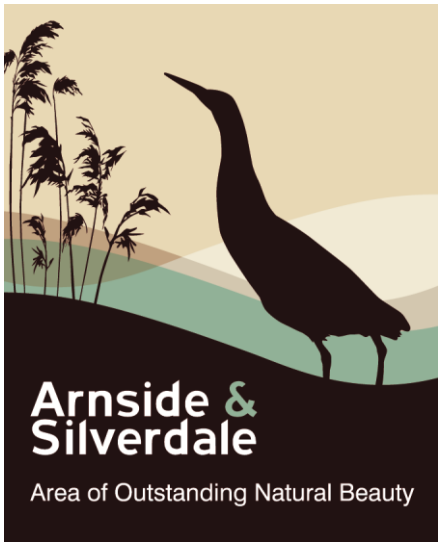


Arnside & Silverdale
Area of Outstanding Natural Beauty

State of the AONB Report: 2019

Prepared by Arnside & Silverdale AONB Partnership

Contents

1 Introduction

1.1 Background

The State of the AONB Report has drawn upon all available data sources to produce an evidence base to underpin the new Arnside & Silverdale AONB Management Plan, 2019–24. The agreed indicators provide a snapshot view of the area and provide a baseline for future AONB condition monitoring.

Where possible, trends since publication of the previous Arnside & Silverdale AONB Management Plan 2014-19, have been analysed and reasons explored. The Arnside & Silverdale AONB State of the AONB Research and Report Projects: Habitats, Species and Biodiversity (2012) and Historic Environment (2013), and the Environment Report (2014) provided evidence to support the 2014-19 Management Plan and comparisons have been made between the new data and data presented in these reports.

1.2 Indicators

In preparation of the State of the AONB Report, the indicators included in the 2014 Environment Report and the AONB Management Plan 2014-19 were reviewed and potential new indicators identified. The availability of new data and its potential usefulness to inform the current picture of the AONB condition was taken into account and also consideration of the range of natural capital within the AONB and understanding the state of the natural capital assets and ecosystem services.

In section 5 there are a number of recommendations made for additional indicators.

A summary of the indicators and current data are set out in Section 6.

2 An outstanding landscape, rich in natural and cultural heritage

2.1 Landscape and Seascape

2.1.1 Landscape characterisation/quality

Background

The landscape and seascape character assessment (LSCA) of the Arnside & Silverdale AONB was published in 2015[1]. The LSCA identified 6 landscape character types within the AONB – See Figure 1.

The assessment identifies and describes the key elements and qualities that make up the distinctive landscape character and seascape of the AONB and classifies its distinctive character types and areas. The assessment also identifies the inherent sensitivity of the AONB's landscape and seascape character and sets out guidelines for future management of each of the landscape character types.

The Landscape and Seascape Character Types are divided into the following:

- **Seascape:** The AONB seascapes combine extensive areas of Morecambe Bay with the River Kent and the River Keer estuaries. The dynamic and changing coastline includes mud and sand, and saltmarshes, bounded in places by shingle bays, rising to low cliffs with caves. The Seascape Character Types are:
  - Seascape Character Type A: **Intertidal Flats**
  - Seascape Character Type B: **Bay Saltmarshes and Lagoons**
- **Transitional and lowland landscapes:** The lowland landscapes of the AONB comprise a diversity of low mosses and wetland landscapes contrasting with enclosed limestone pastures and areas of historic parkland. The Transitional and lowland Landscape Character Types are:
  - Landscape Character Type C: **Lowland Moss**
  - Landscape Character Type D: **Coastal Limestone Pasture**
  - Landscape Character Type E: **Inland Pasture and Parkland**

[1] Arnside & Silverdale Area of Outstanding Natural Beauty Landscape and Seascape Character. Prepared by Arnside & Silverdale AONB Partnership and Land Use Consultants in conjunction with Lancashire County Council, Lancaster City Council, South Lakeland District Council, Cumbria County Council and Natural England, 2015.

- **Wooded limestone hills:** Wooded limestone hills and pavements rise above the lowland landscapes. Inland woodlands are rich and verdant, characterised by the highly distinctive flat bedding planes of the limestone pavements amongst which many of them grow. The Wooded limestone hills Landscape Character Type is:
  - Landscape Character Type F: **Wooded Limestone Hills and Pavements**
- Landscape character types forming the setting of the AONB: The setting of the AONB includes those areas from where the AONB can be seen ie. when looking towards the AONB, and areas which are seen from the AONB, when looking out from within its boundaries. The landscape character types forming the setting of the AONB are:
  - Landscape Character Type G: Drumlin Farmland
  - Landscape Character Type H: Low Coastal Drumlins
  - Landscape Character Type I: Lowland Valley and Coastal Margins

Based on the National Character Areas (England), the majority of the Arnside & Silverdale AONB is within the Morecambe Bay Limestones National Character Area (NCA 20). A sliver of the southern end of the AONB around the River Keer estuary and floodplain falls within the Morecambe Bay Coast and Lune Estuary National Character Area (NCA 31), which also covers the low lying coastal area bordering east Morecambe Bay.

Current status

Indicator: Landscape character type condition

The condition of the landscape character types within the Arnside & Silverdale AONB are:
Good: 3
Intertidal Flats
Bay Saltmarshes and Lagoons
Inland Pasture and Parkland
Moderate to Good: 3
Lowland Moss
Coastal limestone Pasture
Wooded Limestone Hills and Pavements

Source: Arnside & Silverdale Area of Outstanding Natural Beauty Landscape and Seascape Character Assessment, 2015

Indicator: NCA Landscape Change Database

Overall landscape effects of Environmental Stewardship until 2013 for:	
Morecambe Bay Limestones NCA	**Positive**[2]
Morecambe Coast and Lune Estuary NCA	**Neutral**

Source: NE, 2013

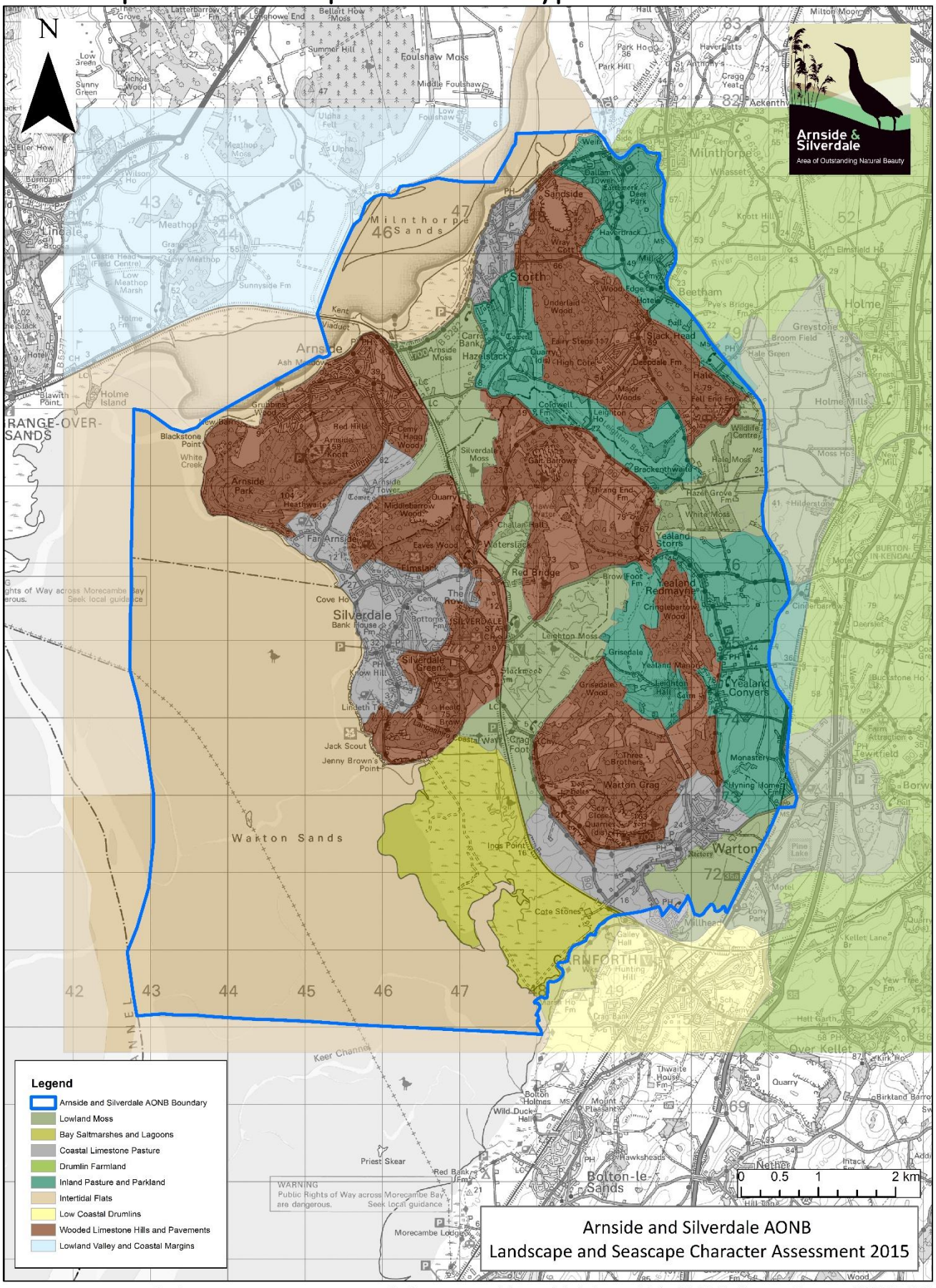
Interpretation

The landscape and seascape character in the AONB, as described in the Arnside & Silverdale AONB LSCA, has a high or very high level of inherent sensitivity with limited or very limited overall capacity to accommodate change. The landscape and seascape condition is **good** or **moderate to good**. There is some evidence, however, of disrepair in the field boundary walls and there are some gappy, overgrown and neglected hedges. Some have been lost, poorly or inappropriately maintained or, grubbed up and replaced by fencing. There is also loss or disrepair of parkland features and lime kilns and some loss of species rich limestone pasture. There are some unmanaged woodland areas and also remnant coppiced areas which have not been managed for this form of timber production for many years. Also, there is some loss of species rich hay meadows resulting from intensification of agriculture, drainage and flood alleviation schemes.

[2] This is based on assessment of ES only

Figure 1

Landscape and Seascape Character Types



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The 'Countryside Quality Counts' (CQC) project, sponsored by Natural England in partnership with Defra and English Heritage, measured landscape change within the NCAs by assessing change in landscape character for two periods: 1990-1998 and 1999-2003. The project used England's NCAs as the geographical framework for reporting and assessing both the magnitude and the direction of landscape change for each NCA, using four categories: maintained, enhancing, neglected, diverging.

Details of the Morecambe Bay Limestones NCA 1999-2003 results are set out in Appendix 1. The overall assessment, 1999-2003, was that '**development pressures are transforming the rural character of the area in some localities, but other elements of character such as agriculture, semi-natural and woodland cover are stable or enhancing**'.

The CQC results indicated that between 1990 and 1998 within the NCA there was some change inconsistent with the countryside character but between 1999 and 2003, the character was generally maintained. It is important to note, however, that the AONB formed only a part of NCA 20 and that the results given may not have reflected accurately the situation within the AONB.

The NCA profiles were revised by Natural England in 2014.

Natural England are currently developing an NCA landscape change database. A set of landscape (character) change indicators for the NCAs have been prepared based upon an analysis of the Statements of Environmental Opportunity that had similar objectives. A range of 6 or 7 themes (e.g. semi-natural habitat, development and settlement patterns, agricultural land use, water/rivers, woodland etc.), similar to those used in the CQC, are proposed.

A discrete element of the NCA landscape change database is the monitoring of the impacts of environmental stewardship (ES) on landscape character and quality. Across all agreements, ES options are assessed for their impact on landscape character and quality – this is achieved through both data analysis and rapid landscape surveys across 100s of 1km survey squares (a number of these squares fall within the AONB). A threshold has been identified for each option (ie. for its contribution to maintaining landscape character), that has allowed NE to make a judgment as to whether ES is having a 'strongly positive, 'positive' or 'neutral' effect on landscape character and quality. A more comprehensive judgement on whether changes in the character and quality of landscape across NCAs are deemed 'strongly positive', 'positive' or 'neutral', including other data/indicators is currently being explored.

The current judgement on uptake of ES until 2013 for NCA 20: Morecambe Bay Limestones overall is '**Positive**'. This is based on assessment of ES only at this point. Currently NE is updating the assessment and judgement for 2013-2018 ES data and should have results later in 2019. Details of the 2013 assessment are provided in Appendix 1.

2.1.2 Farmed landscape

Background

Farming has been a principal influence on the development of the AONB landscape. 56% of the AONB area was registered as agricultural land in 2016 (Defra, June agricultural survey).

Agri-environment schemes are voluntary schemes which give an annual payment to farmers and landowners to ensure they manage their land in an environmentally sensitive way and supports biodiversity, enhances the landscape, protects and enhances historic and archaeological features and improves the quality of water, air and soil. Climate change is an over-arching priority.

The Environmental Stewardship Scheme (ESS) was launched in March 2005 to build upon the Environmentally Sensitive Areas (ESA) Scheme, the Countryside Stewardship (CS) Scheme and the Organic Farming Scheme (OFS). There are two levels of Environmental Stewardship Schemes: Entry level (rewards straight forward environmental management) and Higher level (rewards much higher standards of environmental management). The individual agreements each have a lifetime span of ten years. ES closed in 2014 and has been replaced from 2016 by Countryside Stewardship.

Countryside Stewardship (CS) provides financial incentives for land managers to look after their environment through activities such as:

- conserving and restoring wildlife habitats
- flood risk management
- woodland creation and management
- reducing widespread water pollution from agriculture
- keeping the character of the countryside
- preserving features important to the history of the rural landscape
- encouraging educational access

There are two elements of CS: Mid Tier which offers options and capital items to achieve simple but effective environmental benefit (not for woodland or educational access) and Higher Tier which covers the most environmentally significant sites, commons and woodlands.

ES and CS data is the best nationally available information relating to the management of the wide range of landscape features and elements. Bringing these under management can contribute to their good condition and to an area's landscape character, which are both indicators of natural beauty.

Work is being carried out nationally on the design for a successor agri-environment approach after Britain's exit from the European Union. The key drivers behind this are expected to be priority policy objectives contained in the Defra 25 year Environment Plan.

Current status

Indicator: Number of agri-environment agreements

In 2018:
19 Environmental Stewardship agreements were live, and of these 1 was at Higher Level
5 Countryside Stewardship agreements were live
In total, **24** agri-environment agreements

Indicator: Area managed under agri-environment agreements

In 2018:
1,196 ha within the AONB was in Environmental Stewardship, including 25% at Higher Level
118 ha was in Countryside Stewardship, including 96% at High Tier
In total **1,314 ha** within the AONB was in agri-environment agreements

Indicator: The uptake of themed groups of ES options that contribute to conserving and enhancing landscape character

In 2018:
Area of land under ES specifically for the management and protection of archaeological features was **14.4 ha**
Number of hedgerow trees and in-field trees managed under ES was **304**
Area of woodland managed and created under ES was **30 ha**
Area of low input grassland managed, restored or created under ES was **272 ha**

Indicator: Land use within the agricultural setting

In 2016:
80% of the farmed land was grassland
11% was woodland

5% was crops and bare fallow

Source: Defra Agricultural Survey, 2016

Indicator: Livestock numbers

In 2016 livestock numbers within the AONB were:
2,570 cattle (257 beef herd, 621 dairy herd)
12,047 sheep
10,580 poultry
62 horses

Source: Defra Agricultural Survey, 2016

Interpretation

Agricultural land in the Arnside & Silverdale AONB comprises 4,275 ha (2016 Defra June Agricultural Survey, see Appendix 2), around 56% of the AONB. The main land use, 80%, is Grassland (permanent, temporary and rough grazing. Woodland accounts for a further 11% of the agricultural land and 5% is crops and bare fallow.
The figures from the annual Defra surveys indicate that since 2010 the total farmed area in the AONB has increased by 38%, from 3,105 ha to 4,275 ha. The agricultural land use within the AONB has changed over recent years with 80% of the farmland being used for grazing in 2016 compared with 90% in 2013. Woodland has increased over this period from 6 to 11% and also crops and bare fallow from 3 to 5%.

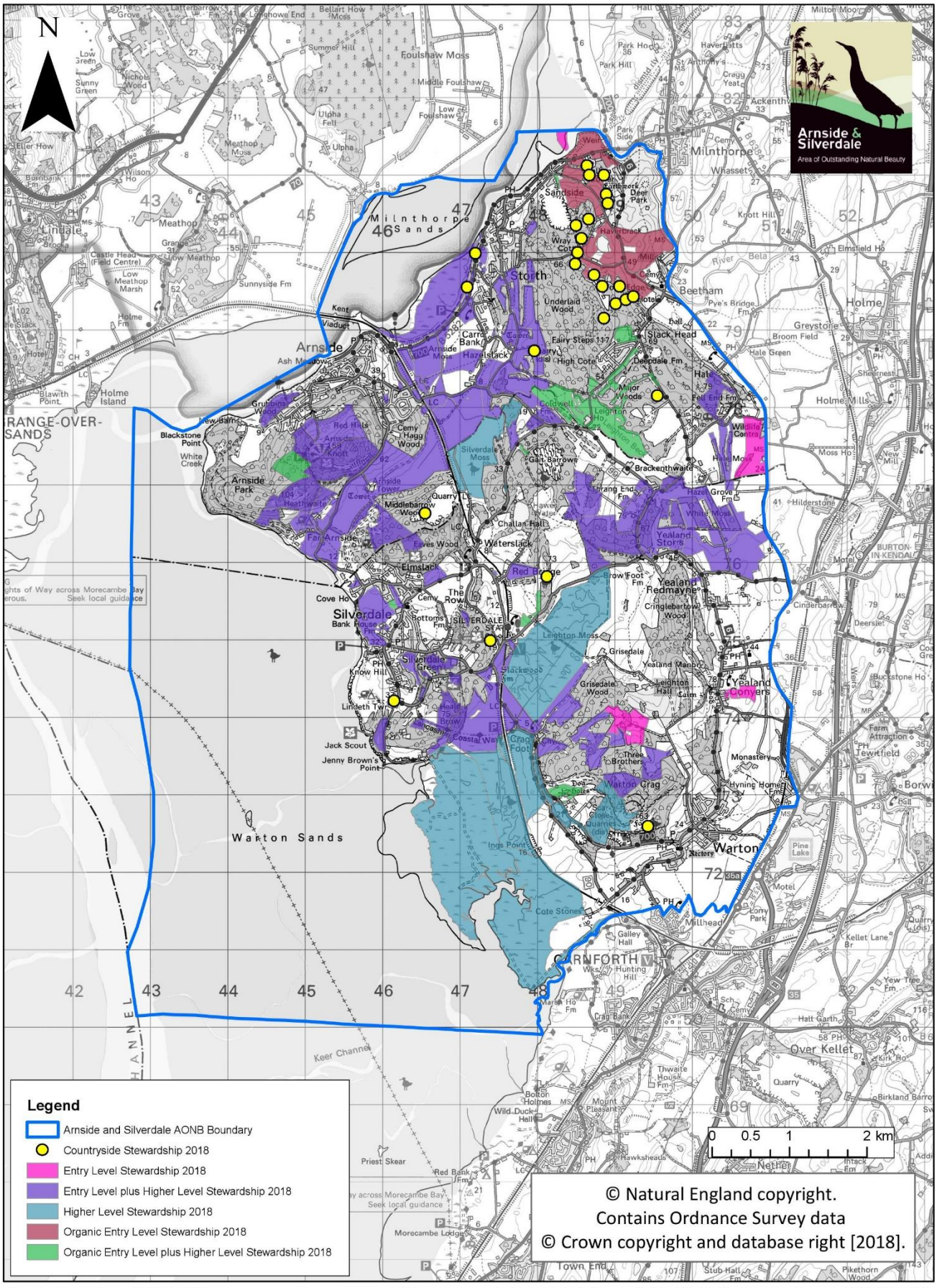
Grazing livestock (beef and dairy cattle and sheep) is the predominant farm type within the AONB. Sheep are the main grazing livestock type (82% of stock) although cattle (both dairy and beef) make up around 18%. The number of cattle and sheep within the AONB have varied over the last 8 years (cattle increasing from 2,935 in 2010 to 3,231 in 2013 and decreasing to 2,570 in 2016 and the numbers of sheep varying from 12,157 to 13,116 to 12,047 respectively) with an overall decline of 12% and 1% respectively. The number of horses have declined from 82 in 2010 to 62 in 2016 and the poultry numbers have increased significantly from 296 in 2010 to 10,580 in 2016.

In a predominantly agricultural landscape like the Arnside & Silverdale area, agri-environment schemes have been the main tool for delivery of positive land management that contributes to conserving and enhancing landscape character. There is significant uptake of Environmental Stewardship and Countryside Stewardship within the AONB, with 24 live agreements in 2018 covering 1,314 ha, see Figure 2. However overall coverage has decreased over the last 5 years from 2,095ha and 33 agreements in 2013. This is because certain ES schemes within the AONB will have come to an end and Environmental Stewardship closed in 2014. Countryside Stewardship schemes were initially introduced in the AONB in 2017 and there are now five CS schemes within the AONB, including at Trowbarrow and Warton Crag.

Options within the AONB as part of Environmental Stewardship schemes have included, for example, management and protection of archaeological features and hedgerow trees and in-field trees and woodland managed and created, and low input grassland managed, restored or created. Management under ES has declined steadily over the last 5 years: in 2013, management and protection of archaeological features was 41.9 ha, and in 2018 is 14.4 ha; number of hedgerow trees and in-field trees managed under ES in 2013 was 336, and is 304 in 2018; area of woodland managed and created under ES was 90 ha and is now 30 ha; and area of low input grassland managed, restored or created under ES was 442 ha in 2013 and is 272 ha in 2018.

Figure 2

Environmental Stewardship and Countryside Stewardship Schemes within the AONB



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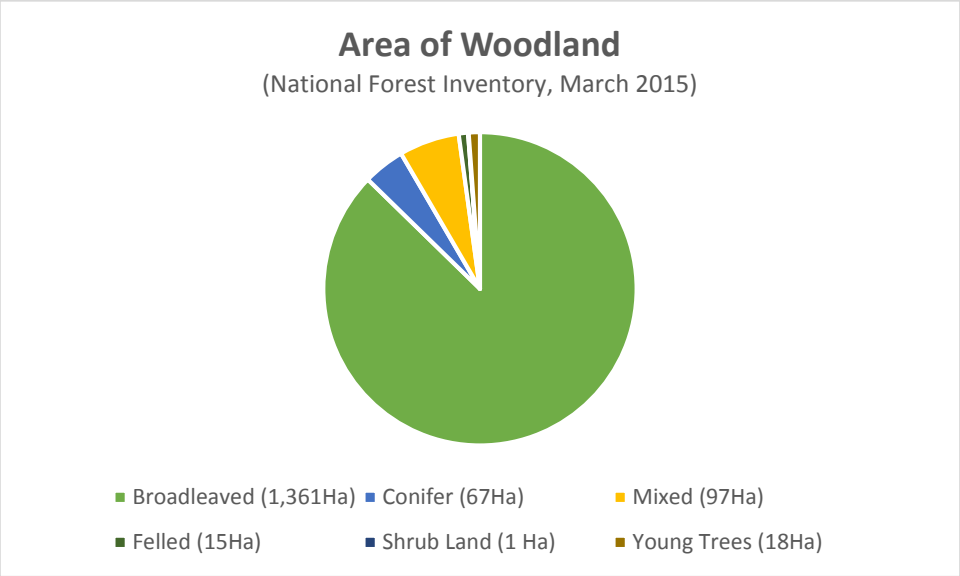
2.1.3 Woodland landscape

Background

Woodland is a key component of the AONB landscape and features strongly within the landscape character assessment. Woodland is often associated with the hills and pavements and covers about a third of the terrestrial AONB. 87% of the AONB woodland is broadleaved, 6% mixed woodland and 4% coniferous woodland – see pie chart and Figure 3 below.



Ancient Woodlands are an important feature within the AONB. They are woods that are present on maps dating back to 1600 in England and Wales, and are likely to be even older. Each ancient wood is unique; it has its own local soil, environment, wildlife and cultural history. For this reason ancient woodland is irreplaceable. There are two types of ancient woodland: Ancient Semi-Natural Woods (ASNW) - woods that have developed naturally; most ancient woods have been managed for timber and other products over centuries but have always had woodland cover, and Plantations on Ancient Woodland Sites (PAWS) - ancient woods that were felled and planted with non-native trees, often conifers. Figure 4 shows the areas of Ancient Woodland within the AONB.

English Woodland Grant Schemes (EWGS) have provided funding for sustainable woodland management, over 10 to 15 years. Figure 5 shows the EWGS present within the AONB, approved from 2005 to 2015, covering an area of 12,639ha. Countryside Stewardship has now replaced the English Woodland Grant Scheme.

Current status

Indicator: Area and % of AONB which is woodland

In 2015: The area of woodland in the AONB is **1,559 ha** covering around a **third** of the terrestrial AONB

Source: Forestry Commission copyright (2017), 2015 data

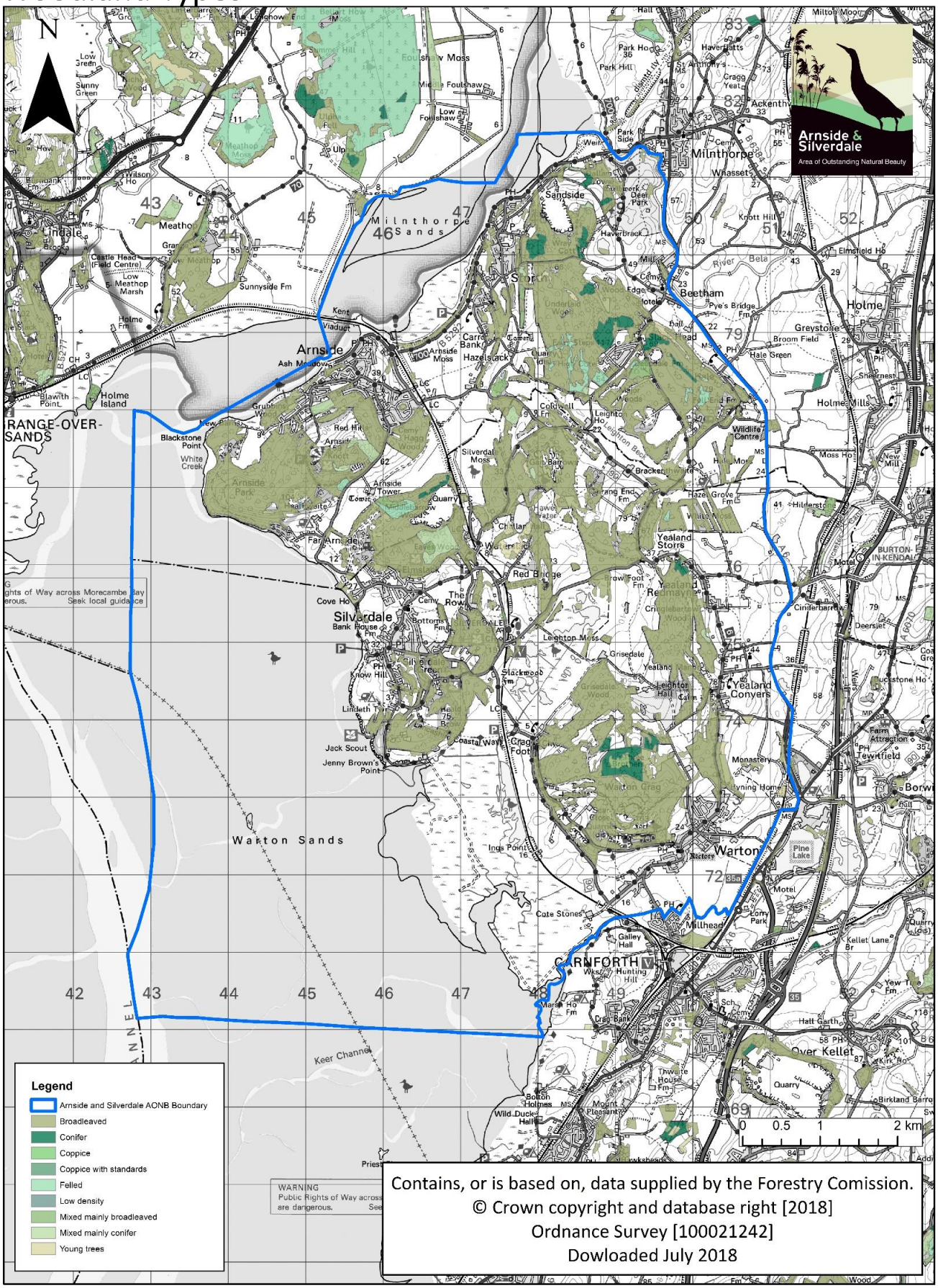
Indicator: Area and % of Ancient Woodland

In 2017: The area of Ancient Woodland in the AONB is **652 ha** Ancient & Semi-Natural Ancient Woodland (ASNW) – **488 ha** Plantations on Ancient Woodland sites (PAWS) – **164 ha**

Source: © Natural England copyright. Contains Ordnance Survey data © Crown copyright and database right 2017.

Figure 3

Woodland Types



Created by LCC on: 01/05/2019

Figure 4

Ancient Woodlands within the AONB

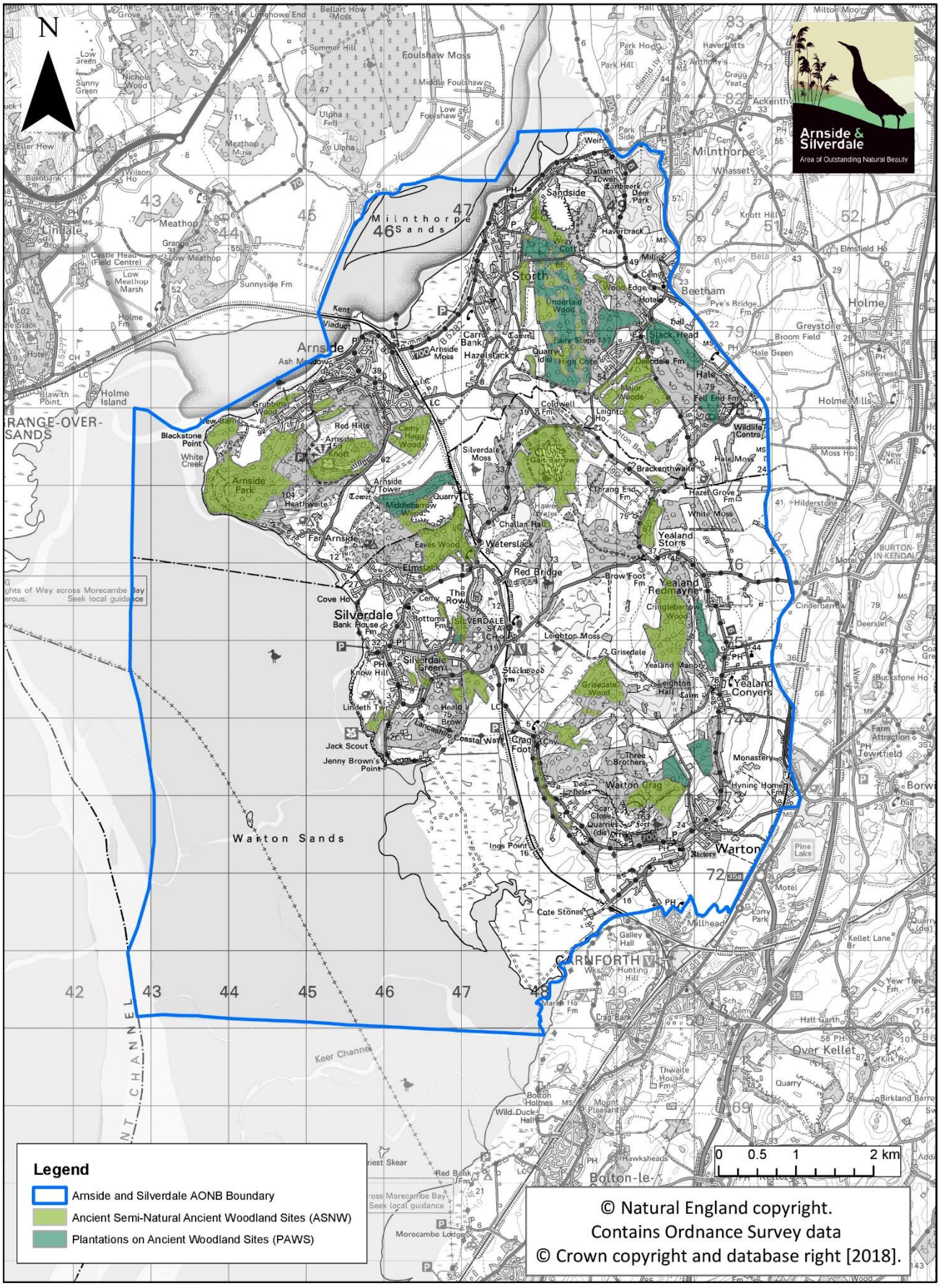


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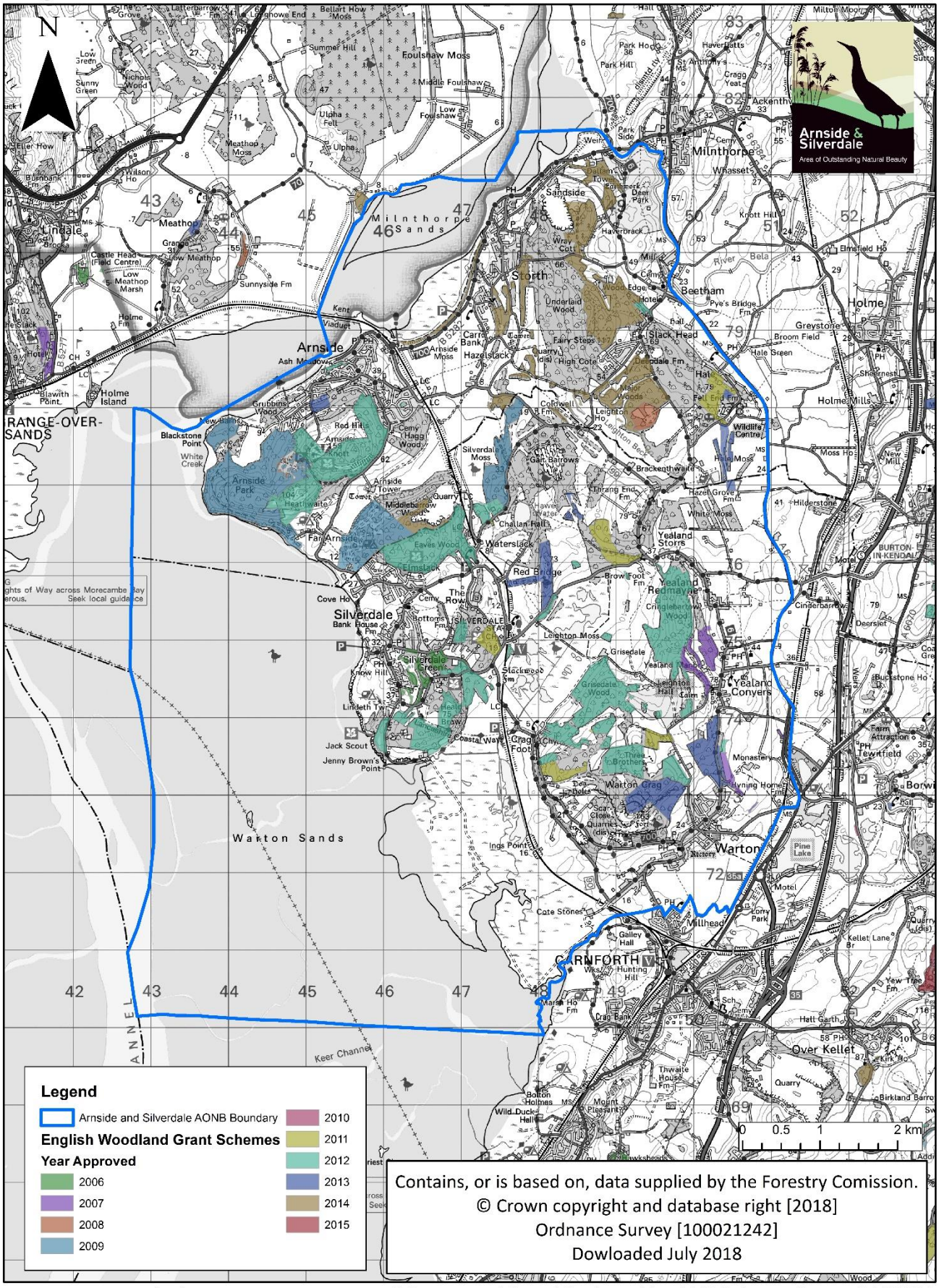
Figure 5

English Woodland Grant Schemes within the AONB (2005-2015)



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Indicator: Woodland in Active Management

In 2017: **73%** of woodland in the AONB is in positive management

Source: © Forestry Commission, 2017

Indicator: Number of ancient, veteran and notable trees

In 2018 in the Arnside & Silverdale AONB there are: **2** Ancient trees **110** Veteran trees **16** Notable trees

Source: Ancient tree inventory

Indicator: Area of Forestry Commission managed land

In 2018 in the Arnside & Silverdale AONB: Total area land managed by Forestry Commission - **221 ha**

Source: Forestry Commission

Interpretation

The area of woodland in the AONB is 1,559 ha, covering around a third of the terrestrial AONB. The percentage of woodland cover has remained fairly stable over recent years. Ancient woodland is very important in the area. There is 652 ha of Ancient Woodland in the AONB (around14% of the terrestrial AONB). 488 ha are Ancient and Semi Natural Woodland and 164 ha is replanted – Plantations on Ancient Woodland Sites (PAWS).

73% of the woodland in the AONB is in active management in 2017. This has increased significantly since 2013 (54% in positive management) as a result of the Nature Improvement Area project undertaken from 2013 to 2015.

Woodland management provides local timber and woodfuel products. Management of woodlands for amenity, recreation and wildlife value is also important. Silverdale District Woodbank is a community group that carries out woodland management work, producing wood fuel and aiming to help people in fuel poverty. There is the potential in the AONB for the development and growth of a successful local woodfuel economy.

There are two ancient trees within the AONB, Common Beech at The Hyning, Warton and Oak in the Dallam Tower Estate. There are 16 veteran and numerous (110) notable trees throughout the area occurring in open fields, within boundaries, within areas of woodland, and as part of designed landscapes and settlements.

2.1.4 Development

Background

Development is a key issue within the AONB and can have a significant impact on the landscape character and visual amenity of the AONB.

The AONB Partnership only concerns itself with planning matters (applications and policy documents) affecting the AONB. 'Affecting' means directly affecting, in that the policy or application relates to land or areas within the AONB itself, or indirectly affecting, in that it relates to land or areas which are contiguous with, or can be seen from the AONB and therefore form part of its setting, or where the policy or application is of such a nature that it might undermine the quality or purposes of the AONB. The Partnership, through formal responses, provides independent advice to local planning authorities to assist with the formal decision-making process.

The Arnside & Silverdale AONB Development Plan Document (DPD) was adopted by Lancaster City Council (LCiC) on 13th March 2019 and by South Lakeland District Council (SLDC) on 28th March 2019. The AONB DPD is a joint document prepared by both local authorities and now forms part of their Local Development Plans. The Arnside & Silverdale AONB DPD, which complements the AONB Management Plan, is the first plan in the country that has been prepared to apply policies and allocations across an AONB.

The DPD places development more clearly in the context of the primary purpose of the AONB - to conserve and enhance the natural beauty of the area – and to put this at the heart of planning for the AONB. A landscape capacity-led approach to development, which is consistent with the primary purpose and the AONB's special qualities, is identified in the plan. The DPD identifies sites for new housing and employment within the AONB to meet local needs and sets out planning policies to ensure that development reflects the AONB designation.

As is the case in many rural areas, within the AONB there is a recognised need for housing to meet local needs, in particular affordable housing. In Arnside & Silverdale AONB there are only a very limited number of sites that are considered appropriate for development (i.e. can be developed without causing harm to the special qualities of the AONB). It is therefore very important to ensure that affordable housing is in fact delivered on the appropriate sites that have been allocated, as well as windfall developments or redevelopments on other sites, otherwise the need and the consequent pressure for development will remain.

Current status

Indicator: Number of planning approvals within the AONB

Number of planning approvals within the AONB:	
2013-2014	**100**
2014-2015	**120**
2015-2016	**112**
2016-2017	**117**
2017-2018	**116**

Source: SLDC/LCiC

Indicator: Number of formal responses to planning applications submitted by the AONB Partnership

Number of formal responses to planning applications submitted by the AONB Partnership:	
2013-2014	**23**
2014-2015	**38**
2015-2016	**53**
2016-2017	**68**
2017-2018	**51**
2018-2019 (Jan)	**78**

Source: AONB

Indicator: Number of new homes delivered within the AONB

Between 2013 and 2017:
Number of new homes delivered within the AONB is **33**

Source: SLDC/LCiC

Interpretation

Over the last 5 years the number of planning applications submitted and approved within the AONB have increased and, for the last 4 years, there have been over 110 approvals each year.

The number of new homes completed within the LCiC AONB area (2013 - 17) is 24. Permissions granted over this period for new homes is 27. The number of housing completions within the SLDC AONB area (2013 - 18) is 9. No new affordable homes were delivered within the AONB between 2013 and 2017, see section 3.1.3 below. All the new dwellings were market housing.

Formal responses to development applications made by the AONB Partnership have increased significantly over the last 5 years. Formal consultations from the local authorities to the AONB Partnership have also increased. The time spent by the AONB Partnership has significantly increased recently in responding to planning applications, setting out our objections or serious concerns and the non-compliance with relevant local plan policies.

The AONB DPD provides detailed policies that, following its recent adoption, will now be used in the determination of planning applications and will help to help manage and shape the quality of new development. **Policy AS01: Development Strategy** requires all development within the Arnside & Silverdale AONB to be consistent with the primary purpose of the AONB designation and support the Special Qualities of the AONB. **Policy AS02: Landscape** requires proposals to demonstrate how they conserve and enhance the landscape and natural beauty of the area and that proposals will not be permitted where they would have an adverse effect upon the landscape character or visual amenity of the AONB. In addition for development proposals within the AONB, **Policy AS08: Design** states that the highest standards of design and construction will be required to conserve and enhance the landscape, built environment, distinctive settlement character and historic, cultural and architectural features.

Also, **Policy AS05: Public Open Space and Recreation** and **Policy AS06: Key Settlement Landscapes** restrict development within certain key areas of open space which make important contributions to the character of the AONB's settlements.

There are a range of other policies within the AONB DPD covering housing, natural and historic environment, economic development and community facilities, infrastructure, visitor accommodation, water quality, energy and communications and advertising and signage. A number of these policies are referenced below in relevant sections.

2.2 Biodiversity

2.2.1 Designated sites

Background

Sites of Special Scientific Interest (SSSIs) safeguard England's most important areas of natural heritage. They include some of the most spectacular and beautiful habitats and provide a refuge for many of the rarest plants and animals. They also protect the most important features of geology and physical geography, places where valuable records of the Earth's history are revealed. Most SSSIs are in private ownership and their management is a shared responsibility with Natural England which is the body responsible for designating SSSIs and for monitoring their condition according to the following classification:

- Favourable
- Unfavourable, recovering
- Unfavourable, no change
- Unfavourable, declining

Figure 6 shows the distribution of these designated sites within the AONB.

In addition, the AONB contains Special Areas of Conservation (Morecambe Bay, Morecambe Bay Pavements) and Special Protection Areas (Morecambe Bay and Duddon Estuary, Leighton Moss) as illustrated in Figures 7 and 8; Morecambe Bay and Leighton Moss are also Ramsar sites.

There are also a range of Local Wildlife Sites in the AONB (Figure 9), one National Nature Reserve, Gait Barrows, and two Local Nature Reserves, Trowbarrow and Warton Crag (Figure 10).

Figure 6

Sites of Special Scientific Interest (SSSI)

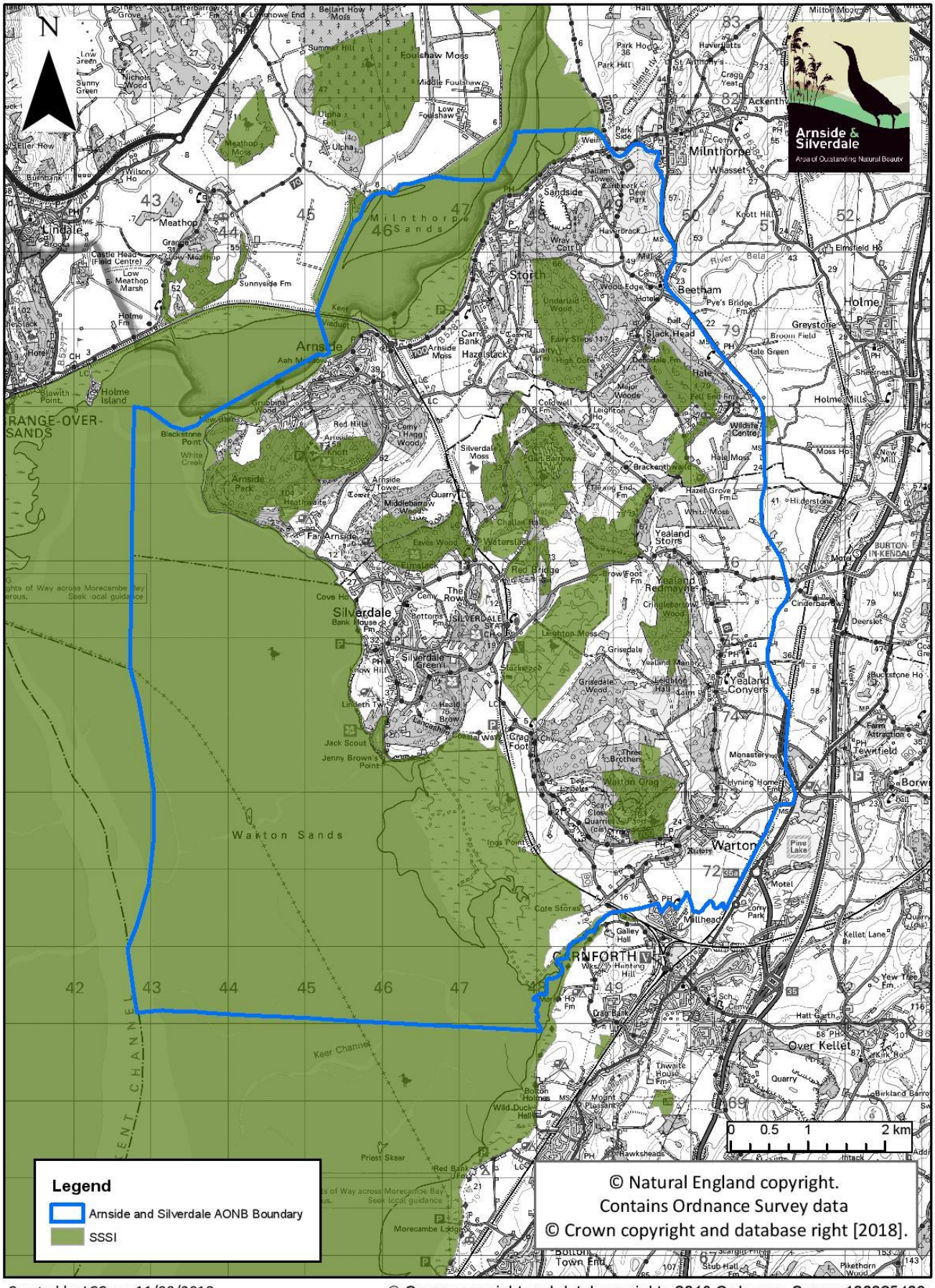

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Figure 7

Special Areas of Conservation (SAC)

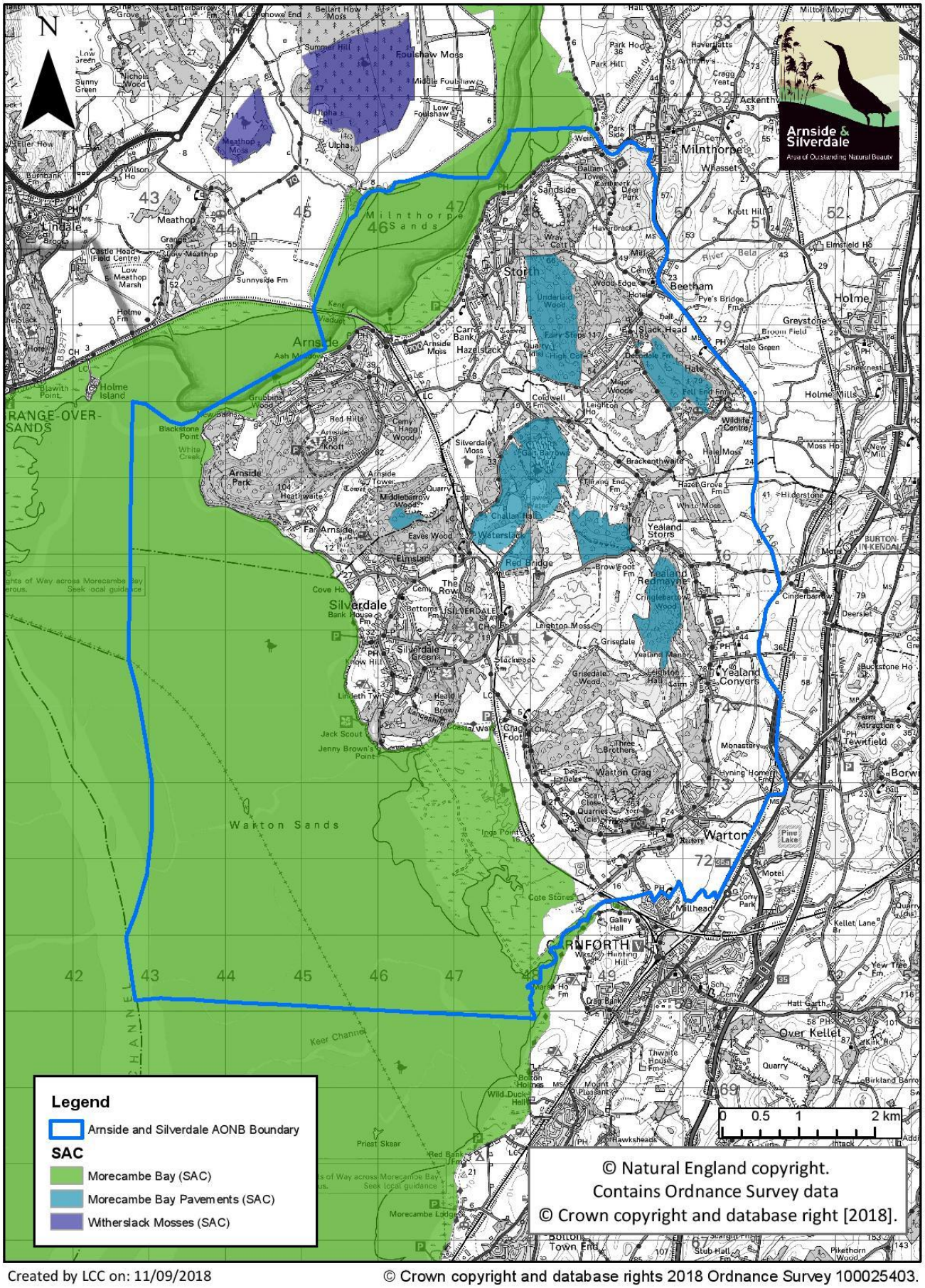

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Figure 8

Ramsar Sites and Special Protection Areas (SPA)

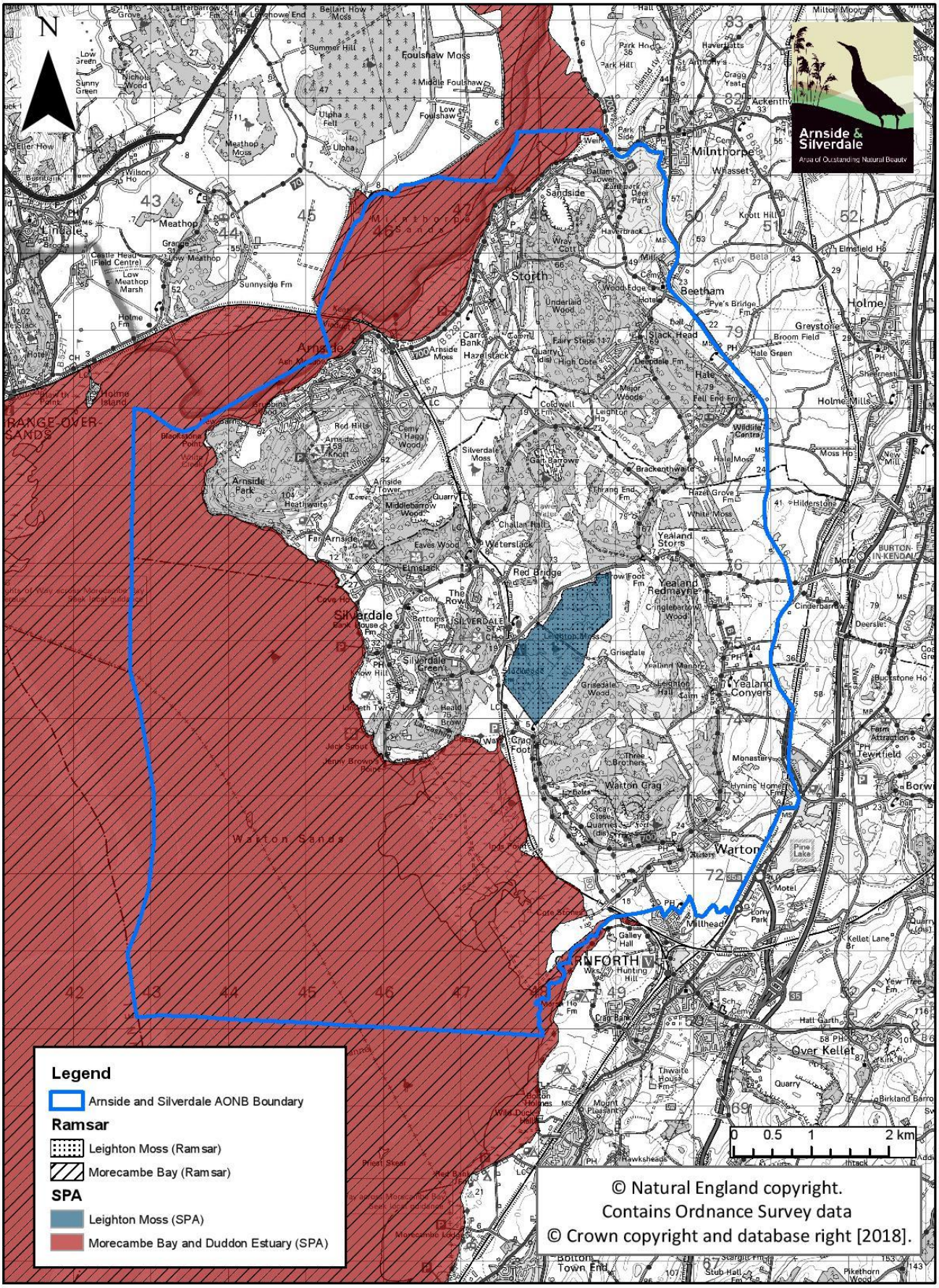

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Figure 9

Local Wildlife Sites

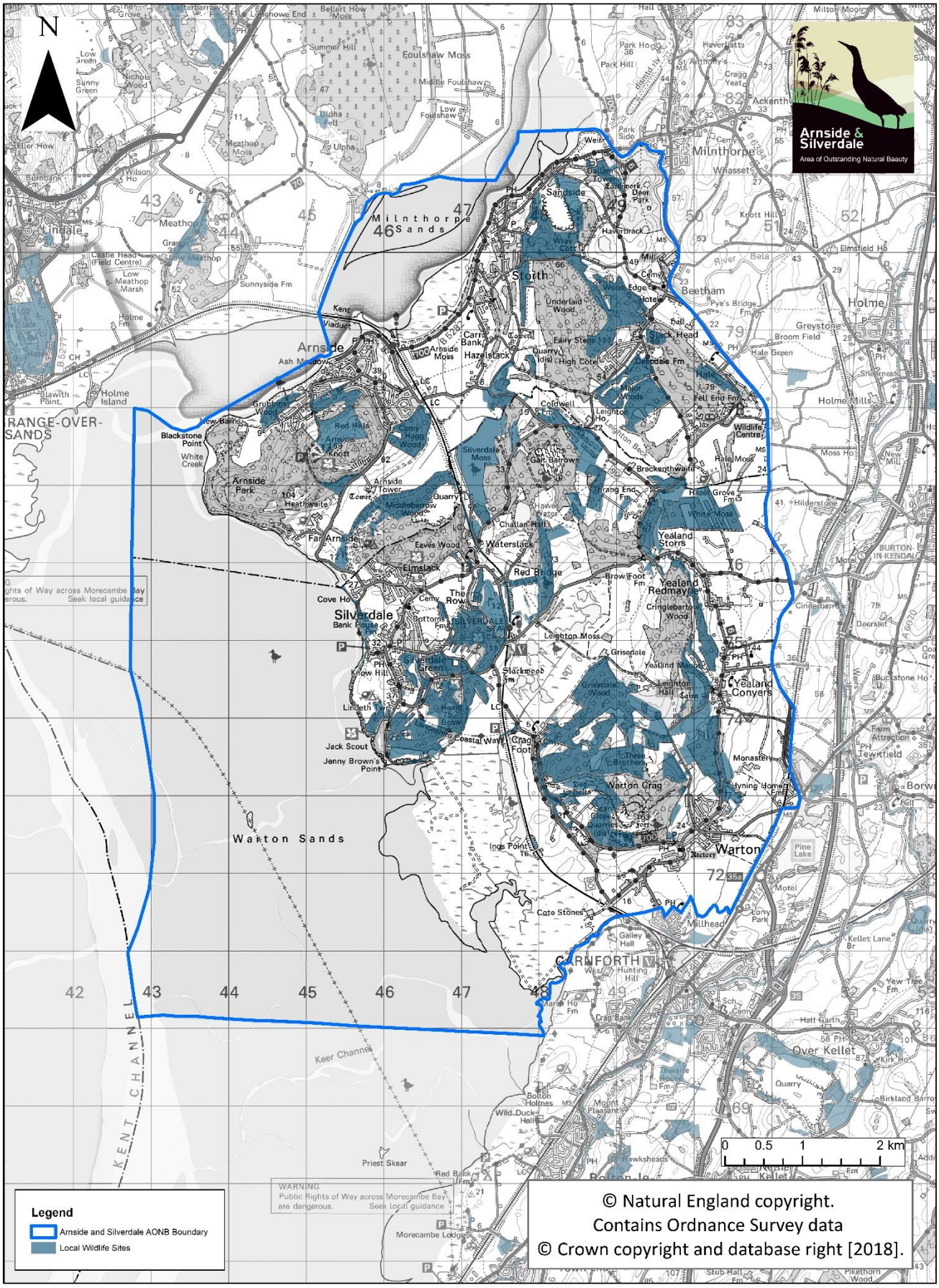

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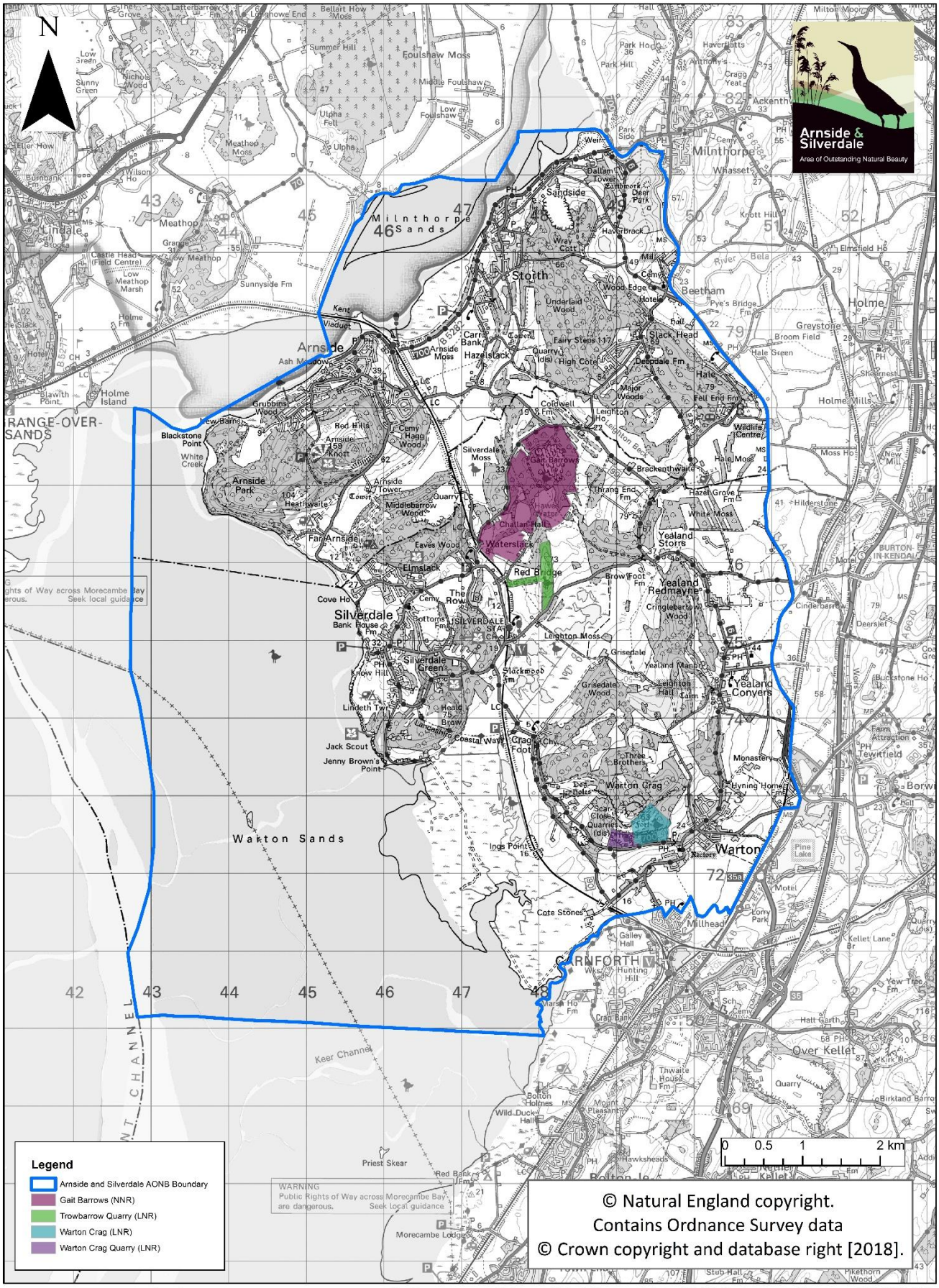
Figure 10

National and Local Nature Reserves



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Current status

Indicator: Number/area of sites and % of AONB

Designated sites within the AONB:

19 SSSIs, covering **4,079 ha, 54%** of the total area of the AONB

2 SACs, covering **3,548 ha, 47%** of the total area of the AONB
3 SPAs, covering **3,312 ha, 43%** of the total area of the AONB

64 LWS, covering **857 ha, 11%** of the total area of the AONB

Source: NE, LCC, CCC

Indicator: Condition of SSSIs

In 2018:
99.1% of the SSSI area in **favourable or recovering** condition

Indicator: Condition of broad habitats within SSSIs

In 2017:
98.7 % of Broadleaved, mixed and yew woodland (upland)
100% of Calcareous grassland (lowland)
100% of Calcareous grassland (lowland)
100% Earth heritage
90% Fen, marsh and swamp (lowland)
91.9% Inland rock
100% Littoral sediment
100% Standing open water and canals
within SSSIs were in **favourable or recovering** condition

Indicator: Condition of Local Wildlife Sites

In 2015:
21 of the 64 LWS were in **positive management**

Source: G Skelcher, County Wildlife Sites Survey (2014/15)

Interpretation

There are 19 Sites of Special Scientific Interest (SSSI) in the AONB area (either completely or partially within the boundary):

- Arnside Knott
- Cringlebarrow and Deepdale
- Far Arnside
- Hale Moss Caves
- Jack Scout
- Marble Quarry and Hale Fell
- Morecambe Bay
- Thrang End and Yealand Hall Allotments
- Trowbarrow
- Warton Crag
- Coldwell Farm Pasture
- Eaves Wood
- Gait Barrows
- Hawes Water
- Leighton Moss
- Middlebarrow
- Silverdale Golf Course
- Thrang Wood
- Underlaid Wood

The sites cover a total area of 4,078 ha. This represents 54% of the total area of the AONB.

48% of the total AONB area is designated under European Directive (combined SACs and SPAs – see above) for its habitat, species or bird interest.

There are also 64 Local Wildlife Sites in the AONB covering 11% of the AONB area. The list of sites can be found in Appendix 3.

Figure 11 shows the condition of the units within the SSSIs within the AONB. In 2018, 64.7 % of the SSSI area were in favourable condition, 34.4 % is in unfavourable but recovering condition, 0.7 % is in unfavourable no change (Hawes Water unit 12, Gait Barrows unit 27, Warton Crag unit 6) and 0.2 % in unfavourable, declining condition (Middlebarrow unit 3, Hawes Water unit 8).

In 2013, 99.8% of the SSSI areas were in favourable or recovering condition but by 2018 this has declined to 99.1%. Over this period, the area of unfavourable no change has increased from 3 ha to 28 ha and area of unfavourable declining condition has increased from 7 to 10 ha. Middlebarrow unit 3 remains in decline. Hawes Water unit 8 declined from favourable to declining. Hawes Water unit 12 remains unfavourable no change. Gait Barrow's unit 27 (Little Hawes Water) and Warton Crag unit 6 (Three Brothers allotments) have declined from favourable to unfavourable no change.

Details of the reasons for decline are given in Appendix 3. In summary:

The removal of around 1 ha of beech plantation at Hawes Water SSSI unit 8 was the reason for decline in condition. This work has been undertaken in 2018.

At Middlebarrow SSSI unit 3 cotoneaster removal and deer control are the reasons for adverse condition.

At Gait Barrows SSSI unit 27 (merged units, 16-18, 20-21) the decline in condition was because the extent of priority habitat (marl lake and base-rich fen) is greatly reduced due to the modified state of Little Hawes Water. Restoring the hydrology by blocking the channel between Hawes Water and Little Hawes Water to increase the extent of the open water and surrounding base rich fen (features of MB Limestones SAC) is underway.

At Warton Crag SSSI unit 6 over grazing is the reason for adverse conditions.

Of the broad habitats within SSSIs, 100% of the calcareous grassland, earth heritage, littoral sediment and standing open water habitats have remained in favourable/recovering condition over recent years (2013-2017). The favourable/recovering condition areas of broadleaved, mixed and yew woodland (upland), fen, marsh and swamp (lowland) and inland rock habitats have all declined over this period from 99 to 98.7%, 100 to 90% and 96.4 to 91.9% respectively.

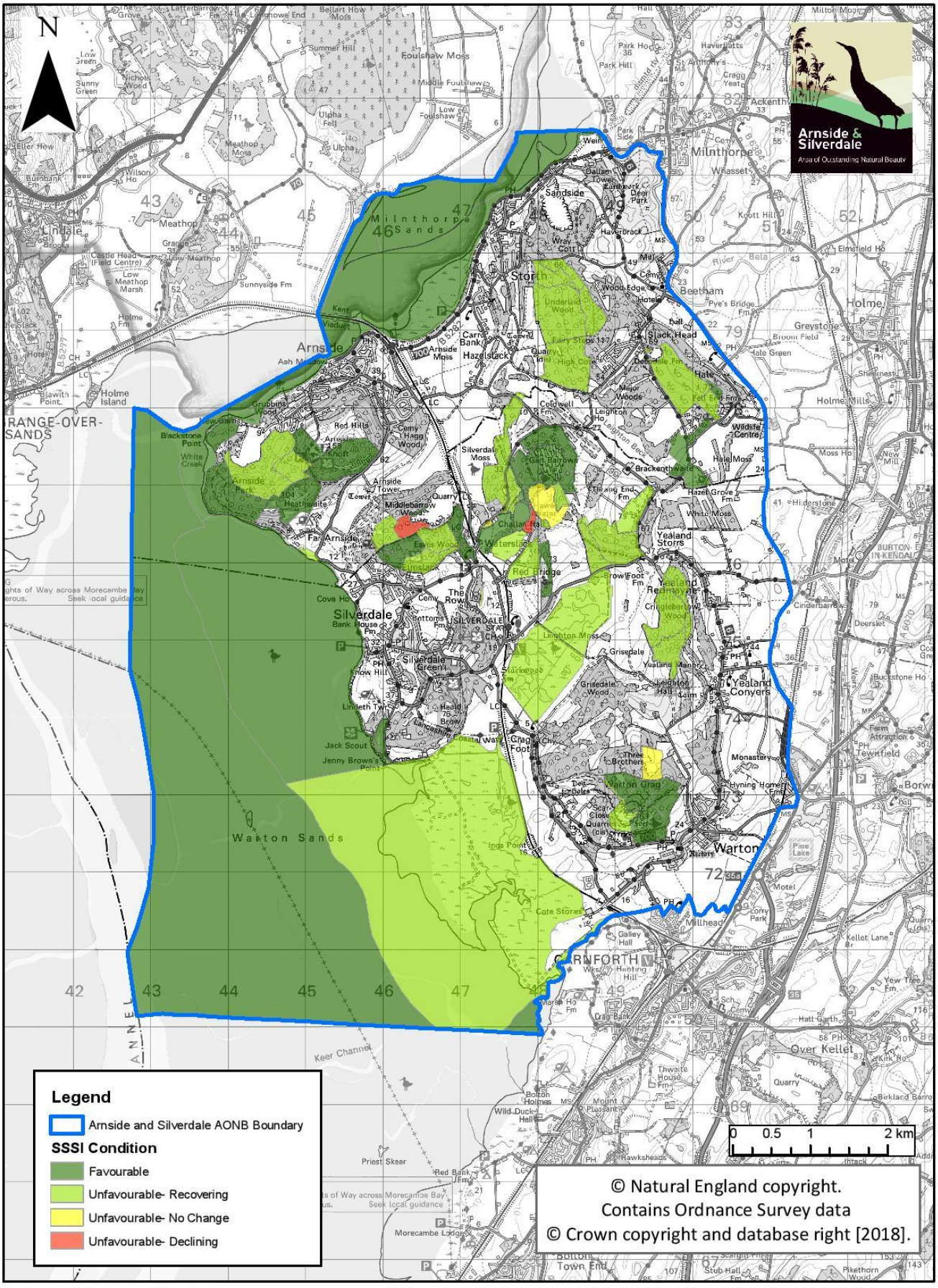
In 2014/2015 a survey was undertaken[3] to assess the status of the Local Wildlife Sites (LWS) within the AONB. Of the 64 LWS, 21 were assessed as being broadly in acceptable management. For most of the sites, however, recommendations were made for management improvements of the sites such as extending areas of grassland by scrub control, more sympathetic grassland management, controlling non-native trees.

Habitats and species are sensitive to and can be harmed by new development, for example through degradation or absolute loss or through impacts such as increased activity or light spillage. The AONB DPD **Policy AS04: Natural Environment** requires new development to conserve and enhance the AONB's biodiversity and geodiversity, avoid the fragmentation and isolation of or disturbance to wildlife, habitats and species. International, national and local designated sites and priority habitats and species are protected by this policy.

[3] County Wildlife Sites Survey 2014/15, G Skelcher

Figure 11

Sites of Special Scientific Interest (SSSI) Unit Condition within the AONB



Created by LCC on: 11/09/2018

2.2.2 Priority habitats

Background

Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act 2006 requires the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England. The S41 list is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under section 40 of the NERC Act, to have regard to the conservation of biodiversity in England, when carrying out their normal functions. Fifty-six habitats of principal importance are included on the S41 list and are regarded as conservation priorities.

In 2016 a detailed survey was undertaken within the AONB to confirm the location, extent and type of priority habitat within the AONB[4].

Current status

Indicator: Extent and type of priority habitat within the AONB

Extent of priority habitat within the AONB – **5,096 ha, 67%** cover of the AONB

Types of priority habitat:
Coastal
Intertidal mudflats
Coastal saltmarsh
Maritime cliff and slopes
Woodland
Lowland mixed deciduous woodland
Upland mixed ashwoods
Wet woodland
Wood-pasture and parkland
Wetland
Coastal and floodplain grazing marsh
Reedbed
Lowland fen
Grassland
Lowland calcareous grassland
Lowland meadows
Purple moor-grass and rush pastures
Heathland
Lowland heathland
Inland rock
Limestone pavements
Inland rock outcrop and scree habitats
Freshwater
Oligo-mesotrophic lakes
Ponds
Rivers
Marine
Estuarine rocky habitats
Arable and horticultural
Traditional orchards
Boundary
Hedgerows

Source: G Skelcher, Priority Habitat Survey, 2016, NE 2018

Further details of the extent of the different habitat types are in Appendix 3.

Indicator: Hectares of land enhanced for nature through the work of the AONB Partnership

[4] Priority Habitat Survey, 2016, G Skelcher

In 2018: Hectares of land enhanced for nature through the work of the AONB Partnership – **36.3 ha**

Source: AONB

Indicator: Hectares of nature reserves (NNR, LNR, NT, RSPB, WT, Woodland Trust, Landscape Trust plus private nature reserves) in the AONB

In 2018: Hectares of nature reserves in the AONB: **2,636 ha**

Source: Natural England, National Trust, RSPB, Cumbria and Lancashire Wildlife Trusts, Woodland Trust

Interpretation

Figure 12 shows the geographic extent and location of the priority habitats within the AONB.

Priority habitats cover 67% of the AONB. The most extensive single priority habitat type is the ***intertidal mudflats***, covering some 2,475 ha, 33%. Together with the 379 ha of ***coastal saltmarsh*** and 3.6 ha of ***maritime cliff and slopes***, the coastal habitats cover almost 40% of the whole AONB.

Nearly 20% (1330 ha) of the AONB comprises priority habitat woodland; at least 775 ha of which is ***upland mixed ashwoods*** (316 ha of woodland incorporated from Natural England data is not defined beyond 'deciduous woodland' and it is likely that a large proportion of this will also be ***upland mixed ashwoods***).

There are nearly 500 ha of wetland habitats, mainly comprising 309 ha of ***coastal and floodplain grazing marsh*** (principally found within three large areas at Arnside Moss, Hale and Warton), and 135 ha of ***reedbed*** (mainly at Leighton Moss, Barrow Scout and Hawes Water). ***Lowland fen*** contributes 52 ha to the wetland total, but much of this at Silverdale Moss has recently been planted over to create an additional reedbed, which will result in about half of this total being lost and added to the area of ***reedbed***.

183 ha (2.4% of the AONB) falls into grassland categories. The most extensive of these is ***lowland calcareous grassland***, which has a mapped coverage of 127 ha, and also includes Lowland meadows (51ha) and Purple moor-grass and rush pastures (6ha).

Inland rock covers about 217 ha (c.3%), limestone pavements and inland rock, outcrop and scree habitats (161ha).

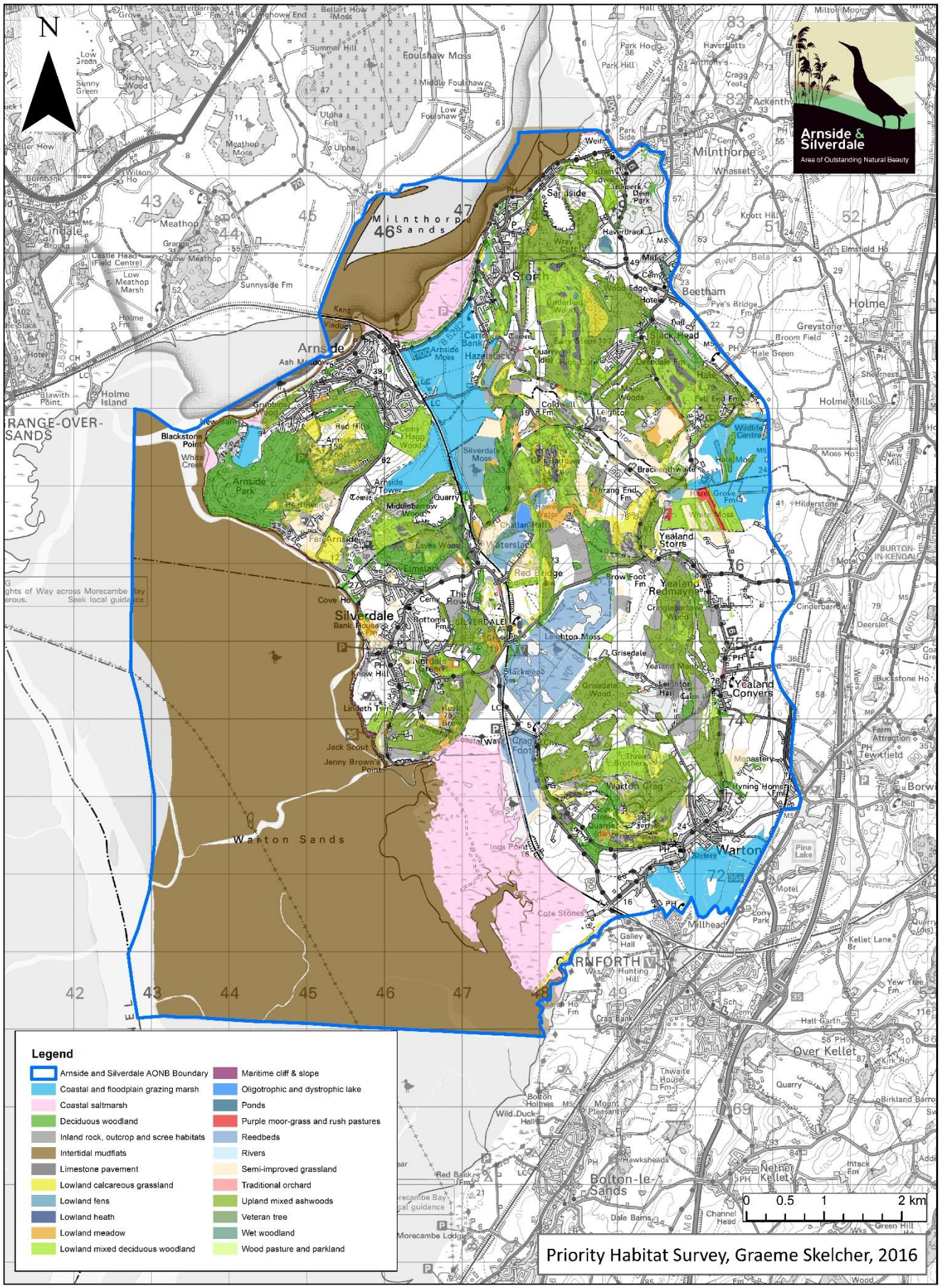
Freshwater (***oligo-mesotrophic lakes***, ***ponds*** and ***rivers***) contribute just under 10 ha, while the total area of ***traditional orchards*** is just over 3 ha. Upper shore ***estuarine rocky habitats*** occur below the Silverdale and Arnside cliffs (Skelcher 2016), but these areas have not been mapped.

The AONB Partnership, through the volunteer programme and contractors, have enhanced over 36 ha of land in 2018. This has included scrub, woodland and grassland management at Trowbarrow (14 ha) and Warton Crag (17 ha) Local Nature Reserves, and a range of small sites across the AONB: Bank Well (0.1 ha, 957 sq m), Crossfield Wood (0.1 ha 600 sq m), Sandside verge (0.1 ha 400 sq m), Sandside cutting (0.5 ha 5000 sq m), Dobshall Wood, including woodland and grassland work, (4.1 ha - directly worked on 0.2 ha grassland and 0.2 ha woodland coppicing), Ashmeadow (0.2 ha 2000 sq m), Woodwell 0.1 ha 237 sq m) and Beechwood (0.1 ha 1320 sq m).

There are a number of nature reserves across the AONB, owned and managed by conservation organisations such as National Trust, RSPB, Cumbria and Lancashire Wildlife Trusts, Woodland Trust, the Arnside and Silverdale AONB Landscape Trust and also private owners. The list of sites is in Appendix 3. At the beginning of 2018, the area of nature reserves in the AONB was 2,636 ha and then increased to 2,844.5 ha by the end of the year. In June 2018, RSPB purchased Warton Mires (32.5 ha), with contributions from other organisations, and the site is currently being restored as wet grassland.

Figure 12

Priority habitats within the AONB



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The Landscape Trust owns and manages a number of reserves in the AONB including Teddy Heights, Coldwell Parrock and Coldwell Meadow. In May 2018, the Trust purchased new land at Coldwell (3.95 ha). There will be links to Coldwell Parrock and Coldwell Meadow and the new land creates an overall horseshoe shaped extended reserve.

Fell End Nature Reserve (12 ha) has been created as part of the Fell End Holiday Park and is now open to both guests and the general public.

2.2.3 Species

Background

There is an amazing diversity of species found within the AONB, many of which are uncommon in a national or international context but thrive within the unique mosaic of habitats. There are over **1,100 species**, regarded as **notable**, which have been recorded in the AONB, and this includes over **170 S41 species**, most of which are likely to be resident or regular visitors[5]. Of particular note are the Bittern, High Brown Fritillary and the Lady's-slipper orchid.

Current status

Indicator: Species records - birds

In 2018:	
Total counts from Leighton Moss, Silverdale Moss, Barrow Scout and Saline Lagoons -	
Bittern	
Booming:	**2**
Nests:	**1**
Bearded Tit	
Pairs:	**25**
Young:	**29**
Marsh Harrier	
Nests:	**3**
Young fledged:	**6**
Avocet	
Pairs:	**29**
Fledged young:	**20**

Source: RSPB

Indicator: Species records - butterflies

In 2018:	
Butterflies of RSPB Warton Crag Nature Reserve –	
High Brown Fritillary	**0**
Pear-bordered fritillary	**0**
Small pearl-bordered fritillary	**73**
Northern Brown Argus	**49**
Dingy Skipper	**41**

Source: RSPB

Indicator: Number of species recovery programmes delivered

Number of species recovery programmes delivered: **1** (Ladys slipper Orchid)

Source: NE

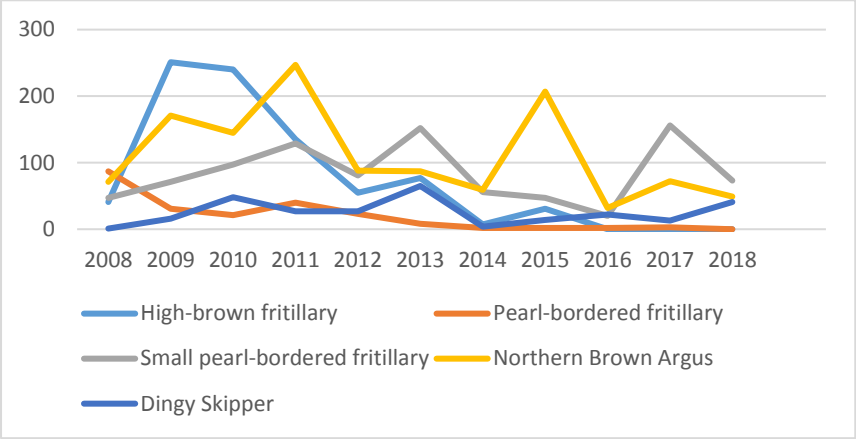
Interpretation

[5] Notable and Characteristic Species in the Arnside & Silverdale AONB, G Skelcher, 2016

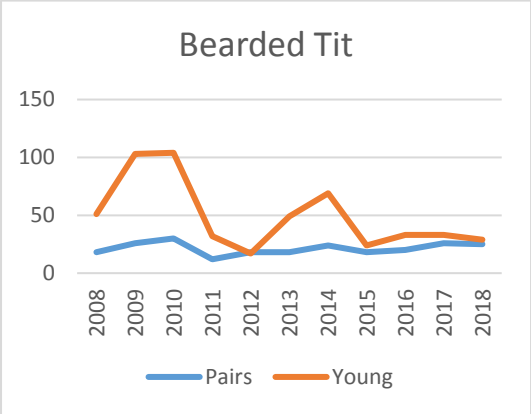
The total counts over the last decade for the key butterfly species at Warton Crag and key bird species at Leighton Moss, Silverdale Moss, Barrow Scout and Saline Lagoons are set out in Appendix 3 and illustrated in the charts below.

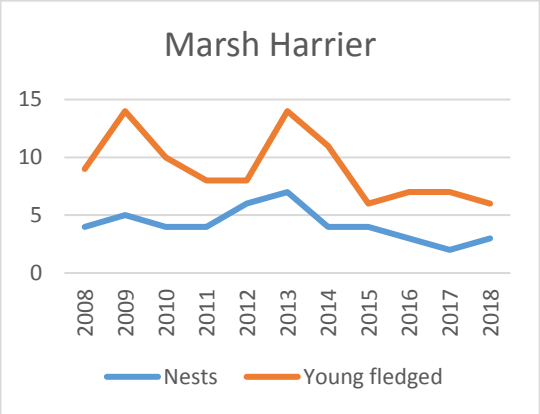
The total species counts for number of High Brown Fritillaries have varied significantly over the last decade from 50 in 2008, increasing to 251 in 2009 and then declining to zero in 2018. Northern Brown Argus have also varied significantly, from 71 in 2008 up to 247 in 2011 to 49 in 2018. Pearl–bordered fritillaries have declined over this period, from 87 in 2008 to zero in 2018. The numbers of Small pearl-bordered fritillaries and Dingy Skippers have varied, increasing and decreasing, over the years, from the lowest of 20 in 2016 to the highest of 156 in 2017 and from 1 in 2008 up to 65 in 2013, respectively.

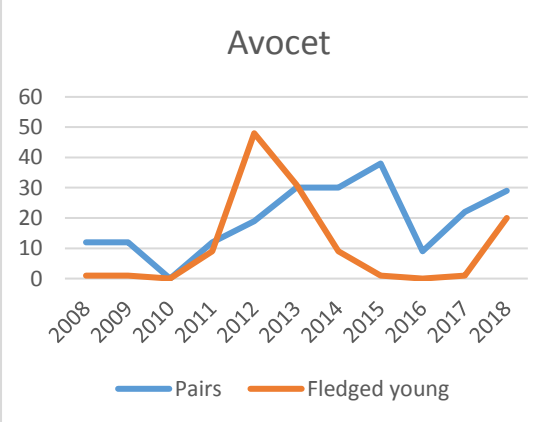
Butterflies of RSPB Warton Crag Nature Reserve



Total bird counts from Leighton Moss, Silverdale Moss, Barrow Scout and Saline Lagoons







Over the past 9 years, from 2008, there has only been one booming bittern within the AONB but in 2018 there were 2. There was one bittern nest in both 2008 and 2009 but then none until one again in 2018. The number of pairs of

Bearded Tits was 25 in 2018 and has varied a little over the years. The numbers of young, however, has varied significantly, from a maximum of 104 in 2010 to a minimum of 17 in 2012 and 29 in 2018. The young fledged Marsh Harriers and Avocets have also varied over the years –from 14 Marsh Harriers (in 2009 and 2013) down to 6 in both 2015 and 2018 , and no Avocets in 2010 to 48 in 2012, down to zero again in 2016 and up to 20 in 2018. The number of Avocet pairs has also varied over the years, with zero in 2010, a maximum of 8 in 2015 and 29 in 2018.

One species recovery programme has been delivered within the AONB over the past five years – for the Ladys slipper Orchid. Following this successful project, Gait Barrows National Nature Reserve is now home to a thriving population of Lady's-slipper orchid, the rarest of British wild flowers.

The University of Cumbria, working with the Forestry Commission, Natural England and Cumbria Wildlife Trust, is planning/delivering a South Cumbria Species Restoration project which will be aiming to restore up to twelve species of plants, animals, birds and invertebrates which are missing from sites in the region.

2.3 Geodiversity

2.3.1 Geology

Background

The Carboniferous limestone bedrock of the Arnside and Silverdale area underpins the natural beauty of the AONB. The limestone unifies its character and creates the conditions that have allowed the wide diversity of habitats to develop.

The superficial geology, for example tidal flats, saltmarsh, lacustrine and peat deposits, also contribute to the natural beauty by creating broad areas of flat ground which contrast with, and provide a natural setting for, the limestone hills. The saltmarsh areas, dynamically changing in their location and extent, provide natural beauty in their contrast with the different colours and textures of the tidal flats beyond. Deposits have contributed to the development of reedbed, fen and mosses.

Key geological elements of the mosaic of landscape characters across the AONB are the limestone hills, open and wooded limestone pavements, limestone scarps and slacks (including 'The Trough' close to Trowbarrow Quarry), the limestone quarries themselves, locally complex geological structures, low coastal cliffs, shingle bays, saltmarshes, tidal flats, former and current lakes, former areas of lowland raised bogs, residual peat bogs and reedbeds, and the shapely rounded low hills known as 'drumlins' which are associated with former ice sheets and glaciers.

However, it is not just the geology (i.e. the characteristics of the rocks, sediments and geological structures), which is important; it is also the 'geodiversity', the sheer variety of geological features, including the fossils, minerals, natural processes, landforms and soils – as well as the rocks – which underlie and determine the physical character of the landscape and the natural environment. Other features of geological interest which also contribute to the landscape character include solution hollows (or dolines) in the limestone, sea caves, scree-covered slopes, erratic boulders, karstic features and Carboniferous limestone fossil assemblages.

The landscape has been shaped, primarily, by its limestone geology but also by range of 'geomorphological' processes, which have acted upon it over many millions of years. Current active processes, such as losing saltmarsh, channel shifts across the estuary, lead to continuing changes; this is clearly not a static landscape.

A Geology Audit and Assessment[6] has been undertaken in 2018. A detailed AONB-wide audit has been carried out and research undertaken into the geological evolution of the area. This has provided a robust evidence base of the geodiversity of the AONB for monitoring delivery of the AONB Management Plan, monitoring landscape change and to inform an ecosystems approach to AONB management activity, helping to ensure the landscape is resilient to change and continues to deliver multiple benefits for people.

Maps of the bedrock and superficial geology of the AONB, prepared as part of the Assessment, are shown in Figures 13 and 14.

[6] Geology Audit and Assessment, Final Report, Cuesta Consulting, January 2019

Current status

Indicator: Number/area of geological sites and % of AONB

Designated sites within the AONB:
2 geological SSSIs, covering **30 ha, 0.4%** of the AONB area
8 Local Geological Sites (LGS), covering **429 ha, 6%** of the AONB area
16 Limestone Pavement Orders (LPOs), covering **1178 ha, 15%** of the AONB area

Source: NE, LCC, Cumbria Geoconservation

Indicator: Condition of geological SSSIs (PLNB12)

In 2018:
100% of the geological SSSI area in **favourable** condition

Source: © Natural England copyright. Contains Ordnance Survey data © Crown copyright and database right 2018 NE

Indicator: Condition of Local Geological Sites

In 2018:
100% of the LGS are in **favourable** condition

Source: AONB Geology Audit and Assessment, 2018, Cuesta Consulting

Interpretation

There are two nationally important geological sites within the AONB, designated as SSSIs for their geological interest - Trowbarrow Quarry and Hale Moss Caves. The condition of both these sites remains favourable. While both Gait Barrows and Leighton Moss SSSIs are primarily designated for their biological interest they are also important for their geology.

There are 16 Limestone Pavement Orders covering 15% of the AONB area (see Figure 15):

- Burton Well and Silverdale Golf Course
- Cringlebarrow and Deepdale
- Gait Barrows
- Heald Brow
- Leighton Beck Wood and School Lots
- Marble Quarry and Hale Fell
- Thrang End and Yealand Hall Allotment
- Underlaid Wood
- Challan Hall Allotment
- Eaves Wood
- Haverbrack Bank
- Hyning Scout Wood
- Major Woods
- Middlebarrow
- Trowbarrow Quarry and the Trough
- Warton Crag and Grisedale Wood

There are 8 Local Geological Sites, covering 6% of the AONB area (see Figure 16):

- Arnside Foreshore
- Sandside (Sandside Rail cutting and Throughs Lane)
- Burton Well, Silverdale
- Warton Crag
- Warton Dolines (Hawes Water and Little Hawes Water, Deepdale Pond, Three Brothers, NW of Warton Crag)
- Far Arnside
- Blackstone Point
- Jack Scout/Silverdale Shore

Figure 13

Map 4 – Bedrock Geology

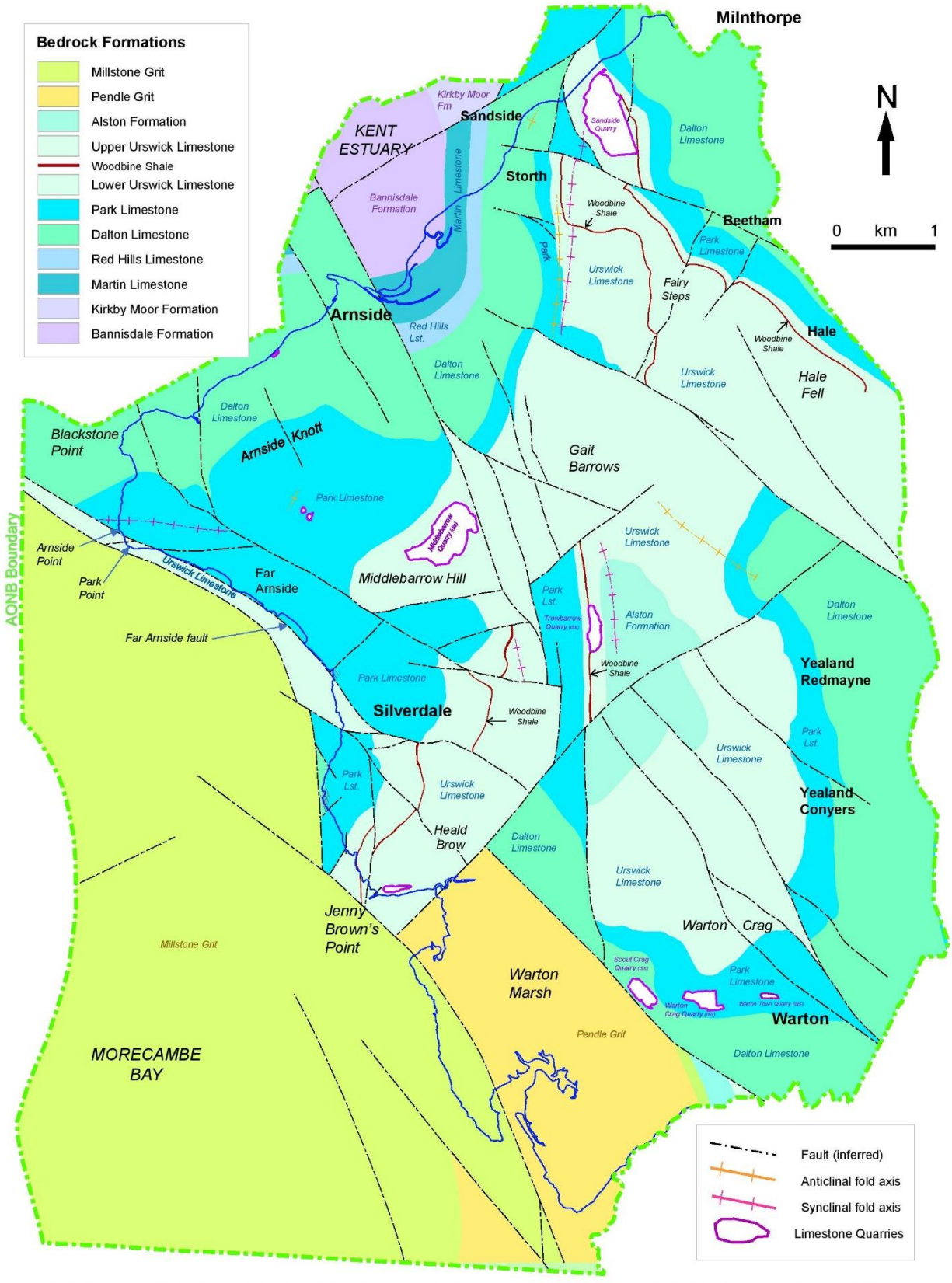
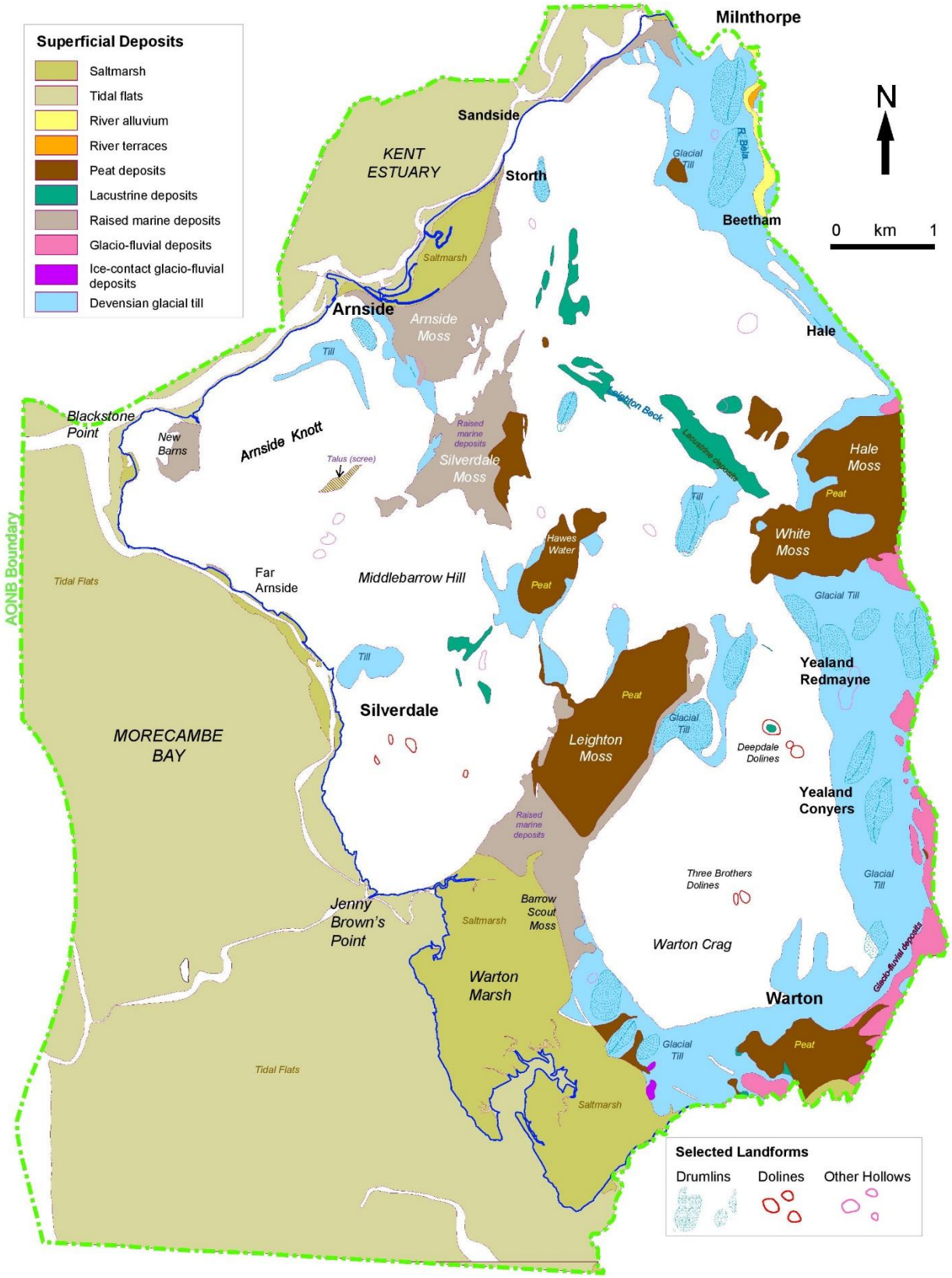


Figure 14

Map 6 – Superficial Geology & Landforms



Geological linework derived from 1:50,000 scale BGS Digital Data under Licence, Natural England Licence No. 2011/052 British Geological Survey. ©NERC.

Figure 15

Limestone Pavement Orders within the AONB

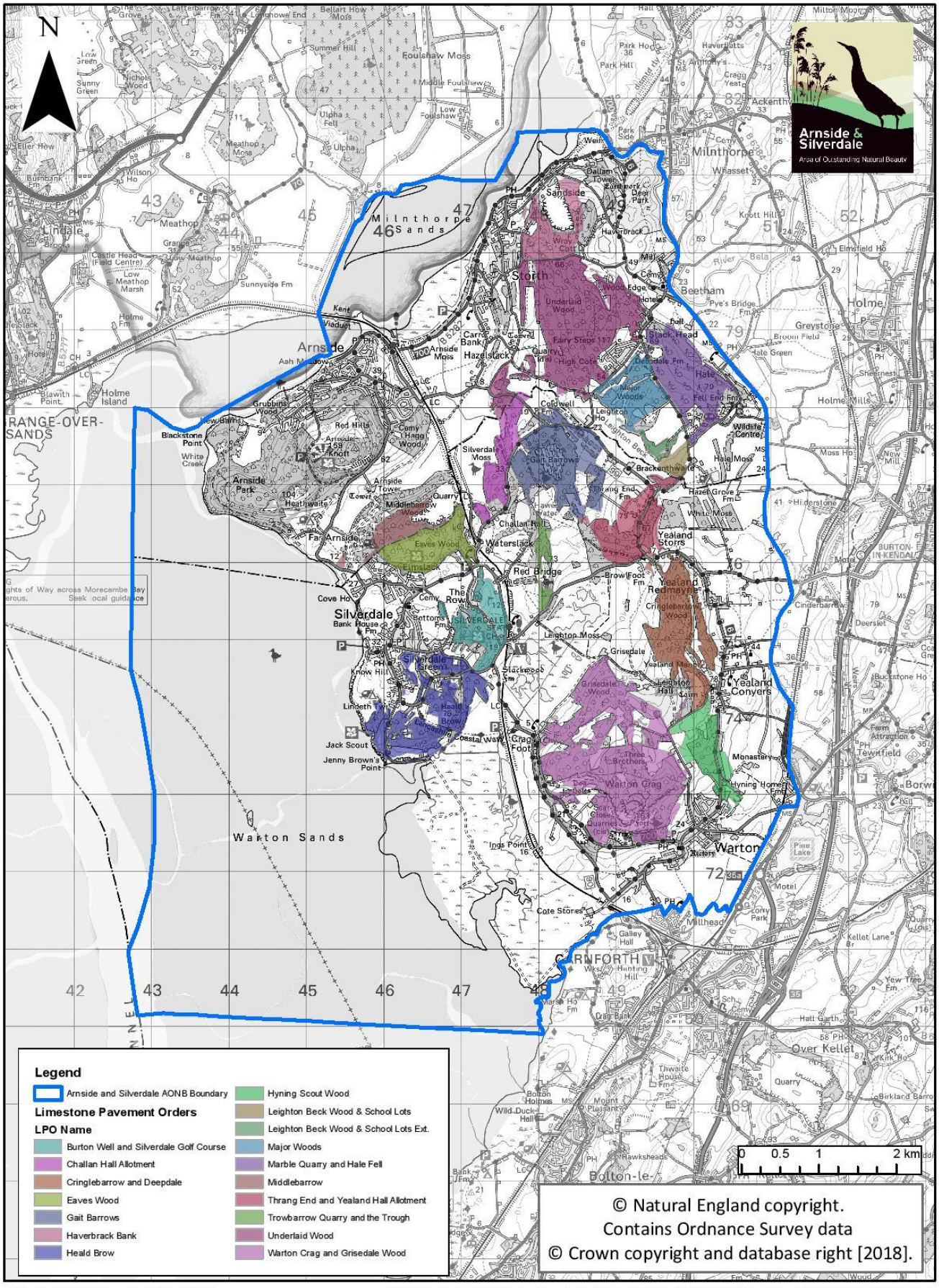


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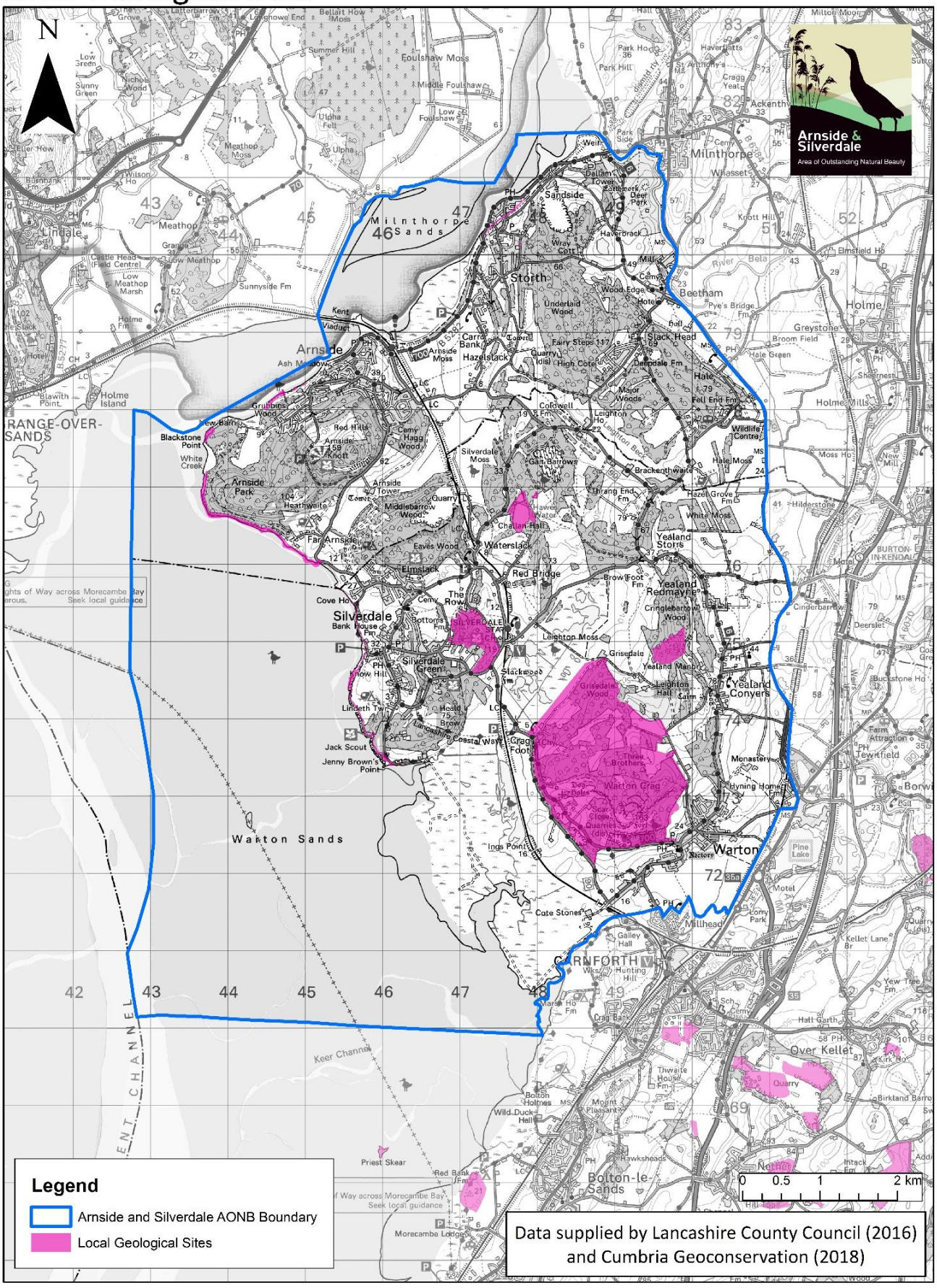
Figure 16

Local Geological Sites



The Geology Audit and Assessment concluded that generally, the sites recognised for their geodiversity importance are in favourable condition. The main conservation issue is the need for vegetation clearance at a number of exposure sites, including Sandside Cutting, parts of Trowbarrow Quarry SSSI, the small quarry within the Arnside Foreshore LGS and possibly the natural outcrop of Whin Scar within which Fairy Steps is situated.

2.3.2 Soils

Background

Soils within the AONB are generally thin and free draining. The range of 'Soilscapes' present within the AONB (categorised by the National Soils Research Institute) are shown in **Figure 17.**

Saltmarsh soils are exclusively in areas of saltmarsh development, and are therefore constantly changing in extent with the growth and erosion of the saltmarsh in response to the changing position of the main channels within the Kent Estuary and Morecambe Bay.

Freely draining, slightly acid loamy soils are present in areas of glacial deposits which, in turn, are derived from a wide range of rock types eroded and transported by glaciers from source areas in the Lake District and Yorkshire Dales, further north. In contrast to the limestone geology of the AONB, these transported materials include many which are more 'acidic' (rather alkaline) in nature.

Freely-draining slightly acid but base-rich soils developed preferentially on outcrops of limestone, and thus contain higher proportions of 'basic' (in this case Calcium carbonate) minerals.

Loamy and sandy soils with naturally high groundwater and a peaty surface are present in low-lying areas near the coast which are underlain by 'raised marine' sediments from times of higher sea level in the past. These areas subsequently developed into mosses (Arnside Moss, Silverdale Moss and Barrow Scout Moss) or coastal marsh (the inland portion of Warton Marsh).

Raised bog peat soils developed in areas which were once characterised by lowland raised bogs (including Leighton Moss, Storrs Moss, White Moss, Hale Moss and Warton Moss). However, these specialised habitats no longer exist, having been cut for peat and/or drained for agriculture in 18th and 19th centuries. Only the lower layers of groundwater-saturated peat now remain in these areas, and the peaty soils now support fen, carr or reedbed habitats.

Current status

Indicator - Agricultural land classification within the AONB

Agricultural land classification within the AONB:
31% in Grade 3
39% in Grade 4
22% in Grade 5

Source: Natural England, 2018

Interpretation

The majority of Arnside & Silverdale AONB soils are relatively poor and highly variable over short distances. Agricultural Land Classification within the AONB (see Figure 18) identifies 31% of the terrestrial AONB as Grade 3 (good/moderate), 39% as Grade 4 (poor), and 22% as Grade 5 (very poor). There is no Grade 1 (excellent) or Grade 2 (very good) agricultural land within the AONB.

Figure 17

Map 7 – Soilscapes

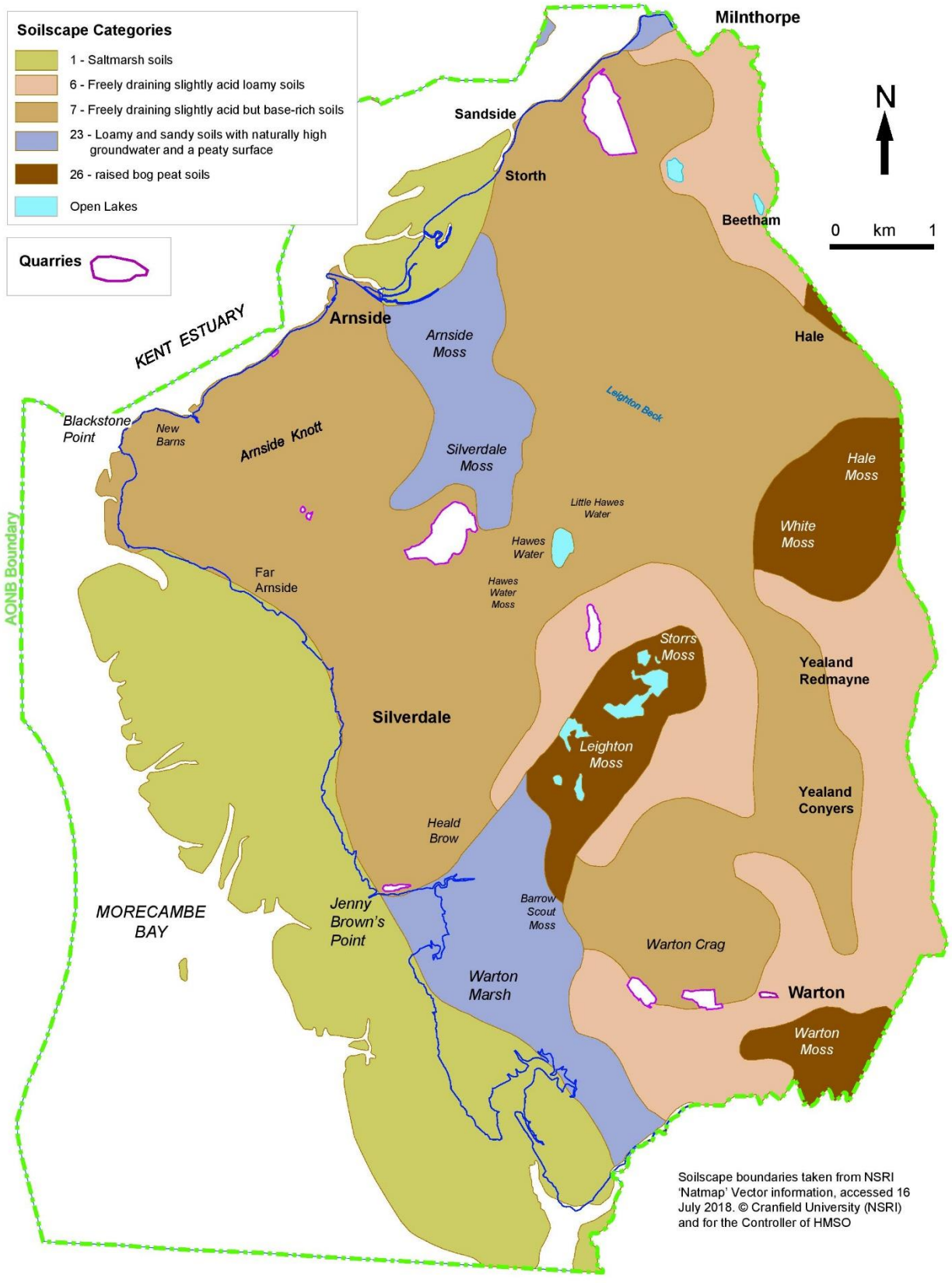
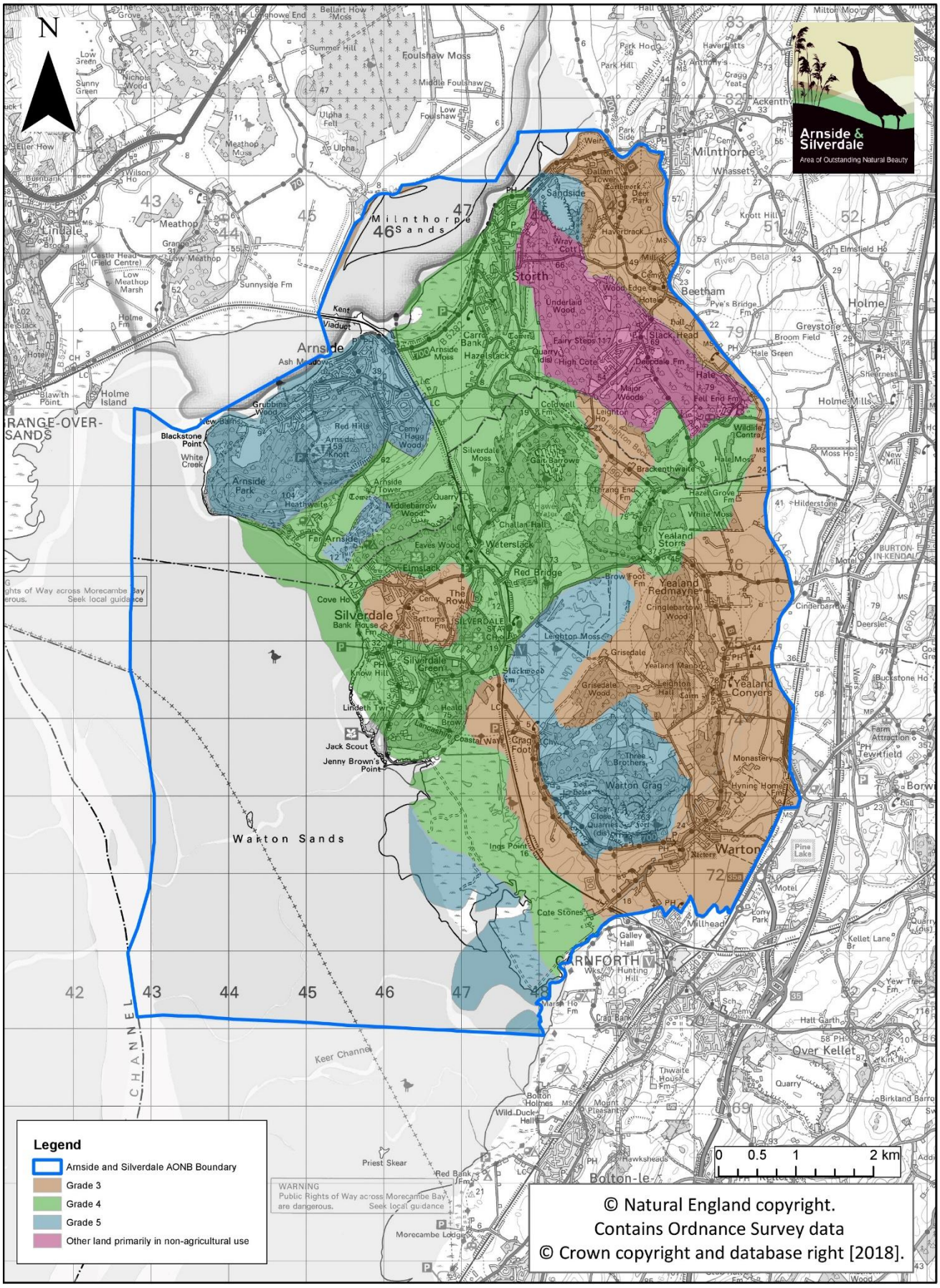


Figure 18

Agricultural Land Classification within the AONB



2.4 Water Environment

2.4.1 Water quality

Background

As a consequence of its geology, the Arnside & Silverdale AONB is a relatively dry landscape. However, water has played an important role in the formation of the area and is a key feature of the landscape. The two principal rivers in the area, River Bela and River Keer form the AONB boundaries, to the north east and south respectively. Leighton Beck, Quicksand Pool and Black Dyke are smaller water courses which are present within the terrestrial AONB. Standing water is rare in a limestone landscape where most water finds its way underground. The main water body within the AONB is Hawes Water, an internationally important marl lake, one of only a small number in England. Open water is also present at Leighton Moss and there is also a small lake at Haverbrack. There are numerous springs and small ponds across the AONB. The springs are historically important having been a key factor in the location of settlements, particularly Silverdale village and its dispersed pattern.

About 37 % of the AONB is covered by the tidal waters of the Kent Estuary and Morecambe Bay.

In 2015, England adopted new Water Framework Directive (WFD) monitoring and classification standards laid out in cycle 2 of WFD. This is a step change in classifications from cycle 1 of WFD and the cycle 1 and 2 data cannot be compared. The data reported in a given year relates to data collected over the previous year and in 2016, the Environment Agency (EA) moved to a triennial reporting system and will report next in 2019. The river water bodies in the AONB monitored by the Environment Agency are Leighton Beck, Leighton Moss and the Pool, River Keer (Lower) and River Bela, (14.33km total length in Cycle 2). The standing water bodies monitored by the EA in the AONB include only Hawes Water and the transitional water bodies are the Kent estuary.

The Government promoted the Catchment Based Approach (CaBA) to help improve the quality of the water environment. CaBA embeds collaborative working at a river catchment scale to deliver cross-cutting improvements to the water environments and aims to generate more effective stakeholder engagement in order to tackle environmental problems at a more local scale. The collaborative ways of working to consider the needs of the water environment and acting to enhance it in a truly collaborative way fit comfortably with the AONB management approach. 'Becks to Bay', led by South Cumbria Rivers Trust (SCRT), and the Lune Rivers Trust (LT) are the local catchment partnerships covering the AONB area.

Current status

Indicator: Ecological status of river, standing and transitional water bodies

Bespoke water quality data set provided by Andrew Frankish of Environment Agency (EA) based on data on EA Catchment Planning System (classification data to 2016).

Source: Environment Agency

The 2016 AONB water quality data is set out in Appendix 4.

In 2018, Wood Well, Burton Well and Bank Well were sampled by the Environment Agency, as part of the Leighton Moss and Hawes Water Diffuse Water Pollution Plan Judicial Review Consent Order, being undertaken by Natural England and the EA, and were found to be free from any contamination. The locations of the monitoring points and the full data can be found in Appendix 4.

Interpretation

Where water quality monitoring takes place in the AONB it shows that water quality is overall generally good in the rivers and streams and in Hawes Water. At Leighton Moss monitoring indicates levels of phosphorus and nitrate elevated above the level required to ensure that the SSSI is in favourable condition. Agriculture has been identified as the primary reason for the elevated levels.

While there is currently little monitoring information to confirm it, there are concerns about groundwater quality in the Silverdale area. Discharges from private sewage treatment infrastructure and assets are the cause of concern

here. The vast majority of the area drains to private sewerage treatment infrastructure rather than the public sewerage system.

The Leighton Moss and Hawes Water Diffuse Water Pollution Plan Judicial Review Consent Order was brought about by a national legal challenge to the Environment Agency by a number of Non-Governmental Organisations, including Fish Legal and the World Wide Fund for Nature. The challenge concerned the deployment of Water Protection Zones. The site at Leighton Moss and Haweswater is a Natura 2000 site and Natural England are required to look at issues affecting water quality there and consider whether a Water Protection Zone would be appropriate, or whether water quality targets could be met by using current legislation and voluntary action. Environment Agency are leading overall on consent order work nationally, but Natural England are leading at Leighton Moss.

An improved water quality monitoring programme for Leighton Moss and Hawes Water has been developed with involvement from local landowners, to identify suitable sites and also to record field management practices which could affect results at the monitoring points. The new sampling and monitoring schedule should give a fuller picture of nutrient and bacterial levels in the water and surrounding drains. The schedule will also include macrophyte sampling which will examine the food sources of the species the site is designated for.

The catchment is managed for agriculture, forestry, sporting and public amenities as well as for wetland habitat. Farming in the catchment is generally pastoral cattle and sheep grazing, with some conservation grazing and smallholdings. Land management practices might be contributing nutrients.

In addition, there is no mains foul drainage in the catchment. Properties are instead served by septic tanks/sewage treatment plants. The source apportionment in the DWPP attributed a small proportion of the problem nutrient levels in the waterbodies to discharges from this infrastructure. Samples from the new Environment Agency monitoring programme referred to above will be analysed to give an indication of the origin of the source of pollutants they contain. This should help indicate whether the share of the problem nutrients currently allocated to the sewage treatment infrastructure is correct.

The AONB DPD **Policy AS12: Water quality, sewerage and sustainable drainage** seeks to ensure that water quality, sewerage and sustainable drainage are planned and managed in ways that avoid adverse impacts on water bodies, ensuring that existing problems are not made worse by new development proposals and that where possible, improvements are made.

2.4.2 Bathing water quality

Background

Bathing water quality is not monitored within the AONB but is monitored by the Environment Agency in two locations close by: north Morecambe and south Morecambe and samples are taken during the bathing water season between May and September. Classification for each bathing water is calculated annually, based on samples from the previous four years. These classifications, from best to worst, are "excellent", "good", "sufficient" or "poor".

The revised Bathing Water Directive (2006/7/EC) has come into force and from 2015 there are new, tighter standards – all bathing waters are to be classified as 'sufficient'. The first official classification under these new standards was published towards the end of 2015, when a full four-year dataset was first available.

Current status

Indicator: Bathing water quality classifications

In 2017, at Morecambe North and Morecambe South: The bathing water quality classifications were **'good'**

Source: © Environment Agency and database right.

Assessments for each of the beaches over the last 4 years are given in Appendix 4.

Interpretation

Both beaches in Morecambe were classified as 'sufficient' in 2014* and 2015 and 'good' in 2016 and 2017.

*A classification from before 2015 indicates the class that the bathing water would have achieved if the new bathing water quality standards had been in force.

2.4.3 Water resources

Background

The Environment Agency is responsible for managing water resources in England. To make sure there is enough water for people (public water supply, industry and agriculture) and a healthy environment, the Environment Agency controls how much water is taken with a permitting system. They regulate existing licences and grant new ones and use the catchment abstraction management strategy (CAMS) process and abstraction licensing strategies to do this. Regarding Private Water Supplies, Section 77 of the Water Industry Act 1991 requires a local authority to keep itself informed about the wholesomeness and sufficiency of every private water supply within its area.

Current status

Indicator: Abstraction licences within the AONB

In 2018 there are:
8 licences:
- **4 surface water** abstractions
- **4 groundwater** abstractions

Source: © Environment Agency and database right.

There are 8 abstraction licences within the AONB, permitting 4 surface water abstractions (3 from the River Bela and one from the River Keer) and 4 groundwater abstractions. Details of the use, volume and locations are set out in Appendix 4.

Indicator: Private water supplies within the AONB

In 2018 there are:
9 private water supplies (pws):
- **8 groundwater** pws
- **1 rainwater harvesting** pws

Source: © SLDC, LCiC.

Interpretation

Abstraction from ground and surface water is not extensive within the AONB.

The local catchment abstraction management strategy (CAMS), Abstraction licensing strategies for South Cumbria and Lune and Wyre, Feb 2013, indicates that there is water available for licensing within the AONB area generally. However, there is no water available from Hawes Water and restricted water available from the Bela. Licensing strategies remain unchanged since 2004, indicating no particular or increasing pressure on water resources in AONB area. Overall, water resources are not considered to be an issue within the AONB.

2.4.4 Flood risk

Background

Fluvial flood risk has been low within the Arnside & Silverdale AONB but in December 2015 Storm Desmond led this to be the wettest calendar month overall since records began and there was flooding in Warton and Beetham villages and flooding across the mosses. Surface water flooding is an issue in Warton and coastal flooding is a potential risk in certain low lying areas of the AONB. The issue of coastal flooding and salt water inundation of the low lying mosses within the AONB is cross cutting with climatic factors.

The Cumbria Strategic Floods Partnership (CSFP) has evolved since the devastating floods of December 2015 and South Cumbria Rivers Trust (SCRT) are locally co-ordinating the Catchment Management Group (CMG) for South Cumbria. The aims are to deliver projects and actions to help increase flood resilience. The South Cumbria CMG currently sits alongside Becks to Bay, the catchment partnership, and as they develop will become more aligned in the future. Becks to Bay will continue to deliver activity to improve flood resilience alongside the other aims of the catchment partnership.

Current status

Indicator: Distribution of areas at risk of fluvial flooding

Environment Agency Flood risk maps, 2018:
- risk of flooding both from rivers and sea (Figure 19)
- surface water flooding risk (Figure 20)

Source: Environment Agency

Indicator: Number of natural flood management projects within the AONB

Within the AONB, 2013-2018:
Number of natural flood management projects = **0**

Source: SCRT

Interpretation

It can be seen on Figure 19 that the area contains a number of areas at risk of flooding, both from rivers and sea. Land and property in flood zone 2 have a medium probability of flooding - land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. Land and property in flood zone 3 have a high probability - land having a 1 in 100 or greater annual probability of river flooding; or land having a 1 in 200 or greater annual probability of sea flooding.

Figure 20 shows the surface water flooding risk within the AONB. Areas at high risk of flooding have each year a greater chance of flooding than 1 in 30 (3.3%). Areas of medium risk of flooding have a chance of flooding between 1 and 100 (1%) and 1 in 30 (3.3%). Both medium and high risk levels of flooding can be difficult to predict, much more so than river or sea flooding.

An initial assessment of the Beetham flood defences following the December 2015 floods has been undertaken and recommended actions in the report - Beetham and Milnthorpe, Flood Investigation Report[7] - include 'exploring opportunities for natural flood management solutions to be used upstream of Beetham and Hang Bridge area in order to 'slow the flow' and manage peak river levels'.

The Lancaster District Flood Report[8], includes Gardners Road Area, Warton.

The AONB Partnership will support Natural Flood Management, whose wider benefits include better wildlife habitats, recreation opportunities and water quality. Natural flood management can play an important role in flood and coastal risk management. The South Cumbria Catchment Management Group are developing a pipeline of projects. Phase I are those which are being currently delivered. Phase II is probably more strategic looking at the communities at risk and developing a strategy for where resources/ projects etc are focused and Phase III is a much longer timeframe. There are no current natural flood management projects within the AONB.

[7] Beetham and Milnthorpe, Flood Invvestigation Report, Environment Agency in partnership with Cumbria County Council, final report, July 2017, http://www.cumbria.gov.uk/eLibrary/Content/Internet/536/6181/4292615406.pdf

[8] Lancaster District Flood Report, Lancashire County Council, February 2017, https://www.lancashire.gov.uk/media/901161/lancaster-final-report.pdf

Figure 19

Likelihood of Flooding

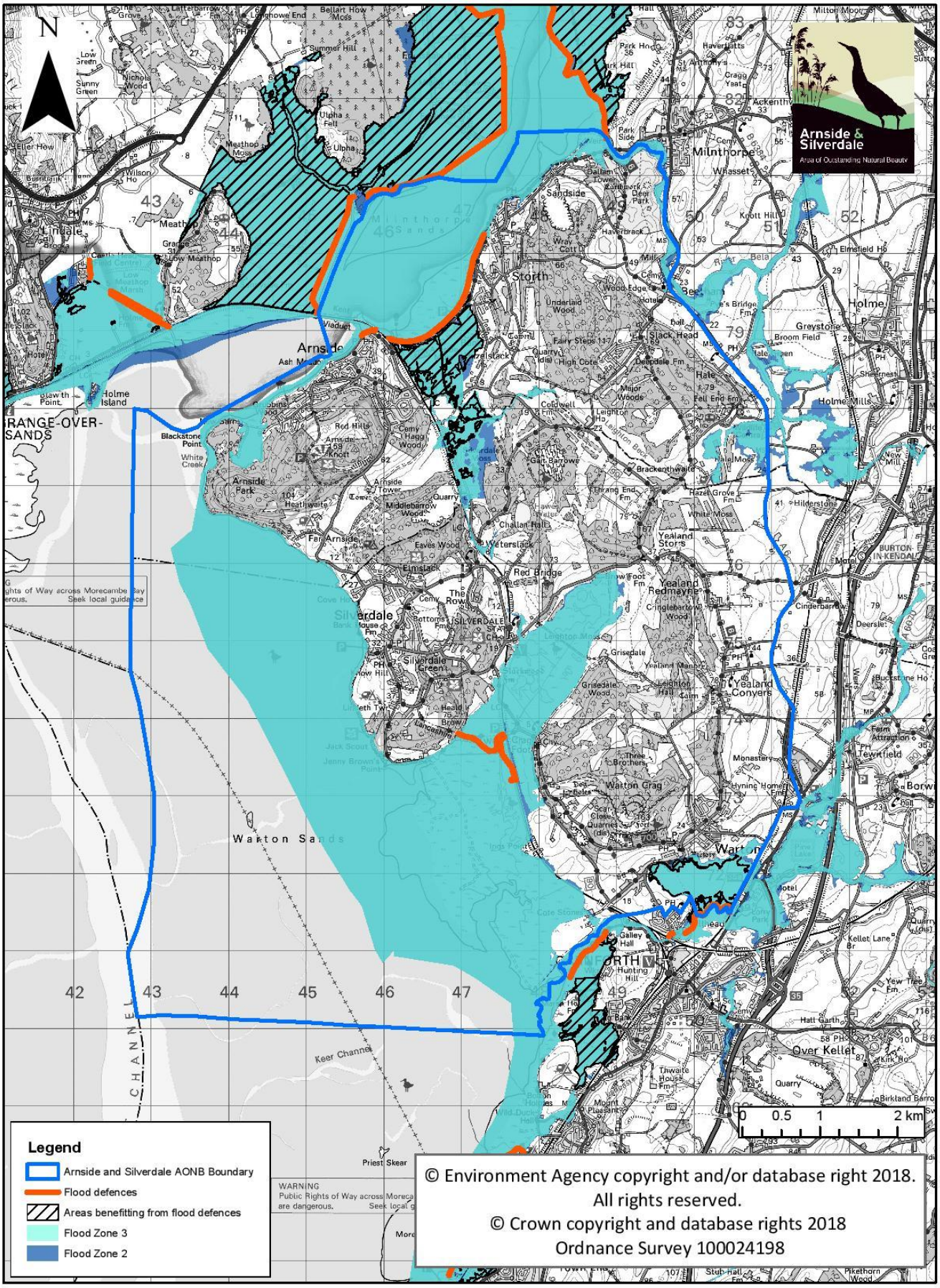


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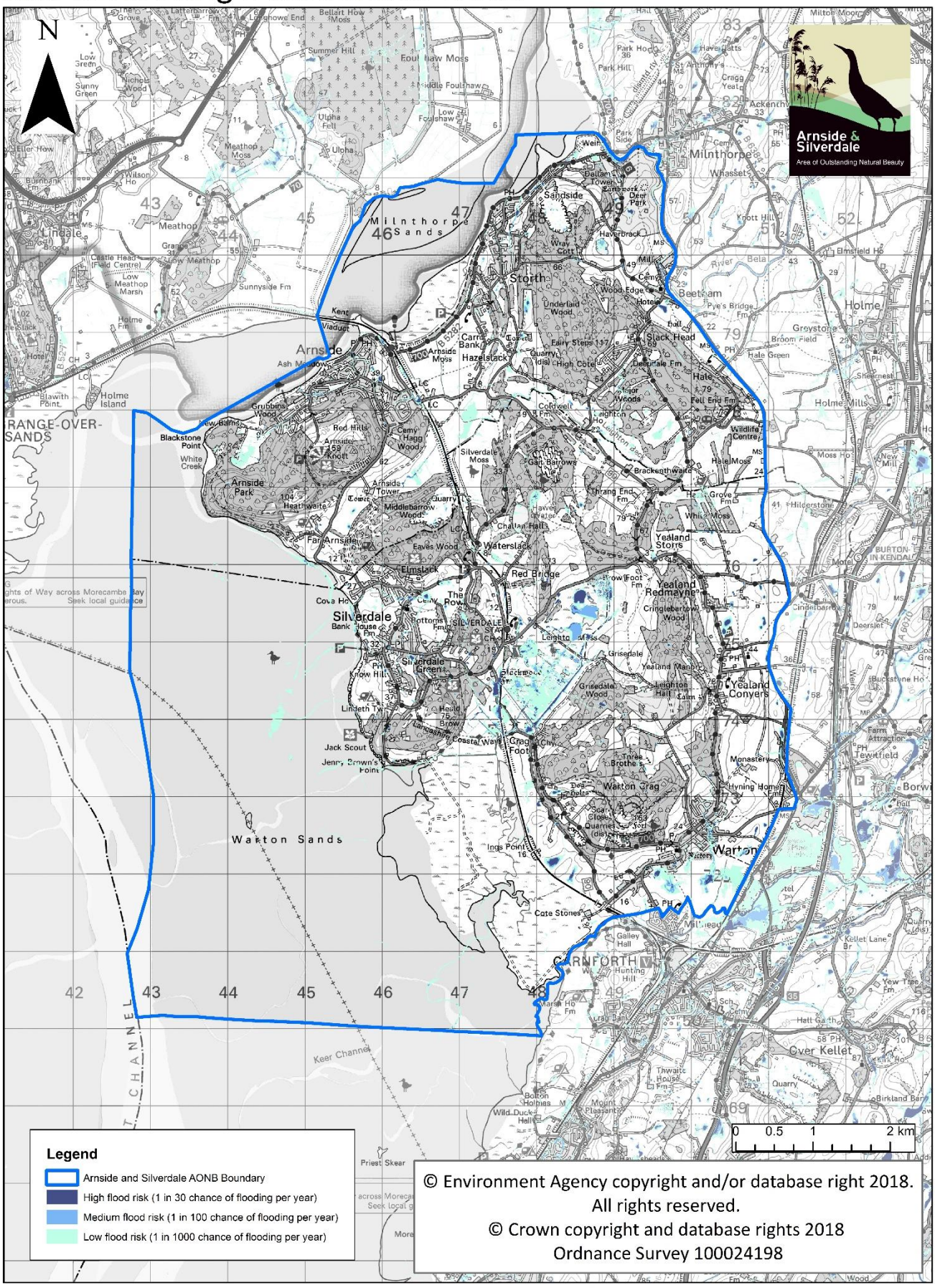
Figure 20

Risk of Flooding from Surface Water



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2.5 Historic Environment

Background

The rich historic heritage of the AONB and the distinctive settlement characters are two of the special qualities of the area and are integral to its character. The historic environment includes all aspects of the environment resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged. This includes designated assets but also not only involves undesignated (or local heritage assets) but the potential for unrecorded archaeology, and historic landscape character areas.

Current status

Indicator: Number of heritage assets

In 2018 in the Arnside & Silverdale AONB there are:
10 Scheduled Monuments
115 Listed Buildings (6 Grade 1, 10 Grade II*, and 99 Grade II)
1 Registered Parks and Gardens
3 Conservation Areas
695 Historic Environment Records

Source: Historic England, CCC, Lancashire Archaeology Advisory Service, SLDC/LCiC

Indicator: Number of heritage assets at risk

In 2017:
4 sites within the AONB are on the Heritage at Risk Register - - Arnside Tower, Beetham Hall (curtain wall and uninhabited portion), Hazelslack Tower and Warton Crag small multivallate hillfort

Source: Historic England

Indicator: Number of heritage assets where condition has been improved through the work of the AONB Partnership (volunteer work)

In 2018:
The condition of **4 heritage assets** has been improved through the work of the AONB Partnership (volunteer work) - Hyning historic designed garden, Bank Well and Woodwell ponds and the hedgelaying competition

Source: AONB

Indicator: Number of research projects that have been undertaken to improve understanding of the heritage assets of the AONB over the last 5 years through work of or support of the AONB Partnership

Over 2013- 2018 in the Arnside & Silverdale AONB there have been :
5 research projects

Source: Morecambe Bay Partnership, UCLAN, Mourholme Society

Interpretation

Within the Arnside & Silverdale AONB there are 10 Scheduled Monuments and 1 Registered Parks and Gardens (see Figure 21), and 115 Listed Buildings (see Figure 22).

The 10 Scheduled Monuments are:

- Arnside Tower, Arnside
- Beetham Hall (curtain wall and uninhabited portion), Beetham
- Hazelslack Tower, Beetham
- Ringwork in Dallam Park 380m south east of Dallam Tower, Beetham
- Dog Holes Cave, Warton Crag, Warton
- Badger Hole, Barrow Scout, Warton
- Warton Crag Hillfort, Warton
- Old Rectory, Warton
- Round cairn on Summerhouse Hill, Yealand Conyers
- Stone circle on Summerhouse Hill, Yealand Conyers

Dallam Tower is the single Registered Parks and Gardens within the AONB and is a Grade II (see Figure 21). Of the listed buildings, there are 6 Grade 1, 10 Grade II*, and 99 Grade II. The Grade I and II* Listed Buildings are listed in Appendix 5.

There are 3 Conservation Areas in the AONB: Beetham, Warton and Yealands, as shown in Figure 22. These are sites which are designated locally to assist in the management of areas of special architecture or historic interest. Up to date Conservation Area Appraisals (CAA) are available for Beetham and Warton. Lancaster City Council is planning to prepare a new appraisal for Yealand.

Historic designed landscapes (HDLs) are an important element of the landscape and heritage of the Arnside & Silverdale AONB. The 18th century deer park at Dallam Tower, including a natural rock garden and a water garden and ornamental gardens, is the only Registered Park and Garden within the AONB. Six undesignated historic designed landscapes were identified to be of exceptional interest and quality and potential national importance in a 2015 research study[9]:

- Ashton House, Beetham
- Bleasdale School, Silverdale
- Hazelwood, Silverdale
- Ridgeway Park (previously Greywalls), Silverdale
- Leighton Hall
- The Hyning, Warton

The Historic Environment Record (HER) holds information on known archaeological sites, finds, landscapes, buildings and other aspects of the historic environment. In addition it contains information on past research and investigations. There are currently 695 data entries within the AONB (in the Cumbria HER and Lancashire HER). The HERs are shown in Figure 23. The Cumbria HER is continually updated with new information provided by professional archaeologists, historians, researchers, and through enhancement projects grant-aided by Historic England and other bodies. The Lancashire HER has not been updated since 2016.

Historic Landscape Characterisation Reports for both Lancashire[10] and Cumbria[11] provide valuable tools for understanding the cultural heritage of the AONB. Figure 24 shows the historic landscape types across the AONB. Brief descriptions are given in Appendix 5.

[9] Arnside & Silverdale AONB Historic Designed Landscapes Research Report, E. Bennis, 2015
[10] The Lancashire Historic Landscape Characterisation Report, December 2002.
[11] Cumbria Historic Landscape Characterisation – final report, July 2009

Figure 21

Scheduled Monuments and Registered Parks and Gardens within the AONB

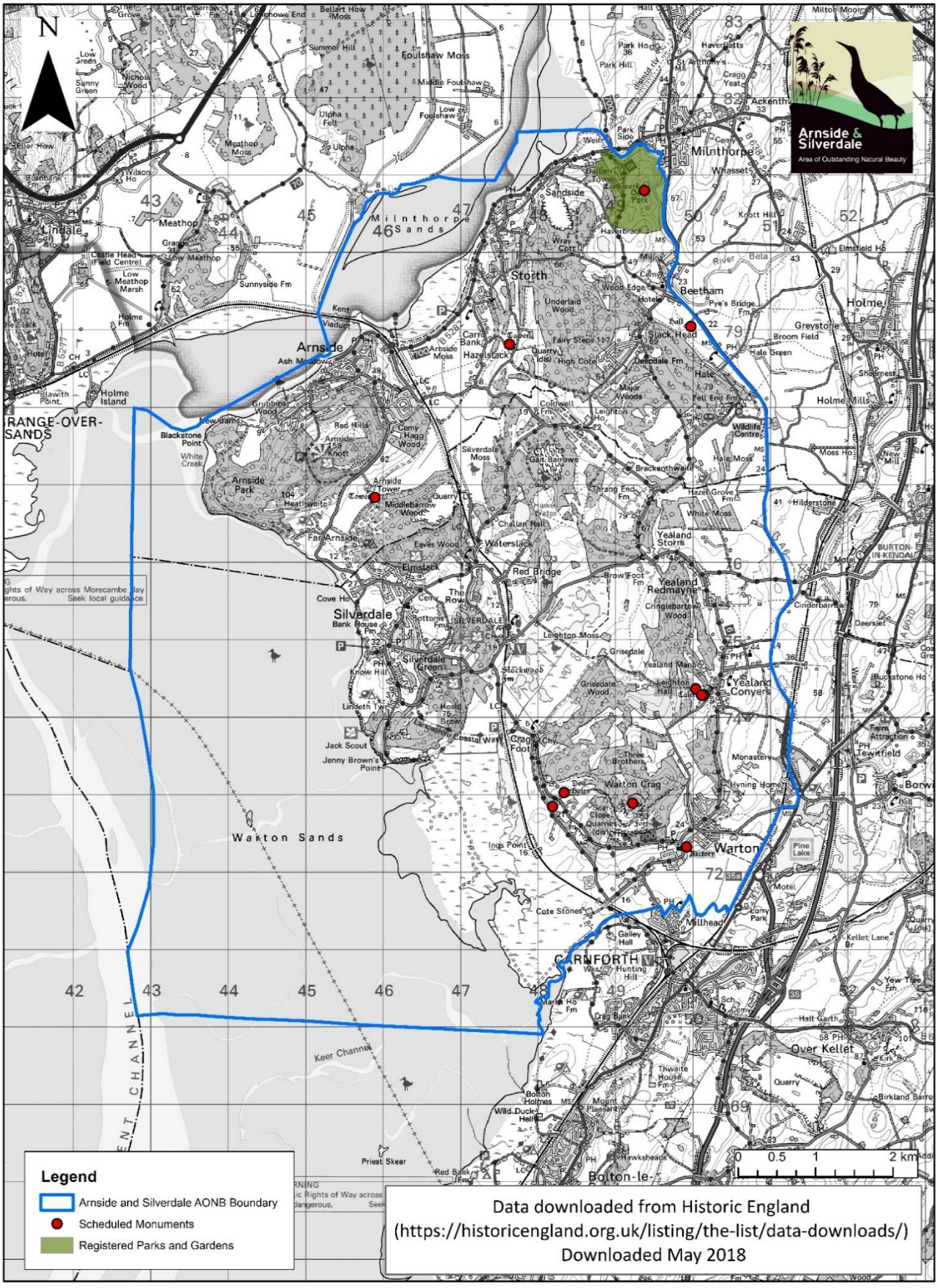

Figure 22

Listed Buildings and Conservation Areas within the AONB

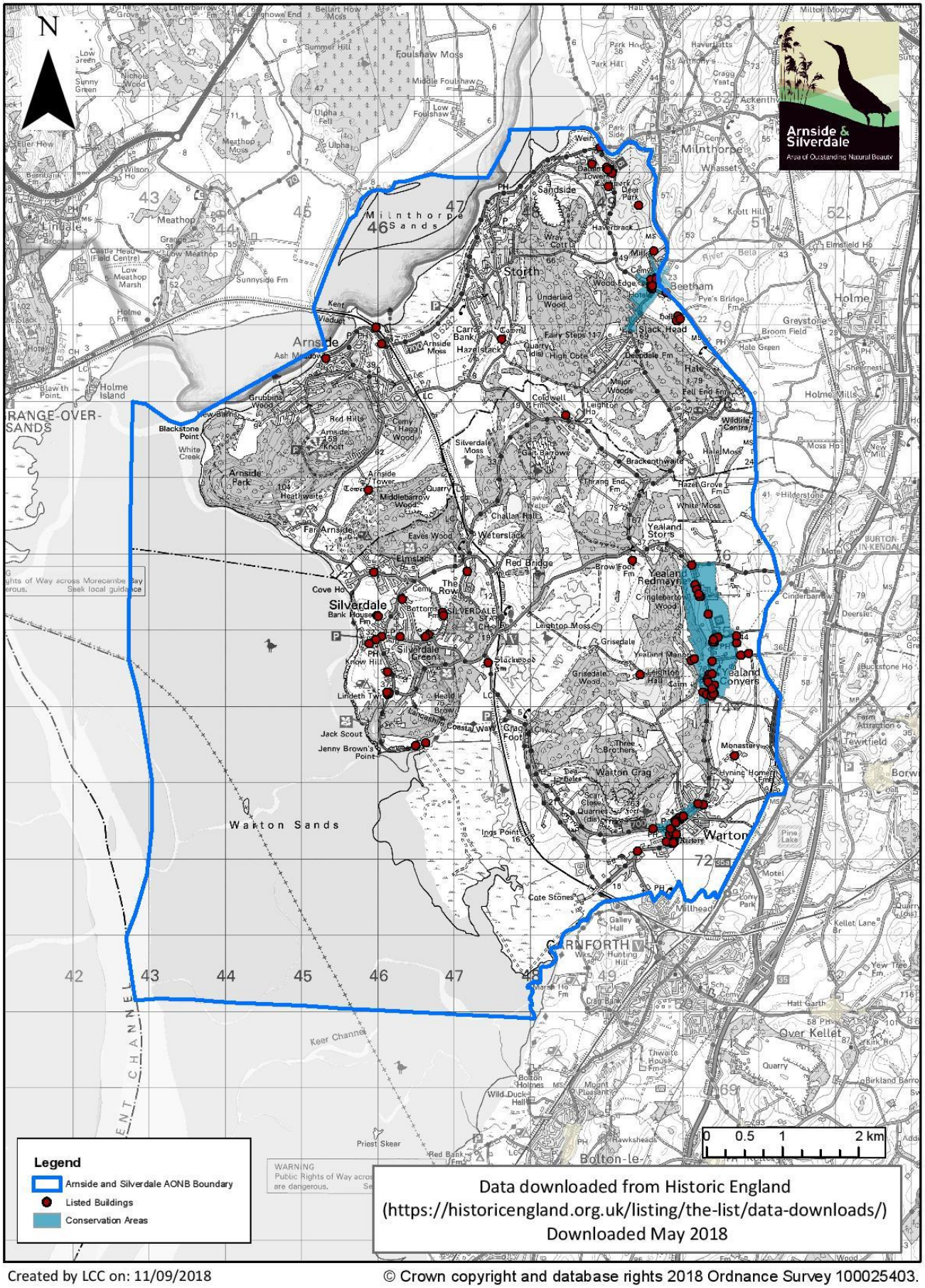

Figure 23

Historic Environment Records within the AONB

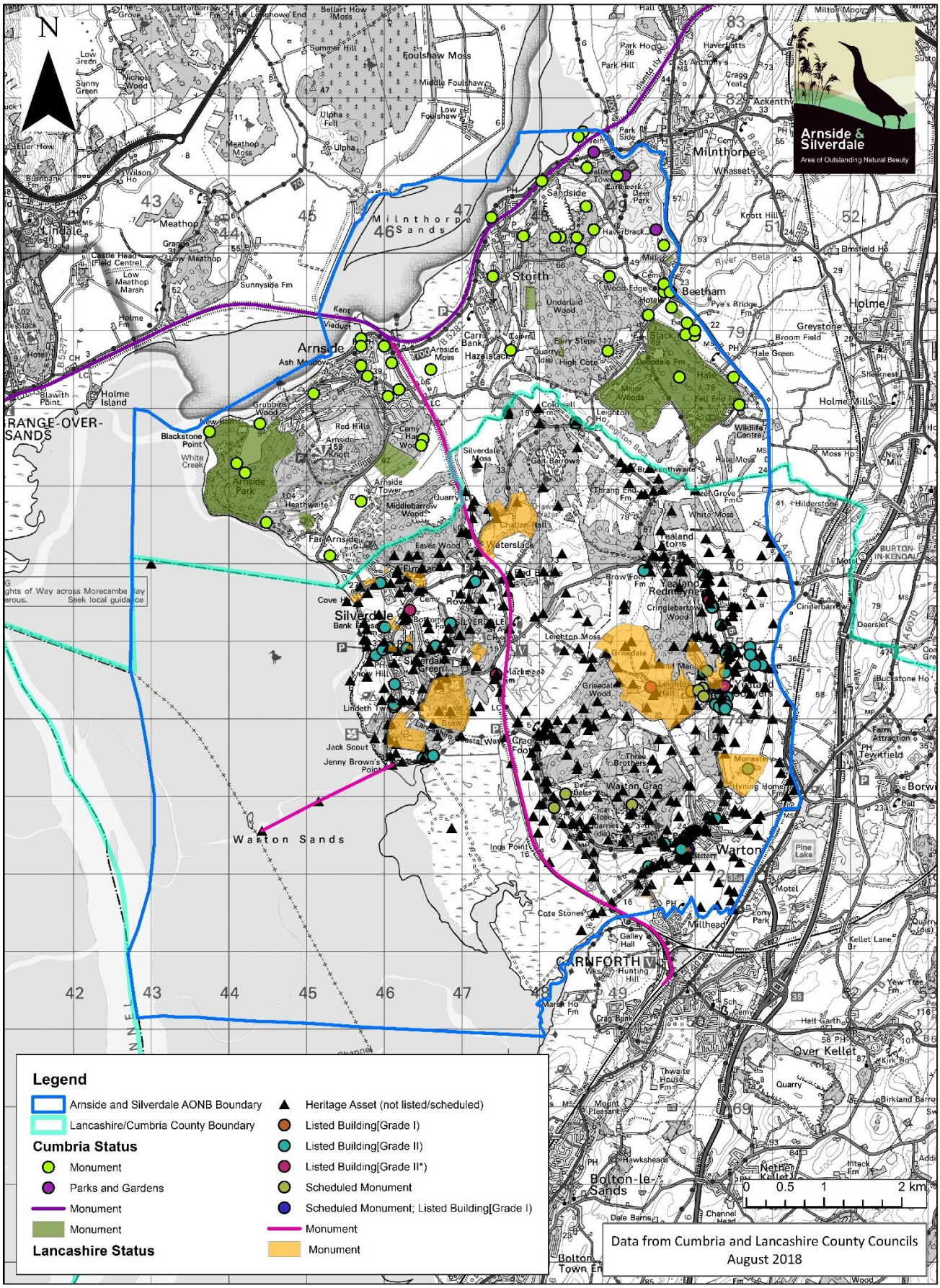

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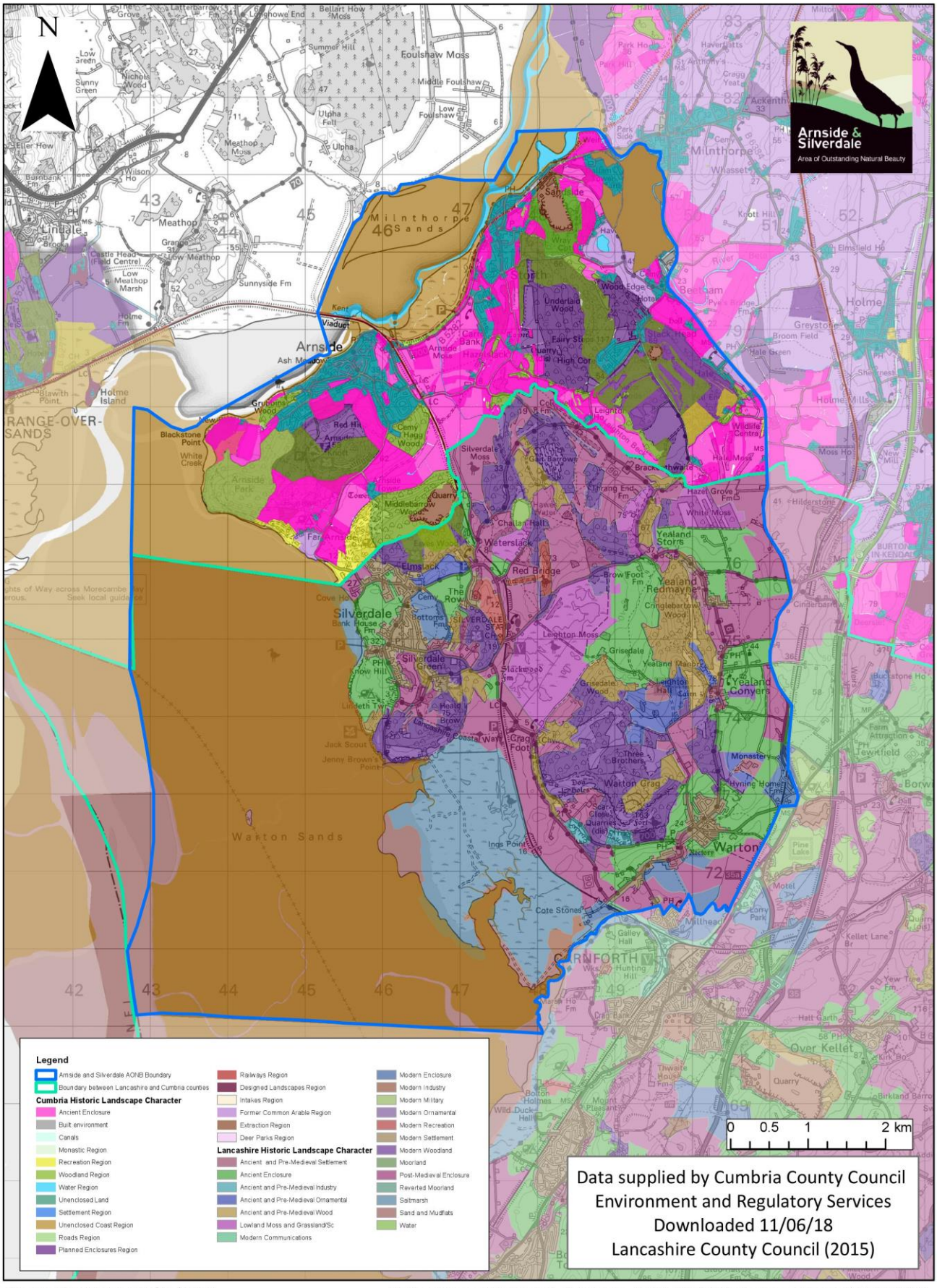
Figure 24

Historic Landscape Classification



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There are four sites which remain on the Historic England Heritage at Risk Register 2017: Arnside Tower, Hazelslack Tower, Beetham Hall (curtain wall and uninhabited portion) and Warton Crag small multivallate hillfort. Since 2013, Slackwood Farm has been removed from the register. Arnside Tower and Hazelslack Tower remain in very bad condition and Beetham Hall remains in bad condition. The small multivallate hillfort on Warton Crag is in generally unsatisfactory condition with major localised problems. Scrub/tree growth is the principal vulnerability but its trend is now improving; was declining back in 2013. Details of the designations and their conditions are given in Appendix 5.

Over the last 5 years as part of the Morecambe Bay Partnership Headlands to Headspace project, there have been a number of research projects undertaken within the AONB: Warton Crag Iron Age hillfort (recording and understanding what remains on the site and helping to develop appropriate land management which balances the needs of the archaeology of the site with the natural heritage and environmental importance of the site); Jenny Browns Point, Silverdale (investigating the chimney site including excavation); Crossfields boatyard and Rock Terrace workshop, Arnside (undertaking a building recording survey and research); documentary research into the salt industry. Archaeological investigations have also been undertaken at Summerhouse Hill by University of Central Lancashire, supported by the Mourholme Society[12].

Historic England has recently entered into discussions with the owner of Arnside and Hazelslack Towers about developing a sustainable management solution as part of a strategic South Lakeland tower houses project. A conservation plan was produced in 2004 for Beetham Hall and plans to reuse the remaining medieval buildings, including the Hall, were approved in 2016.

The Warton Crag research has resulted in a change in how Historic England interpret the scheduled site; what had previously been described as an Iron Age Hillfort is now best interpreted as a Bronze Age Hilltop Enclosure, most likely used as a site with significance for gatherings, rather than as a defensive structure. Work is currently being undertaken to establish a conservation management plan to balance the needs of the archaeology of the site with its natural heritage importance and management. Once this plan is being implemented it is likely that the site will be removed from the Heritage At Risk Register.

The AONB Partnership are actively involved through our volunteer programme in maintaining and managing numerous heritage assets and features throughout the area such as ponds, wells, water troughs, milestones, orchards, hedgerows, drystone walls, and historic designed gardens. In 2018 four assets were managed, the Hyning historic designed garden, Bank Well and Woodwell ponds and a hedgelaying competition was held. In 2017 there were seven assets managed, those mentioned above and including walling training and repainting of milestones at Beetham and hazel hurdle training. 50m of drystone wall, an important heritage feature in the AONB, was also undertaken the year before.

Pressures for development within the AONB are ongoing and there is continuing risk of damage to the AONB's heritage assets and historic landscape character, including the rich archaeological resource and traditional character of settlements and individual buildings and heritage features. **Policy AS07: Historic Environment** in the new Arnside & Silverdale AONB Development Plan Document requires all development proposals in the AONB to take into account the unique heritage assets and historic character of the area, including built, natural, historic and cultural heritage features, and protect, conserve and enhance the significance of heritage assets (including any contribution made by their setting), historic landscape character and the distinctiveness of settlements. Also, development proposals affecting designated heritage assets or non-designated heritage assets that are identified in the Councils' Local List or the historic Environment Record, or discovered during the application process, will have to meet specific criteria. Following adoption of the AONB DPD, in March 2019, compliance with this policy should ensure that new development supports the AONB's heritage assets and special historic character.

[12] The Mourholme Magazine of Local history 2018, No 1, issue 73, http://www.mourholme.co.uk/users/UserFiles/File/Spring%202018%20Issue%2073.pdf

2.6 Tranquillity

Background

'Sense of tranquillity, space and place' is one of the special qualities of the AONB and 'Tranquillity' and 'Sense of place' are identified as benefits to society (cultural ecosystem services) provided by the AONB. Dark skies at night and peace and quiet contribute to this special quality.

Current status

Indicator: Levels of tranquillity

CPRE tranquillity map, 2007

Source: CPRE

Indicator: Levels of intrusion

CPRE intrusion map, 2007

Source: CPRE

Indicator: Dark night skies

CPRE dark night skies map, 2016

Source: CPRE

Interpretation

The Campaign to Protect Rural England (CPRE) Cumbria and Lancashire 2007 maps are illustrated in Appendix 6, and depict levels of tranquillity across the AONB.

The maps clearly show that Arnside & Silverdale AONB is one of the tranquil areas in the region. The western side of the AONB is 'most tranquil'. The levels of tranquillity decline eastwards, and are particularly less along the eastern boundary, adjacent to the A6. Levels of tranquillity also decline a little around the villages of Silverdale and Arnside and along the B5282 coastal road from Arnside to Milnthorpe. It should be noted that this data is now relatively old and has not been updated since 2006.

The CPRE Intrusion Map, North West, 2007, also in Appendix 6, identifies the areas in the AONB disturbed by noise and visual intrusion. The map indicates that Arnside/Storth/Sandside is the area mostly disturbed by noise and visual intrusion. The early 1960s and early 1990s maps, in addition to the 2007 map, show the gradual changing and increase of disturbance within the AONB.

Figure 25 shows very recent data on the extent of light pollution within the AONB. Most light pollution is concentrated around the villages of Arnside, Silverdale, Warton, Beetham and Sandside. The darkest areas are over the estuary and towards the central part of the AONB.

2.7 Air Quality

Background

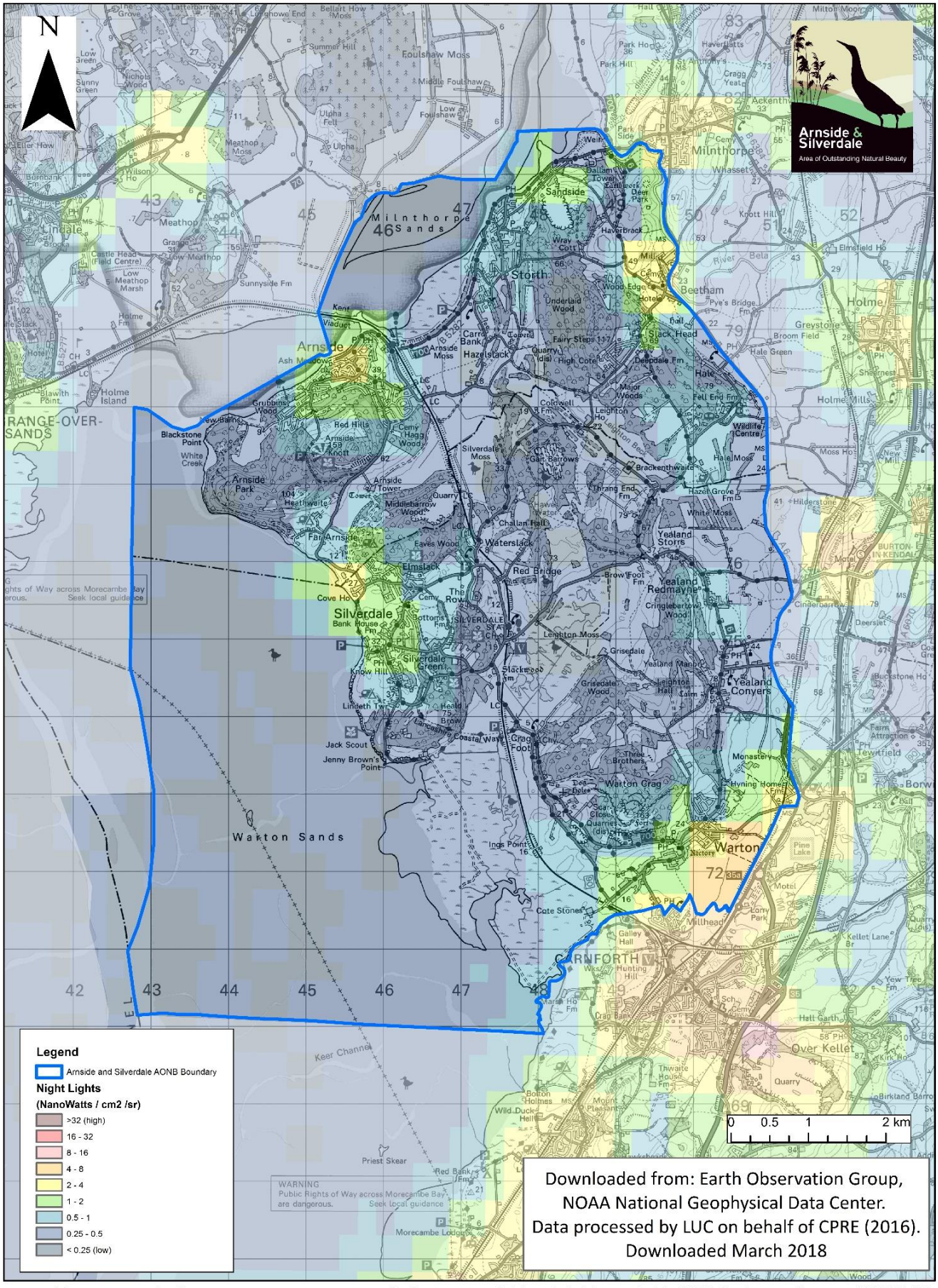
Air quality affects the state of the natural environment and has implications for human health. The Air Quality (England) Regulations 2000 place a duty on local authorities to review and assess air quality for seven pollutants and ensure that standards and objectives laid down for each will be met. The Environment Act 1995 also requires the local authorities to review and assess air quality.

Current status

There are no Air Quality Management Areas (AQMA) within the AONB designation and air quality monitoring is not carried out within the AONB by either South Lakeland District Council or Lancaster City Council. Air quality is not considered to be a current issue within the AONB.

Figure 25

Dark Skies



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