

Scotland's Natural Capital Asset (NCA) Index

2012 version

"The quality, quantity and diversity of ecosystems, species and genes – needs to be preserved not only for societal, ethical or religious reasons, but also for the economic benefits it provides to present and future generations." - TEEB report.

Key finding: Scotland's natural capital fell significantly from the 1950s to the 1990s, but has seen a slow partial recovery since then, marking a shift towards sustainability.



Natural capital is the stock of natural systems, or 'ecosystems', which yields a flow of valuable services into the future. These services include things such as fresh water, pollination, soil formation, as well as recreational opportunities. The term natural capital is increasingly being used. The international TEEB (The Economics of Ecosystems and Biodiversity) report found that nature underpins our standard of living but is being lost, as these **free services of nature are not being valued**. A number of countries are now looking at how to move 'beyond GDP' in terms of measuring the success of their economies.

Why have a Scottish measure?

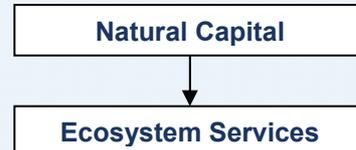
The NCA index is an additional measure to help assess the sustainability of Scotland's economic growth over coming years. Whilst Scotland's natural assets should be used, they need to be - as they are the basis for our way of life, it is better if they are managed in a sustainable way so that they also benefit the next generation of Scots. In this way we can both sustain an improvement in our standard of living and at the same time safeguard our valuable natural environment. So, **increasing natural capital, or even just maintaining the level, whilst also achieving economic growth can be seen as an achievement** (see Findings overleaf).

Scotland is the first country in the world to publish such a detailed attempt to measure annual changes in its natural capital based on an evaluation of ecosystem service potential. It is hoped that the approach adopted here will assist with the further development of reporting. After releasing the index in pilot form in 2011 SNH further refined the methodology and data. The updated index also includes an additional year, 2010, in the index. **SNH intends to continue publishing the index with annual updates** (the figures for 2011 should be available at the end of this year). Additional data sets will be added as they become available.



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All of nature for all of Scotland
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Ecosystem services are the benefits provided by nature (natural capital) that contribute to making human life both possible and worth living, and can be listed under the following headings:

Provisioning services

Examples in Scotland – grass for livestock, timber for building materials or firewood, soft fruits such as raspberries and blueberries, wild salmon and venison, and fresh water for drinking, washing, or using to produce whisky.

Regulating and maintenance services

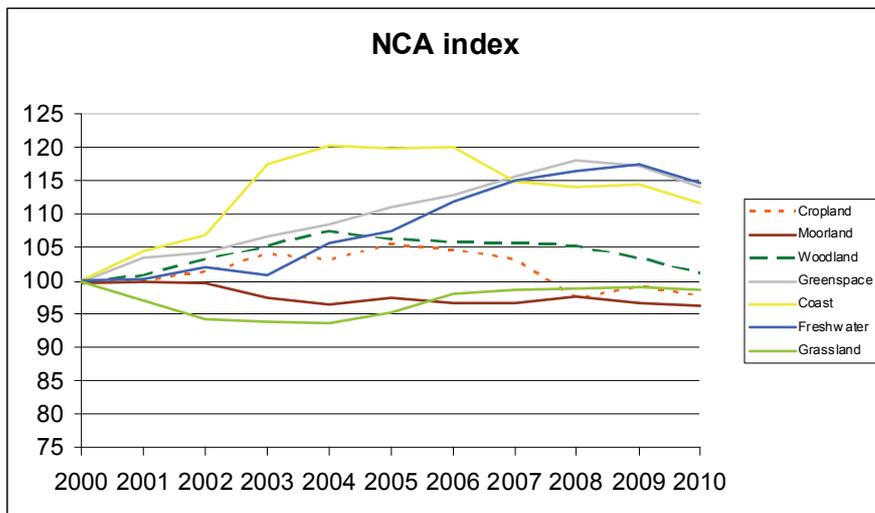
Examples in Scotland – climate regulation via carbon storage in peatlands, natural flood protection from bogs and woodland, pollination of crops, habitats for wildlife to live in, as well as the improvement in air quality from urban parklands.

Cultural services

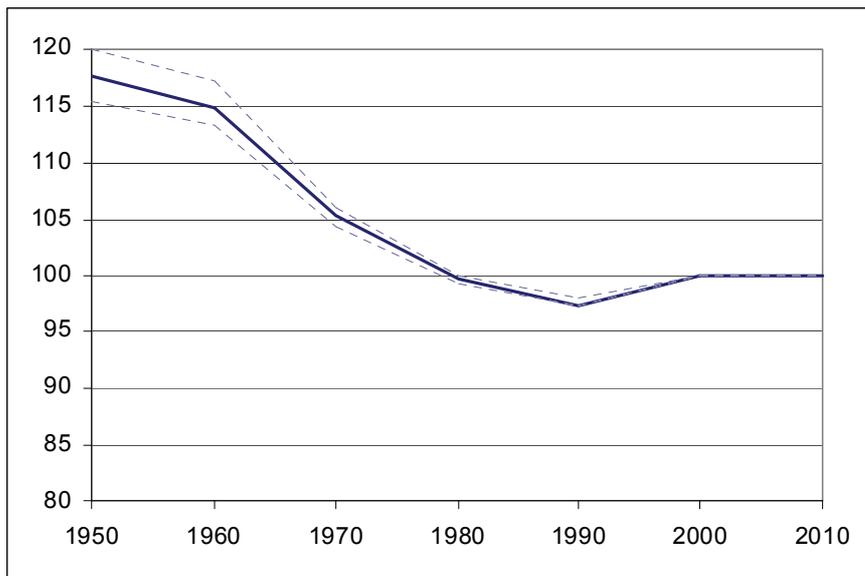
Examples in Scotland – watching wildlife, recreational fishing, hill walking, enjoying wild landscapes, relaxing on beaches, as well as the spiritual value many people associate with places or nature.

Findings

From the analysis for each broad habitat it appears that **four** broad habitats (woodland, freshwater, coast and urban greenspace) showed an improvement in natural capital between 2000 and 2010, whilst **three** declined (moorland, grassland and cropland).



When the broad habitats are combined (taking account of both area and the value of their ecosystem services) an overall index of Scotland's natural capital is produced, which shows no change over the decade.



An indicative back-casting of the index shows that **Scotland's natural capital fell significantly** from circa 1950 to circa 1990, with the greatest rate of decline through the 1960s and 70s. Most ecosystems were in decline during this period and the fall is heavily driven by the change in moorland and grassland. Although their decline has continued, it was outweighed by improvements in natural capital of the other broad habitats. This resulted in **a slow recovery in natural capital since 1990**, though this appears to now be levelling off. Future threats to Scotland's natural capital include invasive non-native species and climate change.

Methodology

The basic structure for the index amounts to ecosystem area multiplied by ecosystem quality for each ecosystem. Seven ecosystems are identified. These are comprised of 'broad habitats':

Coast – dunes, cliff, beach and tidal mud flats
 Freshwater - lochs, rivers and fens
 Cropland - arable land and improved grazing
 Woodland – woods/forests, including commercial forestry
 Greenspace – urban parks, gardens, etc
 Grassland – rough/semi-natural grasslands
 Moorland - heather moor, montane and peatland/bog

'Broad habitats' were used in the Countryside Survey of 2007, and are the basis for many conservation initiatives, and they also provide a basis for area measurements. In addition, the broad habitat definitions used here are compatible with those used for the UK National Ecosystem Assessment, upon which this work has relied. For the overall index the individual broad habitat indices are combined with an ecosystem service weighting attached to each broad habitat.

A number of indicators are used to quantify changes in the quality of each broad habitat (i.e. in terms of their ability to provide ecosystem services). Quality indicators have been linked to each of the three ecosystem service headings. The choice of quality indicator is based on relevance and regularity of collection. However, in most instances data availability has been limited and indicators are chosen as proxies for change in ecosystem service potential. In some cases extrapolation has been used where data is not collected annually. Where there are multiple indicators (in most cases) these are weighted based on data quality and relevance to the ecosystem service. The weightings within the index have been calculated by use of the expert judgement of SNH specialist advisors for each of the broad habitats as well as from surveys of external experts and the Scottish public.

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