

Kynoch's Foreshore Local Nature Reserve

Management Plan



KYNOCH'S FORESHORE LOCAL NATURE RESERVE

MANAGEMENT PLAN October 2011

Contents

1. INTRODUCTION	Page 2
2. DESCRIPTION	Page 2
3. EVALUATION	Page 8
4. OBJECTIVES	Page 12
5. MANAGEMENT PRESCRIPTIONS	Page 112
6. ACTIONS	Page 14
7. PLAN REVIEW	Page 15
APPENDIX 1. BIBLIOGRAPHY	Page 16

1. INTRODUCTION

Kynoch's Foreshore Local Nature Reserve has been designated because the saltmarsh is considered to be extremely special and the best example of its type in the district.

Designation as an LNR raises the profile of this saltmarsh and brings attention to its conservation importance. It provides the area with a valuable tool for education, and enable human activities, including educational visits, to be monitored and controlled, in order to protect the site for the future.

The inclusion of the Tarka Trail in the reserve adds greatly to the recreational and educational value of the reserve. It provides a flat, dry, safe route from which to view the marsh.

The conservation status of the saltmarsh habitat is already considered to be high, therefore the objective is not to physically improve this habitat but to maintain it.

2. DESCRIPTION

Site name: Kynoch's Foreshore Local Nature Reserve

District: Torridge
Declaring Authority: Torridge District Council

Grid reference: Site centre: SS 455 255

Area:	Total area	Saltmarsh	Foreshore	Tarka Trail
	38.9 Ha	4.4 Ha	31.2 Ha	3.3ha / 1.6km in length

The area is essentially split into three main habitat compartments:

The Saltmarsh: A linear strip of relatively diverse and undisturbed saltmarsh on the east bank of the Torridge at East the Water, Bideford. In the upper part of the saltmarsh there is a reed bed of *Phragmites communis*. The landward side of the saltmarsh is bordered by the Tarka Trail (this Trail was formerly a railway line, which was decommissioned in 1982, and has since been converted into a cycle/walkway). To the north of the saltmarsh is a small picnic area which overlooks the marsh. The southern end of the saltmarsh is bordered by the Tarka Trail as it turns to cross the saltmarsh and River Torridge over the Iron Bridge.

The Foreshore: Extensive mud flats from the seaward edge of the saltmarsh to the mean low water mark.

The Tarka Trail; Formerly a railway line, now a cycle/walkway, this route supports a range of closely intermixed habitats including scrub, tall herbs, short grassland, and wet carr. It is a popular recreational resource for both visitors and locals. The Tarka Trail

stretches for approximately 180 miles, but it is the 1 mile (1.6km) section of the Trail immediately adjacent to the saltmarsh which is included in the proposed reserve.

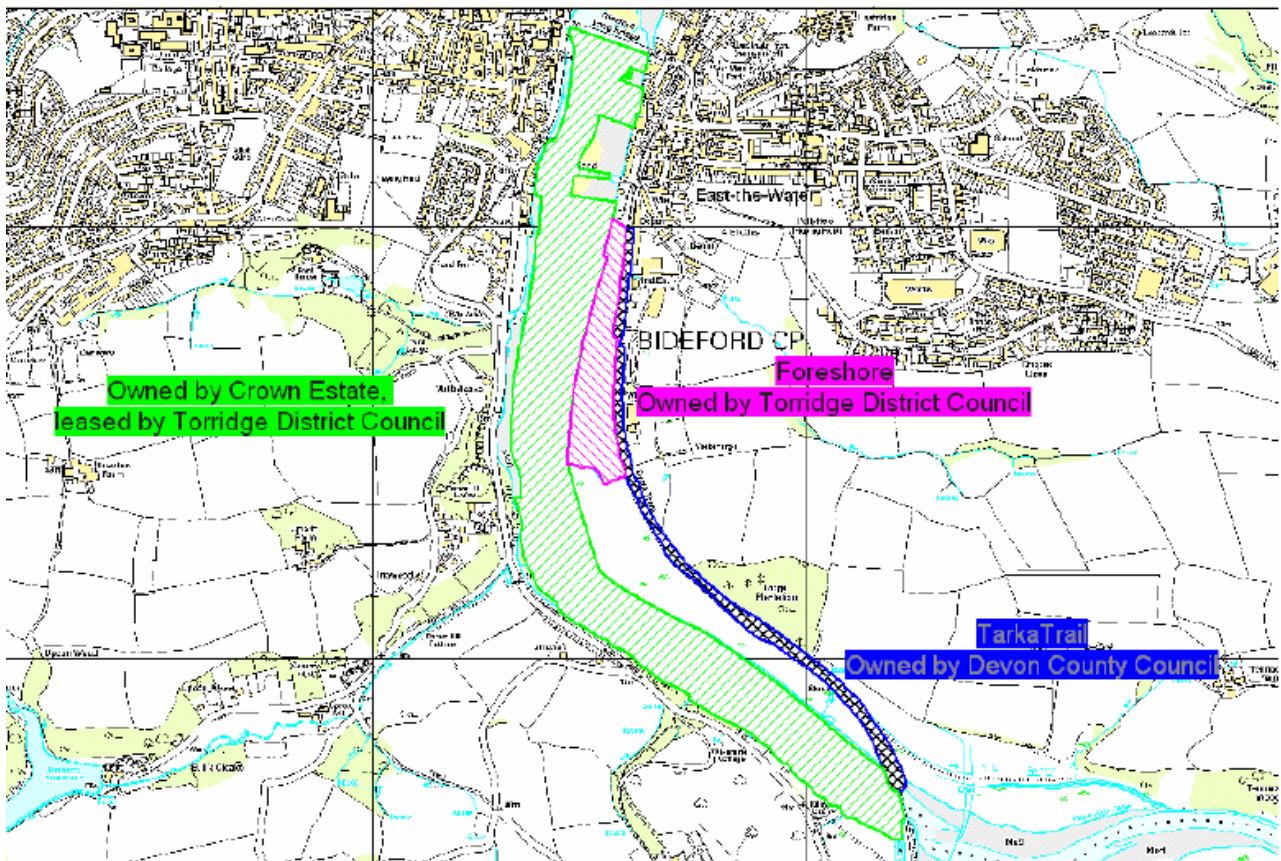
Ownership:

The total area of the reserve is under the ownership of three different bodies:

Torridge District Council own the northern area of saltmarsh

Devon County Council own the Tarka Trail

The Crown Estate own the foreshore



Byelaws:

None

Access:

The Tarka Trail has free public access for cycling and walking. The Trail is wide enough to take vehicles for work and maintenance purposes. There is a fence between the Trail and the saltmarsh and the public are encouraged to keep to the Trail.

Photographic coverage

Photographs of the site were taken during October 1997 (by P. Yeo) and copies are kept at Bideford Station.

There are a set of Tarka Trail fixed point photographs that include this area dated May 1989(Bideford and Instow Railway Group) Bideford Station.

Aerial Photographs (Oblique) Aerial Photo survey Photoair 1995, on prints and CD ROM Bideford Station.

Climate

Devon as a whole experiences a limited temperature range and high winter rainfall.

February is the coldest month, and August the warmest. Annual rainfall is in the region of 90 – 110cm a year.

Hydrology

The estuary is the most notable hydrological factor. The saltmarsh is between the mean and extreme high tide marks and is flooded periodically by spring high tides. Continued tidal inundation is the main factor necessary to maintain the saltmarsh and foreshore habitats. The tidal range at Bideford is 5.9m (Spring) and 3.6m (Neap) (Coastal Research Group, 1993). Maximum currents of approximately 1.0m/s on Spring and 0.5 m/s on Neap tides have been measured (NRA, 1993).

The saltmarsh is believed to demonstrate unusual hydrology (pers. arit. Prof. Maltby, 1996), due to a freshwater flush and upwelling from the hills behind. This has led to the development of the reed bed (*Phragmites communis*) in the upper part of the marsh.

Surface water enters the estuary from the adjacent land. A series of drainage ditches were constructed on the Tarka Trail by the railway companies from the 1840s onwards to control surface drainage water (Devon County Council, 1996). There is a small brackish pond beside the Tarka Trail, on the landward side of the Trail.

Geology

The Torridge lies above the Upper Carboniferous Bideford and Crackington Formations, comprising shales, siltstone, mudstones and sandstones.

Geomorphology

The saltmarsh and foreshore are depositional landforms, indicative of a predominantly low energy environment. They are located on a sheltered meander of the Torridge estuary, where fine sediments can accumulate. Waves from the open Atlantic are prevented from entering the estuary by the configuration of Braunton and Northam Burrows coupled with the presence of Bideford Bar and Crow Neck (Coastal Research Group, 1993).

There is an inherent relationship between the saltmarsh and the mudflats:- The mudflats reduce wave and tidal energy to allow sedimentation, vegetation colonisation and the development of the saltmarsh. The saltmarsh provides an area of inter-tidal zone into which the mudflat can extend during storm waves. The saltmarsh is also capable of feeding the mudflat during extreme storm events when an overall widening and flattening of the inter-tidal zone is necessary. The combined saltmarsh/mudflat landform is an efficient unit and should be considered as inseparable from a management point of view (Halcrow and Partners Ltd).

The physical features of the Tarka Trail are highly influenced by it being a former railway. The gradients are shallow when compared to the surrounding land other than the intertidal area.

Soils

The saltmarsh and mudflats derive from fine sediments deposited mainly by the River Torridge, and influx from the sea. The sediments in this area range from fine silts in the upper marsh area to sandy muds in the river channel.

Flora

The Saltmarsh: The vegetation is typical of a well developed saltmarsh and clearly demonstrates zonation, i.e. distinct vegetation zones arranged in belts parallel to the shore. The dominant species are *Atriplex portulacoides* and *Puccinellia aritime* (Lavington, 1997). These are both typically inland to low marsh species. *Cochlearia officinalis* and *Aster tripolium* are also abundant. There are extensive areas of *Phragmites communis* at the higher levels. Surveys of the vegetation were carried out in 1989 (Oliver, 1989), and again in 1996 (Lavington, 1997). These two surveys reveal that only a slight change has occurred in the distribution of species between the two survey periods. It was concluded, therefore, that the marsh is stable and supports a relatively floristically diverse habitat.

The Foreshore: No floral surveys of the foreshore here have been undertaken. The mudflats are likely to support microphytobenthos.

The Tarka Trail: The present plant communities to be found on the Trail, in many instances, reflect the past management of the railway companies. Cutting and burning of the verges to control woody growth was common practice, certainly before the 1960s (Tarka Trail Rangers in Ecosurveys Ltd, 1994, Draft Tarka Trail Management Plan 1994).

Vegetation from the surrounding semi-natural habitats, past and present have colonised the railway land. The Tarka Trail supports a range of closely intermixed habitats. The section within the proposed reserve includes scrub, grassy areas rich in herbs and

butterflies, wet alder and willow carr, nettles, trees including mature oaks, sycamore, rowan, alder, hazel.

Over 460 species of vascular plants, 232 species of lichen, 68 species of moss and 18 species of liverwort have been recorded for the trail as a whole (Devon Trust for Nature Conservation, 1987). No species can be considered rare but the property forms a vital corridor habitat and a valuable reservoir for a wealth of less threatened species.

Fauna

The Saltmarsh: Initial sampling of invertebrates on the saltmarsh has been undertaken (Jollands, 1996). This has indicated that the community of invertebrates, whilst showing no rarities, probably has a unique assemblage of species. 30 species of invertebrates have so far been identified, but this is believed to represent only a small percentage of the total species present. Extensive further sampling will be necessary to confirm this.

The estuary area as a whole supports a wealth of over-wintering and migratory wading birds. A qualitative species list based on random observations has been put together (Collum, 1996) for the site. Other data is available from bird counts carried out as part of the WeBs data set. Species observed using the site include curlew, golden plover, lapwing, snipe, and reed warblers.

The Foreshore: The Oil Pollution Research Unit of the Field Studies Council undertook a survey of intertidal infauna in 1989. The closest stations to the site were at: (a) SS 463 246 and (b) SS 455 264.

At site (a) the ragworm *Hediste diversicolor* and the amphipod crustacean *Corophium volutator* were numerically dominant with average densities of 2550 /m² and 3000 /m² respectively. *Corophium arenarium* was also recorded at an average density of 150 /m².

At site (b), *Hediste diversicolor* was again the numerical dominant with an average density of 2800 /m². The mollusc *Scrobicularia plana* was present at an average density of 250 /m².

These results indicate a large number of individuals but low species diversity. This is typical of estuarine mudflats. The high productivity means that mudflats are extremely important feeding grounds for birds (at low tide) and fish (at high tide).

The Tarka Trail: In 1987, the Devon Wildlife Trust collected detailed records of habitats, birds and some insect groups, in particular butterflies.

The value of the Trail for birds is mainly the scrub and woodland communities for passerines (Devon Trust For Nature Conservation, 1987).

Some 37 species of butterflies have been recorded on the Trail as a whole. Some of these are visitors dependant on the surrounding habitats. No records exist regarding the number of species using, specifically, the section of the trail within the Local Nature Reserve (LNR), however qualitative observations do suggest the grassland areas are rich in butterflies.

The section of the Tarka Trail within the LNR has also been found to be important for the notable whirligig beetle, *Gyrinus substriatus* (Ecosurveys, 1994).

No specific surveys of mammals have been undertaken other than the records included in the 1987 DWT phase one survey. However, it can be deduced from the structure and heterogeneity of the vegetation and habitats that the Trail would be well suited to a range of animals.

Archaeology

Archaeological interest includes the trackbed of a disused railway and the memorial to the Wellington Bomber that crashed in the vicinity of the reserve during World War II. From the reserve, a disused limekiln can be seen on the opposite bank of the estuary.

Land-use

The saltmarsh and foreshore experience minimal direct human intervention. The saltmarsh is not used for grazing purposes, and little use is made either of the saltmarsh or foreshore for recreation and public interest.

The Tarka Trail is mainly used for recreational purposes. The former railway trackbed has been converted to tarmac surface to make it suitable for walking and cycling.

Past Management

The saltmarsh and foreshore have not been subject to any active management for nature conservation.

Following the closure of the railway line, and subsequent acquisition of the line by Devon County Council, beginning in 1985, a programme of restoration and management was started. Verge management has been revived with the objective of conserving the constituent habitats, wildlife communities, and species of the Tarka Trail.

Public Interest

Little use is made either of the saltmarsh or foreshore for recreation and public interest. The foreshore and creeks are used for bait digging. The saltmarsh is also used for educational visits and for dog walking. Small boats are occasionally pulled up onto the marsh.

The Tarka Trail is a popular route used by visitors and locals alike, particularly during the summer season. Cycle counters are used to record cycle numbers and in 2010 69,132 cyclists were recorded passing Bideford Station. This is thought to equate to around 130,000 walkers and cyclists. The close proximity of the Tarka Trail to the estuary also attracts bird watchers. The flat surface of the trail encourages use by disabled visitors. It is also used by people to exercise their dogs.

The LNR is close to Bideford Station, where many people join the trail. At the station, Devon County Council has restored a railway carriage to provide refreshments and information and to accommodate interpretative displays on the wildlife and landscapes of the Trail.

3. EVALUATION

Current Designations

The LNR is adjacent to the Taw Torridge Estuary Sites of Special Scientific Interest (SSSI) but the site itself has no formal designation. The great majority of the site (up to the edge of the old trackbed) is a County Wildlife Site (CWS).

Operations likely to damage the special interest

Drainage of the marsh surface and changes in the form of the tidal creeks
Digging of scrapes and tidal pools
Reclamation of land
Improvement of sea defence
The introduction of grazing on the saltmarsh.
Dumping, spreading or discharge of any materials.
Application of fertilisers, pesticides, herbicides.
The release into the site of any wild, feral or domestic animal, plant or seed.
Changes to the hydrological regime – e.g. as a result of dredging operations, gravel extraction, developments.
Changes to the water quality and quantity within the catchment.
Changes in sediment supply, e.g. because of increased sea and flood defence works.
Uncontrolled disturbance or trampling on the saltmarsh from human activity.
The mooring or beaching of boats.

Diversity

Saltmarshes, with a few exceptions, tend to be habitats of low species diversity. Marsh vegetation development is bounded by environmental constraints; exposure, salinity, temperature, sediment and tidal range are all important controls. Bearing this in mind, the LNR saltmarsh displays a relatively diverse floral composition. It also displays a diverse structural composition and is believed to support a diverse invertebrate assemblage. Studies of other saltmarshes in the district are extremely limited which makes comparison difficult. More detailed surveys could be undertaken, particularly in terms of invertebrate populations, as part of the function of the reserve.

The Tarka Trail certainly supports a diverse mosaic of habitats. The potential exists to further enhance the structural diversity of the Trail, and the associated flora and fauna.

Naturalness

The Saltmarsh and foreshore have been created through natural estuarine processes, and natural tidal processes continue to control the development of this intertidal area.

The saltmarsh has not been grazed in the recent past, and has experienced minimal human intervention. It is locally significant being one of the only saltmarshes in the estuary complex not to have undergone significant change due to human intervention.

The Tarka Trail is not a natural feature and owes its form to past and present management practices.

Rarity

The development of saltmarshes is restricted to areas with suitable conditions (particularly shelter and abundant sediment) to allow the settlement of suspended particles from the water column onto the tidal flats. The resulting habitat is rare (44 000ha nationally) by comparison, for example, with ancient semi-natural woodland (350 000 ha) (Halcrow and Partners Ltd).

Saltmarsh is a restricted habitat in Devon and is limited in the Taw Torridge Estuary. The total area of saltmarsh in the estuary complex is 240 ha which is 44% of Devon's total. The largest areas are located east of Penhill Ridge and at East Yelland. The LNR includes the largest saltmarsh in Torridge District and one of the most significant areas of saltmarsh in the whole Taw Torridge Estuary complex.

Saltmarshes and mud flats are not generally known for the presence of rare species, and surveys to date have not identified any. However, sampling of invertebrates has indicated that the saltmarsh supports a unique assemblage of species. The sampling method used in the intertidal survey entailed taking four 0.01 m² core samples at each sampling station. This method is unlikely to detect the presence of any rare species, designed instead to provide information on the overall community.

Few species found on this section of the Tarka Trail can be considered rare though the Trail does form a vital corridor habitat and a valuable reservoir for a wealth of less threatened species.

Fragility

The LNR is not believed to be at serious risk at present. However, the saltmarsh is sensitive to trampling and if the intensity of activities such as bait digging or educational visits increases in the future, they will need sensitive management to protect the special interest of the reserve.

Typicalness

The saltmarsh supports typical saltmarsh species, such as sea aster (*Aster tripolium*), a typical pioneer species; common saltmarsh grass (*Puccinellia maritima*), a frequent pioneer of marshes fringing the upstream reaches of many estuaries and a common low marsh species; sea purslane (*Atriplex portulacoides*), a typically dominant low marsh species; and *Phragmites* species, typical in more freshwater areas. It also demonstrates typical saltmarsh zonation.

Recorded History

There is little in the way of long term ecological records. Exeter University did have a monitoring station close to the reserve which can provide some data on nitrate absorption. More recent ecological records are available from The Hallsannery Centre, from student projects undertaken on the marsh. With respect to cultural history, the construction of the Tarka Trail is documented in "Lines to Torrington" by J. Nichols.

Site Features	Importance		
	National	Regional	Local
Habitat types			
Saltmarsh		✓	✓
Mudflats			✓
Freshwater			✓
Woodland			✓
Grassland			
Communities			
Over-wintering and migratory birds		✓	✓
Species			
<i>Gyrinius substriatus</i>			✓
<i>Tortella flavovirens</i>			✓
<i>Campylopus fragilis</i>			✓
Educational Potential			✓
Recreational features			
Tarka Trail		✓	✓
Historic features			
Railway			✓

Natural trends

Sea level rise

Relative sea level of the estuary is predicted to rise by 2.5mm per year until 2030 and then 5mm per year thereafter. Relative sea level change affects wave height, tidal currents, position of water table and position of high water. Over the long term (several decades) change in sea level can affect both saltmarsh morphology and community type. If the rate of sedimentation is less than relative sea level rise, the frequency, period and depth of inundation increases. This may cause creek lengthening, change in floral community, landward movement of saltmarsh extent and increase in potential wave height. The precise long term effect of rising sea level depends largely on the relative balance between the rate of sea level rise, sediment supply and coastal topography. It is predicted that the LNR saltmarsh will be able to keep pace with the predicted rate of sea level rise.

Increase in storm frequency

Scientists predict that, due to global warming, both the frequency and violence of storms will increase. This can lead to saltmarsh loss if accretion between storm events does not replace the eroded material. An increase in storminess can cause lowering of mud flats, erosion of the seaward edge of the saltmarsh and may change the pattern of accretion and erosion.

Migration of channel position

Estuarine channels naturally change their position and this is a common factor leading to alternating episodes of saltmarsh erosion and accretion. Change may occur gradually, due to meander migration, or more dramatically during periods of high flow, extreme tides and strong winds.

Natural succession

Without intervention, the Tarka Trail will undergo the process of natural succession from grassland to scrub species, and eventually to woodland. This would result in a loss of habitat diversity, in particular, areas of grassland and willow carr would be lost. These are both important habitat types, particularly for invertebrates.

External factors

The development of the saltmarsh and foreshore is dictated by the tidal and sediment dynamics of the estuary. Activities such as dredging which affect these dynamics have the potential to influence the reserve, even when undertaken well away from the reserve itself.

The hydrology of the reserve is also influenced by levels of freshwater input from the surrounding catchment. Levels of rainfall, and water abstraction, may influence the features of the reserve, particularly the unusual hydrology and the Phragmites reed bed.

The water quality and nutrient status of the estuary could affect the mudflat and saltmarsh communities.

4. OBJECTIVES

The objectives of management are as follows:

To maintain the saltmarsh and mudflat habitats.

To monitor the structure and diversity of the saltmarsh flora.

To protect the reserve from the damaging practices.

To maintain and enhance the diversity of habitat types along the Tarka Trail.

To enhance the educational value of the site.

To enable local people to contribute towards the management of the reserve.

5. MANAGEMENT PRESCRIPTIONS

In order to achieve the objectives the following prescriptions are proposed

	Objectives	Prescriptions
1	To maintain the saltmarsh and mudflat habitats	1.1 Allow tidal water to continue to inundate saltmarsh 1.2 Maintain the present no grazing regime
2	To monitor the structure and diversity of the saltmarsh flora.	2.1 Collate existing records 2.2 Monitor extent and condition of the saltmarsh and mudflats 2.3 Monitor use of the saltmarsh and the effects of trampling on the saltmarsh vegetation
3	To protect the reserve from the damaging practices	3.1 Introduce/maintain protection measures as necessary
4	To maintain and enhance the diversity of habitat types along the Tarka Trail.	4.1 Survey type and extent of habitats along the Tarka Trail section of the reserve 4.2 Carry out works to maintain diversity of habitats along the Trail section 4.3 Monitor changes in habitat types and

		extent
5	To enhance the educational value of the site	5.1 Provide interpretation material to inform visitors to the reserve
6	To enable local people to contribute towards the management of the reserve.	6.1 Liaise with owners over the management of the reserve 6.2 Involve local people in the management of the reserve

6 ACTIONS

Action	Management Objective	Year				
		1	2	3	4	5
No active management on the saltmarsh or foreshore	1.1, 1.2	✓	✓	✓	✓	✓
Collate presently available photographic coverage	2.1	✓				
Collate presently available aerial coverage	2.1	✓				
Monitor the distribution and zonation of plant species on the saltmarsh	2.2	✓		✓		
Carry out invertebrate surveys for the saltmarsh, and the foreshore	2.2		✓		✓	
Monitor the condition of saltmarsh vegetation and the effects of human activities	2.3	✓				
Record who uses the reserve, how often, and the studies they undertake	2.3	✓		✓		✓
Collect data on type and intensity of public use, e.g. bait digging	2.3	✓		✓		✓
Remove litter from the reserve	3.1	✓	✓	✓	✓	✓
Protect saltmarsh habitat by controlling the level of public use through introducing byelaws (if monitoring indicates that this is necessary)	3.1				✓	
Maintain the fences between the Tarka Trail and the saltmarsh	3.1	✓	✓	✓	✓	✓
Carry out a survey of the species and habitats occurring along the Tarka Trail section of the Reserve	4.1	✓				
Undertake scrub control and grassland management programme for the Tarka Trail	4.2	✓	✓	✓	✓	✓
Monitor the vegetation of the Tarka Trail to assess natural changes and the effects of management	4.3		✓		✓	
Design interpretative panels along the Tarka Trail to inform the public that the area is an LNR, and to provide information on the wildlife present.	5.1	✓				
Approach DCC over the possibility of putting displays in the carriage at Bideford station.	5.1	✓				
Set up Local Nature Reserve Management Group	6.1, 6.2	✓				
Ensure local people are consulted in the planning process for the reserve.	6.2	✓				

Seek to involve local community groups and schools in specific projects e.g. the removal of litter.	6.2	✓	✓	✓	✓	✓
Liaise with local volunteer groups to assist with the monitoring requirements of the reserve.	6.2	✓	✓	✓	✓	✓

7. PLAN REVIEW

The management plan will be reviewed every five years by the management committee. The first review will be in 2016. The group will review whether the management prescriptions meet the objectives or not. The plan will be amended as necessary.

APPENDIX 1. BIBLIOGRAPHY

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