

River Corridor Tree and Scrub Management Guidance

A guide for managers in the Broads

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July 2005



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1. INTRODUCTION

Tree and scrub management is necessary within Broadland river corridors for a variety of reasons, including maintenance of navigation, landscape character, biodiversity and alleviation of flooding. Such management includes whole removal, pollarding, coppicing or lopping branches. These changes inevitably affect interested parties who may have different views about the value of trees and scrub along the river corridor. Thus, the Broads Authority (BA), working in partnership with Broads Environmental Services Ltd, and in consultation with Norfolk and Suffolk Boating Association (NSBA), Broads Society (BS), Environment Agency (EA), Forestry Commission (FC), English Nature (EN) and Wildlife Trusts (NWT, SWT), has developed this overarching guidance to assist with a strategic approach to future tree and scrub management works.

The issues surrounding management of trees and scrub are brought together in this guidance document, informed by a workshop held in May 2004. This workshop involved interested parties from the BA, BESL, EA, Angling and Sailing Clubs, Internal Drainage Board, EN, Department of Environment Food and Rural Affairs (DEFRA), Local councils, Broads Reed and Sedge Cutters Association, Suffolk Wildlife Trust (SWT) and the Royal Society for the Protection of Birds (RSPB).

A key outcome of the workshop highlighted that stakeholder opinion can be ambivalent about trees and scrub. On the one hand people may perceive this habitat as untidy, unmanaged and hazardous and on the other value it as an attractive element in the landscape that encourages a wealth of wildlife, such as song birds. Thus, a document to guide managers through the decision making process was considered to be a constructive way forward.

2. PURPOSE OF THIS GUIDANCE

Tree and scrub management in river corridors is about integrating the requirements of both people and nature. It is increasingly important that flood defences are maintained, public access routes are safe, biodiversity targets are delivered, landscape values are conserved and boats have sufficient space and wind to travel throughout the waterways. Providing a framework for integrating these requirements is the main purpose of this document.

This guidance provides quick reference to key relevant legislation, reasons for removal and retention of trees, best practice and case studies. It also provides a framework for decision making to minimise conflict, and provides signposts to more detailed documents for certain key areas. Information gathered at the stakeholder workshop held in 2004 has also been incorporated into this document.

The aims of this Tree and Scrub Management Guidance are to:

- Identify all the issues and processes relating to the strategic management of trees and scrub in river corridors.
- Guide managers, landowners and their tenants through the, often difficult, decision-making process of river corridor management.
- Encourage consistency and common standards amongst landowners, statutory agencies and non-governmental organisations, when carrying out management.
- Provide best practice guidance for bank side tree and scrub management.
- Minimise conflict between users by providing a robust, transparent decision-making process.

3. GUIDANCE ON DECISION MAKING

The process of planning, consulting, implementing and monitoring tree and scrub removal has several essential stages outlined in this document (Table 1). It is recommended that this process be followed to ensure works are lawful and stakeholders have the opportunity to influence outcomes. Stakeholder consultation for many public bodies has become an essential part of project planning in order to build consensus, thereby contributing to successful completion of projects.

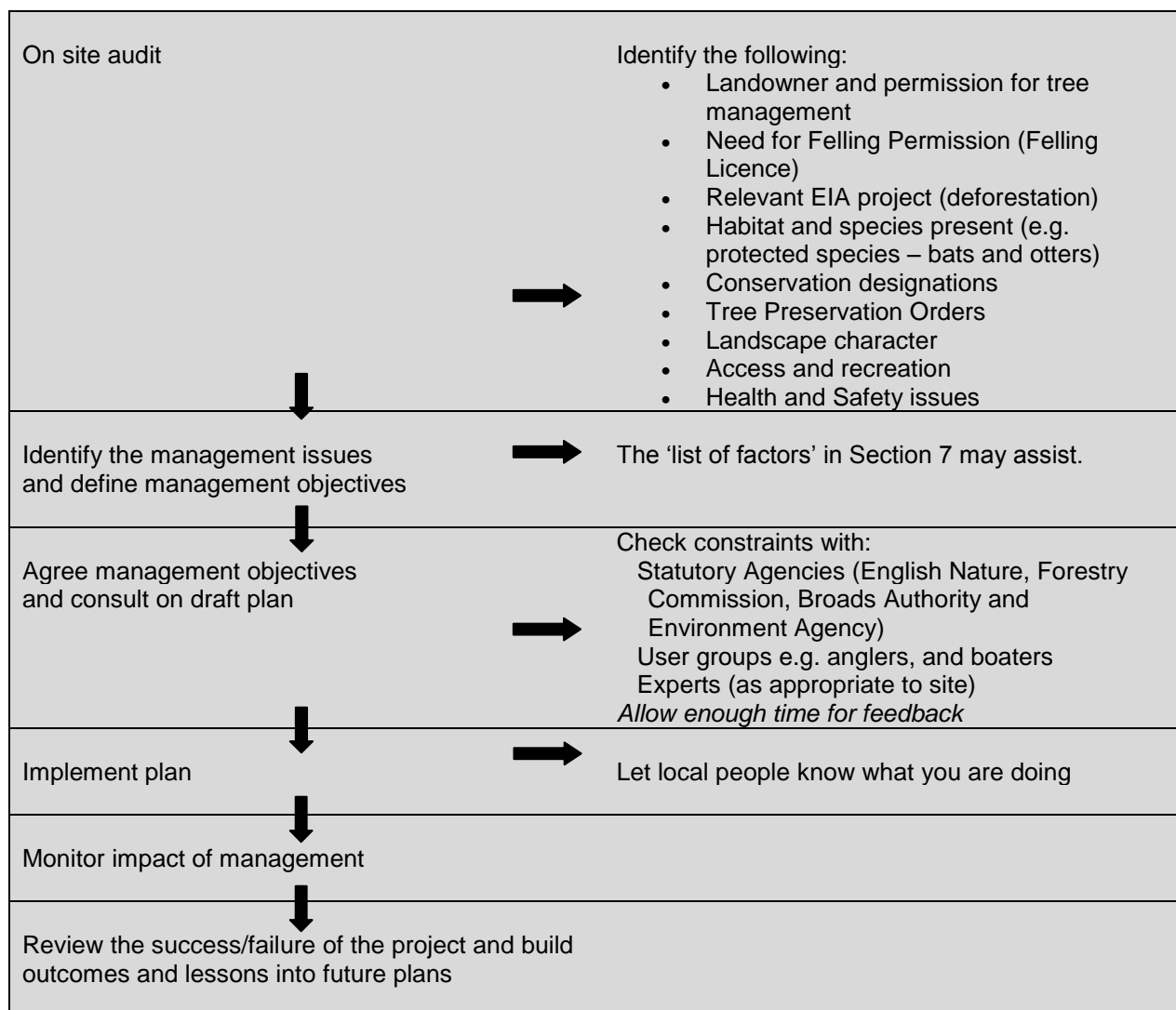


Table 1: Summary of decision making process (adapted from Scrub Handbook, Reference 3)

4. PERMISSIONS

Tree felling is controlled by the Forestry Commission, and permission is normally needed to fell growing trees unless certain exemptions apply. Permission is given by the issuing of Felling Licences. In certain circumstances special permission from another organisation may have to be sought for any proposed felling (e.g. English Nature) and this sometimes applies even if the proposed work does not require a Felling Licence.

Everyone involved in the felling of trees, whether doing the work or by engaging others, e.g. the owner, agent, timber merchant or contractor, must ensure that a felling licence has been issued before any felling is carried out, or that one of the exceptions apply. If they are unsure as to

whether they require a licence, the Forestry Commission should be contacted for guidance, before any tree felling starts.

Clearance of trees and scrub may constitute a 'deforestation' project under the Environmental Impact Assessment (forestry) Regulations. These Regulations require anyone who wishes to carry out a relevant project (i.e. deforestation) for an area above the relevant threshold, and which might have a significant effect on the environment, to obtain consent for the work from the Forestry Commission. The Forestry Commission should again be contacted for guidance before any tree felling or scrub clearance starts.

Planning consent may be required from the local planning authority, which will also be able to give information on Tree Preservation Orders in the works area.

When felling near navigable rivers always contact the Broads Authority to ensure navigation safety criteria are met. English Nature should be contacted when removing trees within or adjacent to a nature conservation area (SSSI or Natura 2000 site).

5. OVERVIEW OF TREES AND SCRUB IN BROADLAND RIVER CORRIDORS AND REASONS FOR MANAGEMENT

Management of trees and scrub has been documented at both national and local level (References 3 and 4). However, managing trees and scrub within a navigable river corridor of a nationally protected landscape has unique issues that require particular consideration. The river corridor area referred to in this document covers the riverbank, including the rond (area of reed or saltmarsh between the river and flood embankment) and the folding (the area of land between the flood embankment and the soke dyke) to the soke dyke as shown in Table 2.

The responsibility for management of river corridor trees and scrub falls to landowners and/or their tenants. However the Broads Authority has responsibility to maintain safe and navigable waterways and for this reason the Authority assesses the potential risk of trees at the edge of waterways falling into the water or obstructing the navigation. Despite landowners having responsibility for tree management, the Authority can also act as agent for the landowner and undertake necessary management to ensure that access is maintained and risks to vessels and the public are minimised.

The Broads is a nationally recognised protected landscape, where in some areas trees and scrub are a part of the local character. To generalise: the upper and middle reaches of the river corridor, broadleaved woodland, alder carr, reedswamp, cultivated areas and coarse or rough vegetation provide a diversity of landscapes. In contrast, the more open valleys of the lower river reaches have extensive open spaces, with little woodland, providing views across grazing marshes, flood embankments, wind pumps and reedbeds. Occasional scrub, alder carr and pollarded willow provide features, with wooded copses sheltering houses on the higher ground.

Cross section of a typical Broadland river-bank and table of the main interests potentially requiring management of trees within the riverbank zones.

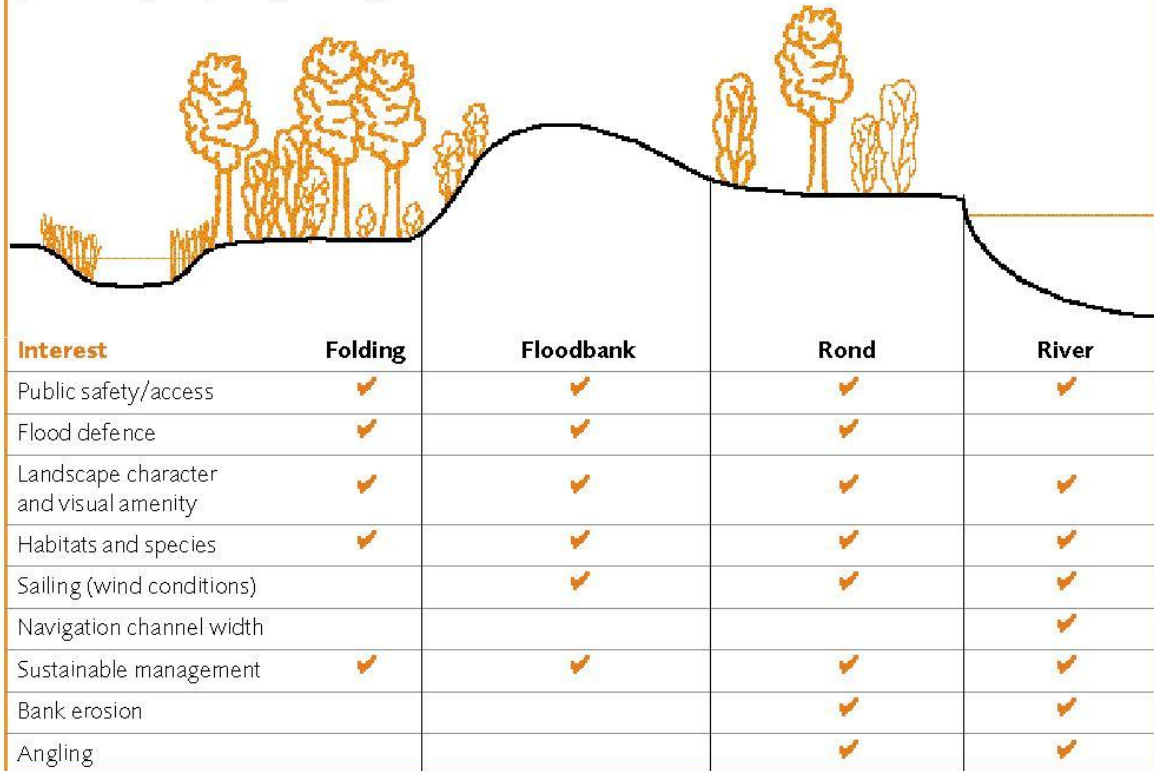


Table 2: Main reasons for managing trees and scrub in the river corridor zones

6. CRITERIA FOR MANAGING TREES AND SCRUB

Criteria for managing trees and scrub for flood defence purposes have been developed by BESL and the Environment Agency (Table 3).

The Broads Authority are developing a policy and procedure for assessing and managing of trees to minimise risk to people and property, this will be consistent with this Guidance. Criteria for other management objectives will be site specific and developed within a tree and scrub strategy.

	Criteria	Reason for management for flood defence	Management
Rond	Rond width less than 2m	Re-establish reedswamp and reed rond for erosion protection to floodbank	Removal of trees and scrub and stump treatment
	Rond width between 2-10m	Ensure adequate erosion protection to maintain integrity of floodbank	Vary according to local conditions
	Rond width over 10m	Need to keep immediate 2m corridor adjacent to bank free of trees and scrub	See floodbank notes below
Floodbank	Not applicable, (whole bank requires tree and scrub removal)	Access for improvement works and subsequent inspection and maintenance	Floodbank management zone to include any trees and scrub on the rond within 2m of the bank toe. Removal and selective lopping of trees and scrub.
Folding – strengthening and rollback	First 5m ^a	Access for improvement works and subsequent maintenance	Complete removal of trees and scrub
	Distances over 5m ^c	Access for improvement works and subsequent maintenance	Retention and/or site specific management such as lopping, pollarding and selective removal
Folding - setback	Not applicable	Existing folding will be incorporated into new rond, (requirement to raise ground levels do not allow for retention of trees and scrub)	Management of new folding as per strengthening and rollback, although in most cases there is unlikely to be extensive trees and scrub

Table 3: Criteria for managing trees and scrub for flood defence purposes (Source: EA/BESL)

^a Distance from toe of new bank following improvement works

7. LIST OF FACTORS THAT REQUIRE CONSIDERATION FOR TREE AND SCRUB MANAGEMENT

Notes on usage

This list summarises the key factors relevant to the management of trees and scrub along waterways in the Broads. It should not be considered definitive beyond the Broads executive area.

Factors	Value of Trees and Scrub	Reasons for Management
Landscape	Provide seclusion and natural visual boundaries to landscape units. Presence of tree and scrub provides landscape contrast and visual interest. People have different perceptions of what is an acceptable landscape based on past, present and future aspirations.	Trees and scrub can block valued landscapes from view if not managed.
Architectural and historical remains	Historically trees and scrub were maintained around some old buildings as a windbreak.	Trees and scrub have potential to damage old buildings.
Modern built environment	Provide natural visual screens to buildings and structures.	Some tree species growing close to structures have potential to cause damage by falling or development of their root systems.
Habitats and species	<p>Trees provide habitats (nesting, perches and shelter), food (pollen/nectar/leaf- feeding) for a wide variety of wildlife.</p> <p>In the Broads, mosaics of different habitats are good for wildlife. These mosaics could include:</p> <p>Mature trees provide otter holts and bat roosts.</p> <p>Open and closed scrub is important for birds such as the cetti's warbler. Dense scrub next to sunny basking areas is important for reptiles.</p> <p>Wet woodland is good for invertebrates and plants such as sedges and ferns and is a BAP target.</p> <p>Overhanging trees and scrub are good for fish (see angling). Kingfishers perch on overhanging branches to feed and can nest in root plates of upturned trees. Some bats favour trees by water.</p> <p>Appendix 1 lists wildlife and their use of trees and scrub.</p>	<p>Encroachment of trees and scrub on fen or reed bed can result in shading and drying out of this vegetation. Reeds will persist under young scrub, however, over time they will be lost. Mosaics of reed and fen with clumps of trees or scrub and single trees can be more important for wildlife by providing variety.</p> <p>Tree and scrub management is required to allow habitat mosaics for wildlife interest.</p>

Factors	Value of Trees and Scrub	Reasons for Management
Public safety		In some circumstances trees can present a safety hazard for boats, property and people. Landowners and managers have a duty of care for public safety, to a reasonable degree. The acting agent, such as the land manager or navigation authority, must consider safety issues, such as hazardous trees, on property or persons.
Angling	Bank side trees, especially those overhanging the water, provide food and habitat for invertebrates, which provide food for fish. Overhanging branches provide refuge from predation, spawning areas and cool shaded water.	Bank side trees can prevent bank access for anglers and reduce casting space. Lines and hooks can get caught on bank side trees.
Navigation	Views of trees and scrub are valued by visitors.	Trees and scrub close to the river can reduce wind strength and result in poor conditions for sailing. Regular gaps are required to allow the passage of wind. Sails can get caught on branches.
Access	Trees and scrub provide shelter and reduce noise from boat engines and road traffic.	Trees and scrub can block public footpaths. Overhanging branches of some trees, such as willow, can root in the water narrowing the river.
Flood defence	See bank erosion below.	River bank trees and scrub can prevent access for flood defence works. Trees rooted into flood banks can fall causing a weakness and will eventually lead to failure of the flood defences.
Sustainable management	Maintaining wet woodland requires a low-intervention approach little, whereas maintaining a mosaic of trees and scrub of different ages requires rotational management.	Commercial cutting of reed and sedge on river ronds is only possible where there are few trees and scrub.
Bank erosion	Healthy rooted vegetation on the river bank provides effective control of bank erosion. Trees have strong, soil binding roots. However, trees have to be appropriately spaced for their roots to effectively bind the bank together, should be positively managed to guard against wind blow. (see Ref. 12 for details on vegetation on bank erosion).	Local bank erosion can sometimes be caused by fallen trees, lone trees and at the beginning and end of runs of trees. Trees cast shade that can prevent reed growth. Reeds that are healthy, actively growing with deep-roots also prevents bank erosion.

8. REGISTER OF REGULATIONS FOR TREE AND SCRUB MANAGEMENT

Notes on usage

This register summarises the key legislation that applies to tree and scrub management along riverbanks in the Broads. It is not limited to environmental issues although it should not be considered as a definitive list outside of the environmental field.

Factors	Legislation and Consents	Organisation
Tree Felling	Forestry Act 1967, Forestry (Felling of Trees) Regulations Any felling carried out without either a licence or other permission is an offence, unless it is covered by an exemption.	Forestry Commission
Deforestation	Environmental Impact Assessment (Forestry) regulations These regulations require anyone who wishes to carry out a relevant project for an area above the relevant threshold, and which might have a significant effect on the environment, to obtain consent for the work from the Forestry Commission	Forestry Commission
Landscape	Conservation Areas – designated and administered by local authority. Under the Listed Building and Conservation Areas Act (1990), it is illegal to carry out works to a tree without giving 6 weeks written notice to the Local Authority.	Local Planning Authority
	Town and Country Planning, Tree Preservation Orders – designated by local authority for individual or groups of trees. It is an offence to carry out works to a TPO tree without the express consent of the Local Authority. The Local Authority holds a definitive map of preserved trees.	Local Planning Authority
	Hedgerow Regulations (1997) – most hedgerows are covered by this legislation, notification for the removal of a hedgerow must be given to a Local Authority who then have 6 weeks to respond.	
Architectural and historical remains	Scheduled Ancient Monuments and Listed Buildings are Statutorily protected (under the Listed Buildings and Conservation Areas Act 1990 and the Ancient Monuments and Archaeological Areas Act 1979) They are designated by the Secretary of State and administered by the Local Authority and English Heritage Respectively and all works that affect them require consent.	English Heritage Local Authority
Habitat Species and biodiversity	Wildlife and Countryside Act (1981) - gives powers to protect wildlife, habitats and geological sites, e.g. bat roosts are protected (even if bats are not present). See Appendix 2	English Nature

Factors	Legislation and Consents	Organisation
	for protocol on how to deal with bats and bat habitats. Protection of Badgers Act (1992) - provides protection for badgers and their setts. Countryside and Rights of Way (CRoW) Act (2000) – covers management of Sites of Special Scientific Interest (SSSIs) and outlines the duty of competent authorities to protect, enhance and restore habitats for wildlife. The Conservation (Natural Habitats, &c.) Regulations (1994) (better known as the Habitats Regulations) () - requires member states to maintain populations of certain bird animal and plant species and to preserve a sufficient diversity of habitats, largely through the establishment and maintenance of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). All SPAs and SACs are nationally designated Sites of Special Scientific Importance (SSSIs) but are afforded greater protection under the Habitats Regulations.	English Nature English Nature English Nature/ Local Planning Authority
	Convention on Wetlands of International Importance especially as Waterfowl Habitat - adopted at Ramsar, Iran on 2 February 1971 and came into force in 1975 (UK Treaty Series No 34, 1976). Provides for the conservation and wise use of internationally important wetlands and their resources (Ramsar sites). Town and Country Planning, Tree Preservation Orders – designated by local authority for individual or groups of trees. Biodiversity Action Plans, Habitats and Species – sets targets for the conservation of key habitats (e.g. wet woodland) and species (e.g. bats and otter), underpinning government's commitment to the Convention on Biological Diversity.	English Nature Local Planning Authority Local Authorities
Public Safety	Health and Safety at Work Regulations (1992) - on areas of public access in river corridors. Safety Signs Regulations (1990). Occupier's Liability Act (1984) - sets out liability to the occupier of any premises (incl. Land) to ensure the premises are safe for anybody who might use them or venture on.	Health and Safety Executive Health and Safety Executive Common Law
Navigation	Norfolk and Suffolk Broads Act requires Works Licence for any works that may affect navigation, except for statutory bodies. The Act also requires that the Authority shall maintain the navigation area for the purpose of navigation to such a standard as appears to it to be reasonably required and develop as it thinks fit. See Public Safety.	Broads Authority
Access	Disability Discrimination Act (1995) - addresses discrimination against people with disabilities in employment, education and access to goods, facilities and services.	Health and Safety Executive Tribunal / Court

Factors	Legislation and Consents	Organisation
Flood defence	<p>Water Resources Act (1991) – issues include water pollution, water resources and flood defence. The Environment Agency has permissive powers to carry out flood defence works on main rivers and coasts. Powers and duties to maintain flood structures and flood control works by others that may affect flood defence.</p> <p>Environment Act (1995) – formed the EA and conferred a combination of powers with regard to contaminated land, pollution, conservation and enhancement of the natural environment.</p> <p>Land Drainage Act (1991) – provided arrangements for Internal Drainage Boards, Local Authorities or the Environment Agency to manage drainage of land or prevention of flooding.</p>	<p>Environment Agency (EA)</p> <p>Environment Agency</p> <p>EA, Internal Drainage Board (IDB), Local Authorities</p>

9. LIST OF CURRENT PRACTICE FOR TREE AND SCRUB MANAGEMENT

Notes on usage

This list summarises the key practises of assessment and management that applies to tree and scrub along riverbanks in the Broads. It is specific to the Broads and management organisations in the Broads; it should not be considered definitive outside of the Broads area.

Factors	Current Practice of Assessment and Management
Landscape	Nationally the Countryside Agency (Countryside Character Initiative) (Reference10) and English Nature (Natural Areas) provide indicators of landscape character. The Broadland Flood Defence Landscape Character Assessment, (Reference 11), has to date assessed the Yare and Waveney river corridors for the purpose of the Broads Flood Alleviation Project.
Architectural and historical remains	<p>The National Lists/Schedules are periodically reviewed, there is also a mechanism whereby buildings or monuments can be added to the list or schedule with immediate effect. Local Authority's are required to review and designate new Conservation areas if identified.</p> <p>A building at risk survey is carried out annually to identify and check on buildings known or thought to be at risk. The Broads Authority has undertaken to identify a pilot area for the cultural heritage strategy, which will identify all those buildings structures areas and landscapes of significant local importance and afford them a degree of protection as well as planning for their secure future.</p>
Habitat	Before during and after work, trained persons should look for potential bat roosts, and otter holts. The overall assessment of biological and ecological value of the habitat including the effects of succession structure and spacing on plants, invertebrates, mammals and birds must also be made, (Reference 3). For management of existing and future veteran trees see Reference 5. Other considerations are habitat connectivity, shelter, wider habitat and species context.
Species and biodiversity	To avoid the bird-breeding season tree and scrub removal works should be undertaken October to mid February, unless clearing fallen or hazardous trees, where appropriate checks for nesting birds should take place. The protocol on assessing trees for bats and bat habitat (Appendix 2) needs to be followed.
Public Safety	<p>Site based risk assessment should be developed by the landowner or manager; management plans should incorporate actions required to minimise risk at sites.</p> <p>The following management protocol is currently adopted on the footpaths managed by the Broads Authority:</p> <ul style="list-style-type: none"> • Where possible maintain 1.2m and 2m safety zones adjacent to footpaths and bridleways respectively. • Leave all mature trees, or if a safety risk pollard or lop hazardous branches. • The landowner should deal with any fallen trees or dangerous trees. The cut wood should be stacked in a habitat pile away from the pathway.

Factors	Current Practice of Assessment and Management
	<ul style="list-style-type: none"> • Dangerous trees are notified to Highways Authority, local Tree Officer and the landowner. • Regular site inspection and an annual footpath survey for the Broads Footpath network is undertaken. <p>The following management protocol is currently adopted on the navigable river banks in the Broads:</p> <ul style="list-style-type: none"> • Dead, diseased or fallen trees, which are a hazard to navigation, are removed. • Scrub or trees, which are restricting the agreed navigation area, are cleared back to prevent rooting in the river. • Leave all stable mature trees, or if a safety risk pollard or lop hazardous branches. • The Broads Authority has the power to achieve this management above only by working from the river. <p>The Broads Authority are developing a policy and procedure for assessing and managing of trees to minimise risk to people and property, this will be consistent with this Guidance document.</p>
Sailing	<p>Where landowner permission is granted and wind conditions are restricted 10m scrub removal zones are maintain from river to improve sailing conditions. These zones do not need to be continual and some blocks can be left, particularly behind the flood embankment. Any land based work or more pronounced clearing needs to be carried out only with the landowner's permission.</p>
Access	<p>See 'Public Safety' above</p>
Flood defence	<p>The Environment Agency (and its predecessors) carries out maintenance of floodbanks in the Broads system, this involves topping-up of floodbank crest levels, sealing of leaks and annually grass cutting the crest and tops of the bank side slopes to prevent the growth of trees and shrubs. Over the last two decades, due to the redistribution of limited resources elsewhere in the Norfolk and Suffolk catchment, much of the grass cutting programme (particularly on the Waveney) was reduced; hence the more intense tree growth that has resulted. Environmental surveys and assessments are undertaken for all schemes with any necessary mitigation and/or enhancement measures incorporated into the work specification</p>
Sustainable Management	<p>Consider the long-term sustainability of works (economic, environment and sociological), traditional management and local economy.</p>
Bank erosion	<p>See Waterway Bank Protection Manual (Reference 12).</p>

10. **CONSIDERATIONS FOR PRACTICAL MANAGEMENT**

Notes on Usage

These are the key considerations and terms for management of tree and scrub along riverbanks in the Broads. These considerations are specific to the Broads, thus it should not be considered definitive outside of the Broads area.

Management Methods (see Reference 4 for appraisal of methods)

Options include:

- Tree surgery – crown reduction/pruning etc
- Coppicing - cutting or pruning trees and shrubs to ground level to produce new growth.
- Pollarding - regular pruning back to the main stem or trunk to force a flush of new growth; usually used on fast-growing trees (Willow).
- Felling and replanting – using native, locally sourced stock
- JCB excavator - removal of whole tree including root system minimising re-growth
- Hand clearance - for small scale works, no heavy machinery required

Disposal of Arisings (see Reference 4 for appraisal of methods)

Options include:

- Reuse (e.g. brash used for faggots and erosion protection)
- Chipping and removal from site or discrete piling on site
- Burning of brash on site on portable trays/sheets and subsequent removal off site
- Burial of woody material under spoil banks if works are combined with dredging of waterways
- Habitat piles of logs
- Incineration for large volume of material

Other Management Considerations

Overall impact on biodiversity

Biodiversity of existing and expected biodiversity of new habitat should be considered, biodiversity of scrub or woodland may be greater than the vegetation that would result if the trees and scrub were removed. For example areas of higher soil nutrient status tree and scrub removal may result in rank tall herb, nettle and thistle growth with few species.

Sustainability

Long-term sustainability of management should be considered. Aspects that require consideration are; long-term economic considerations of maintenance and rotational management, traditional management of land and products, alongside the environmental aspects of managing trees and scrub.

11. BROADS TREE AND SCRUB MANAGEMENT CASE STUDIES

No.	Issue	Site name	Habitat	Objective	Lead organisation
1	Machinery access for crest raising	Aldeby	Dry willow and alder scrub with some large mature trees	Reduction / maintain	BESL
2	Machinery access for crest raising	Puddingmoor	Wet willow and poplar with some mature willows. One was located within the Conservation Area and was removed through planning	Eradicate	BESL
3	Trees shading reeds, blocking access for river bank maintenance, causing poor wind conditions for sailing	Castle Marshes	Dry willow scrub with some large mature trees	Eradicate majority of trees and scrub and enhance mature willows by pollarding and retain scattered scrub	SWT/Broadshear
4	Trees causing navigation hazard	Irstead Shoals	Mix of willow birch and alder scrub	Reduction	BA
5	Trees causing poor wind conditions for sailing	Train Reach, River Yare	Dry willow scrub with some large mature trees	Eradicate scrub, within 10m of river bank – stable mature specimen trees retained	BA

CASE STUDY 1

Aldeby flood bank – branches overhanging the crest of the flood bank were removed by lopping.

Location	Aldeby flood bank
Status	No conservation designation, within Broads National Park
Site manager/owner	Private landowner
Works under taken by	Broadland Environmental Services Limited (BESL). Felling licence not required, EA have permitted development rights.
Description	The folding, rond and floodbank at Aldeby have become partially vegetated with scrub and semi-mature willows, silver birch and a few alder. Mature poplars are also present along the folding.
Issues	<ul style="list-style-type: none">• Access required along the floodbank allowing the placing of clay material on the crest of the flood bank.• Some limited tree clearance potentially required allowing access along the floodbank for heavy plant.• Potential issues regarding any need for tree felling during the main bird breeding season• Potential for local misconceptions on the level of tree clearance undertaken.
Objectives	Minimal removal of branches and brushwood to allow access for plant (dumpers and excavators) along the floodbank crest.
Methods	Lopping with chainsaws and bow saws.
Assessment of lessons learnt	The landowners and the Parish Council were engaged early on prior to the works starting and this reduced any risk of local misconceptions as to the nature of the works and the level of tree clearance required. The works were subsequently undertaken sensitively with no need to completely remove any trees.
Modifications to future proposals	Crest raising schemes such as those undertaken at Aldeby can be achieved through minimal disturbance to the local environment, without the need for large scale tree felling and/or management. BESL look to retain as much of the existing tree and/or scrub cover as possible looking to work within the restriction of the receiving environment
Contact details	BESL

CASE STUDY 2

Puddingmoor – removal of trees between the floodbank and soke dyke.

Location	Puddingmoor, Beccles
Status	No nature conservation designations, though is within Broads National Park and the Beccles Conservation Area encompasses part of the site affected by the works.
Site manager/owner	Leisure plot owners and Beccles Town Council
Works under taken by	BESL – works undertaken with Environment Agency permitted development rights thus Felling Licence not required
Description	The floodbank required crest raising with material sourcing from the adjacent soke dyke. Additional works required replacement of a tidal flap sluice where a mature willow was growing through the sluice, preventing it from operating. The willow had to be removed and as it was located within the Beccles Conservation Area removal required planning permission. The main area of floodbank crest raising was located immediately behind a number of leisure plots and the land beyond the soke dyke consisted of an area of wet woodland dominated by willows and poplars. To allow access for heavy plant, an area of the wet woodland had to be cleared.
Issues	<ul style="list-style-type: none">• Extensive tree cover up to the soke dyke that prevented access for heavy plant for maintenance works• One specimen willow growing through a tidal flap sluice that contributed to the regular flooding of the land behind the floodbank• Overhanging trees causing shading of reed and loss of key habitat within the soke dyke• Loss of tree habitat that may support bats, birds, invertebrates etc
Objectives	To clear all trees (0.25ha) within 10m of the soke dyke on the landward side and all trees between the floodbank and the soke dyke along 200m of floodbank. To remove a mature willow by the existing concrete sluice.
Methods	Chainsaw, burning of brash and piling of logs on site. Excavators were used to remove any rootballs.
Assessment of lessons learnt	The contract to clear the trees and scrub went smoothly. Main issue related to the removal of the specimen willow, located within the Beccles Conservation Area, requiring planning permission. Prior to felling the tree was checked for potential bat roosts and nesting birds. The Landscape Officer for Waveney District Council was consulted and approval was given.
Modifications to future proposals	No adverse reaction was received regarding the works. However, wider public consultation may be required in areas where such clearance is more visible from the river or from the higher ground.
Contact details	BESL

CASE STUDY 3

Location	Castle Marshes
Status	SSSI, c.SAC, SPA, within Broads National Park
Site manager/owner	Suffolk Wildlife Trust
Works under taken by	Instigated by Broadshear, undertaken by specialist contractor, consented by English Nature, felling licence granted by Forestry Commission, funded by DEFRA grant allocated by Broads Authority Sustainable Development Fund
Description	The rond, bank and folding at Castle Marshes is, in parts, vegetated with willow scrub and 40-50 year old willow trees. Beyond the river corridor are extensive open grazing marshes bounded by woodland beyond. The river width is approximately 50m, which is a medium width for the Broads. Work was undertaken in 2004.
Issues	<ul style="list-style-type: none">• Overhanging trees causing shading of reed and loss of key habitat• Wind blockage making sailing conditions difficult• Access across flood bank for maintenance works• Trees provide nesting opportunities for corvids (crows etc) which then prey on ground nesting birds on adjacent SSSI grazing marsh
Objectives	To clear 1ha of scattered willow scrub (c. 1000 willows), to fell in excess of seventy 20-40 year old willows, to create 20 new pollarded willows.
Methods	Chainsaw, burning of brash and piling of logs on site.
Assessment of lessons learnt	The contract to clear the trees and scrub went smoothly. The main issue was the public reaction to the work. A number of individuals questioned the need to cut down the trees. Re-growth of low growing vegetation has begun to re-establish on the rond.
Modifications to future proposals	Better public consultation, on-site explanation of the reasons behind the work. Make better use of cut material, timber and woodchip. Ideally arisings should be removed from site (by river) and sold for power generation. However it should be noted in this case the income would barely cover transport costs, and value would come from the works being perceived as a 'greener' option.
Contact details	Suffolk Wildlife Trust – Steve Aylward, Broadshear – Colin Groves

CASE STUDY 4

Location	Irstead shoals, River Ant
Status	SSSI, c.SAC, SPA, within Broads National Park
Site manager/owner	Mr Neave
Works under taken by	Broads Authority. Works were exempt from felling licence due to small volumes of timber.
Description	True left river bank adjacent to marsh, adjacent to narrow river channel of approximately 20m width. The river is busy with boats during the summer season. Landscape of this river corridor section is bounded by trees up to the river bank with occasional view beyond to open fen and reedbed. Works were undertaken in 2000.
Issues	<ul style="list-style-type: none">• High number of vessels in close proximity to bank• Overhanging branches fouling rigging and narrowing the busy navigation channel• Leaning trees at risk of blocking navigation channel• Erosion scour around individual trees, gaps in tree line no vegetation below MHWL
Objectives	To remove hazardous trees and maintain adequate width of the navigation area through removal of overhanging tree and scrub growth, and improve sailing conditions.
Methods	Lopping with polesaw, chainsaw and bow saw equipment, stump treatment to prevent re-growth. Appropriate check for breeding birds completed.
Assessment of lessons learnt	Reed re-growth successful where shading trees removed. Some concerns from landowners on opposite bank regarding change of landscape and possibility of informal mooring as a result of the works. However informal mooring has been prevented by erection of temporary signage prior to reed fringe establishment.
Modifications to future proposals	Earlier consultation with interested parties (especially local residents, parish council), to advise of works and use of temporary signage to inform local users of purpose of works.
Contact details	Broads Authority

CASE STUDY 5

Location	Train Reach, River Yare
Status	SSSI, c.SAC, SPA, within Broads National Park
Site manager/owner	RSPB
Works under taken by	Broads Authority, with advice and assent from English Nature. Works were exempt from felling licence due to small volumes of timber.
Description	The river channel is over 60m wide, popular sailing area with many boats moored within 5 miles of the site. Works from November to February, over several winter seasons since 1999.
Issues	<ul style="list-style-type: none">• Overhanging trees shading reed rond• Wind blockage making sailing conditions difficult• Bank erosion
Objectives	Remove 10m strip of scrub to improve wind conditions for sailing, and remove hazardous trees but retain mature feature trees as agreed with landowner.
Methods	Chainsaw and bow saw, burning and piling of arisings on site.
Assessment of lessons learnt	Successful in achieving aims by producing better conditions for sailing and allowing reed re-growth. Worked in partnership with Coldham Hall Sailing Club volunteers. Early consultation with stakeholders, and landowner secured agreement of works.
Modifications to future proposals	Would repeat format again
Contact details	Broads Authority

12. REFERENCES FOR TREE AND SCRUB MANAGEMENT GUIDANCE

No.	Title	Date ISBN	Publisher - available from	Summary
General Waterway Management				
1	Environmental Code of Practice: Waterway Maintenance	2001	British Waterways Waterway Conservation and Regeneration Llanthony Warehouse Gloucester Docks Gloucester GL1 2EJ	This section of the Environmental Code of Practice concerning waterway maintenance identifies key impacts of various activities necessary for canal management. Guidance is given on assessment, action and responsibilities for each impact listed below: <ul style="list-style-type: none"> • Planning overview • Mowing and strimming • Bank clearing • Waste disposal • Disposal of dredgings • Clearance of vegetation • Surfacing Signing • Reinstatement • Consultation
2	Environmental Options for Flood Defence Maintenance Works	2003	Environment Agency Kingfish House, Goldhay Way, Orton Goldhay, Peterborough PE2 5ZR Tel: 01733 371811 www.environment-agency.gov.uk	Best practise guidelines for routine maintenance operations for waterways, such as mowing, weedcutting, tree and scrub management and de-silting are described.
General Scrub management				
3	The Scrub Management Handbook: Guidance on the management of scrub on nature conservation sites	2003	English Nature A limited number of paper copies are available from: english-nature@twoten.press.net ; Tel: 0870 1214 177; Fax: 0870	One-stop reference for managers and advisers involved in scrub and shrub management for wildlife. Scrub is viewed from being of value to many wildlife habitats where it is to be encouraged or maintained, through to being reduced or eradicated as it invades on more important vegetation. Profiles of shrubs and tree species are detailed in addition to

No.	Title	Date ISBN	Publisher - available from	Summary
			1214 178 - catalogue number IN 12.4, price £30.	assistance for decision makers, an analysis of management techniques and case studies.
4	Fen Audit - Supplement to the Fen Management Strategy	2004	PDF document can be viewed at: http://www.english-nature.org.uk/pubs/Handbooks/upland.asp?id=8 Broads Authority 18 Colegate, Norwich, NR3 1BQ www.broads-authority.gov.uk	Complete updated evaluation of the Broadland Fens in terms of techniques for restoration and management and the practical suitability of management techniques. This includes methods of managing trees and scrub and material disposal.
Veteran Trees				
5	Veteran Trees Management Handbook		English Nature PDF document can be viewed at: http://www.english-nature.org.uk/pubs/Handbooks/upland.asp?id=6	Veteran Trees are amazing. They contain a wealth of wildlife and are a link to the past world of medieval deer parks and commoners' grazing. As part of the Veteran Tree Initiative led by English Nature, current experience and best practice in the management of old pollards and other veterans has been collated. This handbook will be of value to anyone who has an interest in or needs to manage old trees. Additional (free) booklets about veteran trees on grants, and the issues of safety and legal responsibilities are available from English Nature.
Disposal				
6	Disposal of Cut Vegetation	1999 MD-09/98-B-BCQO	Environment Agency Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol Tel: 01454 624400 www.environment-agency.gov.uk	Best practice guidelines for the selection of appropriate disposal options are presented. Guidelines include: <ul style="list-style-type: none"> • Disposal problems and factors affecting disposal methods that should be considered when selecting the method of cutting, collecting and removing vegetation. • Plant types and appropriate disposal methods for each • Environmental and economic implications of disposal options • Associated legislation and environmental risks

No.	Title	Date ISBN	Publisher - available from	Summary
Species				
7	Bats	Current Web site	Bat Conservation Trust Information on Bats http://www.bats.org.uk/	The Bat Conservation Trust provides information on: <ul style="list-style-type: none"> • Bat conservation • A network of volunteers bat recorders • Information of research into bat ecology • Advice for people who find bat roosts
8	An Invertebrate Survey of Herons Carr – Barton Broad		Broads Authority 18 Colegate, Norwich NR3 1BQ Tel: 01603 610734	Survey of Herons Carr, mature alder carr woodland in the Ant Valley. Result showed this riverbank wet woodland, with natural transition to dryer oak/birch/ash woodland, provides essential habitat for many rare and threatened invertebrates.
Stakeholder Consultation				
9	Draft Statement of Community Involvement	2004	Broads Authority 18 Colegate, Norwich NR3 1BQ Tel: 01603 610734 www.broads-authority.gov.uk	Local and relevant guidelines to consultation with stakeholders in The Broads. It includes reasons for and best practise techniques for consultation in addition to a list of Broads stakeholders. This document is currently in draft, when available it will be on the BA web site.
Landscape				
10	Landscape Character Assessment: Guidance for England and Scotland		Countryside Agency and Scottish National Heritage reference number: CAX 84F http://www.countryside.gov.uk/Publications/articles/Publication_tcm2-14588.asp	Shows how to identify and express the different elements, such as woodlands, hedgerows, moors, mountains and farmland, building styles, and historic artefacts, which give a place its unique character.
11	Landscape Character Assessment - Yare and Waveney (in draft) river corridors		Broadland Environmental Services Ltd (BESL)	Summarises existing landscape character assessments and provides a baseline systematic assessment of river corridor landscape character by identifying features and elements that give a locality its sense of place and distinctiveness.

No.	Title	Date ISBN	Publisher - available from	Summary
Bank Erosion				
12	Waterway bank protection: a guide to erosion assessment and management		Environment Agency Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol Tel: 01454 624400 www.environment-agency.gov.uk	The guide details bank erosion, assessment of causes, decision-making process, identification of appropriate engineering solutions and evaluation process.

(Adapted from The Scrub Management Handbook (Reference 3))

Table A: Insects of conservation importance in the Broads and their use of scrub habitats

BAP – Biodiversity Action Plan species

Local = Local, RDB = Red Data Book – RDB1 is the most threatened, RDB4 is the least threatened

Na = Nationally Scarce Category A (thought to be present in 16-30 10-km squares)

Nb = Nationally Scarce Category B (thought to be present in 31-100 10-km squares)

Most of the species in the table are very rare – RDB1 and RDB2 will be very rare, RDB3 more widespread but still rare.

Species	Status		Use of scrub habitats in the Broads
	BAP	RDB	
Small Eggar moth			Various shrub species. Larva in dense silken web. Occur in Norfolk.
Barred Tooth-striped Moth	Y	Na	Downland scrub with wild privet. Widespread but local. Occur in Norfolk.
Scarce Vapourer moth			Various shrub species. Only known nationally from localities in Yorkshire, Lincolnshire and the Broads. Found associated with birch, bramble and blackberry scrub at Catfield Fen.
Dotted Footman		RDB2	Larvae feed on algae and lichens growing on the stems of scrub. Confined in the UK to the Broads.
Small Ermine moths (Buff Ermine and White Ermine)			Several species. Each host-shrub specific. Feed on a wide range of plants and shrubs. Larvae in silken webs.
Square-spotted Clay	Y	Nb	Scrub patches. Widespread, but declining. Occur in the Broads.
White-spotted Pinion	Y	Na	Elm scrub to breed and Bramble scrub to nectar. Widespread but very local, occur in Norfolk.
Dotted Fan-Foot		RDB2	Fen-scrub-carr transitional habitat. Occur in the Broads.

Table B: Reptiles and amphibians in the Broads and their use of scrub habitats

EC Annex numbers relate to the Directive of Natural Habitats and of Wild Fauna and Flora 1992; Annex IIa requires the designation of Special Areas of Conservation for the species, Annex IVa requires strict protection of the species. Bern Convention (The Convention on the Conservation of European Wildlife and Natural Habitats) species listed in Appendix III are regulated from exploitation; certain means of capture or killing are banned.

WCA: (Wildlife and Countryside Act 1981) Schedule 5 gives species special protection against killing, injuring or taking an animal, damaging, destroying or obstructing its place of shelter and selling or offering for sale.

Species	Status	Use of scrub habitat
Smooth Newt	Bern Convention Appendix III; WCA Schedule 5	Sunny south facing edges to ponds and banks, with adjacent varied vegetation mosaic of bare ground, tussocks, short grass and scrub. Dense humid scrub linking to other wetland areas and with good layers of leaf litter for burrowing. Decaying wood for cover, hibernation and basking. Seems to prefer heavier shade and marginal vegetation than Palmate Newt.
Common Toad	Bern Convention Appendix III; WCA Schedule 5	Open sunny south facing edges to ponds and banks, with adjacent varied vegetation mosaics of bare ground, rough grassland and patchy scrub giving up to 5% shading of the pond surface. Dense humid scrub linking to other wetland areas and with good layers of leaf litter for burrowing. Decaying wood for cover, hibernation and

Species	Status	Use of scrub habitat
		basking.
Common Lizard	Bern Convention Appendix III; WCA Schedule 5	Open sunny south facing banks, with adjacent varied vegetation mosaics of bare ground, tussocks, short grass and well-broken scrub. Dense humid scrub linking to other wetland areas and with good layers of leaf litter for burrowing. Decaying wood for cover, hibernation and basking.
Grass Snake	Bern Convention Appendix III; WCA Schedule 5	Open sunny south facing edges to banks, with adjacent varied vegetation mosaics of bare ground, rough grassland and patchy scrub, linking to ponds and other riparian features with light to dappled of the edges. Dense humid scrub with good layers of leaf litter for burrowing and rough grassland edges, linking to other suitable areas. Decaying wood for cover, hibernation and basking.
Adder	Bern Convention Appendix III; WCA Schedule 5	Light patchy scrub on open sunny south facing banks, adjacent to vegetation mosaics with bare ground, tussocks, short grass and dense scrub. Dense humid scrub linking other suitable moist summer and drier wintering areas, with good layers of leaf litter for burrowing. Decaying wood for cover, hibernation and basking. Occur in the Broads.

Table C: Selection of key bird species in the Broads and their use of scrub

BoCC: Birds of Conservation Concern 2002-2007. Red: Globally threatened, or recent rapid decline in population or range, or a recent historic decline showing no recovery. Amber: Unfavourable European conservation status, moderate recent range decline, recent recovery following historic population decline, rare breeder, or internationally important or localised populations. Green: Species that fill none of above criteria. BAP: Biodiversity Action Plan. PBAP: Priority BAP species with a recovery plan.

Species	Status		Use of scrub habitats
	BoCC	BAP	
Merlin	Amber		
Turtle Dove	Red	PBAP	Nests in lowland mixed scrub, especially Hawthorn and Blackthorn, and Willow Carr. Feeds in open weedy habitat.
Duncock	Amber		Resident in mixed scrub.
Fieldfare	Amber		Feeds on berries and roosts in mixed scrub and coastal dune scrub during the winter.
Song Thrush	Red	PBAP	Uses a range of scrub types for nesting, feeding and roosting.
Redwing	Amber		Feeds on berries and roosts in mixed and coastal scrub during the winter.
Cetti's Warbler	Green		Resident in wetland edge scrub, especially Bramble.
Grasshopper Warbler	Red		Nests in wet scrub, coastal dune scrub, lowland Hawthorn and Blackthorn.
Sedge Warbler	Green		Uses wet scrub, coastal dune scrub, sometimes lowland Hawthorn and Blackthorn mixed scrub for nesting.
Marsh Warbler	Red	PBAP	Uses the edges of Hawthorn and wet scrub in which to breed.
Lesser Whitethroat	Green		Breeds in early successional thorn and Bramble scrub, also in coastal dune scrub.
Blackcap	Green		Breeds usually in tall open mixed scrub, and sometimes winters.

Species	Status		Use of scrub habitats
	BoCC	BAP	
Chiffchaff	Green		Breeds in a variety of scrub.
Willow Warbler	Amber		Breeds in a variety of scrub.
Goldcrest	Amber		Mainly mixed scrub, occasionally breeding, mostly as a winter feeding and roosting habitat.
Willow Tit	Red		Uses mature damp scrub, especially with Birch, Willow or Alder, year round.
Greenfinch	Green		Resident in a range of scrub types.
Bullfinch	Red	PBAP	Lowland mixed scrub, especially with Hawthorn and Blackthorn, used for nesting, feeding and as a winter roost.
Reed Bunting	Red	PBAP	Uses lowland Hawthorn and Blackthorn mixed scrub, wet scrub and coastal scrub in which to nest and feed in and as a winter roost.

Table D: Selection of mammal species in the Broads and their use of scrub as a resource

Species	Status	Use of scrub habitats
Hedgehog	Common	Favours areas where there is a mosaic of grassland, woodland, scrub and hedgerow. Uses scrub for daytime cover and hibernation sites, e.g. under Bramble or Brushwood.
Bat spp	Generally declining	When feeding, bats depend on habitat mosaics and habitat corridors that connect feeding and roosting areas. Mature, structured scrub may be beneficial in this respect.
Natterer's Bat	Nationally widespread but scarce, common in Broadland	
Daubenton's Bat	Widespread nationally and locally	
Noctule	Widespread nationally and locally	
Serotine	Widespread but scarce in the Broads	
Barbastelle	Nationally rare and rare in the Broads	
Brown Long-eared	Widespread nationally and locally	
Common Pipistrelle	Widespread and common nationally and locally	
Soprano Pipistrelle	Widespread and common nationally and locally	
Nathusius' Pipistrelle	Few British records. Generally thought to be a very rare summer visitor (there are a few Broadland records in recent years)	

Species	Status	Use of scrub habitats
Rabbit	Common and widespread	Uses low dense scrub as refuge cover to which to retreat from grassy feeding areas. The bark and shoots of many scrub and tree species are eaten, which may have detrimental or beneficial effects depending on circumstances. Avoids eating Elder.
Bank Vole	Common and widespread	Favours deciduous woodland and thick scrub. Climbing actively, it eats fruits, seeds and leaves of woody plants. May strip bark of Elder bushes.
Wood Mouse	Common and widespread	Favours woodland and scrub, living in runways below the litter but actively climbing to feed on fruits, nuts, buds and seedlings.
Fox	Common and widespread	May use scrub for shelter and lying-up sites.
Badger	Common and widespread. Scarce in Norfolk, very rare in the Broads area	Setts mostly located within woodland, scrub or hedgerows etc, usually close to grassland feeding areas. An omnivorous diet includes fruit and nuts.
Otter	Frequent in Scotland, Wales, N and W England and in the Broads area.	May use scrub adjacent or close to rivers etc for shelter and lying-up sites.
Deer spp	Most species increasing in numbers and distribution	Most species favour dense scrub for shelter. Most will also eat fruit, nuts, bark, leaves and buds of shrubs and deciduous trees, causing variable levels of damage and often preventing regeneration. Holly is favoured by Red and Sika Deer, Bramble by Roe and Muntjac Deer, but all have a wide diet.

(source; Broadland Environmental Services Ltd)

Protocol for dealing with bats and bat habitats

