species into the restoration strip after 4-5 years to enhance species diversity.
9. Once established, wildflower stretches can be hand-gathered for seed and used to seed additional verges.

#### **Option B (turf-cutting with multiple benefits):**

1. Ensure an appropriate cut and clear management regime is put in place across the verge for at least the next 3 years.
2. Closely following a cut and clear operation while the turf is still short, litter pick and then use an industrial heavy-duty turf cutter to remove c.5-6cm of depth from a c.1m wide strip away from a boundary hedge and also clear of a pull-over zone or zone affected by salt. Dispose of the turf towards the back verge (green side up). The act of stripping turf can deliver multiple benefits as part of a restoration:
  - a. Removal of growing unwanted plants above ground
  - b. Removal of shallow vegetative plant parts including the majority of tall-growing umbellifers (tops of tap roots), invasive grasses (stolons and rhizomes), shallow mats of nettle roots
  - c. Removal of a large part of most of the viable weed seed bank
  - d. Removal of some of the soil's fertility which may lessen the relative advantage of more competitive species
3. One follow-up spray of broad-spectrum systemic herbicide may be required of the stripped strip 3-4 weeks later depending on weed regrowth but this will not be necessary in most cases.
4. Sow a wildflower and meadow grass seed mixture which is made up of 20% wildflower seed and 80% grass seed by weight. Do not disturb the soil surface (as this will activate buried, dormant weed seeds) but simply tread/roll sown seed into the surface. Ensure at least UK provenance or ideally regional provenance of seed from a reputable supplier e.g. Emorsgate Seeds, Naturescape, Boston Seeds. To accelerate the establishment of wildflowers you may have the resources to plant pot sized plants that have been propagated from local, native seed before over-sowing.
5. For visibility splays use a flowering lawn mix which contains species which will re-flower between cuts spaced by just 6-8 weeks.
6. Monitor the establishment of the restoration strip over the next few years. With favourable cut and clear management the introduced species should establish well and spread outwards from this strip across the verge in favourable stretches as the more vigorous species either side become less competitive. If grasses dominate and growth remains high, introduce a May cut in addition to a late summer/ autumn cut(s). After several years on thinner, free draining soils the fertility should decrease and the May cut can be skipped. This will benefit invertebrates.

7. If high biodiversity is the aim, consider planting pot (not plug) plants sparsely (e.g. 1 per 5m) of more sensitive grassland species into the restoration strip after 4-5 years to enhance species diversity.
8. Once established, wildflower stretches can be hand-gathered for seed and used to seed additional verges.

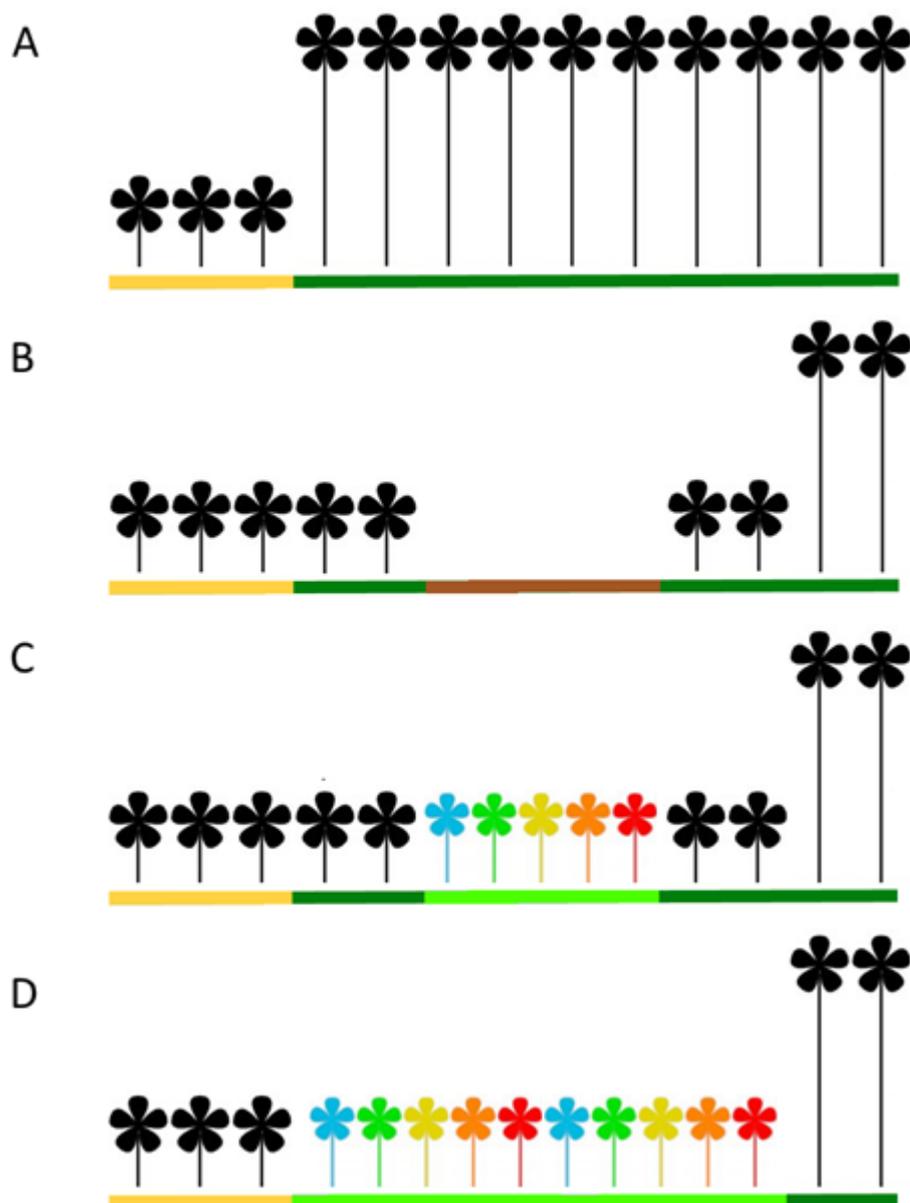
For larger scale verge restoration work, consider a heavy duty turf cutter.....

<http://www.egcoles.com/wp-content/uploads/2013/03/Turf-Maintenance-2011-LR-36.pdf>

See an example in action: <https://www.youtube.com/watch?v=HJ7YqU4faMk> You will note that it cuts and rolls the turves automatically saving a huge amount of labour.

**The 'Restoration Strip' approach is illustrated below in four stages:**

- A: Initial condition showing salt burn and pullover area closest to carriageway in yellow (left) and taller back verge towards boundary (right)
- B: Cut and collect with ground preparation (turf stripped from central restoration strip)
- C: Establishment of introduced species in restoration strip with ongoing cut and collect every month during growth season in year one then 1-2 times annually
- D: Spread of desirable species over time across rest of verge with ongoing cut and collect 1-2 times annually



Photos from a small-scale experiment (200m<sup>2</sup> village verge)

<https://photos.app.goo.gl/HGBCnFN53AqjWHv2A>

The sequence shows early season photos in 2016 with developing cow parsley and hogweed at 75%+ cover. Hogweed and cow parsley was dominating the verge, often growing above head height in the previous summer.

- This was mown and collected, turf stripped, planted, over-sown with 80% meadow grass 20% wildflower meadow mix and cut and cleared. The last photo shows mid-summer 2017 with a nearly 100% reduction of umbellifers which would have been a chest high white flowering display beforehand. The perennial wildflowers were still establishing so not providing much colour. Nevertheless it can be seen how deep a turf cutter blade goes and that it can effectively top cow parsley tap roots these will then not regrow from the base. They will regrow from the cut turves though. I noted that hogweed roots are deeper than cow parsley so regrowth from hogweed may need spot spraying. A mow in early-mid May for the first few years will weaken hogweed and cow

parsley and this timing of cuts (with clearing) should be part of restorative management as it will also reduce the relative vigour of competitive grasses versus forbs to. Papers have shown that by mowing as flower heads are still forming you knock back the plant while nutrients are still moving upward and reduce its ability to spread. Cutting after flowers have opened actually stimulates lateral root budding which is the principal method of spread – more so than by seed. So the best thing you can do to maximise the abundance of umbellifers is therefore to cut after they have flowered and leave the cutting as a mulch that only they can grow through! This explains why they are so abundant on our verges. By eradicating the tallest species like hog weed, cow parsley and hemlock you have reduced the maximum height herbaceous vegetation will reach at any point in the growth season so this should deliver the most notable results to visibility.

### Summary:

- Consider annual displays only for inner urban areas only on a smaller scale
- Try to find areas that would be good to create a positive showcase for Lincolnshire's local wildflowers and create a much lower maintenance and more environmentally sustainable perennial display using the methods above
- Contact us if you would be interested in participating in seed collection, wildflower propagation, planting events in your verges/green spaces and/or would be keen for us to make a presentation to the Town Council.
- A calendar for a trial section of annuals on an inner urban verge would be:
  1. mow and collect in July
  2. turf cut and dispose of turves or spray off in August
  3. spray off (again) in September
  4. sow an annual display in October
  5. allow to grow and flower until the following October, cut then rotovate and re-sow
  6. repeat steps 4 and 5 each year but pull/spot spray unwanted plants if they invade
- A calendar for a perennial wildflower display:
  - mow and collect in July
  - turf cut and dispose of turves or spray off in August
  - spray off (again) in September
  - sow an annual display in October
  - during year 1 mow once every month with a collector mower (no flowers)
  - in year 2 onwards cut and collect at end of May and then again in late August-mid September depending on flowering
  - cease the May cut if growth is slow / height is low / grass is not taking over
  - if you can settle down to a cut and collect in late August/September and another in late October this will be ideal in perpetuity for wildlife
  - augment with wildflower planting in subsequent years to increase colour density
- Management of long grass can be achieved with ride-on or pedestrian rough-cut mowers, flail collectors, drum mowers on compact tractors, strimmers, brushcutters, [power scythes](#), [power rakes](#) or [Austrian scythes](#) and rakes by

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volunteers. LWT could provide training. Arrangements for the collection and disposal of cuttings is crucial but the expense of this would be more than 'paid for' by the savings made by cutting less frequently.

- The [LCC Community Wildlife Grant](#) can be applied for and is up to £500 annually. You may be able to share equipment and storage across a number of sites, spread cost and increase funding.
- Contact email for LCC Highways is: [cschighways@lincolnshire.gov.uk](mailto:cschighways@lincolnshire.gov.uk)