Forestry Commission England

FOREST ENTERPRISE ENGLAND

NATURAL CAPITAL ACCOUNTS 2015/16

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Acknowledgements

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1. Summary

- Forest Enterprise England (FEE), with eftec environmental economics consultants, has developed the first organisation-wide Natural Capital Account (NCA). We hope this work will pioneer the way in which 'natural capital' management data is brought together.

- FEE manages England's woods and forests with the aim of balancing the social, environmental and economic benefits derived from them. The account covers an area of 254,000 ha, approximately 2% of land in England.

- The Natural Capital Account provides a structured and transparent way of quantifying the full value of the services provided by the natural assets in FEE's care and the impact of FEE's management of them. The account reflects both value to the organisation (private value) and wider society (external value), providing a broader perspective compared to financial reporting.

- The value of the services delivered by England's woods and forests is estimated to be £11.9bn. Over 95% of this value is as a result of the benefits it provides to society, for example through recreation and climate regulation. This value is not captured in traditional financial accounts.

- The account should be interpreted as providing order of magnitude estimates based on the currently best available data and assumptions. While it provides a comprehensive account of the costs of management and commercial returns from the estate, it is currently a partial account. Some functions, such as air and water quality and flood risk mitigation, offer potentially significant additional value but further research is needed to be able to include this in the natural capital account. This means the values published in this report significantly underestimate the total value of our natural capital.

- FEE's ambition is to embed the account as a strategic management tool that will complement decision-making processes, through tracking the condition of natural capital and its value over time, and helping to understand sources of value and trade-offs in maintaining England's woods and forests.

- The next steps are to build on the account by refining existing estimates and expanding its coverage to include additional metrics and benefits. Further development of the account will enhance its use as a management and reporting tool.

- The process of developing the natural capital account each year will be embedded within FEE.

2. Introduction

2.1 Background

Forest Enterprise England (FEE) delivers benefits to people, nature and the economy through the sustainable management of England's woods and forests. This is done by thoughtful stewardship of the land in FEE's care; delivering services and activities that protect the environmental benefits, providing jobs and income to local economies and making it possible for people to enjoy woods and forests for recreation.

FEE strives to ensure that a balanced approach is taken when decisions are made about the management of the land, such as choosing the location of a new visitor centre that has a minimal impact on precious habitat or deciding to allow an income generating activity like quarrying gravel, in order to pay for the maintenance of walking trails or of sites of special scientific interest (SSSIs).

FEE staff are experts in their respective fields and make decisions using the best information available. However, FEE does not have an agreed way of measuring whether it is increasing or decreasing benefits that flow from the natural assets in its care and by how much. Natural capital accounting allows FEE to better understand this and the account will be another tool to help make even more informed decisions about which policies are pursued and allow FEE to monitor the combined long-term impact of these decisions on the natural capital value.

The Forest Enterprise England Natural Capital Account is reported for the financial year ending 31 March 2016 (2015/16). Data used to populate the account is based on the 2015 Forest Design Plans, as recorded in our sub-compartment database. The baseline for the account, against which the changing states of natural capital will be evaluated, is the financial year ending 31 March 2014 (2013/14).

2.2 Natural Capital Committee and the account framework

The Natural Capital Committee (NCC), chaired by Professor Dieter Helm, was set up in 2012 to provide advice to Government on the sustainable use of natural capital. The Committee worked with eftec, RSPB and PWC to develop a framework to guide the development of Natural Capital Accounts. Forest Enterprise England and eftec have worked together using this to construct FEE's account, which is the first organisation-wide application of the framework.

The account has been developed to use available data with the guiding principle to ensure the account is replicable; both for future accounting periods and other organisations with similar land management responsibilities.

2.3 Why develop a NCA for FEE?

The development of FEE's Natural Capital Account is a pioneering contribution to the practical application of the NCA framework, 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. The work represents an important advance in the application of the NCA framework, moving from the pilots initiated by the Natural Capital Committee in 2014, 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 Natural Capital Account 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 decision making by making a clearer link between the management and value of natural capital assets; and
- 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.

2.4 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 humans need to intervene to realise the benefits but in other instances production is simply the result of natural capital combining with natural processes.

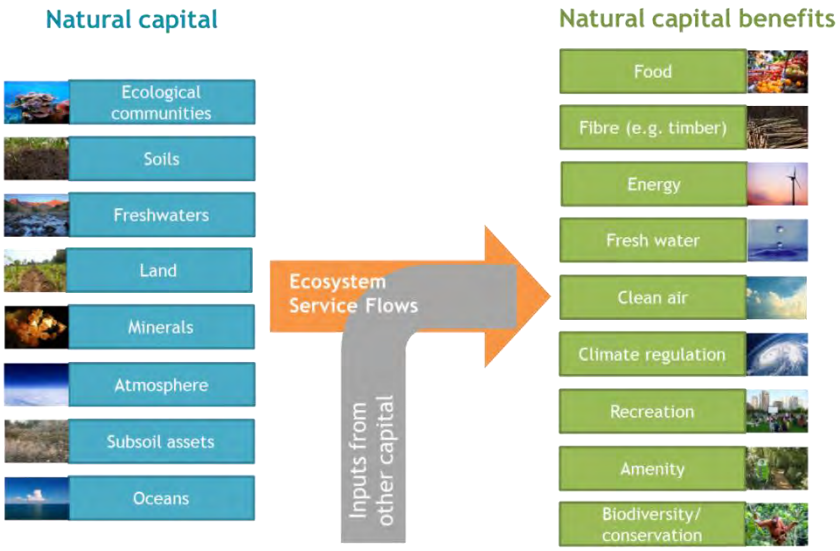

Fig. 1: Diagram showing the flow of natural capital benefits that come from natural capital.

2.5 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 this 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 forecasted 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.

3. Structure of the account

The Natural Capital Account 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.

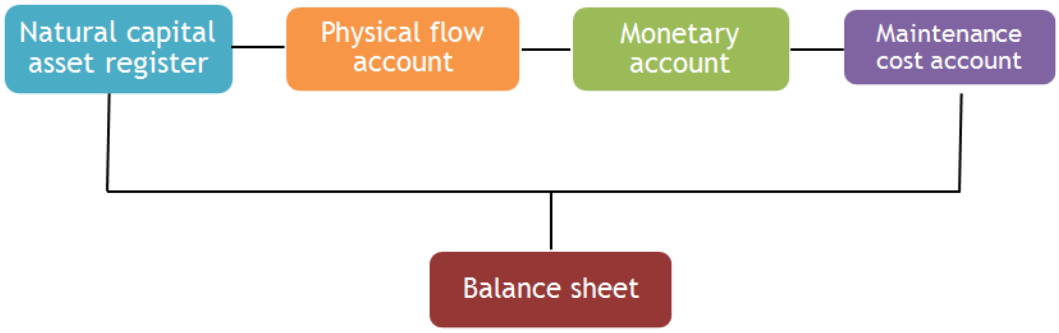

Fig. 2: Forest Enterprise England natural capital account structure

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 sections below.

3.1 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 may be particularly useful while the account is being developed and not all assets can be fully represented in the monetary figure.

3.2 Physical flow account

The physical flow account records the **volume** of ecosystem service flows from England's woods and forests. It covers both market and non-market goods and

services. This account is important because it separates the physical flows of goods and services from the land from the value of those flows (which are captured in monetary account). We have used the best available data to generate these estimates but there is potential to refine them in future accounts if more information becomes available.

Natural capital benefit	Indicator	Units	Baseline year 2013/14	Reporting year 2015/16
Timber provision				
Woodland	Total FEE timber production	m^3/yr	1.520m	1.374m
Climate regulation				
Woodland	Carbon sequestered / (emitted)	tCO_2/yr	1.646m	1.331m
Bogs			(0.009)m	(0.009)m
Grassland			-	-
Woodland	Carbon embodied in environmental goods (timber)	tCO_2/yr	2.787m	2.520m
Recreation & Public Access				
Whole estate	Visits to England's national woods & forests	visits/year	73m	73m
Plant and seed supply				
Whole estate	Number of trees produced	number/yr	14.961m	15.767m
Food provision				
Whole estate	Wild game carcass numbers	number/yr	0.012m	0.012m
Minerals				
Whole estate	Mineral production volume	tonnes/yr	1.296m	1.081m

3.3 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 one reason why 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)[1] which gives a value for recreational visits to woods and forests. Because we do not have this research for all natural capital benefits yet, we are unable to include everything in the monetary account, which is why our NCA for 2015/16 is a partial account.

Natural capital benefit	Indicator	Units	Baseline year 2013/14	Reporting year 2015/16
Timber provision				
Woodland	Net asset value for timber produced	£/yr	8.492m	7.335m
Climate regulation				
Woodland	Carbon sequestration value	£/yr	98.739m	83.074m
Bogs			(0.523)m	(0.547)m
Grassland			-	-
Recreation & Public Access				
Whole estate	Net asset value for recreation	£/yr	147.142m	147.943m
Plant and seed supply				
Whole estate	Plant and seed revenues	£/yr	3.091m	3.774m
Food provision				
Whole estate	Net asset value wild game management	£/yr	0.013m	0.040m
Minerals				
Whole estate	Mineral sales value	£/yr	0.896m	0.594m

3.4 Maintenance cost account

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 is maintained in the long-term. 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 and so do not appear again in the maintenance cost account.

	Private	External	Total
Liabilities	**£m/yr**	**£m/yr**	**£m/yr**
Legal	91	-	91
Other	393	31	424
Total maintenance	**484**	**31**	**515**

[1] http://www.forestry.gov.uk/pdf/sebreport0703.pdf/$FILE/sebreport0703.pdf

4. Reporting Statements

4.1 Natural Capital Balance Sheet

The Balance Sheet brings together the data provided by the supporting schedules (Asset Register, Physical Flow, Monetary and Maintenance accounts) and provides an overall view of the capital value of the assets.

The net asset value of England's public woods and forests is estimated to be £11.9bn. This value is calculated based on the expected value of timber, carbon, recreation, plants, seeds, wild game and minerals to be derived from England's national woods and forests into the future. Because we are unable to value all the benefits provided by England's national woods and forests, this is an underestimate of the total value. Improving air and water quality, flood alleviation and aesthetic value are all important natural capital benefits that flow from England's national woods and forests and are not yet captured in the final value, despite potentially being very significant figures.

The net asset value reflects both value of England's national woods and forests to Forest Enterprise England as an organisation (private value) and the value to society (external value). These values are combined and balanced against the cost of maintaining the estate and sustaining the condition of natural assets over time. The natural capital balance sheet reveals that over 95% of the value of the benefits from the land in FEE's care is attributable to the external value it provides to society through recreation and climate regulation.

The Natural Capital Balance Sheet is the main reporting statement of the account.

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 Forest Enterprise England to the external value delivered to society; and
- The cost of maintaining natural assets and the productive capacity of England's national woods and forests.

	Private Value					External Value					Total Value				
	Baseline	Gain/ Loss	Add/ Disp.	Reval./ Adj.	Report Yr	Baseline	Gain/ Loss	Add/ Disp.	Reval./ Adj.	Report Yr	Baseline	Gain/ Loss	Add/ Disp.	Reval./ Adj.	Report Yr
	PV £m	PV £m	PV £m	PV £m	PV £m	PV £m	PV £m	PV £m	PV £m	PV £m	PV £m	PV £m	PV £m	PV £m	PV £m
Assets															
Minerals	4	-	(1)	-	3	-	-	-	-	-	4	-	(1)	-	3
Total Non-Renewables	4	-	(1)	-	3	-	-	-	-	-	4	-	(1)	-	3
Timber	209	11	-	(13)	207	-	-	-	-	-	209	11	-	(13)	207
Wild Game	-	1	-	-	1	-	-	-	-	-	-	1	-	-	1
Plant & Seeds	-	-	-	-	-	14	8	-	-	22	14	8	-	-	22
Carbon	-	-	-	-	-	7,282	(122)	-	435	7,595	7,282	(122)	-	435	7,595
Recreation and public access	(308)	25	-	-	(283)	4,880	-	-	-	4,880	4,572	25	-	-	4,597
Total Renewables	(99)	37	-	(13)	(75)	11,601	(114)	-	435	12,497	12,077	(77)	-	422	12,422
Government PES Funding	575	-	-	-	575	(575)	-	-	-	(575)	-	-	-	-	-
Total Gross Asset Value	480	37	(1)	(13)	503	11,601	(114)	-	435	11,922	12,081	(77)	(1)	422	12,425
Maintenance Costs	(428)	(56)	-	-	(484)	(20)	(11)	-	-	(31)	(448)	(67)	-	-	(515)
Total Net Natural Capital Assets	(52)	(19)	(1)	(13)	19	11,581	(125)	-	435	11,891	11,633	(144)	(1)	422	11,910

4.2 What drives change in the balance sheet?

We plan to continue to produce a Natural Capital Account alongside our traditional financial accounts in future years, so we are able to monitor the changes in natural capital value over time. There are many factors that can influence the value of natural capital, some of these are within the control of Forest Enterprise England and others are not. It is important that we recognise this variety of factors so that we can interpret the value appropriately across the various benefits and understand what the underlying cause of the change is. For example:

Timber

- An increase in forecast volume of timber produced would lead to an increased natural capital value, vice versa if the forecast went down.
- Fluctuations in the timber market and changing prices would see a similar relationship, with increased revenue leading to an increased private natural capital value.
- Changes to the cost of production would also impact on the private value. This is because the figures in the account are net, so assuming everything else stayed the same, a reduction in costs would see a bigger net value.

Climate Regulation

- The natural capital value associated with climate regulation will increase if timber removals are less than the increment (the amount of growth in the forest) over the same period. This is because the amount of carbon sequestered will be more than has been removed through harvesting.
- This difference could be as a result of a reduction in the forecast volume of timber produced or due to an increase in planting.
- Fluctuations in the price of carbon, as seen as a result of the UK's decision to leave the EU, could have a significant impact on the overall natural capital value reported in the account.

Recreation and Public Access

- The private natural capital value of England's woods and forests could be increased by generating more revenue from leases, events, car parking or permissions or by reducing the cost of providing recreational opportunities.
- In addition, external natural capital value is influenced by the number of visits made to the forest but could also change if we refined the way in which we value a recreational visit.

Wild Game

- A decrease in the number of licenses/permits for deer management activities could lead to a decrease in revenue to FEE and as a result would act to decrease the associated private natural capital value.
- An increase in the amount of venison or boar sold or the price that is paid for this would also increase natural capital value.

By thinking about the scenarios above, we can begin to see where an increase in value in one area, i.e. an increase in the timber production forecast, could lead to decrease in value in another i.e. climate regulation. It will also be important to look beyond the total net value figure and in to the detail to get the true picture as a reduction in one part of the account could be offset by an increase in another area. Similarly, the usefulness of the information will be improved with an understanding of what is driving the changes in value, which could be changes to visitor numbers as well as to the natural environment.

It is these relationships that FEE will need to balance when using natural capital accounting to help inform decisions on the management of England's woods and forests.

5. Next steps

Having a natural capital account is new and FEE is the first organisation to have this information available for all the land it manages. It represents a way to better connect the overall financial and natural capital performance of the estate as a whole.

This first natural capital account has been developed based on the best available information. Access to high quality data is an essential step in developing a NCA that is sufficiently robust and repeatable. Forest Enterprise England has access to wide-ranging datasets such as the National Forest Inventory and visitor number surveys which were used to develop the accounts.

The development of a NCA for England's woods and forests is an ongoing task. This first set of accounts provides monetary values for timber and other commercial products, carbon sequestration and open access recreation. Future versions could include a value for providing flood alleviation or improving water and air quality but this would require further research and information to provide a sound basis for assessing the volume and value of these benefits. As it stands the FEE Natural Capital Account does not account for the entire range of benefits provided by England's national woods and forests and means the values published in this report significantly underestimate the total value of our natural capital. Figure 3 shows the scope of the 2015/16 account as well as identifying where there is potential to further FEE's Natural Capital Accounts in future years.

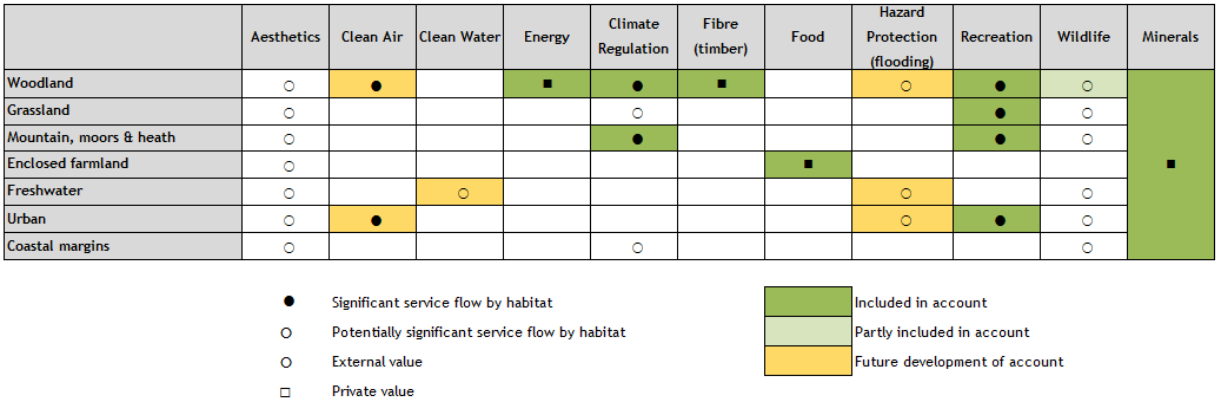

Fig. 3: The scope of the 2015/16 account as well as where there is scope to improve coverage.

We see our NCA as a valuable additional tool in helping inform our strategic decision making and long-term planning, enabling us to monitor the effects of management decisions on the natural capital value of the estate and in some cases informing individual investment & business decisions. The way we use the account may evolve as the data and assumptions that inform the account are refined and expanded. Being able to monitor the impact of decisions in this way will be helpful in more fully assessing the ways in which new policies and developments are impacting England's woods and forests and ensure that our decisions are increasing the natural capital value of the fantastic resource we manage on behalf of the nation in to the future.

As the production of the NCA becomes embedded within Forest Enterprise England teams we will look to refine and expand the account wherever possible by improving current estimates, refining the most significant assumptions and addressing the current gaps in the account wherever possible. In doing this we will be open and transparent with our findings and look to collaborate with other organisations who are also developing Natural Capital Accounts wherever we can.

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

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