Forest Enterprise
England

Natural Capital Account

2016-2017

Forestry Commission
England

Symonds Yat, Forest of Dean

Welcome

In Forest Enterprise England (FEE) we are fortunate to be the custodians of hundreds of thousands of hectares of England's most wonderful natural resource - its woodlands.

We look after ancient oaks that were planted by Nelson for navy ships; we care for conifers that grow straight and true to build our homes and offices; and we create space in between the trees for wildlife to thrive.

Our role is special because of the value of what our woodlands deliver for us all. It is more than the financial value of timber fence posts produced from our trees, or the money spent on a cup of tea and cake after a hearty walk in the woods. The woods we manage lock up carbon; shape the countryside landscape that we all enjoy; reduce flooding; clean our air and contribute to the health and well-being of all who stroll amongst them.

The decisions our staff make on a daily basis aim to deliver as many of these positive benefits as possible. But we don't actually know if we are, across all these benefits, leaving our public forests in a better environmental position each year.

We know there is value to each component part of what we do, but we have to achieve a balance, for example between more trees to absorb carbon and more open space for our birds.

Now FEE's annual Natural Capital Account (NCA) is providing evidence that will help us to answer those questions, and to make ever better decisions about how we look after our woods and forests.

We're delighted that this year we have improved how we are accounting for the millions of visits we receive every year. In 2016-17 this had been *significantly under-valued, and substantial technical work has now enabled us to update our visit data. The 226 million visits members of the public make to the public forest estate demonstrates clearly how important England's forests are to so many people.

2016-17 is the second year we've produced a NCA. It's a big learning curve for us, and every year we'll make sure it gets better and more informative.

Simon Hodgson, Chief Executive
Miranda Winram, Head of Strategy and Insight

* See Page 8
Significant reported total value change

Grizedale Forest, Cumbria

Executive summary

The total net natural capital asset value of England's public forests in 2016-2017 is £22.5 billion.

Over 98.8% of this value comes from the intangible benefits delivered to society, rather than the income (*private value) to Forest Enterprise England (FEE).

The Public Forest Estate (PFE) is 252,076 ha, and FEE is the custodian of it. The PFE comprises 2% of all England's land, and is about 18% of all the forests in England. Other woodland is in private, local authority or charitable ownership. The PFE was visited by 21 million members of the public, and they made 226 million visits during the year. The land managed by FEE has a higher natural capital value per hectare because of the value attributed to the significant visits from the public that we generate.

The figures in this NCA are calculated according to guidance from the Natural Capital Committee which means we can compare the figures for this year against a baseline.

The value in looking at NCA changes over time comes from longer-term trends rather than immediate year to year changes. This is because:

- The NCA approach assesses the net natural capital value by looking ahead at proposed husbandry over the next 50 years; for example, if FEE's management plan was to fell all our trees in 10 years time, our NCA takes this into account. This means that short-term changes are smoothed to some extent.
- The nature of forestry means that changes to the number and location of trees - one of the significant factors that influence natural capital value - are planned over a 20 year term in our forest design plans (reviewed every 5 years).

As 2016-17 is the second year that FEE has undertaken an NCA, trend information is limited.

The full natural capital value is much higher than the £22.5 billion given, because several of the benefits to society, such as flood alleviation and air quality, can't yet be calculated. As new methodologies to do this become available we will add them into the account, and make sure we provide like-for-like comparison, so that as trend data emerges it can be interpreted.

* See Page 21
Appendix 1: An introduction to Natural Capital Accounting in FEE

The New Forest

Contents

NCA commentary

FEE's overall natural capital value story

The total net natural capital value reported for FEE in 2016-17 is £22.5bn.

This dwarfs the value of the land, property and biological assets (mostly trees), which are accounted for in our annual report and accounts for 2016-17 as £1.4bn.

There are no significant changes to the natural capital value story this account is telling compared to last year's 2015-16 account.

This reflects that:

- The area of the Public Forest Estate (PFE) is broadly unchanged.
- The values that society places on the benefits the PFE delivers (the external values) are broadly similar; for example, the carbon price today is almost the same as in the baseline (although the account also uses the future non-traded carbon price published by the Department of Business, Energy and Industrial Strategy.
- The values attached to some of the private value have changed; for example, the timber price. However the impact of this is low because the proportion of the natural capital value that comes from private value is so low.

Significant reported total value change

There is a significant change in the total net natural capital value reported for FEE. It has changed from £11.9bn reported in the 2015-16 NCA to £22.5bn in this year's NCA.

This year's financial model behind the balance sheet, and the reporting balance sheet shown in this 2016-17 NCA, makes an adjustment to the baseline to reflect a number of improvements we have made to how we calculate and report our natural capital value. The net natural capital value for the baseline year 2013-14 has therefore been updated to £21.6bn, and compares to the 2016-17 figure of £22.5bn.

These improvements have been made because accounting for natural capital value is a new area of work, and FEE is leading the way, not just in England but the world, in natural capital accounting at this scale. FEE is learning about natural capital accounting as we undertake this work, identifying errors and building our organisational capacity to provide relevant data to make the account more complete. We expect to continue making improvements like this as we develop our understanding of NCA every year.

Learning or changes that have impacted on the change in our total net natural capital value this year are:

1. Our assessment of the number of visits made to the PFE has substantially increased. This has had the biggest impact (approx. £10bn) on the changed reported figure.

- Prior to 2015 FEE did not undertake regular surveys of visitor numbers. Because our new survey work was in the very early days when we produced the first NCA last year, we used a very cautious estimate of 73m visits to the PFE in the 2015-16 NCA.
- Since 2015 we have run quarterly surveys with a major national market research agency. This identifies that 226m visits every year is a more accurate figure to use. This means that the PFE

Prior year comparisons

The NCA methodology has been designed to compare the current year assessment with a baseline year. It has not been designed to provide prior year comparisons of the kind that are standard in financial accounts. FEE would, nonetheless, like to be able to provide this prior year comparison as part of its annual presentation of the NCA and in its development of trend information, however at the present stage of development we are unable to do this.

This is because as we are identifying amendments or changes to the data going into the account, in some cases this is data that can't be retrospectively generated; for example, the geographic mapping changes to timber information this year cannot be retrospectively generated to re-do last year's NCA.

Where there are amended or new methods we are therefore amending the baseline to reflect the first year of a new or amended data set; for example, the baseline visit data is now from 2016-17, whereas the baseline carbon data is from 2013-14 (our selected baseline year – where this is possible).

When the account is developed enough to have a stable number of data sets and methodologies, it should be possible to provide prior year comparisons.

accounts for about 50% of all visits estimated to woodland in England (MENE 2015-16 survey by Natural England/Defra). The PFE provides more than 50% of accessible woodland in the UK, and proactively provides the vast majority of visitor activities in woods (walking paths, cycling paths, cafes, activities etc). It is likely that the visit number we are using remains conservative.

- We have no data to base any changes in our visit number from the baseline year 2013-14 to today, and we don't want to artificially suggest there has been a beneficial change from our management that we can't prove. So we have updated the baseline to reflect the 2016-17 visit number figure, and therefore it shows no change to date.
- The data we have derived our visit number from is based on a high sample size, is consistent from quarter to quarter and is replicable. In future years we will use the average data from surveys undertaken in that year, using the same methodology, to update the visit numbers. Any change in the total net natural capital value as a result of the future visit number is part of the change we want to track.

2. We've been able to collect some more data from the business, for example we have included the value of arable and pastoral farming from the relatively small area of farmland on the estate. This has a positive impact of £6.3m.

3. The mapping of the timber data has been amended, this affects a number of metrics.

4. We've identified discrepancies with the value attributed to volunteer time in our 2015-16 NCA and other official documents such as the annual report and accounts. We have made sure that this year the value is calculated in the same way. This has an impact of £11m on the baseline figure.

The detailed balance sheet is included in this NCA on page 15.

Updating the NCA natural capital asset register

The first step in collating an NCA is establishing a natural capital asset register. This underpins the methodology that produces the balance sheet.

The asset register, however, adds more value than just providing the basis for identifying physical flows, monetary value and the grand totals on the balance sheet. This is because the value of natural capital is far more nuanced than a single £ figure.

This is explained in more detail below, because this aspect of the NCA was not covered in detail in the 2015-16 NCA commentary. In future years this explanation will be added to the explanatory Appendix 1 for those new to natural capital value and accounting.

The approach of natural capital accounting is important because numbers – costs and income – drive most of the world we live in, including providing public support to natural capital services that the market doesn't pay for. Natural capital accounting is the only way so far identified to try to add up the various different kinds of natural capital benefits. It is also the only way so far identified to allow a cost-benefit analysis that can be replicated and compared from year to year and between different organisations. This approach is very useful to help us take a big picture overview, and to make more visible the impact one management decision may have in reducing benefit in one area and increasing it in another.

At the moment not all aspects of natural capital can be given a monetary value in natural capital accounting. Furthermore, the pricing of natural capital is subjective, will always be an average and will never reflect a completely up-to-date understanding of the relative importance of benefits.

It is important to look below the headline numbers at the component parts and apply specialist knowledge and judgement to that data. The asset register is the tool that allows us to do this. See page 16 for the 2016-17 asset register. For example, our net natural capital value may go up because we have planted trees on every open space in Sites of Special Scientific Interest (SSSIs) we manage. The biodiversity benefits the SSSIs used to deliver currently don't have a monetary value in the account and so wouldn't show as a reduction, and we are now sequestering more carbon through trees which would show as a positive monetary flow.

At a headline level this would look like a positive change. Understanding that our stock of SSSIs had fallen, or that their condition had deteriorated, is an important part of the overall picture we must be able to identify. The asset register is the tool that allows questions to be asked about the changes it reveals.

Whinlatter Forest, Cumbria

In this year's NCA asset register:

We have continued to build FEE's capacity to provide and update items of relevance to our custodianship of natural capital.

- In some cases we have improved our ability to report on existing geographic information system data, e.g. the area of wood pasture as a sub-set of woodland was blank last year, but is now identified.
- In other cases there has been a substantial investment of staff time and effort in developing new systems to report on areas of interest that were previously impossible; for example, a system to report on the condition of environmental sites that were not covered by the SSSI or woodland habitat established reporting. This has involved establishing a new internal process, and has an ongoing FEE commitment to invest staff resource into maintaining and updating the new condition reporting system. This is a substantial improvement in our corporate understanding of the quality of management we are providing to all our environmentally sensitive areas.
- Some data has been re-run to remove inaccuracies; for example, data on travel time from priority places.
- We are able to see, for the first time, some of the changes in our land from year to year and this visibility enables questions to be asked, and for the management team to be held to account in having good answers to those questions.

The red/amber/green rating on the asset register flags where there are changes that are unplanned and/or unwelcome. The stripe red/amber/green rating identifies where there are changes that are planned or welcome. This seeks to easily identify changes that the reader should ask further questions about.

The full asset register is included in this NCA on page 16.

FEE's learning from our NCA experience to date

The process of collating data and reporting our NCA has highlighted a number of learning points:

- It has given senior managers greater understanding of our impact on natural capital.
- The possibility of using the concept of natural capital to aid decisions, for example in relation to investment or land acquisition, is being considered by the senior management team.
- Natural capital is providing a frame of reference for board overview of management decisions, for example understanding the benefits of a change in land ownership title through the natural capital benefits impacts it would confer. As our recording of data and use of natural capital increases, this frame of reference will be enhanced further by the ability to make more tightly evidence-based decisions.
- We have developed a strong appetite for building a better evidence-base to assess the areas of social external benefit that presently lack data.
- Technical understanding of the challenges of this approach has grown, for example, revising the baseline as we identify errors or improvements has been possible in this second year of producing the account. It will be increasingly difficult to do in the future, and we need to ensure that future changes retain visibility in our reporting.
- Trend information is not yet possible to establish.
- Collating the data is time consuming for staff and the benefits of the approach need to be well explained. In 2017-18 we will assess the time taken to report the various data sets, and assess the benefit.

Natural capital collaborations

FEE has taken the lead in developing this NCA, and is keen to work with others to encourage the adoption of natural capital value and natural capital accounting, and to help others learn from our work.

We are collaborating with a range of public and third-sector organisations to share information and learning. These include the Defra-sponsored Natural Capital Committee, the international alliance the Natural Capital Coalition, Defra pioneer areas in north Devon and Cumbria, and collaborations like Manchester City of Trees and with the University of Exeter's Chartered Institute of Management Accountants project.

Natural capital value next steps

Missing natural capital value

There remain several areas of natural capital value that cannot be included in the monetary element of our NCA at present. FEE is dependent on other, more specialist bodies developing their research and methodologies to a point where we can adopt them. The areas where it is hoped we will be able to include more aspects of natural capital benefit are:

- Flooding (possible inclusion 2017-2020)
- Biodiversity - Aspects of biodiversity are already captured in some of the values in this NCA, for example some of the recreation value comes from the visible diversity of flora and fauna. There is a wider academic debate about the intrinsic value of biodiversity and this is unlikely to be resolved and transfer into a useable methodology in the short term.
- Water quality (possible inclusion 2017-2020)
- Air pollution (possible inclusion 2017-2020)

Increased standardisation

FEE will work to help develop increased standardisation of methodology and assumptions across those using NCA as a tool. This will increasingly validate the NCA approach and allow its use in a broader variety of forums.

Practical internal applications

FEE will identify, trial and develop the use of natural capital value to help inform and improve some specific management decisions within FEE. We are looking at how we can use our natural capital approach to inform investment decisions and optimise our timber production activity.

Balance sheet

This is a breakdown of the balance sheet, reporting asset values (into perpetuity) for each natural capital benefit. It draws together the headline values reported under each of the monetary account schedules and the maintenance cost. See notes on page 15.

	Private value				
	*Baseline 2013-14	Cumulative gains (losses)	Additions / disposals	Revaluation / adjustments	Reporting year 2016-17
	Present value (£m)				
Non-renewables					
Minerals	4	-	-	-	4
Total non-renewables	4	-	-	-	4
Renewables					
Timber	238	14	-	88	340
Food	7	(1)	-	-	6
Plant and seeds	-	-	-	-	-
Carbon	-	-	-	-	-
Recreation and public access	(270)	90	-	-	(180)
Total renewables	(25)	103	-	88	166
Government PES funding	578	-	-	-	578
Total gross asset value	557	103	-	88	748
Maintenance costs	(428)	(53)	-	-	(481)
Total net natural capital assets	129	50	-	88	267

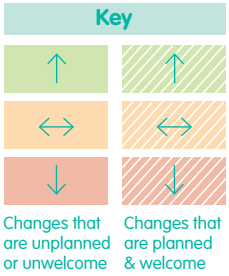
* Baseline year 2013-14 or more recent year if data has just become available.

Notes:

A. All values in 2016-17 prices (£m) in present value terms, rounded to the nearest £1m.
B. Present values are calculated as discounted flow of annual value in perpetuity. A 3% discount rate is used. Annual values are forecast over 50 years and from year 51 to perpetuity it is assumed that the annual value is constant.
C. The baseline value represents the value of assets at the baseline date (31 March 2014).
D. Cumulative gains/losses show the net change in asset values (compared to the baseline date). The change is normally due to a change in the condition of the assets, either through natural improvement/deterioration or through management intervention.
E. Additions show the increase in asset values associated with the acquisition, realisation or discovery of new assets since the baseline date.
F. Disposals disclose the reduction in asset values associated with the disposal or extraction (for non-renewable resources) of natural assets.
G. Revaluations and adjustments calculate the asset value changes arising from changes in external factors and key assumptions (e.g. market prices).
H. Gross asset values are for the reporting year (2016-17) and are calculated after the deduction of production costs.
I. Negative values are reported with brackets (for example, for cumulative losses between the baseline and reporting year).
J. Private value of assets is to the reporting entity (Forest Enterprise England), external value of assets is to the rest of society.
K. Maintenance costs include the cost of all legal obligations and other activities necessary to preserve the long term output of the natural assets at the benefit levels assumed in the asset values section of the balance sheet. External costs are the opportunity costs of volunteer time. As other areas of natural capital become external valued the maintenance will move into the private value renewables area.
L. 2013-14 PES funding reflects funding plus an allocation for overheads that were not previously charged to FEE. 2016-17 already recognises the increase in service level agreement value due to the transfer/charge of corporate overheads from the Forestry Commission to FEE.

External value					Total value				
*Baseline 2013-14	Cumulative gains (losses)	Additions / disposals	Revaluation / adjustments	Reporting year 2016-17	*Baseline 2013-14	Cumulative gains (losses)	Additions / disposals	Revaluation / adjustments	Reporting year 2016-17
Present value (£m)					Present value (£m)				
-	-	-	-	-	4	-	-	-	4
-	-	-	-	-	4	-	-	-	4
-	-	-	-	-	238	14	-	88	340
-	-	-	-	-	7	(1)	-	-	6
14	6	-	-	20	14	6	-	-	20
7,282	(104)	-	529	7,707	7,282	(104)	-	529	7,707
15,108	-	-	9	15,117	14,838	90	-	9	14,937
22,404	(98)	-	538	22,844	22,379	5	-	626	23,010
(578)	-	-	-	(578)	-	-	-	-	-
21,826	(98)	-	538	22,266	22,383	5	-	626	23,014
(31)	(26)	-	-	(57)	(459)	(79)	-	-	(538)
21,795	(124)	-	538	22,209	21,924	(74)	-	626	22,476

Asset register



The asset register is an inventory of the status of the natural capital assets that make up the PFE, including evidence of their extent, condition, and spatial configuration. Other forms of capital (such as car parks) that may influence natural capital benefits are also included.

Indicator		*Baseline year 2013-14	Reporting year 2016-17	Trend	% change	Units	Explanation of trend
Ecological communities and species							
Extent	**Broad and priority habitat area**						
	Broad habitat area						
	Woodland area	207,876	205,336	↔	-1.2%	ha	**Broad habitat area** The plantation on ancient woodland site (PAWS) and open habitats policies continue to impact on woodland area with other broad habitat changes mostly being reclassification or landholding change related. Because the woodland area change is small in percentage terms it is not RAG rated as a decline.
	Grassland area	12,748	13,992	↑	9.8%		
	Mountain, moors heathlands area	28,564	28,730	↔	0.6%		
	Enclosed farmland	724	723	↔	-0.1%		
	Freshwater	265	257	↔	-3.1%		
	Urban area	742	720	↔	-3.0%		
	Coastal margins	17.0	17.1	↔	0.6%		
	Total area	250,936	249,776	↔	-0.5%		
	Priority habitat within PFE						
	Broadleaved, mixed and yew woodland	22,757	22,915	↔	0.7%	ha	**Priority habitat within PFE** Priority habitats continue to increase in area according to PAWS and open habitat policies being implemented via the Forest Plans. Minor changes to classification of open land and upland agricultural land have also been made.
	Lowland dry acid grassland and lowland heath	14,628	14,709	↔	0.6%		
	Other priority grassland	522	587	↑	12.5%		
	Lowland raised bog	782	782	↔	0.0%		
	Blanket bog	6,793	6,844	↔	0.8%		
	Upland heathland	6,881	6,830	↔	-0.7%		
	Other	364	383	↔	5.2%		
	Total area	52,727	53,051	↔	0.6%		
	Woodland area						
	Plantation	165,192	166,825	↔	1.0%	ha	**Woodland area** The trends generally indicate an increase of recording in species diversity and a trend of moving toward native species. However this is marked by landholding changes in this instance.
	Native	37,897	35,220	↓	-7.1%		
	Non-intervention	13,275	13,275	↔	0.0%		
	Wood pasture	735	735	↔	0.0%		

* Baseline year 2013-14 or more recent year if data has just become available.

Indicator		*Baseline year 2013-14	Reporting year 2016-17	Trend	% change	Units	Explanation of trend
Ecological communities and species							
Extent	**Total land area holdings**						
	Freehold	197,527	199,377	↔	0.9%	ha	**Total land area holdings** Some significant leasehold areas were surrendered this year with minor amounts being converted to freehold. The decline in leasehold is a function of the terms of those leases and is therefore anticipated and is therefore not RAG status red.
	Leasehold	58,319	52,699	↔	-9.6%		
	Total agricultural land use	3,345	7,178	↔	114.6%		**Total agricultural land use** Reclassification of some upland heathland to agricultural land use due to their ongoing management results in this unusual increase this year. Although a substantial increase, this has no impact on FEE's achievement of its strategic priorities.
	Area of land under statutory designations (SSSIs, AONB, SAM, NP)	147,823	147,795	↔	0.0%		
	Area of priority open habitat restored or created	42,844	44,398	↑	3.6%		
	Area of land with potential to restore to priority open habitats	54,474	54,474	↔	0.0%		
	PAWs (area by semi-naturalness score)						**Area of priority open habitat** The open habitats policy implementation via the Forest Plans continues to create or restore targetted areas of open priority habitat. The rate of policy implementation is as per our open habitat plan and therefore this is green RAG rated.
	1 (over 80% native)	8,261	9,792	↑	18.5%	ha	
	2 (between 50-80% native)	3,332	3,876	↑	16.3%		
	3 (between 20-50% native)	5,765	5,949	↑	3.2%		
	4 (under 20% native)	27,252	24,941	↓	-8.5%		
	0 (no trees)	993	952	↓	-4.1%		
	Total area	44,610	44,558	↔	-0.1%		**PAWs (area by semi-naturalness score)** The PAWS policy implemented predominately by thinning continues to impact negatively on SN4 conifer and positively on the SN1, 2 and 3 native species becoming dominant.
	Ancient semi natural woodland and PAWS (area by semi-naturalness score)						
	1 (over 80% native)	19,774	21,054	↑	6.5%	ha	**Ancient semi natural woodland and PAWS (area by semi-naturalness score)** The PAWS policy implemented predominately by thinning continues to impact negatively on SN4 conifer and positively on the SN1, 2 and 3 native species becoming dominant.
	2 (between 50-80% native)	4,272	6,320	↑	47.9%		
	3 (between 20-50% native)	6,459	6,672	↑	3.3%		
	4 (under 20% native)	28,614	26,523	↓	-7.3%		
	0 (no trees)	1,700	1,769	↑	4.1%		
	Total area	60,819	62,338	↔	2.5%		
Condition	**Conditions of SSSIs**						
	% in favourable condition	35.6	36.8	↑	3.3%	%	**Conditions of SSSIs** Changes to SSSI condition occur slowly as both resurvey and the result of restoration works combine but the increase in favourable condition reflect ongoing work to improve these important habitats.
	% in unfavourable recovering condition	63.9	61.8	↓	-3.2%		
	% in unfavourable no change or declining condition	0.5	1.4	↑	182.0%		
	% part destroyed or destroyed condition	-	-	↔	0.0%		

Indicator		*Baseline year 2013-14	Reporting year 2016-17	Trend	% change	Units	Explanation of trend
Ecological communities and species							
Condition	**Site condition of non-SSSI priority woodland habitat**						
	Ancient and semi-natural woodland						
	Favourable	1,422	1,422		-	%	**Site condition of non-SSSI priorty woodland habitat** Habitat condition records are new for this so there is no long term trend at present.
	Recovering	2,667	2,667		-		
	Declining	170	170		-		
	Unfavourable	763	763		-		
	Not known	92	92		-		
	Priority ancient woodland						
	Favourable	2,061	2,061		-	%	
	Recovering	10,850	10,850		-		
	Declining	1,364	1,364		-		
	Unfavourable	791	791		-		
	Not known	14,793	14,793		-		
	Broadleaved (non-ancient woodland)						
	Favourable	3,130	3,130		-	%	
	Recovering	7,634	7,634		-		
	Declining	1,077	1,077		-		
	Unfavourable	1,898	1,898		-		
	Not known	2,458	2,458		-		
	Wood pasture						
	Favourable	283	283		-	%	
	Recovering	192	192		-		
	Declining	-	-		-		
	Unfavourable	260	260		-		
	Not known	-	-		-		
	Non-intervention						
	Favourable	679	679		-	%	
	Recovering	1,352	1,352		-		
	Declining	330	330		-		
	Unfavourable	573	573		-		
	Not known	10,340	10,340		-		
	Site condition of non-SSSI non woodland habitat						
	Lowland dry acid heath and grassland						
	Favourable	-	-		-	%	**Site condition of non-SSSI non-woodland habitat** This is newly recorded data and at present is only available at a top-level, though in future years we hope to be able to expand this into the categories shown.
	Recovering	-	-		-		
	Declining	-	-		-		
	Unfavourable	-	-		-		
	Not known	-	-		-		

Indicator		*Baseline year 2013-14	Reporting year 2016-17	Trend	% change	Units	Explanation of trend
Ecological communities and species							
Extent	**Other grassland**						
	Favourable	-	-		-	%	**Site condition of non-SSSI non-woodland habitat** This is newly recorded data and at present is only available at a top-level, though in future years we hope to be able to expand this into the categories shown.
	Recovering	-	-		-		
	Declining	-	-		-		
	Unfavourable	-	-		-		
	Not known	-	-		-		
	Other grassland						
	Favourable	-	-		-	%	
	Recovering	-	-		-		
	Declining	-	-		-		
	Unfavourable	-	-		-		
	Not known	-	-		-		
	Lowland raised bog						
	Favourable	-	-		-	%	
	Recovering	-	-		-		
	Declining	-	-		-		
	Unfavourable	-	-		-		
	Not known	-	-		-		
	Blanket bog						
	Favourable	-	-		-	%	
	Recovering	-	-		-		
	Declining	-	-		-		
	Unfavourable	-	-		-		
	Not known	-	-		-		
	Upland heath						
	Favourable	-	-		-	%	
	Recovering	-	-		-		
	Declining	-	-		-		
	Unfavourable	-	-		-		
	Not known	-	-		-		
	Other						
	Favourable	1,679	1,679		-	%	
	Recovering	3,582	3,582		-		
	Declining	1,176	1,176		-		
	Unfavourable	738	738		-		
	Not known	175	175		-		

	Indicator	*Baseline year 2013-14	Reporting year 2016-17	Trend	% change	Units	Explanation of trend
Ecological communities and species							
Condition	**Woodland ecological calculator index**						
	Deadwood volume	-	-		-	m^3 per ha	**Woodland ecological calculator index** This is an area that it is possible we may be able to report on in the future and it is being investigated.
	Vertical structure	-	-		-	Index	
	Ground flora	-	-		-	%	
	Veteran trees	-	-		-	trees/ha	
	Nativeness of occupancy	-	-		-	%	
	Invasive species	-	-		-	%	
	Tree pests and diseases	-	-		-	%	
	Woodland bird indicator						
	All	-	-		-	Index	**Woodland bird indicator** This is an area that Defra have been investigating, though as yet we are not aware of a method of calculating. We have retained it as an area for future expansion.
	Generalists	-	-		-		
	Specialists	-	-		-		
	Carbon stock in...						
	Living biomass	12,397	13,143	↑	6.0%	1000 metric tonnes	**Carbon stock in...** This represents the carbon stored in the PFE. This is distinct from the assessment of carbon dioxide (equivalent) flows from the PFE that are assessed in the physical and monetary accounts.
	Deadwood and litter	-	-		-		
	Soils	-	-		-		
	CO_2e stock in...						
	Living biomass	45,456	48,190	↑	6.0%	1000 metric tonnes	**CO_2e stock in...** This shows carbon dioxide equivalent (CO_2e) of the carbon stored in the PFE. The change in the stock as a result of sequestration or emissions of carbon (CO_2e) enter the physical account, monetary account and balance sheet.
	Deadwood and litter	-	-		-		
	Soils	-	-		-		
	Biomass stock...						
	Total above and below ground	24,794	26,285	↑	6.0%	1000 metric tonnes oven-dry weight	
	Above ground	19,295	20,456	↑	6.0%		
	Below ground	5,499	5,829	↑	6.0%		
	In deadwood	-	-		-		
	Standing timber volume (overbark standing)						
	Coniferous	26,148	26,457	↔	1.2%	1000 m^3	**Contiguity of SSSI and priority habitat areas)** This is an area that it is possible we may be able to report on in the future and it is being investigated.
	Broadleaved	8,147	9,852	↑	20.9%		
Spatial configuration	**Contiguity of SSSI and priority habitat areas**	-	-		-		
	Contiguity of different habitats	-	-		-		**Contiguity of different habitats** This is an area that it is possible we may be able to report on in the future and it is being investigated.
	Location of PFE woodland by ONS land classification						
	Rural town and fringe	27,601	27,869	↔	1.0%	ha	**Location of PFE woodland by ONS land classification** Urban conurbation change is not something we have identified a reason for.
	Rural village and dispersed	205,464	205,963	↔	0.2%		
	Urban city and town	16,294	16,459	↔	1.0%		
	Urban conurbation	1,840	1,990	↑	8.2%		

Indicator		*Baseline year 2013-14	Reporting year 2016-17	Trend	% change	Units	Explanation of trend
Freshwater							
Extent	**Freshwater broad and priority habitat area**	-	-		-	ha	It is possible that we may be able to report on these indicators in future and it is being investigated.
Condition	**No. of water bodies where PFE forestry is identified as contributing factor in reasons for not achieving 'good' status**	-	-		-	no.	
	Area of PFE contributing to water bodies as risk of acidification	-	-		-	ha	
	% of woodland area in catchments affecting assets at risk (people and property)	-	-		-	%	
	% water bodies achieving optimal shading (40-60% dappled shade)	-	-		-	%	
Minerals							
Extent	**Volume of exploitable reserves by type**	-	-		-	-	
Land							
	% of people in 'priority places' close to accessible PFE woodland	9.0	9.0	⟷	0.0%	%	
	% of England's population within 6 miles of all PFE land	49.1	48.5	⟷	-1.2%	%	
	% of England's population within specific drive time to accessible PFE sites						
	15mins	40.3	41.0	⟷	1.7%	%	
	30mins	85.8	86.6	⟷	0.9%	%	
	60mins	99.9	99.9	⟷	0.0%	%	
Soil							
	Area of woodland on deep peat soil	21,401	21,401		-	ha	
	Area of woodland on shallow peat soils and peaty pockets	44,781	44,781		-	ha	
Air							
	Area of woodland in areas of differing air quality						
	Urban	18,134	18,449	⟷	1.7%	ha	
	Perfi-urban	27,601	27,869	⟷	1.0%	ha	
	Rural	205,464	205,963	⟷	0.2%	ha	
Other forms of capital							
	Car parks	568	569	⟷	0.2%	no.	
	Area of land by accessibility status						
	CRoW access	149,940	149,937	⟷	0.0%	ha	
	Other accessibility based on deeds	85,730	85,980	⟷	0.3%	ha	
	Km of published recreational routes across the estate	2,859	2,894	⟷	1.2%	km	

Physical flow account summary

This schedule reports the flow of natural capital benefits (by FEE as well as FEE tenants and contractors) that are produced from the PFE in the baseline year and the reporting year.

Spatial accounting unit by natural capital benefit	Indicator	Units	*Baseline year 2013-14	Reporting year 2016-17
Timber provision				
Woodland	Total PFE timber production	m^3 / yr	1,520,129	1,476,720
Climate regulation				
Woodland	Carbon sequestered / emitted	Tonnes CO_2 / yr	1,645,657	1,677,396
Bogs			(8,717)	(8,784)
Grassland			-	-
Heathland			-	-
Woodland	Carbon embodied in environmental goods (timber)	Tonnes CO_2 / yr	2,786,903	2,707,320
Recreation				
Whole estate	Visits to PFE	Visits / yr	226,000,000	226,000,000
	Visitors to PFE	Visitors / yr	21,000,000	21,000,000
Plant and seed supply				
Whole estate	Plant supply number	Number / yr	14,961,000	15,982,000
	Seed supply number	Kg / yr	-	-
Food provision				
Whole estate	Wild game carcass numbers	Number / yr	11,586	12,914
	Livestock production from tenant farmers	Number / yr	7,309	7,146
	Crop production from tenant farmers	Kg / yr	381	421
Minerals				
Whole estate	Mineral production value	Tonnes / yr	1,295,850	1,054,867

* Baseline year 2013-14 or more recent year if data has just become available.

Notes:

A. Physical flow estimates are the total (annual) production from the PFE. This includes production by FEE itself, contractors and tenants. Total production is relevant to report because total (annual) production relates to FEE management decisions.

B. Carbon embodied in environmental goods does not represent a release of carbon to the atmosphere. Therefore the flow associated with the movement of embodied carbon in these products is neither a benefit nor a dis-benefit. The subsequent decision to use this timber in construction or as a fuel is often outside the control of FEE and where FEE does burn wood fuel, the decision to do so is unrelated to the management of natural capital and therefore outside of the scope of the NCA.

Monetary account summary

This schedule collates the estimated total annual value (£) of natural capital benefits that are produced from the PFE in both the baseline year and the reporting year. These values are calculated after deducting production costs (but not maintenance costs, which cannot be attributed to individual benefits but are netted off the gross value of assets in the balance sheet.

Spatial accounting unit by natural capital benefit	Indicator	Units	*Baseline year 2013-14	Reporting year 2016-17
Timber provision				
Woodland	Net asset value for timber produced	£ / yr	£9,658,116	£11,618,967
Climate regulation				
Woodland	Carbon sequestration value	£ / yr	£98,739,421	£94,140,801
Bogs			£(523,001)	£(549,699)
Grassland			-	-
Heathland			-	-
Recreation				
Whole estate	Net asset value for recreation	£ / yr	£477,550,332	£480,712,211
Plant and seed supply				
Whole estate	Plant and seed supply revenues	£ / yr	£3,091,288	£4,284,880
Food provision				
Whole estate	Wild game carcass value	£ / yr	£12,677	£(17,233)
	Livestock production value	£ / yr	£143,783	£145,336
	Crop production value	£ / yr	£57,030	£59,265
Minerals				
Whole estate	Mineral sales value	£ / yr	£896,060	£283,587

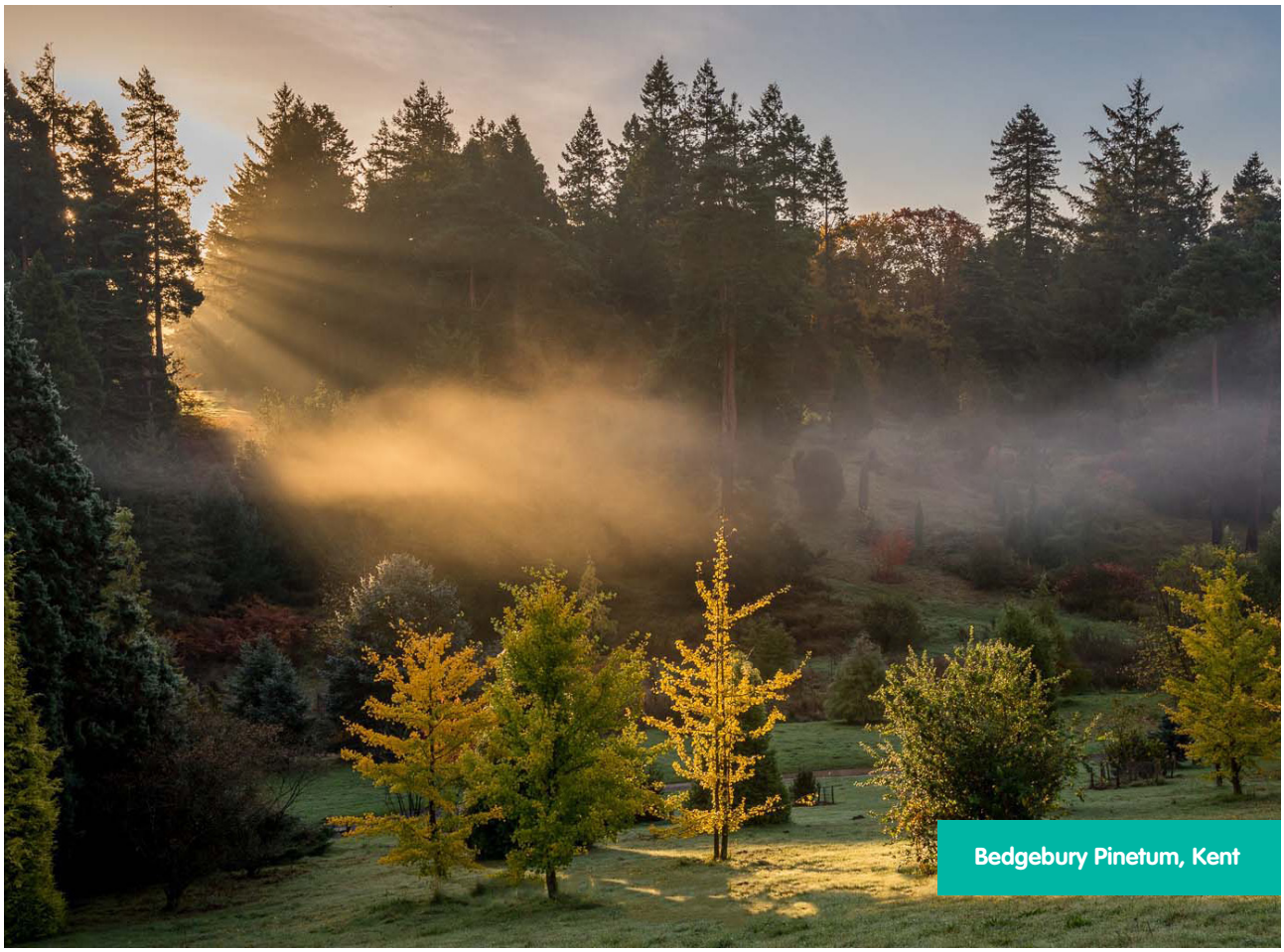
* Baseline year 2013-14 or more recent year if data has just become available.

Notes:
The monetary account does not report the estimated value of the total output that is reported in the physical account. Instead it reports the value to the reporting entity (private value from rents) and to wider society (external value from the direct consumption of benefits only). It does not include the indirect or downstream value to farmers and aggregates/timber contractors from the sale of their produce. This is because these sales are based on decisions outside of the control of FEE and exist further along the value chain).
Values reported above are the sum of annual private and external value.

Maintenance account summary

The aggregate estimate of maintenance costs produced from this worksheet feeds into the balance sheet.

Liabilities			
Private		**External**	
Legal maintenance obligations	£(91,166,789)	Other maintenance provisions	£(57,283,644)
Other maintenance provisions	£(390,128,822)		
Total net maintenance provisions	£(481,295,610)		



Bedgebury Pinetum, Kent

Appendix 1: An introduction to natural capital accounting in Forest Enterprise England

What is natural capital?

Natural capital refers to the stock of natural assets upon which our economy and society is built. Natural capital produces value for people in the form of goods such as timber or minerals, and services such as climate regulation and air purification. Sometimes people need to intervene to realise the benefits but in other instances production is simply the result of natural capital combining with natural processes.

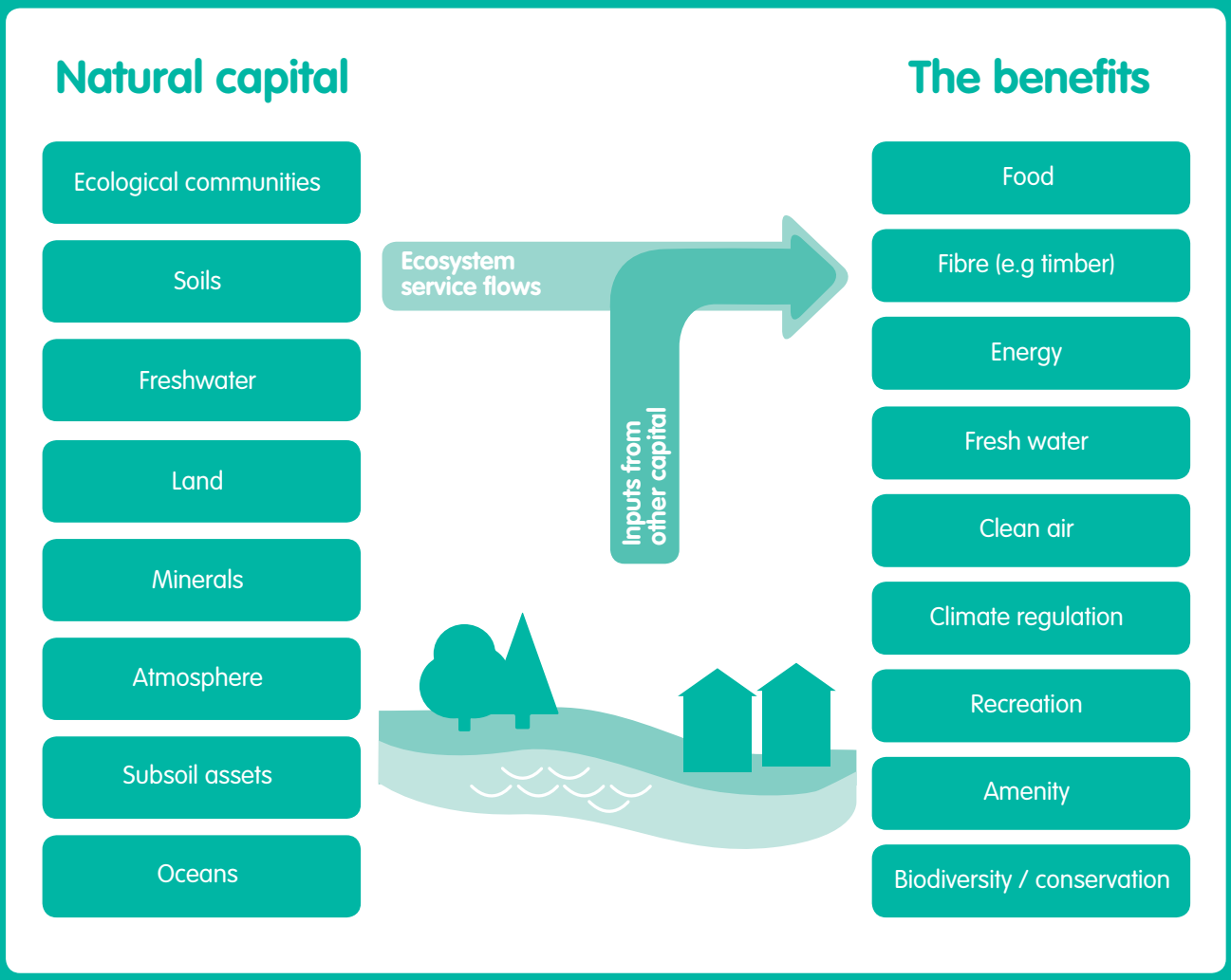


Fig. 1: Diagram showing the flow of natural capital benefits that come from natural capital.

Appendix 1

Why develop a Natural Capital Account for FEE?

The development of FEE's NCA is a pioneering contribution to the practical application of the concept of natural capital, both in the UK and internationally. It represents the first organisation-wide account by anyone responsible for the care of such a large base of natural capital.

Bellever Forest, Dartmoor

The work represents an important advance in applying the NCA framework developed in 2014 by the Natural Capital Committee (an advisory committee for the Defra-sponsored UK Government established in 2012), to an organisation level account with the stated ambition of establishing the account as a management tool that will complement decision-making processes.

Having a NCA will help:

- Complement existing reporting on the environmental, social and economic outcomes that are delivered by England's woods and forests.
- Demonstrate the overall societal value delivered by England's woods and forests and the management of them by FEE.
- Inform decisions by making a clearer link between the management and value of natural capital assets.
- Assess the impact on natural capital values from both short-term and long-term decision making.

The NCA will provide a replicable basis for comparison of trends from year to year. Over time FEE's Strategy Board will be able to use the NCA to assess whether FEE's custodianship of England's public woods and forests is increasing or decreasing the natural capital value. The account will provide a valuable evidence base and result in an annual prompt for the Strategy Board to engage in debate about policy and strategic goals and their long-term impact on the natural capital assets FEE looks after.

Time horizon

The NCA framework presents a forward-looking perspective for understanding the value of natural capital assets. This is because the purpose is to provide information in an accounting format that can inform strategic and business decisions concerning ongoing and future management of natural capital, with the aim of safeguarding the health and condition of natural assets into the future. This requires reporting the long-term value of natural capital assets and liabilities.

Consistent with the NCA framework, natural capital asset values in the account are calculated at a discounted rate of the expected future values into perpetuity. Discounting means we can compare the costs and benefits that occur in the future at today's prices. It is based on the principle that, generally, people prefer to receive goods and services now rather than later.

In FEE's account it is based on:

- **Profiling/forecasting values over 50 years.** This time period has been selected since it is consistent with the time horizon of the forest design plans that set the management objectives for each forest block. It aligns with data availability from the sub-compartment database, which is used to estimate timber and carbon flows over time.

- **A residual value assumed beyond 50 years.** This is an assumption that the level of provision from the last year of the forecast period into the future will remain steady with regards to costs and benefits.

The profile of costs and benefits over time are discounted at the social discount rate (3.5% declining to 3% after 30 years) as detailed in the HM Treasury Green Book. Use of the social discount rate to calculate present values, reflects the strategic objectives of balancing social, economic and environmental outcomes.

Structure of the account

The NCA framework is structured around four accounting schedules and reporting statements that draw on, and organise the financial and environmental management data which forms the basis of the natural capital account.

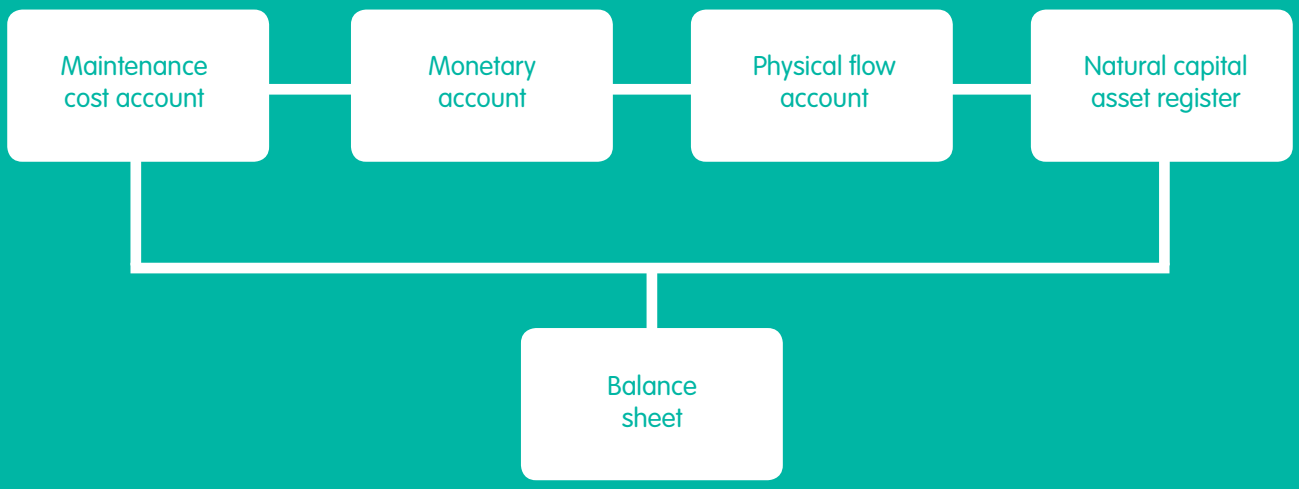


Fig. 2: Forest Enterprise England's natural capital account structure

Each of the schedules has a different focus which come together and make up the overall account. The purpose of each of the schedules is described in the next section.

FEE natural capital account structure

Natural capital asset register

The asset register is an inventory of the amount, condition and location of natural capital assets. Changes in these metrics over time help us understand the capacity of England's public woods and forests to produce benefits into the future. The asset register can be used as a tool in its own right to monitor the trends of natural capital assets. This is particularly useful while the account is being developed and not all assets deliver flows of services that can be measured and can then be fully represented as a monetary figure.

Physical flow account

The physical flow account records the volume of ecosystem service flows from England's woods and forests. It covers both market (for example, the amount of timber) and non-market (such as the amount of carbon sequestered by our woodland) goods and services. These figures are the basis for subsequently calculating the value of those flows (in the monetary account).

Monetary account

The monetary account is where the annual value of the goods and services flowing from England's woods and forests is reported. It records both the private value in terms of FEE's revenue from marketed goods and services such as timber, and the external value to wider society from non-market goods and services such as recreation. Both values are calculated net, with the cost of producing the benefit removed. For example the cost of timber harvesting activity is deducted from the total revenue generated. This is so that only the value which comes from natural capital is reported, rather than value generated by other inputs. This is why some of the figures in the monetary account appear different to those reported in the financial annual report and accounts.

We are only able to include benefits in our monetary account where there is a robust evidence base for allocating a value. For example, for recreation we have based our valuation on the results of a study by Willis et al (2003) which gives a value for recreational visits to woods and forests. Because research work has not yet been undertaken for all natural capital benefits yet, we are unable to include everything in the monetary account, which is why FEE's (and anyone's) NCA at present is a partial account.

Maintenance cost account

The costs that are attributable to producing specific goods and services have been netted off against revenues from those goods and services in the monetary account, but there are substantial other costs involved in managing the public forest estate; for example, managing some of our woodland to an environmental standard that is above the standard required for timber production.

The maintenance cost account shows the money needed to manage the natural capital assets of the estate so that the value of the natural capital assets does not decline in the long-term.

Natural capital balance sheet

The natural capital balance sheet is the main reporting statement of the account. The total net natural capital assets figure is the figure that shows overall value.

It provides an overall summary of the inputs from the four reporting schedules including:

- The total value derived from England's national woods and forests.
- Sources of change in asset values over the accounting period.
- The balance of private value to FEE to the external value delivered to society.
- The cost of maintaining natural assets and the productive capacity of England's national woods and forests.

The net asset value reflects both value of England's national woods and forests to FEE as an organisation (private value) and the value to society (external value). These values are combined and balanced against the cost of maintaining and sustaining the condition of natural assets over time.

The natural capital balance sheet highlights that what an organisation produces or delivers may be very under-valued if it is just assessed on the visible financial profit or loss it makes.

There are many factors that can influence the value of natural capital, some of these are within the control of FEE and others are not.

Dalby Forest, Yorkshire

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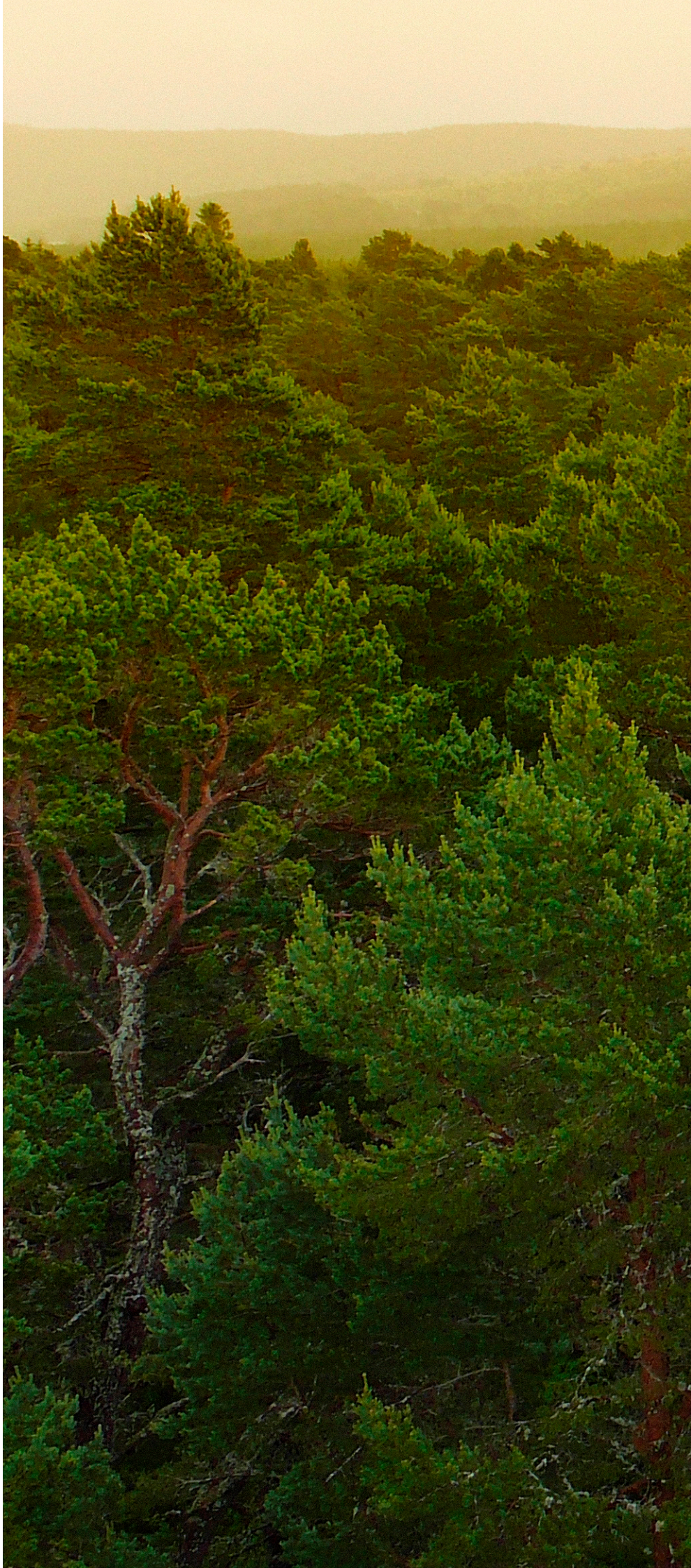
Forest Services: David Cross, Rob Pole

Forest Research: Ben Ditchburn, Lesley Halsall, Robert Mathews

Find out more

Further information about Forest Enterprise England's Natural Capital Account can be obtained by contacting:

Forest Enterprise England
620 Bristol Business Park
Coldharbour Lane
Bristol
BS16 1EJ
0300 067 4000
fe.england@forestry.gsi.gov.uk



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