What is a reedbed and why are they important?

Reedbeds are wetlands dominated by Common reed - a perennial, flood-tolerant grass that grows to over 2 m high. In the UK the majority of reedbeds are found in river floodplains and low-lying coastal areas. Two distinct reed habitats exist: Reed swamp and Reed fen (see photos, right)

Reedbeds have declined drastically over the last century. They are an important habitat in their own right and a number of threatened species rely directly and indirectly on them. Reedbeds are one of the most important habitats for birds in the UK, including six nationally rare birds (See Appendix 1 for details).

Why restore reedbeds?

- Because they are fantastic wildlife refuges
- For birdwatching
- They help treat sewage and poor water quality
- For game shooting
- As buffer strips to filter soil/run off from fields
- As bankside protection from erosion by wind, water and waves
- For the production of thatching material

Why have reedbeds declined?

Traditional uses of reed such as thatching have declined, however the disappearance of reedbed is mainly due to the development, destruction and drainage of wetlands. Less than 300 hectares of reedbed are now left in Sussex.

Historical management of reedbeds

Reed beds were traditionally managed by hand by reed cutters who used the reed for thatching. This sustainable system provides a rotational harvest of reed while preventing the build-up of dead material in the reedbed which dries out the habitat. The demand for good quality thatching reed now currently outstrips supply and much of the UK’s thatching reed is imported from abroad.
How To Create & Manage Reedbeds

How to establish a reedbed

What size and shape should my reedbed be?

When designing the size and shape of your reedbed, consider long term management and physical land restrictions. Larger reedbeds are more attractive for sustainable commercial reed cutting, but smaller, more diverse reedbeds are better for wildlife. Natural changes in local soils, water supply and slopes may restrict the area where reed will grow. Reedbed sewage treatment systems require a specific area of reed to clean water to a particular standard (These can be calculated before constructing your reedbed).

Any size reedbed is beneficial to wildlife. However some species require large reedbeds of up to 25 ha e.g. bittern and marsh harrier. Open water within a reedbed encourages more birds, fish and insects. Small reedbeds are still valuable, as are multiple small scattered stands of reed. Fringing reed (reed at the edges of open water) is often vigorous and supports a relatively high density of wildlife. A 50 -100 metre fringe of reeds around ditches, ponds and lakes can have enormous benefits. The more natural your reedbed, the lower your habitat management and maintenance costs will be.

REMEMBER - Drier, raised areas and space may be required for stock or machinery access.

Where should I put my reedbed?

Reedbeds can be created anywhere there is:

- A reliable natural water supply, with spring flow or up to 300 mm of water depth in spring
- Sufficient low level ground or ground with very shallow gradients
- Access for management such as harvesting, cutting, stock grazing and land forming
- An available, vigorous reed source which is not infested with non native plants
- If needed, where cattle or stock can seasonally poach and graze reeds

What is the best way to establish reeds and reedbeds?

Establishment of reed can be achieved on most soil types, though it is easier on clays and silts which retain water. Once established, reed will spread naturally to wet areas and water up to 1 m deep at around 1.5 m per year. You may wish to speed up the process however with:

Natural expansion
This is the simplest and cheapest option for establishing reed — a naturally developing reedbed is often more beneficial to wildlife. Reed will automatically establish once water levels are suitable and / or grazing and mowing management is ceased. Shallow flooding of low-lying land with an existing reed resource, e.g. ditches, provides an ideal source from which reed can spread naturally. Expansion rates vary and are affected by temperature, soil type, grazing, birds, land form and water depth.

Planting
Planting seedlings usually has a success rate of over 90%. Reed taken from local sites with similar conditions tends to grow more successfully. Planting when water levels are 5 cm above the surface is best. Be Aware not to transfer invasive species such as Crassula when using locally sourced reed.
What do I need to consider before creating a reedbed?

Do you want a man made/managed or a natural reedbed? If you want a natural reedbed, look for areas where reeds occur naturally. A small change (raising) of water levels can encourage reeds to spread naturally. Reeds prefer water from 5 cm – 1 m deep but will tolerate damp soils with water around 5 cm below the surface. Also consider:

1) Water supply and management
An adequate water supply at key times of year is essential for a reedbed. Reeds prefer water levels to vary through the year. Dry periods allow for management and maintenance, and encourage the oxidation of plant litter, making nutrients available and prolonging the life of the reedbed. Young reed plants are vulnerable to dehydration and drowning and during sowing or planting they require damp soil. After young shoots have sprouted, water levels can be raised, but the top 1/3 of the plants must be above the water surface. Older reeds can ‘breathe’ in deeper water.

Drainage channels, dams, sluices, and wind pumps can increase water supply and control. However they can be costly. Where possible, natural reedbeds are best. **NOTE: Changes to watercourses such as wind pumps or structures may require Land Drainage Consent from the Environment Agency.**

2) Preparing soil for reed planting
When reed plants are young, controlling competing vegetation helps them establish. Clearing back existing vegetation and topsoil can sometimes help, but should be done sensitively and only if there is no existing wildlife interest. Flooding land for a short period will kill most terrestrial plants, especially after rotovation or ploughing which exposes seeds. However, each piece of chopped rush root will grow, so only rotovate if the land can be flooded immediately afterwards.

3) Land Forming to help reeds establish
On many naturally wet sites there will be a minimal need for land forming. Reeds will naturally recolonise the lowest areas of floodplain or wetlands. However, where land levels are too uniform/flat (i.e. where fields have been ploughed), they have been raised by artificial landfill, or they are naturally too high, the first stage of creating a new reedbed is to reprofile land levels to create the desired shape, micro topography and open water networks.

Having subtly varied land levels in your reedbed will create variations in water depth and habitat. Surplus soil from excavating open water areas can be used to create islands that are less prone to flooding and which provide dry land for wildlife during floods. If land forming when commercial reed harvesting be aware that too much variation in water depth leads to reed of variable quality. Also consider where you will put soil when landforming. Creating artificial piles or ‘embankments’ of soil in floodplains is not legal. Moving soil into or out of floodplains will require legal consent. A rotary ditcher can save you the need to bank up spoil. [www.rspb.org.uk/whatwedo/projects/details.aspx?id=297721](http://www.rspb.org.uk/whatwedo/projects/details.aspx?id=297721)

**NOTE: If land forming within 8m of a main river, you may require consent from the Environment Agency. Land forming must not compromise flood movement or storage.**
I need to plant my reedbed. How do I choose between seeds, plants or roots?

Planting rhizomes (the matted roots of the reed plant) is generally as, or more effective than using seed or individually potted / rooted reed plants.

**Sourcing plant material**

Try to use plants obtained from close to your planting site and if harvesting seeds, try and take seed heads (panicles) from a local seed source.

**CAUTION.** Transporting reeds from other areas can introduce invasive plants.

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**When should I plant my reedbed?**

**For soil containing rhizomes**
Excavate and spread in winter (Nov to Feb).

**For turf transplanting**
Winter during draw-down of water levels.

**For actively growing shoots**
Dig rhizomes in late winter/early spring before shoots emerge. Optimal planting time is May/June, when shoots are green with 2-4 leaves or immediately after harvesting.

**For planting rhizome fragments**
Plant in March/April as early as possible after the last frost. Planting any later leaves reeds vulnerable to competition from other plants:

**For planted stem cuttings**
Roughly 40% take in April compared to 25% in July and 2% in August. Plant after spring frosts.

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**Potential problems establishing reed**

Excessive flooding or drought can cause problems with reed establishment and some peaty / acidic soils are less favourable for reeds. The main problem generally experienced with reed establishment is the palatability of new reed shoots to a variety of grazing animals (e.g. deer, geese, rabbits and livestock). Fencing is essential where grazers are present in numbers, though alternatives may be considered:

- Over-planting to compensate for grazing.
- Aerial netting can to keep wildfowl off planted areas but is wasteful and makes weeding difficult.
- Minimising the area of open water by phasing planting as water levels are slowly raised.
- Sowing strips of grass amongst reed. These are grazed preferentially but can be removed by flooding later.
- Trees and tall vegetation (e.g. existing reed or hedges) inhibit geese from flying into small areas, & unsettle feeding birds by reducing visibility and increasing the risk of predation
- Consider active deterrence of problem birds (i.e. geese) during the vital first year of vegetation establishment. i.e. by covering reed with blackthorn cuttings etc.

**SEE APPENDIX 2 for more detail**
Can I get grant aid to plant a reedbed?

Landowners can often claim grant payments under Countryside Stewardship Schemes. Free advice and help with other grant sources may also be available from the Environment Agency, Natural England/Defra, RSPB, Wildlife Trusts etc.

I have created a reedbed – How do I manage it?

Reedbeds in deep water need little management but in most cases a reedbed needs cutting, grazing or management each year to maintain a mosaic of vegetation at different stages of growth. Reedbed management is often aimed at increasing structure and diversity and preventing the invasion of scrub and eventual natural succession to carr/wet woodland. You may wish to allow some natural succession to occur, it will depend on whether you are receiving grant money for your reedbed and the stipulations of the grant. Allowing some patches of scrub and wet wood to develop in drier areas provides niche habitats for more species. There are a number of other ways you can manage your reedbed:

- **Managing the water table.** Something as simple as blocking land drains can increase your water levels. Otherwise, water levels can be increased or managed by using sluices and flexi-pipes on in and out-flowing streams and ditches. These will need consent from the Environment Agency if on main watercourses — its always best to check. Seasonal flooding of vegetation can help control growth of specific plants. Seasonal drying (preferably natural) also helps reed litter to break down and keep the reedbed wetter in the long term.

- **Removing reeds** to prevent decomposition, litter build-up and nutrient enrichment and to keep some reed young and healthy. This can be done by:
  - Controlled burning – although this method is often destructive to wildlife.
  - Scrub control – coppicing or root removal of scrub.
  - Seasonal grazing, usually with hardy cattle or ponies.
  - Machine cutting and removal – of different compartments in different years.

- **Reed cutting.** Cutting and removing different areas of reeds on a 4–7 year rotation to prevent the build-up of nutrients and dead plant material.

- **Using heavy plant** to create and maintain areas of open water. RSPB use a ‘soft track’ machine which can blow soil to spread it and which creates intricate micro-topography in wetlands.

Further information on managing reedbeds can be found in the Wetland Restoration Manual (Wildlife Trusts, 2001) on the RSPB website, and in the Wet grassland guide (RSPB, 1997)

**NOTE:** If clearing reeds, be aware that storing cut reeds on site can cause localised nutrient enrichment and decreased plant diversity/water quality. Where possible, reeds should be burned/composted off-site or, if suitable, cut and used for thatching.
APPENDIX 1- Wildlife benefits of reedbeds

Importance of reedbeds for wildlife in the UK

Reedbeds are a nationally scarce habitat, and wildlife dependent on reedbeds is often ever scarcer. Reed swamps support characteristic communities of uncommon birds and invertebrates and reed fen habitats are more important for their diversity of plant and invertebrate interest. Many species which live in and utilise reedbeds have declined. These include:-

**Plants:**
- Cowbane
- Greater Spearwort
- Greater water parsnip

**Birds**
- Bittern
- Marsh harrier
- Bearded tit
- Savi’s warbler
- Cetti’s warbler
- Reed Bunting
- Crane

**Insects:**
- Red Leopard moth
- Dragonflies

**Amphibians and Reptiles:**
- Grass snake
- Common frog
- Common toad
- Newt species inc. great crested

**Fish & Eels**
- Numerous native species

**Mammals:**
- Water vole
- Otter
- Water shrew
- Harvest mouse

### Habitat niches supplied by reedbeds

<table>
<thead>
<tr>
<th>Group/Species</th>
<th>General Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Breeding Birds</strong></td>
<td>Bittern require fish stocks and hunt along the reed/open water interface in shallow water in reedbeds &gt;20 ha, with 20% open water and at least 600 m of reed edge per hectare.</td>
</tr>
<tr>
<td><strong>Fish</strong></td>
<td>Reed-fringed shallow water and open water with abundant aquatic plants provide important food and cover for juveniles. Connectivity with other waterbodies helps with recruitment of eels and other species.</td>
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<tr>
<td><strong>Invertebrates</strong></td>
<td>All stages of reedbed succession support important invertebrate communities. Maximum diversity occurs in areas of reedbed which have a dry litter layer. Over 23 Red data book species have been recorded in reedbeds.</td>
</tr>
<tr>
<td><strong>Amphibians and Reptiles</strong></td>
<td>Amphibians use well-vegetated water bodies within the reedbed. Grass snakes can be abundant in reedbeds, using piles of cut vegetation to lay their eggs.</td>
</tr>
<tr>
<td><strong>Mammals</strong></td>
<td>Reedbeds can host high densities of harvest mouse which feed on invertebrates in the summer and seed during the winter. Other mammal species such as water vole prefer good cover of a range of aquatic plants including reeds, otters use reedbeds as holts and hovers and for food i.e. amphibian stocks.</td>
</tr>
<tr>
<td><strong>Aquatic flora</strong></td>
<td>Wetlands such as reedbed with a rich variation in water and land levels can create abundant niches for a wide range of flowering and non flowering vegetation.</td>
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</tbody>
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How To Create & Manage Reedbeds

APPENDIX 2 – Methods of planting reeds

Spreading soil containing rhizomes (roots)

This involves transferring the top 300-500 mm of soil from an existing area with reeds to a prepared site. The following points should be considered:

- Soil should be spread at least 250 mm deep and can be flooded by up to 200 mm of water.
- Ensure soil containing rhizomes doesn't dry out.
- Minimise handling of soil to avoid damaging rhizomes.
- Use soil immediately if possible - do not store for long periods.

This method has the advantage that litter, soil-living invertebrates and plants of conservation value are introduced to the site. It is generally only practical over small areas as 2,500 m³ of material is required per hectare. It can however be made to go further by establishing reeds in a patchwork.

Turf transplant

Small reedbeds can be created by transplanting root ‘turfs’ of common reed in winter into shallow areas of water. This is an easy method of establishing reeds, particularly if you are already clearing reed in your ditches with a digger and bucket. Place clods just above the water table in damp ground. Complete turves can also be cut by hand with a spade. The following pointers may help:

- Larger turves contain more undamaged material and will establish a reedbed more quickly.
- By positioning 1m² turves at 10 m spacing (100/ha) full cover is possible within one year.
- By positioning 1m² turves at 25 m spacing (25/ha) full cover is possible in 3-5 years.
- Water levels can be up to 500 mm deep providing turves have long, intact reed stems attached.
- Land forming/soil preparation is less critical, providing some shallow surface flooding occurs to suppress competition.
- Do not sack turves when transporting or storing them, as this damages aerial stems and rhizomes.

Rhizome (root) fragments

Planting individual cut root fragments is labour intensive with variable success. These tips may help:

- Separate rhizomes from soil, using a high pressure hose.
- Use intact rhizomes with at least one internode (the thickened band on the rhizome), bearing a bud.
- Plant in wet soil and follow with shallow flooding leaving part of the rhizome exposed to the air.
- Plant rhizomes at an angle with one end above the surface.
- Planting should be at a density of 4-10 rhizome per metre squared. Expect 20-25 % losses.
- Rhizomes 200-400 mm long with actively growing shoots are more tolerant of flooding.

A digger and bucket can be used to lift turfs containing reed roots © F Southgate
Planting stem cuttings

Planting cut reed shoots directly into soft soil, especially nutrient rich soil is often successful. The method can be quick and simple. Helpful hints include:

- Harvest reed stems locally, cutting as low as possible, into 20 -50 cm lengths, with 2-6 nodes (thickenings on the stem)
- Trim the leaves from the upper stem to reduce the need for water whilst the stem roots
- Keep stem bases wet, plant as soon as possible into soil covered by 10-20 mm of water
- Plant stem cuttings so that a node is close to the soil surface (new roots develop at the nodes)
- Plant at densities of 10-15 cuttings per metre square
- Water levels must not overtop the stems during the winter following planting, as this will kill them (dead reed stems act as a snorkel in winter!)
- Successful stems initially look dead but soon send out roots and shoots

Planting pot-grown seedlings

Planted seedlings can survive adverse weather conditions and in good bed conditions, success rates approach 100%. Planting pot-grown seedlings of known origin is the most reliable method of reedbed establishment, but growing your own plants can be labour intensive and expensive. Buying nursery grown material is also expensive, although costs are reduced if buying in bulk for large projects. Nursery grown stock may have more risk of invasive species being present. It can be more cost-effective to grow your own reeds. Pot-grown plants can be individually dibbed-in. Plant individual seedlings at densities of 4 per m². This takes around 540 person hours per hectare. Nuclei of plants can be established in areas with relatively stable water levels, from which reed can naturally spread out.

Growing your own reed from seed (panicles)

Growing reeds from seed can be easy but be aware that not all seed heads contain viable seed.

- Collect 10 panicles (seed heads) in November/December (when panicles are dry).
- Chop into small pieces with a pair of scissors, directly into a blender.
- Add about 80 ml of water.
- Operate blender in short bursts until separation of material is evident.
- Pour through a coarse sieve, to remove debris, into a large bowl. Seed will settle to the bottom.
- Pour off the water/debris to leave the seed behind.
- Place seed on filter paper and dry at room temperature.
- Incubating at 28-30°C by day (12 hours) and 15-17°C by night (12 hours).
- Seeds should germinate in as little as 36 hours.
- You now have a choice. You can either harvest panicles in winter and store in a cool, dry place until they can be sown in spring OR you can collect the seed and start to grow your own reeds.
Growing your own reed seedlings

This can be time consuming and is more successful in a greenhouse or polytunnel if sufficient water supply is available. Once seeds have been harvested from reed panicles:-

- Use seedling trays, recycled plastic pots or trays with soil to a 20mm depth.
- Make sure pots/holders have holes in the bottom as seedlings are supplied with water from below by capillary action.
- Use a fine, rich compost or soil and water before adding shredded/blended seeds or panicles.
- Press reed material firmly into soil, and water again.
- Water seedling AT LEAST once daily from below (you may need to create bays covered with polythene to allow watering from below).
- Germination takes roughly 7 days and seedlings are ready for planting out after about 6 weeks.

Pre-planted coir fibre rolls

Some aquatic consultants such as SalixRW can supply mats of coir (coconut) fibre which are pre-planted with reeds and other native wetland plants. These mats can be expensive, but are very effective at helping to establish areas of reed quickly over smaller areas of land. Check your supplier to make sure they know about the dangers of non native invasive aquatic plant species.

Newly established reedbeds in the Pevensey Levels, East Sussex
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How To Create & Manage Reedbeds

Contacts

Sussex Wildlife Trust
(Wetlands Project)
www.sussexwildlifetrust.org.uk
01273 497555

Natural England
0845 600 3078
enquiries.southeast@naturalengland.org.uk

Environment Agency
Ask for Fisheries & Biodiversity or Land Drainage consent teams
03708 506506
www.environment-agency.gov.uk

Sussex Reedbed Habitat Action Plan
www.biodiversitysussex.org

References & Further Reading


Sussex wetlands project promotes the sustainable management of rivers and the restoration of wetland habitats for people and wildlife