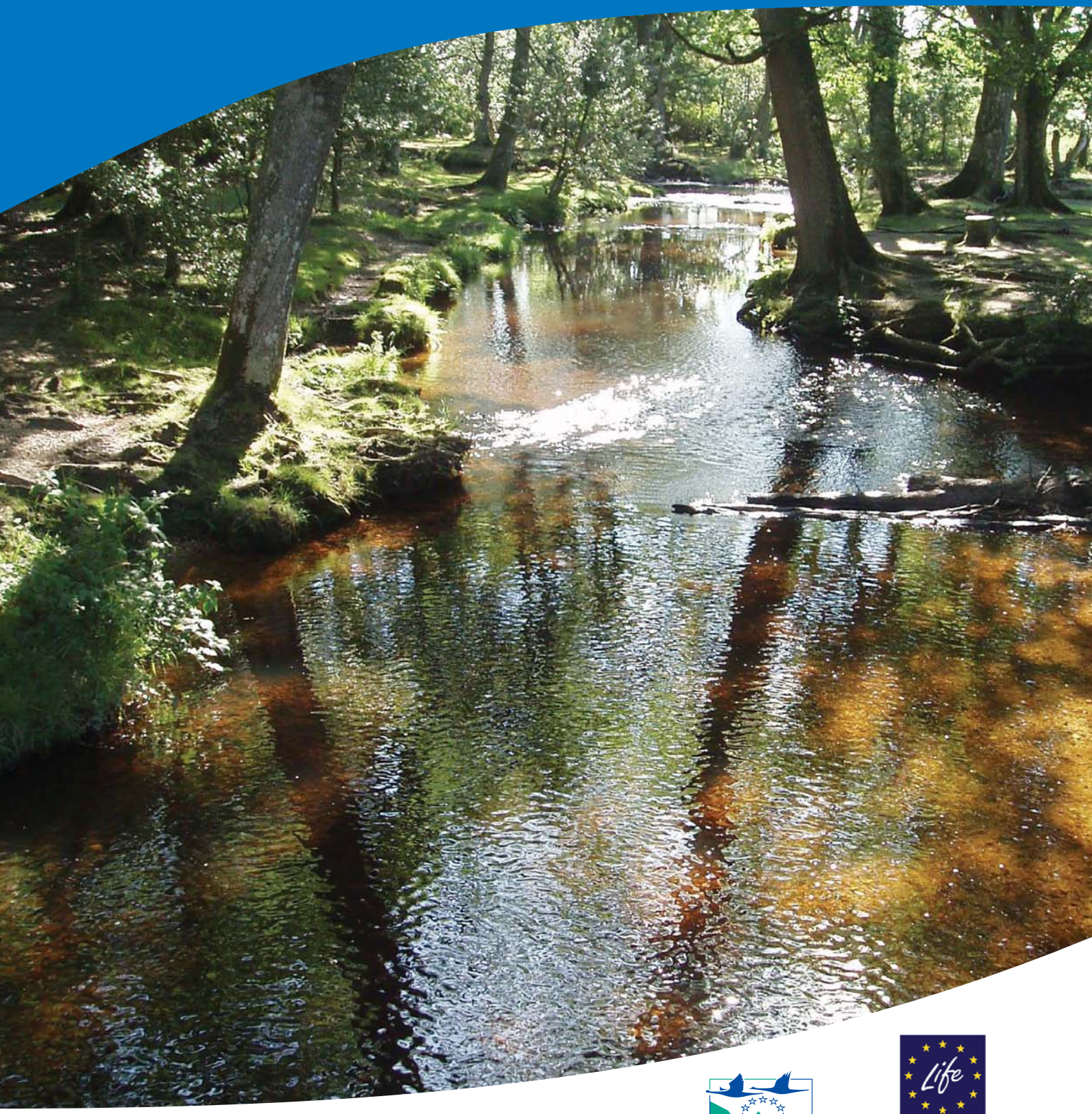
NEW FOREST WETLAND MANAGEMENT PLAN 2006 - 2016



NATURA 2000

New Forest Life
PARTNERSHIP

Sustainable Wetland Restoration in the New Forest - A LIFE-Nature European Union funded project

NEW FOREST WETLAND MANAGEMENT PLAN 2006 - 2016

LIFE02/NAT/UK8544 April 2006

Prepared by:
Jane Smith
Forestry Commission
The Queen's House
Lyndhurst, Hampshire, SO43 7NH

Supporting Statements of Water Basin Management Forum Members

Dr Alan Drinkwater; Chairman

It has been a pleasant and constructive experience to act as the 'independent' chairman of the consultation Forum. This was the formal body created to meet one of the three main objectives stipulated for the LIFE III project-consultation with those living in the Forest and affected by it in various ways.

I saw my role to facilitate the project and enable local members to learn and comment on the project as it unfolded. At the final meeting, it was rewarding to learn that members had found the Forum, and indeed the project as a whole, a helpful experience.

The practical achievements of restoration on the ground, and the ten-year Management Plan, together with a well-accepted consultation process will be the main focus of progress. There are three positive factors, which should be noted; receiving European Union funding for a second LIFE project in the New Forest was a cause for celebration. Members of the consultation Forum were personally very committed, had clear views and were very protective about their home and interests in the New Forest. And lastly, officers of the partners responsible for the work under the project were also professionally committed to the project and worked well together.

Comments expressed by Forum Members

Joan Chessell – Brockenhurst Manor Fly Fishing Club

"It has been fascinating to watch the cautious and the sceptical being totally won over during the past three years. The calibre of the Forestry Commission, Environment Agency, National Trust and Hampshire County Council personnel involved in the administration and presentation, planning and execution of LIFE 3 quickly reassured forum members that this ambitious project had been well-researched and could be delivered. It has been delivered, on time and within budget.

The LIFE 3 exercise deserves to be used as a model of best practice in every sense of the word; it produced 'added value' by providing an arena for a multi-discipline/multi-interest group to interact; appreciate the other's view; and forge links for the future."

Neil Sanderson-Botanical Survey & Assessment

"LIFE 3 has demonstrated, that with sufficient resources and a will to think 'BIG' restoration of internationally important habitats is possible on a scale that nature conservationists have not really contemplated before in Britain".

Peter Frost- Verderer

"As someone who spent much of his childhood playing along the Forest streams, I have been particularly interested in this exciting project. Streams that were straight and deep are now meandering and shallow. Not only will this benefit wildlife, it will also make these streams as beautiful and natural as the majority of streams in the New Forest."

John Durnell- Hampshire & Isle of Wight Wildlife Trust

"Whilst these very tangible gains are extremely important, obviously there have been considerable achievements on the ground, in my opinion at least as important has been the degree of trust that has developed during the consultation process. Drawing together a disparate group of stakeholders, who represent interests that have often been portrayed as conflicting, into an effective and representative forum is not an easy task. The feedback I have received from forum members is that the Life III process has been an excellent example of public consultation, within which each interest group has had a genuine opportunity to promote its particular interest.

We can only hope that improvements in understanding that have resulted from the process are as long lasting as the physical changes on the ground."

Jennifer Tubbs- New Forest Association

"The New Forest Association appreciated the opportunity to send a representative to the Forum and to be involved in the consultation process for individual proposals. The NFA would like, in principle, to support the proposals to continue with sustainable wetland restoration".

Acknowledgements

The development of the New Forest Wetland Management Plan has been helped considerably by the provision of data, advice and feedback from staff and colleagues within the Partner Organisations and members of the Water Basin Management Forum.

In particular I would like to thank the following individuals for their significant contributions and advice – Kevin Penfold, Bruce Rothnie, Simon Weymouth, Grace Ford, Simon Smith, Mike Abraham, Harry Oram and Richard Burke of the Forestry Commission, Maxine Elliott, Tim Holzer and Bethan Davies of the Environment Agency, Amanda Craig and Diana Westerhoff of English Nature, Jenny Tubbs of the New Forest Association, Richard Reeves of the Christopher Tower New Forest Reference Library and Julia Branson of Geodata for producing the maps.

Jane Smith – May 2006

NEW FOREST WETLAND MANAGEMENT PLAN

CONTENTS

LIST OF FIGURES

LIST OF APPENDICES

PART 1
INTRODUCTION & BACKGROUND

NEW FOREST WETLAND MANAGEMENT PLAN (2006-2016)

1 INTRODUCTION & BACKGROUND

1.1 Background

The New Forest, Hampshire (Figure 1) is of outstanding importance for nature conservation in the UK and Europe due to the size, quality and complex mosaic of habitats. In 1995, the UK government proposed 29,000 hectares of the New Forest as a candidate Special Area of Conservation (cSAC) and full status was achieved in April 2005. In terms of wetland habitats, the New Forest supports one of only four significant sites of bog woodland, together with one of the six best sites of riverine woodland (ancient residual alluvial forest) in the UK. Together with other scarce wetland habitats the Forest also contains the most extensive lowland valley mire systems in Western Europe. The network of rivers and streams in the Forest, despite some interference by man, represent one of the best examples of a nutrient poor, acidic, lowland stream network in southern Britain. In addition, the New Forest is now the most important area in the region for breeding waders. As a further enhancement to its status, the New Forest was designated a National Park in 2005.

The Forest's unique history and associated land management practices of forestry and pastoral commoning have been largely responsible for the development and preservation of habitats and eco-systems in their present form as well as the cause of degradation in some areas. One of the greatest threats to the wetland habitats has been the lack of a holistic approach to the management of the hydrological networks which support these habitats. Indeed, man's past interference has led to the decline of wetland habitats though drainage and straightening of river channels leading to:

- Fragmentation of habitats following drainage & afforestation
- Headward erosion of the mire system
- Erosion of over straightened channels leading to increased deposition of gravel downstream
- Reduction in seasonal flooding
- Impeded drainage due to remnant spoil banks
- Scrub invasion
- Introduction of exotics

The successful Life 2 Project, LIFE97/NAT/UK/4242 'Securing Natura 2000 Objectives in the New Forest', identified a series of generic prescriptions and management policies in relation to wetland habitats[1] (**Appendix A**). Where wetlands have been identified as being in unfavourable condition these management prescriptions have been progressed under the Life 3 Project 'Sustainable Wetland Restoration in the New Forest' to achieve the sustainable restoration of:

1 New Forest Special Area of Conservation Management Plan 2001
www.newforestlife.org/life2/managementplan.htm

- 261 ha of riverine woodland
- 18 ha of bog woodland
- 184 ha of valley mire
- 141 ha of wet grassland
- 10 km of river channel

A summary of the wetland habitats types and the issues affecting them is given in Table 1-1.

The Life 3 Project was implemented by a number of Partner Organisations comprising Hampshire County Council (HCC), Environment Agency (EA), Forestry Commission (FC), English Nature (EN), National Trust (NT) and the Royal Society for the Protection of Birds (RSPB). In addition a Water Basin Management Forum, comprising representatives from a number of key organisations and individuals was set up to review the works and promote discussion and understanding of the issues involved (Appendix B).

1.2 Purpose the of 10 year Wetland Management Plan

The purpose of this Wetland Management Plan is to carry forward the work achieved to date and take on board the lessons learned into the next 10 year period (2006-2016) to ensure the continued long term sustainability and integrated management of the water-courses and wetland habitats. It is hoped that this will help prevent further decline of SAC habitats and bring them into favourable condition. Therefore, this Plan is intended to be a practical working document aimed at managers, planners and ground staff within the Partner Organisations to:

- Provide a summary of works carried out to date
- Indicate where future works need to be targeted and prioritised over a 10 year period to help in the planning and funding of works
- Give an understanding of the local environmental conditions which prevail in the river basins to provide information and act as a starting point in the identification of any key impacts or issues which staff need to be aware of when planning future works or applying for consents.
- Draw upon lessons learned from the works to date by outlining the most successful restoration techniques for implementing future works
- Provide outline information on costs based on actual project experience
- Identify any additional survey, maintenance or monitoring programs which may be required to plan, progress or evaluate the impact and success of the works.

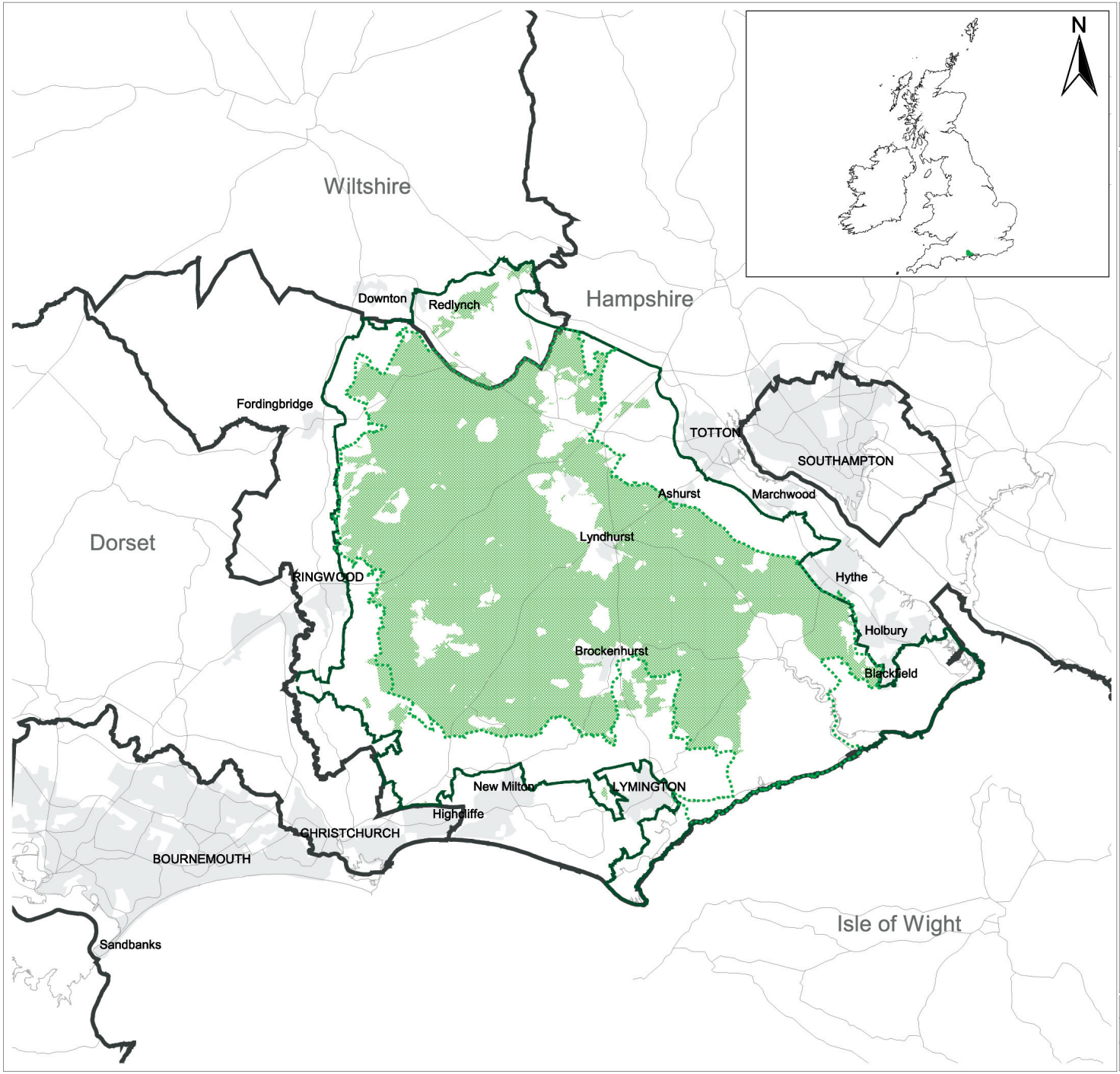


Figure 1

Location Plan

New Forest Life PARTNERSHIP

Legend

- New Forest National Park
- New Forest perambulation
- SAC
- County boundary

Produced by:	Date: 07 February 2006
Scale: 1:200,000	Source: G:\Data\Life 3\FinalReportMapping

1.3 Geographic Boundaries

Under the terms of the Life 3 Project, the 10 year Wetland Management Plan is required to cover all six main river basins within the New Forest SAC (Figure 2):

- Lymington River
- Avon Water
- Beaulieu River
- Bartley Water
- Cadnam River
- Hampshire Avon (south eastern tributaries)

Given the dynamic nature of river and wetland environments, the influence of works carried out in the upper reaches of a river basin can have implications much further downstream. Thus it is considered that where relevant, the study area will extend beyond the SAC boundary to take in the geographic area defined by the New Forest National Park (Designation) Confirmation Order 2005. This boundary generally covers the extent of the river basins. In the case of the Hampshire Avon, its south eastern tributaries which drain the western edge of the New Forest will be considered as far as their confluence with the River Avon.

1.4 Legislative Setting within the Water Framework Directive

The Wetland Management Plan is intended to be a practical working document that can be used to help achieve and implement the aims and objectives of the Life 3 Project. Although it will embrace the principles defined by the Water Framework Directive, it is not intended to be a statutory document. Nor should it be confused with the more strategic River Basin Management Plans which come under the remit of the Environment Agency. These plans will help promote more integrated river basin management and are due to be published by the end of 2009. The New Forest SAC straddles the south-east and south-west river basin districts (Appendix C) and it is envisaged that the Life 3 River Basin Implementation Plan will be fed into the statutory river basin planning process as it develops.

1.5 Methodology

In developing the Implementation Plan data and information have been drawn from:

- Existing published reports and management plans
- Data generated as part of the Life 3 project to date
- Monitoring data generated by statutory bodies
- Consultation with statutory bodies
- Consultation with Project Partners and members of the Water Basin Management Forum

1.6 Organisation of the Plan

The Plan has been divided into 5 Parts:

Part 1 outlines the background and purpose of the Plan

Part 2 sets out the historic legacy and management of the Forest in order to provide an understanding of why the Forest is like it is today and to place many of the issues which are relevant to wetland restoration into context.

Part 3 provides a description of the current catchment characteristics under the topic headings of:

- Climate
- Geology, Geomorphology & Soils
- Hydrology & Drainage
- Ecology, Fisheries & Nature Conservation
- Archaeology & Cultural Heritage
- Landscape
- Land Use
- Other policies, plans & strategies

Key issues relevant to wetland restoration works are highlighted for each topic area.

Part 4 provides a summary of the restoration works carried out to date and outlines the location, priority, type and cost of future works that will be required to bring the wetland habitats back into favourable condition. It also provides an outline of the most successful restoration techniques used to date to help in the future planning and execution of restoration works.

Part 5 sets out a series of case studies to highlight where some of the different restoration techniques have been used along with an indication of project costs.

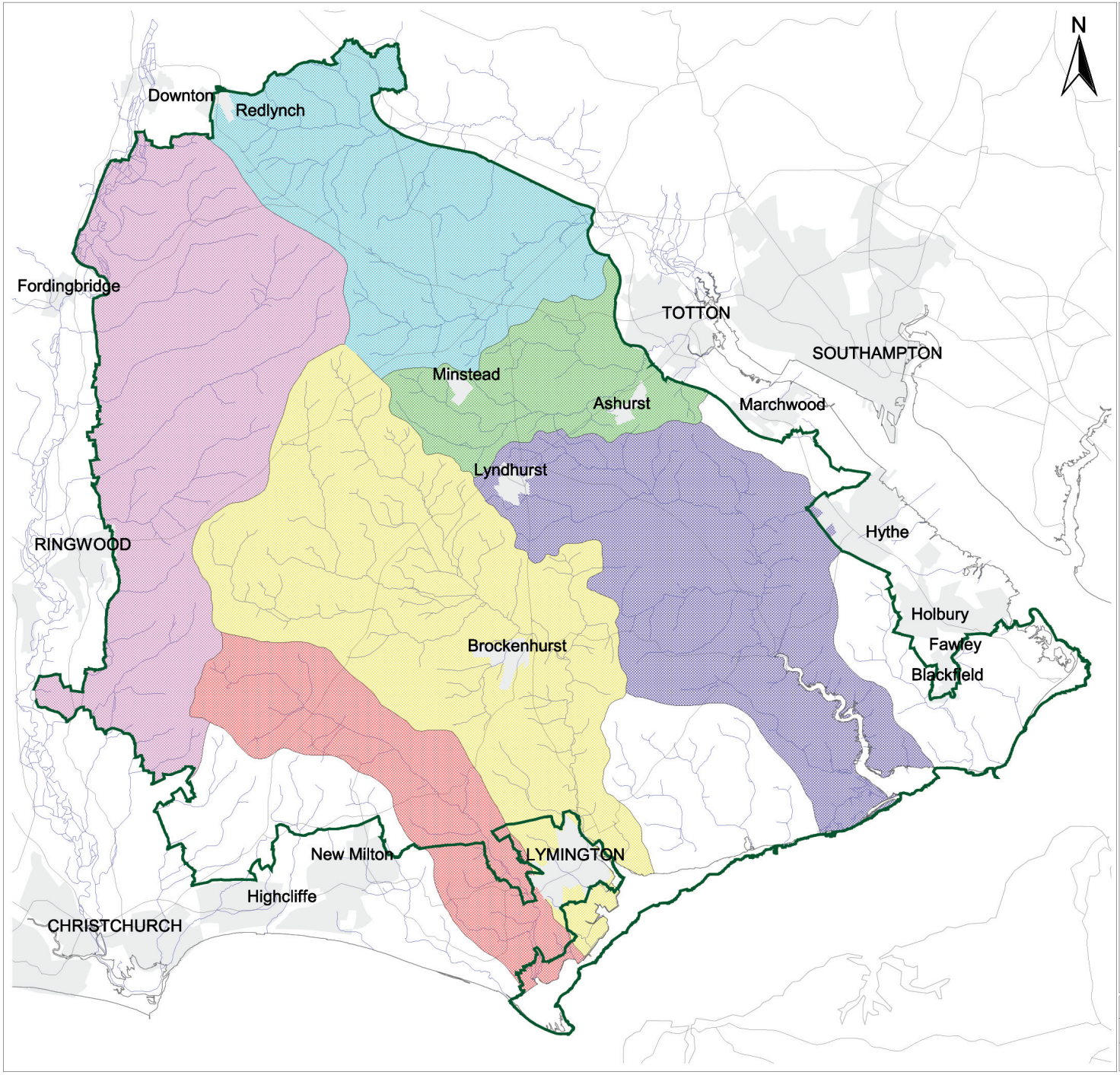


Figure 2

River Basins

New Forest Life PARTNERSHIP

Legend

- Avon Water
- Bartley Water
- Beaulieu River
- Cadnam River
- Hampshire Avon Tributaries
- Lymington River
- New Forest National Park

Note:

1. River basin boundaries subject to confirmation
2. Boundaries to west and north have been cropped to National Park Boundary

Produced by:	Date: 07 February 2006
Scale: 1:130,000	Source: G:\Data\Life 3\FinalReportMapping

Table 1-1: Summary of wetland habitats types and Life 3 issues

Wetland Habitat Type (Total Area HA)	Issues	Works required to restore to favourable condition	Area of Restoration Achieved Under Life 3 (2002-2006)
Riverine Woodland	Straightening and over deepening of channels resulting in reduced seasonal flooding of riparian woodland. Creation of drainage ditches leading to reduced seepage and overland flow Invasion of scrub and exotics. Habitat fragmentation due to fencing and afforestation. Loss of grazing due to reduction in ground flora	Restoration of straightened channel sections to recreate natural river course and restore seasonal flooding though reinstatement of meanders, bed level raising and installation of debris dams. Selective management of scrub and certain exotics. Pollarding and coppicing of holly. Pollarding of some oak, ash and beech.	261 ha + 10km of river channel
Bog Woodland	Same issues as Riverine woodland	As for Riverine Woodland	18 ha
Valley Mires	Damage due to drainage and headward erosion.	Infilling of drains and erosion repair.	184 ha
Wet Grassland	Drainage and straightening of river channels has reduced seasonal flooding resulting in drying and deprivation of essential nutrients carried by flood water. Scrub invasion in drier areas. Erosion from straightened over steepened channels resulting in excess gravel deposits downstream.	Channel restoration work Select removal of scrub	141 ha

PART 2
HISTORY, LEGACY & MANAGEMENT

2 HISTORIC LEGACY & MANAGEMENT

2.1 Introduction

The history of the New Forest and its associated legacy is intricately responsible for the management structure, customs and condition of the Forest today. On one hand the historic management has helped to create and maintain the valuable mosaic of habitats found in the Forest today while on the other it has led to the decline and degradation of the wetland habitats which the Wetland Management Plan is seeking to reverse. In order to understand the need for wetland restoration and some of the issues which the works face, it is important to appreciate this historic legacy and the associated conflicts which have led to the current day position.

Certain key historical periods and events have been particularly important in shaping the New Forest today as summarised in Table 2-1 with the most significant developments described further below.

2.2 Key Historical Events

1079 - The designation of the New Forest as a royal 'forest' by William I

Although the area has been inhabitated since prehistoric times, the New Forest as we know it today has its' origins back in the 11th Century and the Saxon occupation. Entries in the Domesday Records suggest that the New Forest perambulation was created some time between 1066 and 1086 to provide a hunting forest for William 1 and his court. A medieval hunting forest was not a forest in its true sense, but a mix of woodland, heath, pasture and scrub whose management was devoted purely for hunting. Indeed it was a:

" territory of woody grounds and fruitful pastures, privileged for wild beasts and fowl of forest, chase and warren, to rest and abide there in the safe protection of the King, for his delight and pleasure" (Manwood, 1598)

In order to protect the game and their associated habitats the Forest was governed by a complex series of judicial and legal structures. Local inhabitants were forced to remove fences, cease their own hunting activities and restrict fuel wood cutting. In compensation for the curtailment of activities the inhabitants were granted certain forest rights, some of which are still exercised by commoners today. For example, forest laws regulated grazing by livestock, allowed pigs to be turned out at certain times of the year to eat the fallen acorns and controlled the collection of fuel wood and turfs. Further Orders and Rules controlled an annual cycle of management in which dues were collected, animals marked, drifts made and "beasts of strangers" impounded for fine and collection. They also controlled deer and timber exploitation and allowed for the enclosure of coppices. Indeed the imposition of forest laws instigated many of the conflicts and issues between commoners and crown which still persist today!

The system of administering Forest Law was complex but it is known that there were two courts. The lower court, the Swainmote, was held by the Verderers, who were elected by the County on the King's writ. They sat with a jury and heard presentments on Forest offences and decided the appropriate course of action including passing on offences for

settlement in the higher court, the Forest Eyre. The Forest Eyre had both judicial and investigative functions and was assisted by the Regarders. The Regarders role was to inspect and report on the condition of the Forest every three years and one of their main functions was to mark trees for felling.

Act of 1483

In the early days the emphasis was on managing the Forest for deer and other game and forestry was only a secondary consideration. It was not until the reign of Elizabeth I that silviculture gained any prominence under the Act of 1483. This Act encouraged the enclosure of forest coppices. The coppices were leased by "wood seller tenants" who could cut the hazel underwood and lop pollarded oak for fuel, charcoal, fence stakes and house repairs. However sapling oaks had to be left to mature for use by the Navy.

However, it would appear that Forest Law was not always strictly imposed. Poorly paid officers remote from Crown supervision were often idle and corrupt while Forest rights were regularly abused by the commoners, particularly in relation to the coppice system. During the 16th/17th centuries it became more difficult to lease coppices and regulations relating to coppice management were frequently abused. Reports from the Regarders repeatedly note the inadequacy of the coppice system to preserve timber, mainly due to short time scale of enclosure leading to lack of any management incentive. From 1612 quantities of mature oak were felled to supply ship building in local Naval Yards, often from the open forest, but by late 17th century harvestable timber had declined to an all time low.

1698 Act of the Increase and Preservation of Timber in the New Forest

The 1698 Act allowed for the first large scale timber production through the permitted enclosure and planting of 6000 acres in a rolling programme over 20 years. In reality only 3296 acres were ever planted, most being spurred on by the Napoleonic Wars and the need to keep generating timber for the Navy.

Although the 1698 Act gave statutory recognition to common rights and stipulated that the Inclosures were to be on land which 'could be best spared from the commons and highways' it led to significant conflict between Crown and commoner. More than a thousand free-holders and commoners petitioned against the Act and local resistance often led to broken fences and incursions by stock. Furthermore, since the break down of Forest Law the commoners had claimed the right to de-pasture stock on the Forest throughout the year. However, the 1698 Act reintroduced the regulation to remove stock from the forest during the fence month (14 days either side of midsummer day when deer calve) and during winter heyning (22 November to 4 May) when winter forage was low.

Maladministration and corruption continued to reign. By 1789 'The Fifth Report of Commissioners to Enquire into the Woods, Forests and Land Revenues of the Crown' report-ed that the New Forest was over run by deer, most of the forest customs had lapsed and the Forest was regularly exploited by those entrusted to look after it. Indeed, three of the inclosures had been turned into rabbit warrens by the keepers who found it more profitable to rear and sell rabbits than tend trees!

1808 Act of the Increase and Preservation of Timber in Dean and New Forests

With concern about the poor state of timber production, the 1808 Act of the 'Increase and Preservation of Timber in Dean and New Forests' was passed which allowed for a further 6000 acres to be enclosed. This instigated the actual enclosure of 5557acres between 1808 and 1817 with a further 1147 acres enclosed between 1830–1848. It is in some of these earliest Inclosures that wetland restoration work has or needs to be carried out to repair the damage originating from this time (Figure 3).

1851 Deer Removal Act

Increased afforestation was justified by the national need to supply the navy with timber but it was not proving a popular move in the New Forest and the Crown needed to find a suitable motive for doing so. By this time no monarch had hunted in the forest for a few hundred years and the deer population was seriously over stocked. Thus the 1851 Deer Removal Act saw the Crown award itself a further 10,000 acres for silviculture as a compensation payment for relinquishing the Crown's right to stock the Forest with deer!

Despite most of the deer being eradicated, the Office of Woods still attempted to enforce the fence month and winter heyning which together with the degree of afforestation and loss of common grazing enraged the commoners. In turn, the gentry many of whom were landowners were further provoked because they could charge enhanced rents from land carrying commoning rights. With increased Inclosure such areas were being drastically reduced.

Together with loss of grazing went the habitats of ancient mosaic woodland, heath, bog and lawn under a blanket of Inclosures. Where new inclosures were created the main streams were often straightened and new drains cut in tributary valleys. On the upstream side the cutting of drains was usually restricted to within the inclosure boundary and indeed the 1870 1:2500 O.S. maps show many of these tributary channels originating at boundary of the inclosure fences. Over the years these channels have deepened significantly and extended well beyond the boundary fence into the open forest. It is in many of these Inclosures that wetland restoration works are taking place today to regenerate the wetland habitats damaged at this time.

The Act also allowed for species other than oak to be planted. Thus conifers were introduced both as nurse crops for young oak and as pure stands within some inclosures on poorer soils. Indeed it was at this time that some of the biggest incursion of conifers into the forest took place.

It was the great landowners who led much of the campaign to save the Forest from further Inclosure. In 1866 the New Forest Association was formed to organize opposition and petition Parliament. At the same time the New Forest's landscape, ecology and amenity value was becoming increasingly recognised by outsiders, many of whom were wealthy, well educated individuals. The felling of large stands of old oak pollards and beeches to make way for regimented planting was not appreciated! The opening of the Southampton & Dorchester Railway in 1845, despite cutting a large swath through the forest, had done much to open the Forest up to general recreation. Thus in 1877 the lobbying forces of landowners,

commoners and environmental campaigners alike were instrumental in producing the 1877 New Forest Act.

It was also around this time, 1846-52, that some of the earliest drainage schemes took place on the Open Forest to improve grazing on lawns. Indeed a number of subsequent schemes carried out in the 1920's, 30's, 50's, 60's and 70's were focused around mires.

1877 New Forest Act

The 1877 New Forest Act restricted any further enclosure to the 17,645 acres enclosed under the Acts of 1698, 1808 and 1851 with no more than 16,000 acres allowed to be enclosed at any one time. Significantly the remaining 45,000 acres of Crown common land, now referred to as the Ancient and Ornamental Woodland was to remain permanently unenclosed. Furthermore the Act established a new management body to control the exercise of common rights - the Court of Verderers of the New Forest. They became a Body Corporate with powers to manage the pastoral interests of the Forest as well as adopting the role of controlling development on the Open Forest. For 40 years or more following the 1877 Act, the Crown and Verderers were constantly at logger heads over their respective roles and powers on the unenclosed forest. The Verderers insisted that the Crown only had unimpeded rights within the Inclosures and anything on the open forest required their consent. Ultimately the cost of litigation between the Court and Office of the Woods drained the Verderer's funds but lack of compromise ensured that the Forest remained relatively unchanged until 1914 and the impact of the First World War.

The Victorians, with their interest in landscape and amenity were instrumental in introducing ornamental trees or "exotics" to the Forest. Between 1882–1889 around 3000 ornamental trees comprising 13 species were planted in and around the unenclosed Forest, including Turkey Oak, Sweet Chestnut, Sycamore, Limes, Maples and Scarlet oaks. Although most were planted on roadsides and around villages a few were planted deeper in the forest and these have left a legacy of secondary regeneration. One aspect of the wetland restoration work is the removal of such exotics from the flood plain.

The War & Inter War Years

Through the wars years the Forest was intensively managed for timber production to support the war effort. Land acquisition for national interest during the Second World War reeked havoc. Around 8,700 acres of land on the open forest was appropriated for military training, airfields and firing ranges as well as growing crops. Although most has been returned to the Forest some has been poorly restored.

In 1924 the management of the New Forest passed to the Forestry Commission under the Forestry (Transfer of Woods) Act, 1923 and became vested in the Minister of Agriculture rather than the Sovereign. The Forestry Commission embarked on implementing national forest policy which was essentially the conversion of broad-leaved woods to conifer plantations. Despite anger at some of the Forestry Commission's felling policies during the interwar years the Verderer's Court was too weak and impoverished to have much influence.

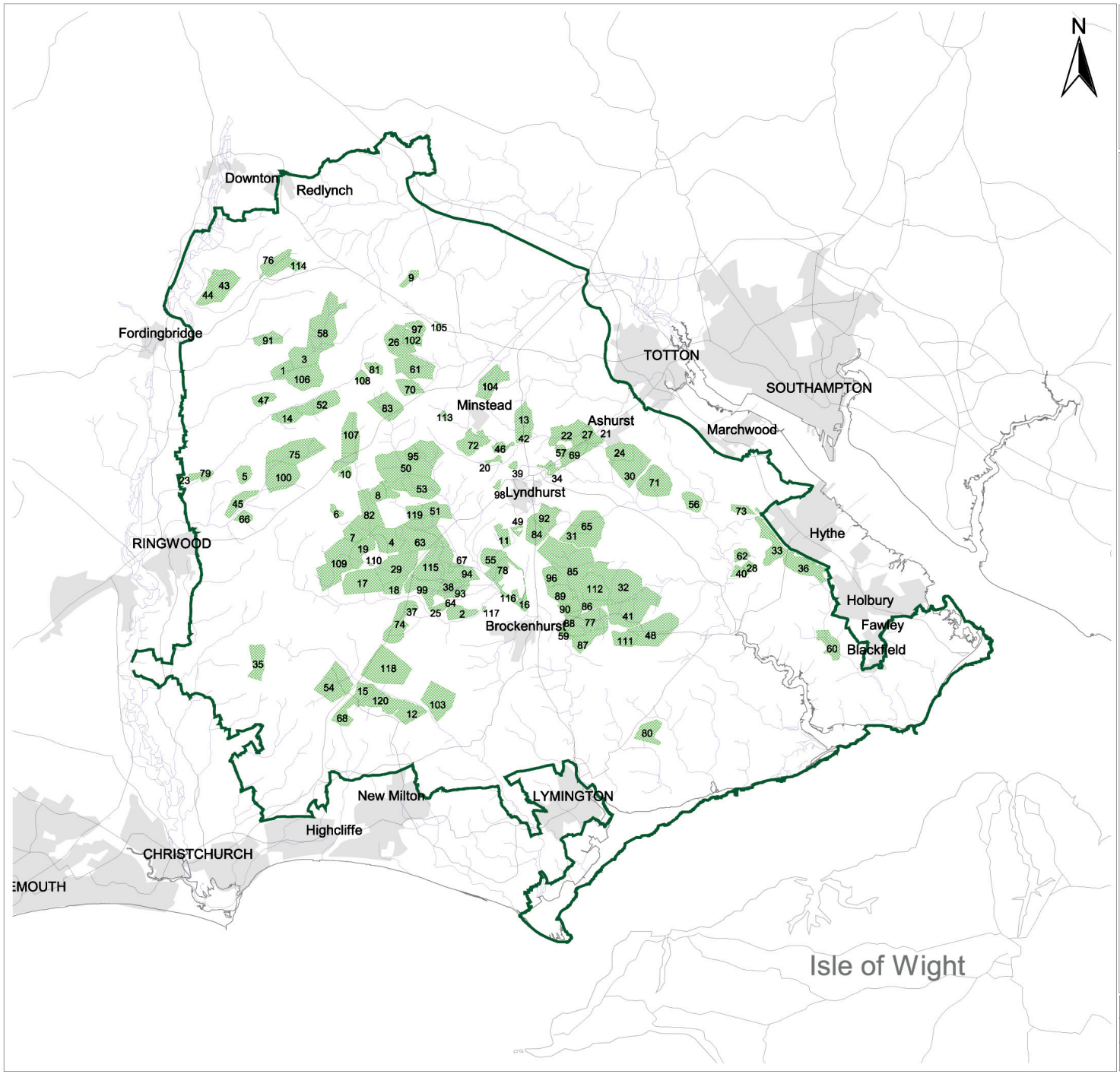


Figure 3

Historic Development of Inclosures

New Forest Life PARTNERSHIP

Legend

Inclosure[1]

New Forest National Park

1 Refer to Appendix Q for list of Inclosure names and dates

Produced by: Date: 07 February 2006

Scale: 1:130,000

The New Forest Act 1949

The New Forest Act 1949 overhauled the administration of the forest and revived the Verderer's Court. Importantly for the current day administration of the Forest, it clarified responsibilities between the Verderers and Forestry Commission. Section 11 is of particular relevance:

"It shall be the duty of the Forestry Commissioners ……to carry out such work as appears to them after consultation with the Verderers, and with due regard to the interests of amenity…..for securing that the Forest will be properly drained, that culverts and bridges crossing drains or streams in the Forest….will be properly maintained, and that the grazing will be kept sufficiently clear of coarse herbage, scrub and self-sown trees."

Indeed between 1965-1986, ninety-six drainage projects were carried out implementing Section 11 of the 1949 Act (Tubbs, 2001).

The Act also gave the Verderers power to authorize the Forestry Commission to enclose a further 5000 acres of Open Forest for plantations but in return compensation had be paid to the Verderers for any land enclosed. These became known as the Verderers Inclosures but unlike earlier Inclosures they are only held on 150 year lease and have to be opened to stock for much of that time. In 1958 approval was given to enclose 2005 acres despite strong opposition from the New Forest Commoners Defence Association, the New Forest Association and local residents.

The 1877 Act required that the *"ancient ornamental woods and trees shall be preserved".* This sparked controversy over whether these woodlands should be left to regenerate naturally or be subject to management intervention to secure regeneration. The resulting outcome was that the 1949 Act gave the Forestry Commission powers, with the consent of the Verderers, to enclose small areas (no more than 20 acres) of the Ancient and Ornamental Woodlands in order to secure their future regeneration. These enclosures, known as the 'A & O' Regeneration Plots total 57 sites covering around 800 acres.

The New Forest Act 1964

Although the 1964 Act was principally concerned with altering the perambulation in respect of animal husbandry and range of pasture rights it did contain an important clause in relation to conservation, notably that the Forestry Commission and Verderers were to:

"have regard to the desirability of conserving flora, fauna and geological and physiographical features of special interest"

The Act also made provision for recreation by allowing the Forestry Commission with the Verderers' consent to make camp sites on the unenclosed forest

The Ministers Mandate

Through the 1950's and 1960's, in order to comply with national forest policy, there was a huge drive by the Forestry Commission to eliminate broad leaved trees within the Inclosures and replace them with conifer plantations. Conifers are not generally suited to damp ground and it was through the drainage and ground preparation for the plantations that many of the water courses were straightened leading to the damage to the hydraulic network which wetland restoration is seeking to address:

> *"Before planting, main watercourses had to be drained with a mechanical excavator and then the whole area ploughed at 5½ ft. spacing with crawler tractors and special ploughs… On the worst soils, that is the compact gravels which often have an underlying pan, a subsoiler was used behind the plough in order to break the pan."* W.A. Cadman

The effects of drainage works are described further in Section 3.4.

However in 1969 an attempt was made to commercially exploit the unenclosed pasture woods starting with the 'thinning' of Rushpole Wood. The public outcry was enormous and resulted in the Ministers Mandate 1971. This Mandate recognised the unique heritage and conservation value of the New Forest and essentially allowed the Forestry Commission to operate a forest policy in the interests of the New Forest rather than Great Britain as a whole. Significantly the Mandate declared that the unenclosed woods were to be managed without regard to timber production and conversion to conifers within the Inclosures was to cease.

The latest Ministers Mandate 1999 (**Appendix M**) places a further obligation on the Forestry Commission to conserve the natural and cultural heritage and places a high priority on maintaining the Forest's traditional character.

Further protection to the nature conservation interests of the Forest has been gained through agreements between the Forestry Commission and the Nature Conservancy Council (now English Nature). In 1959, three Forest Nature Reserves[1] were established under an Agreement between the Nature Conservancy and the Forestry Commission and five areas[2] of the Forest were notified as Sites of Special Scientific Interest (SSSI) with further extensions made in 1971 and 1987 covering 28,947 hectares. Furthermore, recent designations of parts of the Forest as a RAMSAR site, Special Area of Conservation (SAC) and Special Protection Area (SPA) have helped to recognise the importance of the Forest on an International and European level. Nature conservation objectives have not always been popular with all interested parties. In particular there have been significant disputes with Commoners over such issues as scrub control and loss of grazing. Some see the more recent agreements and management techniques as contrary to Section 11 of the 1949 Act quoted above.

[1] Bramshaw Wood & Bramble Hill Walk, Mark Ash, Matley & Denny

[2] Beaulieu Heath East, Cranes & Vales Moor, Hatchet Pond, Linwood Valley, Wilverley Walk & Holmsley Station

Another legislative mechanism to improving the condition of the Forest has been the Countryside and Rights of Way Act 2000 (CROW Act). The CROW Act amends the Wildlife and Countryside Act to introduce a number of legislative measures that give greater protection to wildlife and enable the process of achieving favourable condition. In particular the provisions of the CROW Act place clear duties and responsibilities on many organisations and individuals to promote the interests and sustainability of these special sites and to view them as national assets.

The New Forest National Park Establishment Order 2005

The latest twist to the historic development of the Forest is the creation of the New Forest National Park with the objectives to:

- conserve and enhance the natural beauty, wildlife and cultural heritage of the Park; and

- promote opportunities for the understanding and enjoyment of the Park's special qualities by the public.

The National Park Authority took over limited powers in April 2005 with full statutory functions relating to planning and right of access from 1 April 2006.

Table 2-1: Summary of Key Historic Events

Date	Historic Significance
1079 - The designation of the New Forest as a royal 'forest' by William I	Forest managed exclusively for deer and other game. Removal of all fences and introduction of Forest Laws. Common rights granted as recompense
Act of 1483	First introduction of silviculture allowing enclosure of small coppices for up to 7 years. Oak cut from Open Forest to supply timber for building naval ships
1698 Act of the Increase and Preservation of Timber in the New Forest	First large scale afforestation through the creation of Inclosures. Conflicts with commoners over loss of grazing and imposition of Forest Laws. By end of 18th C Forest poorly managed and timber supplies declining.
1808 Act of the Increase and Preservation of Timber in Dean and New Forests	Allowed for creation of further 6000 acres of Inclosures to address declining timber supply
1845	Opening of Southampton & Dorchester railway bringing artists, naturalists and other recreational users to the New Forest.
1846-52	First drainage schemes to improve Forest for grazing
1851 Deer Removal Act	Culling of deer in return for Crown enclosing 10,000 acres of open forest. Forest Laws of fence month and winter heyning still imposed which together with loss of grazing led to large scale revolts among commoners and gentry. Large scale introduction of conifers and drainage works
1877 New Forest Act	No further creation of Inclosures permitted other than that granted under previous Acts. No further enclosure of Ancient & Ornamental woodland allowed "Re-creation" of Court of Verderers to administer common rights and pastoral interests remote from Crown influence. Introduction of ornamental trees into Forest by Victorians
The War & Inter War Years	Forest intensively managed for timber production. Large tracts of land acquired for airfields, firing ranges and food supply.
1920's-30's	Further drainage of the Open Forest
1924	Forestry Commission takes over responsibility for management of New Forest from the Crown. National forest policy ensures that afforestation is vigorously pursued
The New Forest Act 1949	Revived Verderers Court and clarified responsibilities between Verderers and Forestry Commission. Act set out requirement for Forestry Commission to maintain drainage and scrub control for grazing interests. Led to significant drainage between 1965-1986. Creation of Verderers Inclosures in return for compensation payments. Afforestation led to further drainage and destabilisation of hydraulic network Enclosure of small areas of Ancient and Ornamental woodland allowed to secure its future regeneration.
The New Forest Act 1964	Alteration of perambulation boundary and addition of fencing and cattle grids to help control livestock movement and prevent accidents Provision for creation of campsites Obligation for Forestry Commission & Verderers to give due regard to nature conservation interests.
The Ministers Mandate 1971	In recognition of the unique environment of the New Forest permission was granted to allow forest management to diverge from national policy of large scale conifer planting.
1971	Extension of New Forest SSSI
The Ministers Mandate 1991	Places obligation on the Forestry Commission to conserve the natural and cultural heritage and places a high priority on maintaining the Forest's traditional character
Countryside and Rights of Way Act 2000 (CROW)	Legislative requirements place duty on organisations and individuals to promote the interests and sustainability of the Forest and to achieve favourable status of habitats.
The New Forest National Park Establishment Order 2005	New Forest designated a National Park
2005	New Forest receives full status as a Special Area of Conservation (SAC)

2.3 Summary

So it can be seen that the Forest has had an interesting but turbulent history which has given rise to the unique landscape, habitats and traditions which survive today. Past land management practices have resulted in damage and degradation of important wetland habitats which restoration and management is seeking to reverse. The old conflicts and suspicions between "Crown and Commoner" still simmer along with the Verderers working hard to ensure that the Commoners rights and interests are wholly addressed. However, the importance of nature conservation and the need to protect the unique heritage of the Forest is being increasingly recognised and embraced by different organisations involved in the management and working of the Forest. The process of consultation and involvement of those with an interest in the Forest has been key to progressing wetland restoration and management to date and will continue to be so in the future.

It is impossible to give more than a potted history in this Section thus a list of further reading is given below.

FURTHER READING

Colin R. Tubbs, **The New Forest**, *New Forest Ninth Centenary Trust 2001*

New Forest Forestry Commission Guide, *HMSO 1969*

Anthony Pasmore FRICS, **Historical Background to the New Forest** can be found in Management Plan for the Crown Land of the New Forest 2001-2006 (Appendix 5)

A Brief History from the Deputy Surveyor can be found in Management Plan for the Crown Land of the New Forest 2001-2006 (Appendix 5)

Stephen L. Stover, **Silviculture and Grazing in the New Forest: Rival Land Uses Over Nine Centuries**, *Journal of Forest History 1985*

David Stagg, **Silviculture Inclosure in the New Forest From 1850 To 1877**, *Proc Hampsh Field Club Archaeol Soc **48**, 1992, 143-159*

PART 3
CATCHMENT CHARACTERISTICS

3 CATCHMENT CHARACTERISTICS

3.1 INTRODUCTION

Part 3 of the New Forest Wetland Management Plan describes the physical and social environmental conditions prevailing in the New Forest river basins. Key issues associated with wetland restoration works and Life 3 works to date are also identified. It is not possible to describe each subject area in a huge amount of detail in the context of this Plan thus further reading or sources of information via the internet are suggested at the end of each topic.

It is important to outline the existing environment because:

- An understanding of the environmental conditions prevailing in the river basins is an integral part of the Water Framework Directive as a tool in river basin planning. It is necessary to understand the catchment characteristics to appreciate the benefits or any negative impacts which the works may have either in the immediate area or further downstream.

- An appreciation of the issues relating to topic areas can be useful both for planning purposes and aiding consultation with interested parties.

- Knowledge of the likely impacts of any works will allow planning of appropriate mitigation measures.

- The information provided on the existing catchment characteristics can provide a source of baseline information for preparing supporting documentation as part of the consents process.

- Staff often change throughout the lifetime of a project and this section can be used as a starting point in their learning curve about the Forest.

3.2 CLIMATE

3.2.1 Climate Statistics

Located in the climatic region of central southern England, the New Forest generally experiences warm summers and mild winters. Rainfall is higher than average for south east England. Small falls of snow are experienced most winters but large, extended falls are rare. Frosts are common, but night temperatures seldom fall below -9OC. The area is not subject to frequent strong winds and values of windiness are classed as very suitable for all timber producing species.

Climatic statistics for weather station at Everton the south of the Forest are shown in Table 3-1.

Table 3-1: Climate Statistics from Everton Weather Station (16m AMSL) (1971-2000 averages)

Month	Max Temp ^{O}C	Min Temp ^{O}C	Days of Air Frost	Sunshine Hours	Rainfall mm	Days of Rainfall >=1mm
Jan	7.9	2.6	8.3	61.7	81.0	12.8
Feb	7.9	2.3	7.2	81.1	58.7	10.3
Mar	10.1	3.6	4.4	121.8	60.3	10.6
Apr	12.4	4.7	2.0	181.5	48.4	8.8
May	15.9	7.7	0.1	223.2	45.9	8.4
Jun	18.4	10.4	0.0	212.4	51.9	7.8
Jul	20.8	12.5	0.0	231.6	37.7	6.5
Aug	20.8	12.6	0.0	223.2	49.5	7.1
Sep	18.3	10.7	0.0	160.2	67.1	9.5
Oct	14.9	8.2	0.3	120.0	88.0	10.9
Nov	11.1	5.0	3.8	80.7	84.2	11.0
Dec	9.0	3.6	6.3	53.3	91.2	12.1
Year	14.0	7.0	32.5	1750.7	763.7	115.8

Source: Meteorological Office

Small micro climatic variations do occur across the Forest as a whole, generally in response to topographic changes. For example, the highest levels of rainfall (around 900mm) tend to occur over the highest ground in the north and west. Rainfall is the principle source of water feeding the Forest streams via percolation and overland flow. As a result variations in river flows tend to closely reflect the intensity and duration of rainfall thus the Forest streams are characterised by their flashy nature. However, during prolonged, dry summers many of the ponds, ephemeral wetlands and smaller streams dry out whilst others are reduced to a mere trickle.

3.2.2 Climatic Issues

a) Climate change

Climate is changing more rapidly now than at any time in the past ten thousand years. A key factor in this warming is considered to be due anthropogenic activities, particularly greenhouse gas emissions, because a large part of the warming cannot be explained by natural climatic variations alone. The UK Climate Impacts Programme (UKCIP) has been carrying out in depth modelling and research into the possible effects of climate change in the UK, based on different climate change scenarios (Hulme et al, 2002). The general climatic changes are summarised in Table 3-2.

Table 3-2: General Climatic Changes

Climate Variable	UKCIP02 Scenario	Relative Confidence Level
Temperature	Annual warming by the 2080s of between 1°C - 5°C depending on region and scenario	High
	Greatest summer warming in the south-east	High
	Years as warm as 1999 become very common	High
	Thermal growing season increases everywhere with largest increases in the south-east	High
Precipitation	Generally wetter winters for the whole UK	High
	Precipitation intensity increases in winter	High
	Substantially drier summer for the whole UK	Medium
	Summers as dry as 1995 become very common	Medium
Humidity	Specific humidity increases throughout the year	High
	Relative humidity decreases in summer	Medium
Snowfall	Total decreases significantly everywhere	High

Source: UKCIP

The MONARCH project, which is part of the UKCIP programme, has attempted to evaluate the effects of climate change on nature conservation (Harrison et al, 2001). Monarch provides climatic bioclassifications for the UK and considers changes for various scenarios based upon different levels of atmospheric CO2. The majority of the New Forest lies within Bioclass 19, and the climate changes predicted for this class are shown in Table 3-3.

Table 3-3: Climate Characterisation of Class 19 for UKCIP98 Climate Change Scenarios (located in southern and eastern England)

Climatic Variables	UKCIP Climate Change Scenarios 2020LO	2020ML	2020MH	2020HI	2050LO	2050ML	2050MH	2050HI
Summer T_{mean}	+0.6oC	+1.1 oC	+1.3 oC	+1.5 oC	+0.9 oC	+1.5 oC	+2.1 oC	+2.5 oC
Winter T_{mean}	+0.5 oC	+0.8 oC	+1.3 oC	+1.4 oC	+0.9 oC	+1.5 oC	+2.0 oC	+2.3 oC
Summer Rain	-5.6%	-5.6%	-5.6%	-5.6%	-5.6%	-5.6%	-16.7%	-16.7%
Winter Rain	+4.0%	+4.0%	+8.0%	+8.0%	+4.0%	+8.0%	+8.0%	+12.0%
Summer PET	2.7%	5.4%	8.1%	8.1%	5.4%	8.1%	13.5%	16.2%
Winter PET	0.0	0.0	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
Annual Windsp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Windsp	0.0	0.0	0.0	1.7%	0.0	1.7%	1.7%	1.7%

T_{mean} is mean air temperature, Rain is rainfall, PET is Potential evapotranspiration, Windsp is mean monthly windspeed. LO, MH, HI refers to different scenarios of CO2 concentrations.

The predicted climate changes have potentially significant consequences for the New Forest wetlands, for example:

- Increase in winter flooding and erosion potential
- Increasing frequency of summer drying
- Possible increase in levels of invasion by alien species, pests & diseases
- Change in hydrological regime
- Changes in water quality due to increased temperatures resulting in lower levels of available oxygen increased biological respiration rates leading to reduced levels of dis solved oxygen
- Changes in fish and macroinvertebrate populations
- Changes in species diversity
- Changes in species distribution including that of wetland waders
- Reduction in drought intolerant species such as Beech
- Rising sea levels

Therefore it is important that the wetland habitats and the hydrological regimes that support them are restored to a favourable condition to allow them the opportunity to withstand and deal more effectively with climatic extremes.

All the LIFE Project Partners are members of the South East Climate Change Partnership whose mission is to investigate, inform and advise of the threats and opportunities arising from the impacts of climate change in South East England and to promote adaptive planning in the region.

b) Increased evaporation due to vegetation clearance and low summer flows

Concern has been expressed that during the summer months, the clearance of stream side vegetation, particularly in Inclosures, would allow more sunlight to penetrate to the stream bed. This could increase water temperatures leading to greater evaporation rates and thus more rapid drying out of streams with associated effects on fish and macroinvertebrates. It is considered that to date this has been a localised effect related to the scale of clearance, with plenty of shade still existing elsewhere along the river corridor and that the benefits of streamside clearance have outweighed any local disbenefits. However when planning future works it is worth considering the vegetation balance along the stream and possibly preserving certain patches of overhanging scrub particularly where previously heavily shaded river corridors have been cleared and opened up.

Further Reading

Broadmeadow M. (2002) **Bulletin 125 : Climate Change: Impacts on UK Forests.** Forestry Commission

Broadmeadow M. & Ray D. (2005) **Information Note – Climate Change and British Woodland.** Forestry Commission

Harrison, P.A. et al (2001) **Climate Change and Nature Conservation in Britain and Ireland: Modelling natural resource responses to climate change (the MONARCH project).** UKCIP Technical Report, Oxford

Hulme, M. et al (2002) **Climate Change Scenarios for the United Kingdom: The UKCIP02 Scientific Report**, Tyndall Centre for Climatic Change Research, School of Environmental Sciences, University of East Anglia, UK

www.climatesoutheast.org.uk

3.3 GEOLOGY, GEOMORPHOLOGY & SOILS

3.3.1 Geological History

The New Forest lies in the centre of a chalk syncline known as the Hampshire Basin. The majority of rocks are sedimentary, comprising soft clays and sands laid down during the Tertiary Period (60-40 million years ago) which give rise to the largely free-draining acidic soils of the New Forest. The rocks tilt gently southwards at an angle of 1o – 2o with the oldest exposed in the north and the youngest in the south. Some of the earliest deposits can be found in the basins of Cadnam and Hampshire Avon tributaries. Southward there are sequential exposures of Bagshot Sands, Bracklesham Beds, Barton Sands and Barton Clays. The key geological characteristics of these deposits are summarised in Table 3-4 and their distribution shown in more detail in Figure 4.

Tertiary deposits were laid down during the Eocene and Oligocene Epochs by shallow inshore seas, in deltas, estuaries and lagoons on the eastern and southern margins of a low-lying hinterland. At times the sea level rose to cover the whole area but only for short periods. During the Eocene the climate was that of tropical low lands such as those found in south–east Asia today. By Oligocene times a marked cooling had set in and the flora indicates subtropical swamp conditions like those of present day Florida.

During the Quaternary period the Tertiary deposits were overlain by superficial sheets of gravel and brickearth laid down by the extensive Solent River system. A distinctive feature of the Quaternary gravels is their angular flints. The Solent River system may have developed back in the Anglian Glaciation 450,000 years ago, but would have been disrupted during sea-level rise during inter-glacial periods. The climate varied greatly during this time with successive glacial and interglacial period with tundra conditions prevailing for much of the time. Large amounts of gravel would have been washed from more upland areas following snowmelt each year. Though much eroded, particularly in the north, extensive remnants of the gravel and Brickearth deposited by ancient river systems still survive as flat terraces. On the terraces below 80m there are extensive deposits of Brickearth up to 3m deep resting on top of gravel or infilling ancient drainage channels.

Rising sea levels over the last 10,000 years caused the river valleys to become drowned and infilled by fluvial deposited sands and gravels. More recent deposits of alluvium and peat can be found in the valleys and floodplains of the modern day river system.

Seven sites of special geological or physiographic interest are designated within the New Forest SSSI as highlighted in Table 3-5.