NRA

National Rivers Authority
North West Region

GUARDIANS OF THE WATER ENVIRONMENT

MANAGEMENT PLAN
OF
DAVENHAM FISHERIES DEPOT

A REPORT PREPARED BY
RACHEL MACDONALD,
CONSERVATION SECTION,
N.R.A. N.W. REGION,
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CONTENTS

Location of Davenham sewage works . Scale 1 : 25000

1. GENERAL INFORMATION

1.1 Introduction

The site is located in Davenham at Grid Reference SJ 666 715, near the A556 in the County of Cheshire.

The site was a former North West Water Sewage Treatment Works, which ceased operating in late 1988. It became part of N.R.A. ownership in 1989, when the site was leased by the North West Water Authority to the Fisheries Department of the N.R.A. transferred.

The site covers an area of 4½ acres and supports a total of 43 derelict concrete tanks - former filter beds and sediment beds. At present the Fisheries utilize a couple of the tanks holding coarse fish. The intention is to utilize the whole site as a Fisheries Depot, with the majority of tanks being used for fish holding and growing-on coarse fish from the Authority's hatchery at Leyland, Lancashire. Fish from the site will be used to re-stock depleted watercourses as necessary throughout the southern area.

The Conservation Section has been asked to prepare Management Plans, for nature conservation, for all N.R.A. land holdings consistent with their operational uses.

Although limited by size, through appropriate management the site is expected to develop a greater nature conservation interest than that of its current state.

At present the Davenham Depot is of limited conservation interest and offers an excellent opportunity for enhancement. This report proposes a number of management options which will enhance the site both visually and for wildlife.

1.2 Site Description

The site is enclosed by a 3 m. high wired fence and access is restricted to a narrow road owned by the N.R.A. (Figure 3, page 15).

Within the site there is one derelict pumphouse, two large percolating filters and forty three concrete tanks - storm tanks, primary and secondary sedimentation tanks and sludge drying beds. The rectangular tanks vary in size and are approximately 2-3 m. deep. The majority are surrounded by existing metal railings (Figures 8, 9 and 10, pages 17 & 18). The tanks are fed by water from the River Dane, which has a water quality of inferred Class 2, i.e. fair water quality capable of supporting coarse fish.

There are 2 portacabins and a large storage shed situated in the centre of the site which are currently being used by the Fisheries Department (Figures 1, page 14 and 4, page 15). Behind the storage shed there is a track which runs parallel to the eastern boundary fence (Figure 18, page 22). A large metal container is situated at the end of the track and conceals a disused entrance into the site (Figure 17, page 22). The container is currently on hire by the N.R.A. Design Engineers based at the Region's Head Office in Warrington, for storing equipment.

The area east of the track has been severely damaged by spoil from one of the percolating filters. A narrow strip of woodland runs along the north boundary fence, and several trees have been damaged where the spoil has been heaped around their trunks (Figures 14, 15 and 16, pages 20 and 21).

The site supports several rough, open grassland verges and banks which have a limited conservation interest. These areas are dominated by common rank grasses and tall herbs.

The derelict site is screened from the A556 and adjacent farmland by mature Lombardy Poplars, Hornbeam and Lime trees. Several tree species (Oak, Hawthorn and Sycamore) are regenerating successfully on site, despite signs of rabbit grazing.

1.3 Environmental Information

1.3.1 Physical

1.3.1.1 Climate

Average annual precipitation	809 mm.
Average daily temperature -	
Maximum July	19.4°c.
Minimum January	6.1°c.
Average annual duration of sunshine	1,359 hrs.
Average number of days with air frost	45.3
Average number of days with ground frost	72.2
Average number of days with snow lying at 9 a.m.	8.9

(Figures obtained from the Met. Office, Manchester Weather Centre).

1.3.1.2 Geology

The site is underlain by a blanket of drift deposits consisting of boulder clay and alluvial sands. (Geology of England and Wales scale 1:625,000 Sheet 21).

1.3.1.3 Soils

The soils are typically sandy gley soils (pH8). They support a neutral grassland vegetation type which is typical for this pH value (Soils of Cheshire scale 1:250,000).

1.3.1.4 Hydrology

Most of the rainfall which falls in this catchment is absorbed by the porous sandy substrate or collects within the concrete tanks.

1.3.2 Biological

1.3.2.1 Flora - For full species list see Appendix II, page 24.

The site cannot be considered as rich on purely floristic grounds.

Grassy banks and verges dominated by Common Bent (Agrostis tenuis), Yorkshire Fog (Holcus lanatus), Cocksfoot (Dactylis glomerata) and Perennial Ryegrass (Lolium perenne) surround the perimeter of the site. Yellow Compositaes, including Sow Thistles, Common Catsear, Common Ragwort and Hawkweeds are locally abundant.

A small patch of Sedges (Carex spp.), Soft and Hard Rush (Juncus effusus and Juncus inflexus) is present along the southern grassy bank, surrounded by Meadow Vetch (Lathyrus pratensis), Black Knapweed (Centaurea nigra) and Clovers (Trifolium spp.)

Beneath the tree-lined east boundary, where the soil is impoverished, the vegetation is restricted to ruderal species such as Plantains (Plantago spp.), Silverweed (Potentilla erecta), Yarrow (Achillea millefolium) and Nettles.
The vegetation is floristically poor along the northern boundary, where Redshank (Polygonum persicaria), Knotgrass (Polygonum aviculare), Shepherds Purse (Capsella bursa-pastoris), Ground Ivy and Nettles are abundant. A single Almond tree (Prunus dulcis) is present at the edge of this damaged area and offers ideal food source for much wildlife.

A single row of Hawthorns (Crataegus monogyna) form an attractive, gappy hedge along the western bank, beneath a line of mature Lombardy Poplars (Populus nigra). Scattered Sycamore (Acer pseudoplantanus), Field Maple (Acer campestre) and Oak trees (Quercus robur) are present along the perimeter of the site.

Occasional patches of ferns (Dryopteris pseudomas), Maidenhair Spleenwort (Asplenium trichomanes) and Wall Rue (Asplenium ruta-muraria) are present in the empty concrete tanks.

1.3.2.2. Fauna - For uncompleted species list see Appendix II, page 23.

There was no attempt made to assess the fauna populations.

Several common butterflies, including small tortoiseshells (Aglais uticae) and wall browns (Lasiommata megera), were seen basking on bramble in the rough, open grassland areas.

The tall herbs and grasses provide a diverse habitat for butterflies and insects. The trees offer ideal nesting and feeding areas for much wildlife. A heron is known to frequent the site during early mornings and feeds on fish from the tanks.

2. MANAGEMENT OBJECTIVES AND PRESCRIPTIONS

2.1 Ideal Management Objectives

The derelict site offers an excellent opportunity for enhancement. To make the site more visually attractive and of more value to wildlife, the site should be managed for the existing and potential habitats, safeguarding existing species and encouraging new ones.

The ideal management objectives are:-

i. To enhance the grassland verges, banks and open areas by re-seeding with a conservation seed mix.

ii. To ameliorate the damaged wooded area adjacent to the A556.

iii. To promote the visual appearance of the site by additional planting of whips, shrubs, bulbous and creeping plants.

iv. To improve the diversity of the site by creating pond plant holding and growing areas in a small number of existing sedimentation tanks.

2.2 Outline Prescriptions

2.2.1. To enhance grassland verges

The areas indicated on Figure 19, page 30 can be re-seeded with a wildflower conservation seed mix. A suggested seed mix is listed on page 29.

The following procedure should be adopted:-

1. Clear the ground of perennial weeds (Docks, Thistles, Nettles) by spot spraying with glyphosate. As ragwort is tolerant to the herbicide treatment and cutting, eradicate by hand during late Spring before setting seed.

2. Prepare the seed bed by rotovating, harrowing or raking. Sow the seeds by hand at a rate of 15 kg./acre during Autumn or early Spring to avoid periods of prolonged wet and dry weather.

3. Cut with an Allen scythe or reciprocal blade mower to 3 cm. every 2 months in year 1, and thereafter in late Autumn. A single Autumn cut will avoid the bird breeding season and maintain insect populations by retaining shelter and food plants.

4. After a minimum of 3 days, or a maximum of 5 days, rake off all cuttings, litter and other such deleterious matter. Establish a permanent compost area for the cuttings, to avoid disposal off-site, which would be expensive (See Figure 12, page 19). A suggested area is indicated on page 12. Use the compost during the following years as a form of mulch for the tree-planted areas.

5. To benefit wildlife, leave parts of the grassland areas uncut for several years, or alternate the area cut yearly. This would increase the habitat diversity, particularly for beetles, butterflies and grasshoppers, which require a varied micro-climate present in tall vegetation.

2.2.2. To improve the damaged wooded area

1. To maintain the health of the damaged trees, face all the dead, broken and diseased branches. Avoid encouraging infection into the heartwood by cutting clearly above the branch collar, using bow saws.

2. Fell any dead tree that may be a potential hazard. Use the dead wood to create log piles to encourage the species diversity. Dead wood affords valuable micro-habitats for invertebrates and fungi.

3. Clear spoil where it has been heaped around the bases of trees to a radius of 3 m.

4. Diversify the area by pit planting a mixture of shrubs and whips. See pages 30 & 27 for planting proposals and suggested species.

5. Cover any remaining areas of spoil with imported top soil and seed with a conservation seed mix.

2.2.3. <u>To enhance the site by additional planting</u>

To visually enhance the site and increase the species diversity, a mixture of shrubs, whips, bulbous and creeping plants can be planted. Use native species, as they support more wildlife (See Figure 19 and Appendix III for planting proposals and suggested species).

1. <u>Bulbs</u> - These should be planted with pointed end uppermost, at the required depth, and covered with top soil. Plant in small groups or clusters along the grassy verges, to create an attractive feature in Spring before the overshading trees come into leaf. Avoid cutting off dead foliage, as this will deprive the bulbs of essential nutrients.

2. <u>Creepers</u> - Establish creeping plants at the base of the boundary fence, railings and walled sections. Train the plants to climb up them, to create visually attractive screens.

3. <u>Shrubs/feathers/whips</u> - Pit plant container-grown shrubs/feathers/whips at root collar depth in small groups along the top of the western boundary embankment and in the damaged wooded area. Lay the gappy hawthorn hedge along the western bank during Winter, to create an attractive screen.

4. Mulch all planted species annually, to prevent the soil from drying-out in hot weather, to improve the soil texture and to supply the species with food.

5. Control weed growth around the planted species by cutting or spraying during mid-late Summer.

6. Establish rabbit guards around the shrubs/feathers/whips, to protect against grazing.

7. Apply fertilizer to all tree/shrub species.

2.2.4. To create ponds in existing tanks and plant with aquatic vegetation.

The tanks provide an excellent opportunity for creating pond planting, holding and growing areas. The tanks selected (Figure 9, page 18) are accessible by vehicle and wheel barrow and also have a limited shading from adjacent trees. This reduces the amount of leaf fall which would create problems with the water quality.

The following procedure should be adopted:-

1. Add top soil to the base of the tanks, to provide the plants with some footing (approximate depth 50 cm.)

2. Increase the variety of water depth, to allow a wider range of species to establish. Create gentle slopes and shelves by utilizing the available spoil.

3. Introduce transplants from nearby watercourses. Cuttings should be pushed into the bottom mud or anchored under stones until they root. Individual plants can be planted by sinking them in weighted containers.

4. Control the water level and invasive species in a two-year cyclic rotation.

5. Select suitable trees around the tanks to erect bat boxes. The ponds will help to diversify the derelict works and provide a greater range of habitats and food source for wildlife.

For all the management objectives to be implemented successfully, ensure the site is safe at all times and that the workers are protected under the Health and Safety Act.

2.3 WORK SCHEDULE - THE FIVE YEAR WORK PLAN

Objective	Priority (scale 1 - 3)	Year 1	2	3	4	5	Season
Manage grassy areas by reseeding	2	*					late Sp.
Eradicate perrenial weeds by spot spraying with glyphosate		*	*	*	*	*	late Sp.
Mowing , collection and disposal of cuttings		*	*	*	*	*	Autumn
Scrub control		*	*	*	*	*	All year
Manage damaged wooded area	1	*					
Clear spoil		*					Autumn
Face damaged trees		*					Autumn
Eradicate weeds and control scrub growth		*	*	*	*	*	All year
Create ponds for aquatic plants	3			*			
Control water level and invasive species				*	*	*	All year
Manage the site by additional planting	2						
Plant whips / shrubs		*					Autumn
Plant bulbous species			*				early At
Plant creeping plants			*				Autumn
Control weeds and provide mulch		*	*	*	*	*	All year

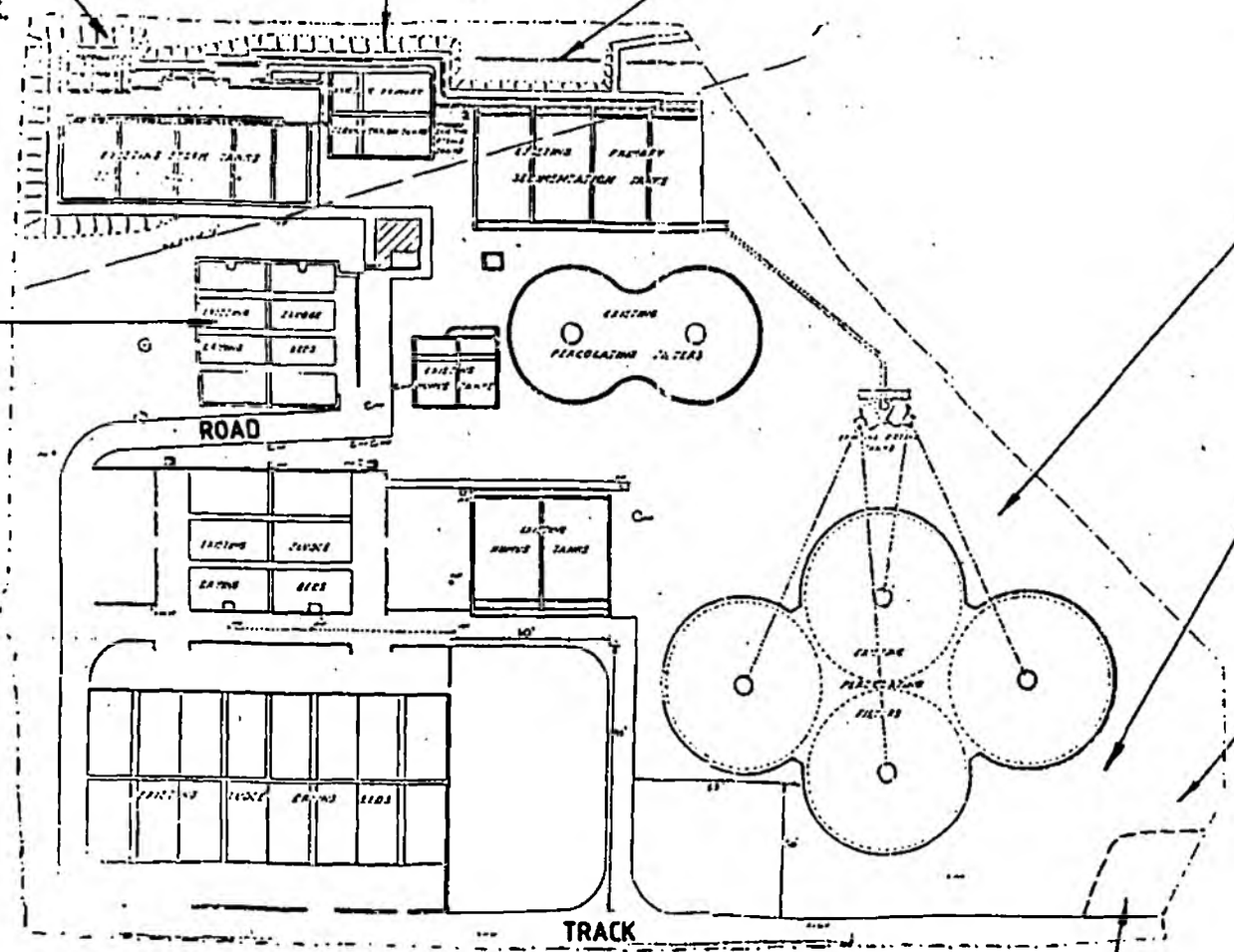
RE[illegible]RED [illegible]NA[illegible]EN[illegible]

TO KEEP DISTURBANCE TO A MINIMUM THE REQUIRED MANAGEMENT SHOULD BE UNDERTAKEN IN CYCLIC ROTATIONS WORKING IN SMALL SECTIONS AT ONE TIME. AVOID FUTURE DUMPING OF SPOIL ON SITE.

FLAIL BANKS AND ERADICATE PERENNIAL WEEDS BY SPOT SPRAYING WITH GLYPHOSATE. RESEED WITH CONSERVATION SEED MIX. CUT ANNUALLY AND REMOVE CUTTINGS.

PLANT SMALL GROUPS OF WHIPS AT BANK TOP. CONTROL WEED GROWTH AND MULCH ANNUALLY. ESTABLISH RABBIT GUARDS.

LAY GAPPY HAWTHORN HEDGE TO CREATE ATTRACTIVE SCREEN.



FACE ALL DAMAGED TREES. CREATE LOG PILES TO INCREASE SPECIES DIVERSITY.

CONVERT TANKS INTO PLANT GROWING AND HOLDING AREAS. CREATE SHELVES USING SPOIL. CONTROL WATER LEVEL AND INVASIVE SPECIES. CLEAR TANKS IN ROTATION.

CLEAR SPOIL FROM BASE OF TREES (MIN. 3M. RADIUS).

DIVERSIFY BY PLANTING ADDITIONAL SPECIES. IMPORT TOP SOIL CONTROL SCRUB AND WEED ANNUALLY. PROTECT YOUNG STEMS WITH RABBIT GUARDS.

FOR PLANTED SPECIES CONTROL WEED GROWTH AND MULCH ANNUALLY.

SUGGESTED COMPOST SITE FOR ALL CUT MATERIAL.

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APPENDIX I.

Figures 1 - 18.

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APPENDIX II

Species Lists

SPECIES LIST

FLORA

Lime	Tilia europaea
Hornbeam	Carpinus betulus
Hawthorn	Crataegus monogyna
Lombardy Poplar	Populus nigra
Almond	Prunus dulcis
Elder	Sambuscus nigra
Laurel	Umbellularia californica
Sycamore	Acer pseudoplantanus
Field Maple	Acer campestre
Oak	Quercus robur
Beech	Betula fagus
Common Laburnum	Laburnum anagyroides

Self-heal	Prunella vulgaris
Creeping cinquefoil	Potentilla reptans
Common birds foot trefoil	Lotus corniculatus
Marsh stitchwort	Stellaria palustris
Bittersweet	Solanum dulcamara
Creeping buttercup	Ranunculus repens
Meadow buttercup	Ranunculus acris
Common mouse ear	Cerastium holosteoides
Meadow vetch	Lathyrus pratensis
Meadow sweet	Filipendula ulmaria
Black knapweed	Centaurea nigra
Hard rush	Juncus inflexus
Soft rush	Juncus effusus
Sedge species	Carex spp.
Common nettle	Urtica dioica
Dock species	Rumex spp.
Sow thistles	Sonchys spp.
Creeping thistle	Cirsium arvense
Dandelion	Taraxacum officinale
Cleaver	Galium aparine
White clover	Trifolium repens
Red clover	Trifolium pratense
Daisy	Bellis perennis
Oxeye Daisy	Chrysanthemum leucanthemum
Common ragwort	Senecio jacobaea
Scentless mayweed	Tri-pleurospermum maritimum
Ribwort plantain	Plantago lanceolata
Hoary plantain	Plantago media
Shepherds purse	Capsella bursa-pastoris
Common catsear	Hypochoeris radicata
Yarrow	Achillea millefolium
Ground ivy	Glechoma hederacea
Cow parsley	Anthriscus sylvestris
Smooth hawksbeard	Crepis capillaris
Autumn hawkbit	Leontodon autumnalis

Pineapple weed	Matricaria matricarioides
Germander speedwell	Veronica chamaedrys
Silverweed	Potentilla aviculare
Marsh willowherb	Epilobium palustre
Rosebay willowherb	Chamaenerion angustifolium
Greater willowherb	Epilobium hirsutum
Bramble	Rubus fruticosus
Maidenhair spleenwort	Asplenium trichomanes
Wall rue	Asplenium ruta-muraria
Fern species	Dryopteris pseudomas

Common bent	Agrostis tenuis
Yorkshire fog	Holcus lanatus
Perennial ryegrass	Lolium perenne
Timothy	Phleum pratense
Tufted hair grass	Deschampsia caespitosa
Cocks foot	Dactylis glomerata
Couch grass	Agropyron repens

FAUNA

Meadow Brown	Maniola jurtina
Wall Brown	Pararge megra
Small Tortoiseshell	Aglais urticae

Rabbit	Oryctolagus curuculus

Wood pigeon	Columba palumbus
Robin	Turdus pilaris
Blackbird	Turdus merula
Tree sparrow	Passer montana
Song thrush	Turdus philomelos
Magpie	Pica pica
Swallows and martins	Apodidae and Hirundinidae
Heron	Ardea cinerea

APPENDIX III

Suggested Species for Planting
and Grass/Wildflower Seed Mix

SUGGESTED SPECIES	Approx. Price
Whips/feathers (Container Grown)	
Hawthorn (Crataegus monogyna) 60-90 cm, 15 @ £1.40	£21.00
Guelder Rose (Viburnum opulus) 30-45 cm, 15 @ £1.97	£29.55
Hazel (Corylus avellana) 120-150 cm, 10 @ £10.50	£105.00
Ash (Fraxinus excelsior) 120-180 cm, 10 @ £9.25	£92.50
Holly (Ilex aquifolium) 90-120 cm, 10 @ £4.55	£45.50
Climbers	
Ivy (Hedera helix) 30-45 cm, 10 @ £2.60	£26.00
Clematis (Clematis sp.) 60-90 cm, 10 @ £2.30	£23.00
Honeysuckle (Lonicera peridymernum) 90-120 cm, 10 @ £8.00	£80.00
Bulbs	
Bluebells (Hyacinthoides non-scriptus) 10 for £2.50 (60 No.)	£15.00
Celendine (Ranunculus ficaria) 100 for £2.50 (100 No.)	£2.50
Wild daffodil (Narcissus pseudonarcissus) 10 for £3.00 (60 No.)	£18.00
Wood anemone (Anemone nemorosa) 10 for £2.00 (60 No.)	£12.00
General	
Mulching compost (80 L. bag) 5 @ £2.45	£12.25
Rabbit guards (18" spiral plastic) 60 @ £0.95	£57.00
APPROX. GRAND TOTAL	£539.30

PRICES QUOTED FROM:-

Blackdown Nurseries,
Belbroughton Road,
Blakedown,
Kidderminster,
Worcs.,
DY10 3JG.

John Chambers,
15, Westleigh Road,
Barton Seagrove,
Kettering,
Northants,
NN15 5AJ.

CONSERVATION WILDFLOWER SEED MIX
Sandy Soils Meadow Mixture EMT

% Flower Species

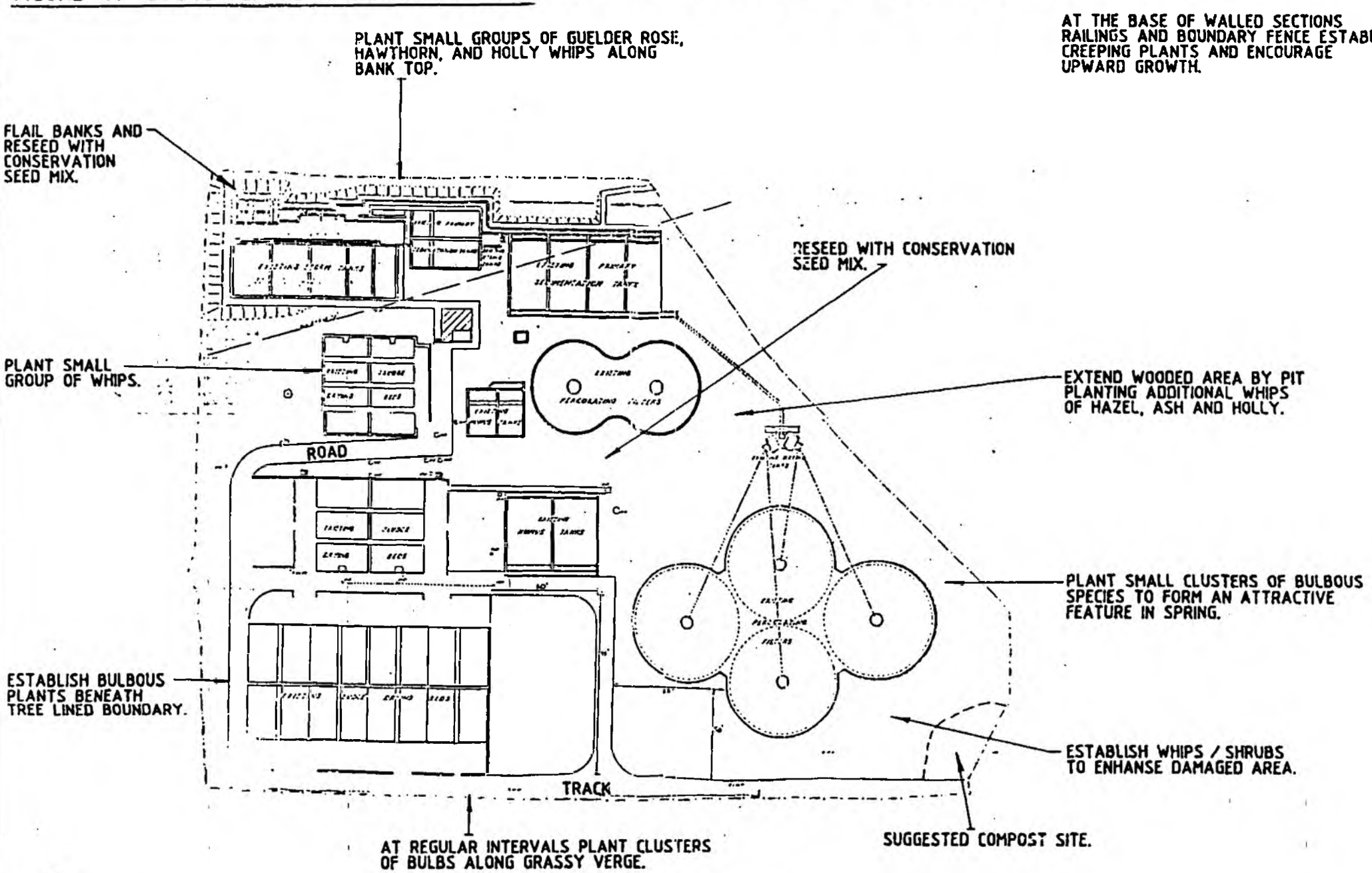
1.0	Achillea millefolium (Yarrow).
1.0	Centaurea nigra (Lesser knapweed).
2.0	Daucus carota (Wild carrot).
2.5	Galium verum (Lady's bedstraw).
2.0	Leucanthemum vulgare (Moon daisy).
1.0	Lotus corniculatus (Bird's foot trefoil).
2.0	Malva moschata (Musk mallow).
2.0	Plantago lanceolata (Ribwort plantain).
1.0	Plantago media (Hoary plantain).
1.5	Prunella vulgaris (Self-heal).
0.5	Rhinanthus minor (Yellow rattle).
1.0	Rumex acetosa (Sorrel).
0.2	Rumex acetosella (Sheep's sorrel).
1.3	Silene alba (White campion).
1.0	Verbascum thapsus (Great mullein).

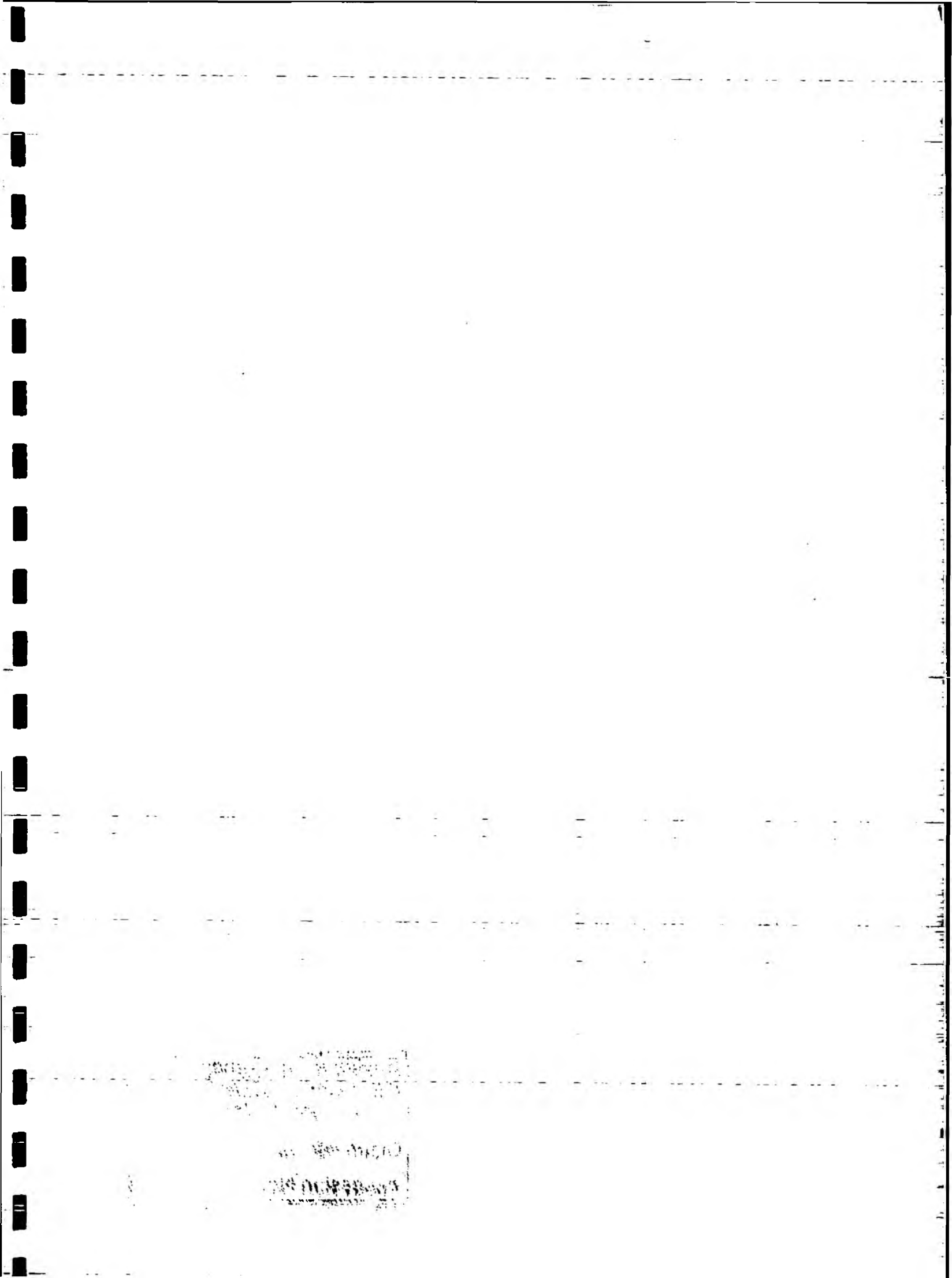
% Grass Species

15.0	Agrostis capillaris (Common bent).
20.0	Cynosurus cristatus (Crested dog's tail).
5.0	Deschampsia flexuosa (Wavy hair grass).
10.0	Festuca longifolia (Hard fescue).
10.0	Festuca ovina (Sheep's fescue).
10.0	Festuca rubra spp. purinosa (Slender creeping red fescue).
10.0	Pheum pratense spp. bertolonii (Small timothy)

Sowing Rate : 15 kg./acre.
APPROX. COST : £369/acre.

FIGURE 19. SUGGESTED PLANTING PROPOSALS.





NRA

National Rivers Authority
North West Region

Headquarters: P.O. Box 12, Richard Fairclough House, Knutsford Road, Warrington WA4 1HG. Telephone: (0925) 53999 Telex: 628425 Fax: (0925) 415961