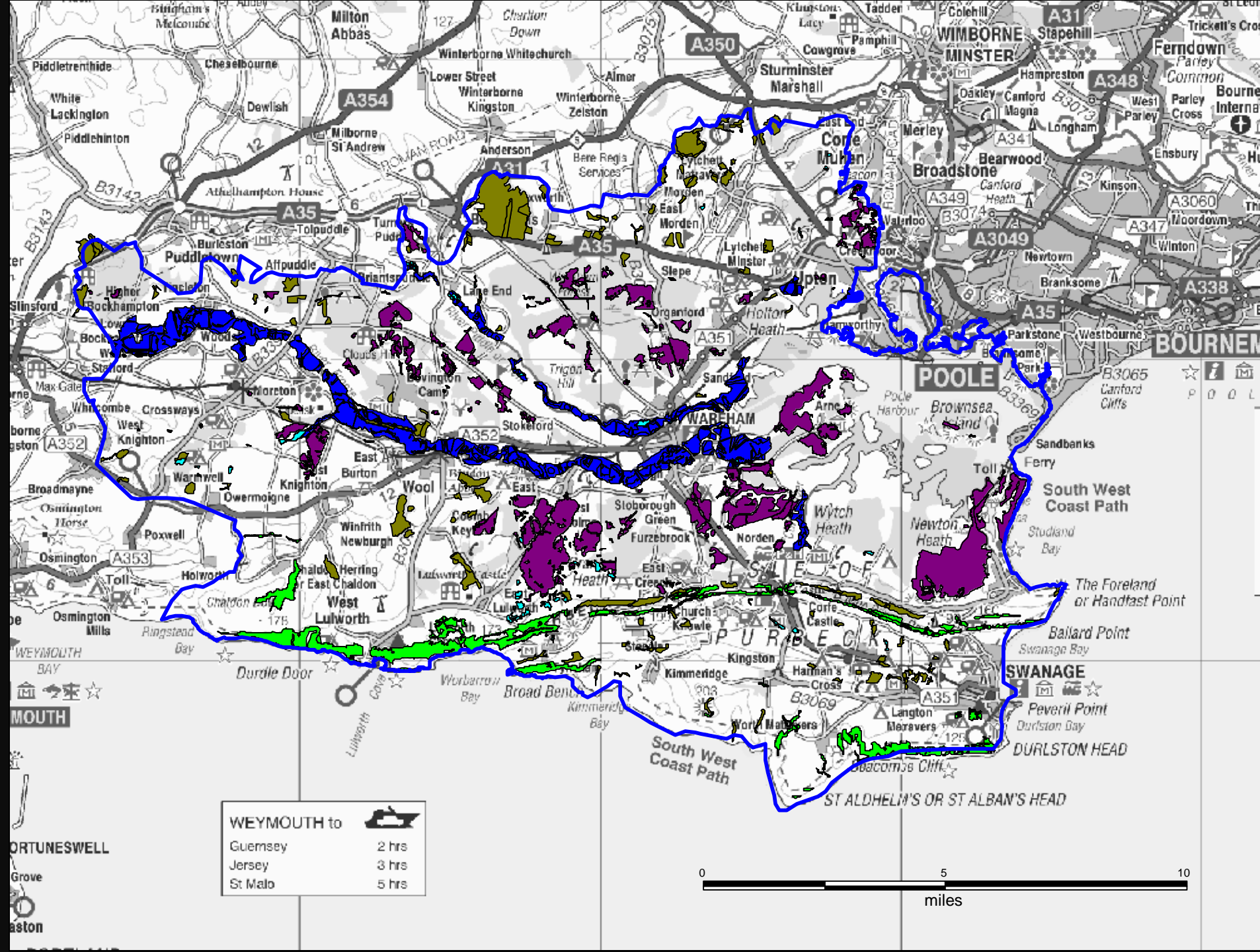




CLIMATE CHANGE ADAPTATION





Wild Purbeck

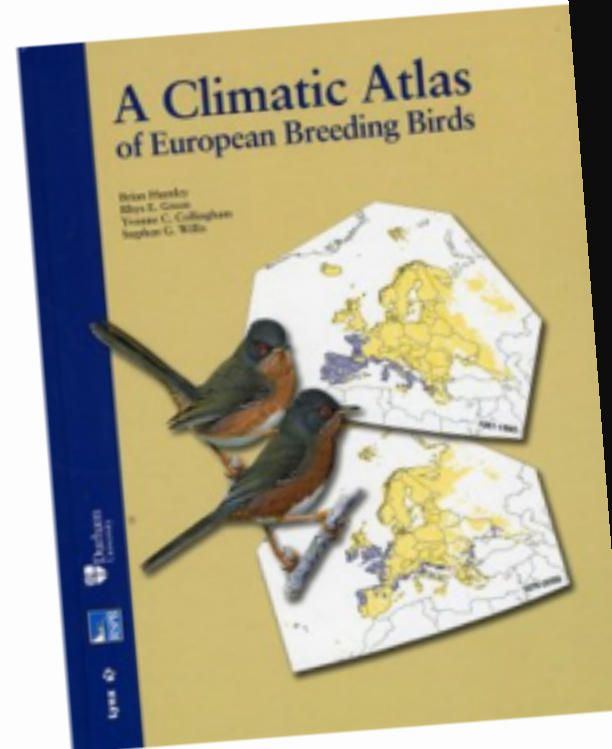
NIA Themes



- Land management & advisory services
- Community at the heart
- Building resilience
- Green economy

Predicted shifts in climate envelopes of birds

- **Average north-easterly shift of European bird species of nearly 550 km** (based on a 3°C rise in global temperatures above those of pre-industrial times (Huntley *et al.* 2007),
- **Average north-easterly shift in wintering waders (and presumably also other waterfowl)** (Maclean *et al.*, 2008)



climate

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2008)

From Google images

But...

- Some species will not necessarily be lost
- Existing areas of semi-natural habitat will always remain important for biodiversity
- There is such enormous uncertainty that it would be irresponsible to prematurely 'give up' on particular species



NIA Climate Change Adaptation Project



Focus on building resilience in the landscape

- Land use systems
 - Arable
 - Grassland
- Habitats
 - Heathland
 - Wetland
 - Woodland

Building Resilience to Climate Change on Arable Land

CLIMATE CHANGE IMPACTS ON ARABLE LAND IN WILD PURBECK

Climate change is likely to present challenges to arable farms in terms of yields but also opportunities to adapt in the form of new crops which may become more suitable. Arable farmers need to adapt to current climate change effects to maintain their business and take predictions of likely changes into account to plan ahead and thereby ensure the farm is resilient in the future.

Arable land covers 10% of the land area in Wild Purbeck and the majority is located towards the coast and at the western end of the area. Cropping includes winter and spring cereals, oil seed rape, and increasing areas of maize production. Climate change will likely impact on cropping with the probability of drier summers and wetter, milder winters as well as the risk of more extremes such as high winds, torrential rainstorms and extended periods of drought. This will affect crop establishment, yields, disease risk, and quality, soil moisture, working days, and increase the risk of soil management problems.

As a result farmers will need to consider rotations, crop choice and crop varieties. The key to farms successfully adapting to the effects of climate change is soil



management. This should aim to build the soils inherent resilience to changing weather patterns and extremes. A well-structured soil, rich in micro-organisms and invertebrates, will allow rainfall to infiltrate and hold on to the water, enabling it to cope better in wet winters. Therefore more water will be available to the growing crops in dry spells and roots will be able to reach deeper in the soil to access moisture. There are a range of tools to help achieve this including cultivation techniques, building soil organic matter, winter cover crops, and planting hedgerows along fence lines or use of in-field grass barriers to break up slopes and provide reservoirs of beneficial wildlife.

Climate Change Predictions

The UK Climate Projections 2009 (UKCP09) for South West England provide an overview of how Wild Purbeck's climate is expected to change in future. UKCP09 was produced in 2009 and provides a comprehensive set of future climate for the UK. See <http://www.metoffice.gov.uk/ukcp09/>

human activities does not dramatically increase or decrease over the next 100 years.

Date	2020	2050	2080
Increase in mean winter temp	1.3°C	2.1°C	2.8°C
Increase in mean summer temp	1.8°C	2.7°C	3.9°C
Change in mean winter rainfall	+7%	+17%	+23%
	-8%	-20%	-28%

How you can help farmland wildlife adapt to climate change on arable land

It is not just cropping that is potentially affected by climate change. Farmland species dependant on arable farmland will also be challenged by changing weather patterns and temperatures. Ensuring a distribution of habitat across arable farmland will help wildlife move through the landscape, as well as providing nesting sites and foraging habitat.

- Cut some hedges on a rotation, or leave hedge junctions free-growing to provide increased nesting and over-wintering opportunities plus a rich source of nectar, pollen, berries and nuts
- Leave field margins and grassy field corners uncult 1 year in 2 to provide tussocky over-wintering sites for insects
- Add wildflowers or nectar-flower mixes to margins and field corners to boost pollen and nectar sources
- Sow small-seeded crops in wild bird and game mixes to feed birds in winter
- Encourage weed growth in stubbles or sow green manures over-winter to provide cover in otherwise bare fields
- Conservation headlands (strips kept free from fertilizer and pesticides) provide weed and insect-rich habitat and are excellent for farmland birds such as grey partridge



Building Resilience on Arable Land

CLIMATE CHANGE IM LAND IN WILD PURBECK

Climate change is likely to present challenges to arable farms in terms of yields but also opportunities to become more suitable. Arable farmers need to adapt to current climate change effects to maintain their business, and take predictions of climate changes into account to plan ahead and thereby ensure the farm is resilient in the future.

Arable land covers 10% of Wild Purbeck and the majority is towards the coast and at the end of the area. Cropping and increasing areas of maize and spring cereals, oil seed rape and winter wheat will like climate change with the proliferation of wetter summers and drier autumns. As a result of more frequent extreme weather events, crop rotations, crop management and the key to farm to the effects.

Climate

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Building Resilience to Climate Change on Grassland

CLIMATE CHANGE IMPACTS ON GRASSLAND IN WILD PURBECK

Climate change is likely to affect the management of grassland farms, with a longer growing season producing a greater volume of grass over the course of the year, but with a higher risk of grass burning off in summer and reduced grazing days in autumn and spring due to wetter weather. Livestock farmers need to adapt to current climate change effects to maintain their business, and take predictions of climate changes into account to plan ahead and thereby ensure the farm is resilient in the future.

Grassland makes up 40% of land use in Wild Purbeck. The unimproved chalk grasslands of the Purbeck Ridge and south Dorset coast dominate the landscape in these parts, and there are also smaller neutral, acid and limestone grasslands and floodplain meadows reflecting the varied geology of the area. Some of these will be designated areas of conservation interest and may require their own bespoke adaptation management. The Corfe valley and low-lying River Frome valley provide productive grasslands that could be affected by changes in weather patterns and will be vulnerable to drought and prolonged flooding.

Livestock will be affected, as well as



the grass that they eat. Heat stress affects cattle in summer and warm conditions in winter can increase the occurrence of pneumonia and other illnesses in housed livestock. Liver fluke and red water could increase as a result of wetter conditions and warmer conditions respectively.

As a result farmers need to consider livestock management, forage production, use of inputs, and species composition of leys to make the most of their grassland and care for livestock.

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Change in mean winter rainfall	+7%	+17%	+23%
Change in mean summer rainfall	6%	-28%	-24%

Building resilience to climate change on semi-natural grasslands

Species-rich grasslands are one of the more resilient habitats, however changes in soil moisture in particular will affect species composition. Deep-rooting species are better adapted to finding water in dry grasslands such as those found on the Purbeck Ridge and hills. In wetter locations such as the valleys, grasses will be better able to out-compete broad-leaved species. Wet sites will also be vulnerable to poaching and compaction.

- Maintain existing species-rich grasslands by adapting grazing in response to grass growth to avoid over or under grazing
- Increase the variety of management regimes in response to seasonal conditions, e.g. graze hay meadows before letting the grass up for cutting if there is a lot of grass in spring, vary cutting dates, or aftermath graze if there is a lot of autumn grass growth.
- Create new areas of species-rich grassland to extend and link up existing areas.
- Small areas of scrub can be beneficial to provide shade for livestock and wildlife.



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Climate change is a management of grass for longer growing season, volume of grass or year, but with a high off in summer and autumn and spring. Livestock farmers, climate change a business, and to changes into a thereby ensure future.

Grassland in Wild Purbeck
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geology of the
designated area
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and low-lying
productive grass
affected by
and will be
prolonged by
livestock

Climat

The UK Climate Projections for South East England is expected to be produced by the Comprehensive Projected Climate Model. The table shows average temperature scenarios of gas change from the human



Conservation management of Purbeck's heathlands in the face of climate change



Dartford warbler, UK is likely to become more globally important for this species under climate change scenarios. Ben Hall (rspb-images.com).

A RICH HABITAT

Lowland Heathland is an extremely valuable and rare habitat, making the Dorset heathlands one of UK's most important wildlife areas – with much of it designated as Special Protection Areas or Special Areas of Conservation under European law. The total Heathland extent in Purbeck is around 5,607ha (7.84% of the NIA) of which around 1,365ha is wet Heathland. Within the Heathland complex there are important concentrations of other priority habitats including mires and fens, acid grassland, wood pasture and wet woodland. Valley mires are particularly well represented (around

3253ha) and together with the New Forest support the vast majority of remaining European habitat. Over the last 250 years 85% has been converted to agriculture, forestry or urban development but intensive conservation investment in the past 30 years has improved the status and quality of that which remains. A range of pressures continue to constrain the survival and future management of lowland Heathland areas including climate change and the impacts of this and other factors may not be readily separable.

LOWLAND HEATHLANDS – FIVE TOP 'NO REGRETS' ACTIONS

#1

Ensure that responding to climate change is well integrated into site management plans with the emphasis on monitoring change and flexible response

#2

Bigger sites are more robust – seek to attain larger sites, in the best possible condition and restored and linked up wherever possible

#3

Wet heaths are most vulnerable to changes in water availability – focus on reducing water loss and having the ability to respond to drought events

#4

Ensure good up to date fire management plans are in place which take a landscape scale approach.

#5

Build public support for any changes that you need to make and engage people in monitoring the impact of and response to climate change



Wild Purbeck

NATURE IMPROVEMENT AREA

Building Resilience on Arable Land

CLIMATE CHANGE IMPACTS ON LAND IN WILD PURBECK

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Arable land covers 10% of the land in Wild Purbeck and the majority of the area. Cropping towards the coast and at the end of spring cereals, oil seed rape and increasing areas of maize. Climate change will likely increase the risk of more frequent and wetter summers and drier autumns and extended periods of high winds, torrential rain and extended periods of drought. This will affect crop establishment, disease risk, and working days, and management practices.

As a result of these changes, crop yields are likely to fall. The key to farm resilience is to adapt to the effects of climate change.

Climate Change

The UK Climate Change Act for South of England is expected to be implemented by 2015. It was produced by the Department of the Environment, Food and Rural Affairs (Defra) and the Met Office.

Purbeck

NATURE IMPROVEMENT AREA

Building Resilience on Grassland

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Purbeck

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Conservation of wetlands in the face of climate change



Dartford wetlands showing the impact of climate change.

A RICH

Lowland heathland is a valuable and important part of the landscape in Dorset. It is designated as a Site of Special Scientific Interest (SSSI) and is also a European Special Area of Conservation (SAC). The heathland in Purbeck is part of the NIA and is managed to conserve its biodiversity.

Conservation management of Purbeck's wetlands in the face of climate change

FRESHWATER AND INTERTIDAL WETLANDS IN PURBECK

Freshwater and coastal wetlands cover a relatively small part of Purbeck but have a disproportionately high wildlife value, holding many scarce species. Wetlands occur mainly along the two chalk rivers of the Frome and Piddle, and on the margins of Poole Harbour. The internationally important wet heathland and acid mire habitats are considered within a separate Lowland Heathland guidance note. The majority of the reedbed (c 157ha or 0.56% of Purbeck) and saltmarsh (364ha or 0.79% of Purbeck) form part of a continuous transition from dry habitats to the open water of Poole Harbour itself, much of which is recognised as of international importance both for its

habitats and for numbers of wetland waders and wildfowl. Smaller areas of wet grassland are important for remnant populations of breeding waders and for rivers have highly modified floodplains (in total), wet grassland and woodland. The Frome is a Site of Special Scientific Interest for most of its length and holds populations of wildfowl during episodic flooding. The Piddle has been subject to extensive mineral operations over several decades and opportunities now exist to substantially enhance the nature conservation value of the area during restoration phases.

Purbeck

Wild NATURE IMPROVEMENT AREA



French's Farm: showing how a wet grassland site has been transformed by tidal inundation due to a breach in the sea wall. By kind permission of Tormod Adnansen, Biotopie (birding architects).

WETLANDS – FIVE TOP 'NO REGRETS' ACTIONS

#1

Ensure that responding to climate change is well integrated into site management plans with the emphasis on monitoring change and flexible response

#2

Bigger sites are more robust – seek to attain larger sites, in the best possible condition and restored and linked up wherever possible

#3

Water management will become increasingly critical – the ability to respond to either drought or excess water and to understand the long term needs of the site

#4

Restore natural wetland features where compatible with other land uses

#5

Build public support for any changes that you need to make and engage people in monitoring the impact of and response to climate change

Building Resilience on Arable Land CLIMATE CHANGE IMPACTS LAND IN WILD PURBECK

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Climate

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Conservation of heathlands in Wild Purbeck



Dartford warbler in Wild Purbeck

A RICH

Lowland heathlands are a valuable and important part of the Purbeck landscape. They are home to a wide range of rare and unusual plants and animals, and are also important for the local economy. The Purbeck heathlands are a valuable and important part of the Purbeck landscape. They are home to a wide range of rare and unusual plants and animals, and are also important for the local economy.



French's Farm: a flooded area due to Blotop (bird)

Conservation of wetlands in Wild Purbeck

FRESHWATER

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Conservation management of Purbeck's woodlands in the face of climate change WOODLAND HABITATS IN PURBECK

Purbeck remains quite a well wooded area, despite its high proportion of other important habitats. Around 22% of the land is wooded, predominantly coniferous woodland (59%), broadleaved woodland (7%) and scrub (4%). Wet woodland and wood pasture – both extremely valuable wildlife habitats – make up just 0.5% (128ha) and less than 0.1% (26ha) respectively. Most of these habitats are well protected from direct loss and damage, although there is a trend for some of the extensive areas of coniferous woodland to be restored to their original

heathland and other open habitats of high conservation value. There is an aspiration to compensate for these losses by creating new woodland of high economic, conservation and amenity value elsewhere. In common with most parts of the UK, there is a challenge to ensure that woodlands are better managed – a large proportion remaining under managed resulting in closed canopy and reduced light levels to the detriment of ground flora and associated invertebrates and their predators.



Marsh tit, a declining woodland species that benefits from actively managed deciduous woodland with a rich shrub layer. Ben Hall (rspb-images.com).

WOODLANDS – FIVE TOP 'NO REGRETS' ACTIONS

#1

Reduce the impacts of other pressures, such as pests and diseases, pollutants, over-grazing by deer and development.

#2

Increase the age structure and structural heterogeneity of woodland, and encourage continuous cover forestry rather than large scale clear felling where appropriate – this should reduce wind blow and soil carbon losses while maintaining higher humidity levels.

#3

Undertake contingency planning for the likelihood of increased frequency and severity of wildfires (including in new woodland).

#4

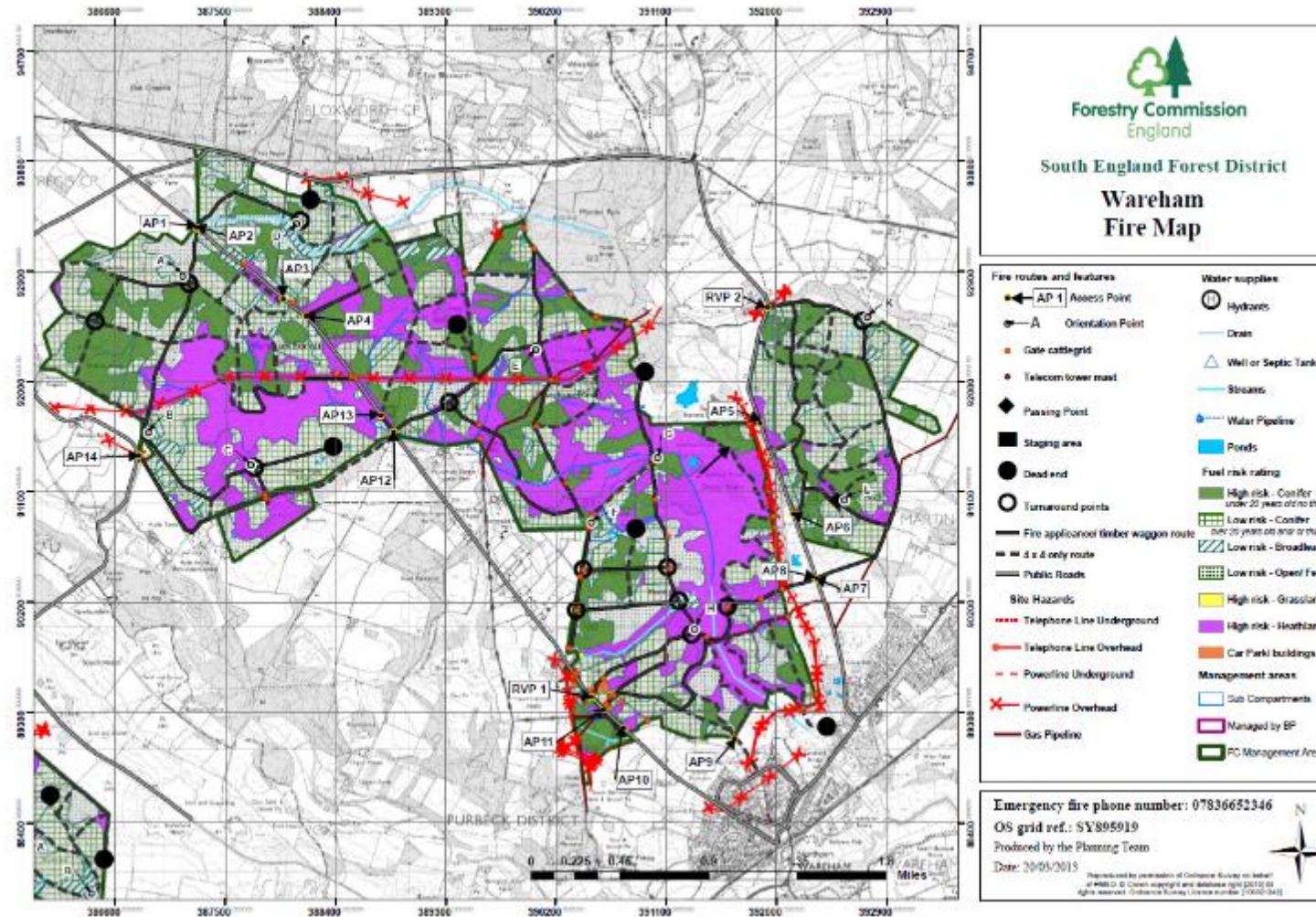
Increase the size and connectivity of small woods and reduce edge effects. This will increase the wildlife value and help reduce water loss and other external effects.

#5

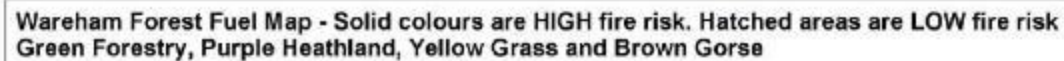
Where possible, identify opportunities to restore or create wet woodland and other habitats as part of flood management schemes within river floodplains or new green infrastructure.

NIA Fire Management Planning Project

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County Council

