

Evidence published in 2013/2014

Natural England publishes evidence on all aspects of our evidence work from investigations into the impact of the interventions we make in the natural environment, to understanding the state of the natural environment and its value to people, through to assessing new tools and approaches we can use. The topics reflect the broad range of our remit and in 2013/2014 we published reports on subjects as diverse as economics, wellbeing, landscape, geology, climate change, as well as many aspects of terrestrial and marine biodiversity. Many of our publications take a national view, but some relate to specific localities or sites. Publications are written by our own staff, in partnership, and on our behalf by contractors.

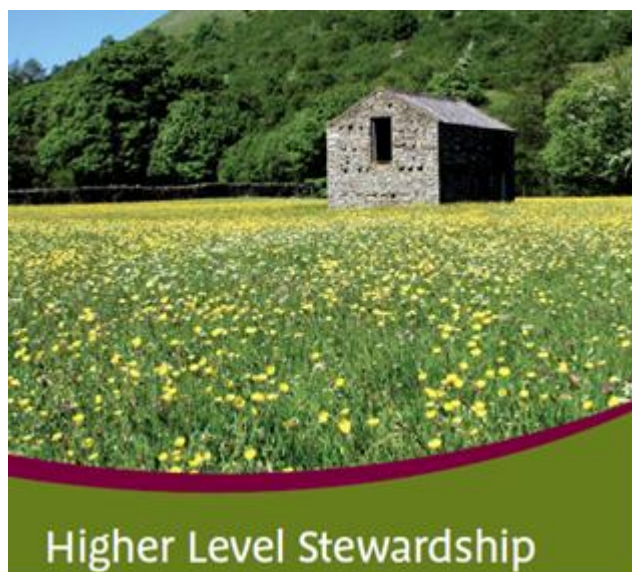
Chief Scientist Tim Hill

“Evidence underpins everything we do as an organisation. As Chief Scientist I see first-hand the considerable breadth and variety of evidence we produce and use. I want this evidence to be available, understood and used by all those with a need and interest – both within our organisation and more widely. That is the purpose of publishing the results of our evidence work.

I hope that this overview of our most recent publications and the key evidence messages set out in them contributes to the important task of ensuring our evidence has maximum impact on how we and others approach the conservation, enhancement and management of England’s natural environment.”

Understanding the impacts of our advice and interventions, and improving their effectiveness

A significant proportion of our resources are spent on gathering and evaluating evidence on the impact of our interventions in the natural environment so that we can assess their effectiveness and, in particular, identify where improvements can be made.



Examples of this include:

- [NECR114 - Monitoring the outcomes of Higher Level Stewardship](#)
- [NECR133 - Monitoring the Impacts of Entry Level Stewardship](#)
- [NECR131 - The economic impact of Natural England’s National Nature Reserves](#)
- [NECR144 - The Dormouse Reintroduction Programme: A review](#)
- [NECR113 - Higher Level Stewardship permissive access evaluation](#)

NECR114 - Monitoring the outcomes of Higher Level Stewardship

The results of this agreement-monitoring programme, which lasted 3 years show a generally positive assessment of Higher Level Stewardship (HLS), its potential to deliver desired outcomes and its likely contribution to the Rural Development Programme for England as measured by the Common Monitoring and Evaluation Framework. Although the study identifies some deficiencies in delivery, HLS is shown to be a better targeted scheme than those previously operated.

For example, compared to habitats not under HLS, most habitats under HLS tend to:

- be more species-rich;
- have fewer ruderals;
- have fewer indicators of fertile conditions; and
- have a greater component of stress-tolerant species.

The report found operational improvements could be made, for example by ensuring that options are targeted to areas where it is possible to achieve the desired outcomes of the scheme.

The findings from this study are being used to inform targeting, implementation and development of current and future schemes.

NECR133 - Monitoring the Impacts of Entry Level Stewardship

This report presents results of agreement holder attitudes and of field surveys of environmental features and habitats. These indicate that there is strong support for the wildlife conservation benefits of Entry Level Stewardship (ELS) among agreement holders and suggest that ELS has been instrumental in raising awareness of wildlife conservation amongst ELS agreement holders.

A majority of the agreement holders surveyed appeared to be happy with ELS. However, the survey raises questions around the extent to which environmental gains have been achieved. For example no change in presence/absence of submerged or floating vegetation was observed in ditches (2005 to 2011) and the species richness on ditch banks declined.

However, hedgerow width increased within ELS options. The results:

- support the need for a continued role for providing advice to agreement holders;
- suggest that the impact of advice and guidance could be improved; and
- that the scope of advice and guidance should be widened.

NECR131 - The economic impact of Natural England's National Nature Reserves

This report provides the first overall assessment of the economic impact of National Nature Reserves (NNRs). Overall, the 143 NNRs managed by Natural England are estimated to have supported 679 Full Time Equivalent jobs and contributed £23 million of Gross Value Added in their respective local economies in 2011/12, after taking account of all direct, indirect and induced effects.

The largest impacts are associated with the visitors to the NNRs, who spend money on-site and in the local economy, while in comparison the impacts associated with managing and maintaining the reserves are relatively small.

NECR144 - The Dormouse Reintroduction Programme: A review

The first re-introduction took place in 1993 and since then 18 re-introductions have taken place throughout England. This review of the reintroduction programme was commissioned to help identify the best approach to:

- the long term conservation of dormice;
- inform decisions about future action under the Dormouse Species Recovery Programme; and
- achieve the aims of Biodiversity 2020.

The report reviews the procedures involved in selecting sites, breeding dormice, preparing them for release and the actual reintroduction process. Of the nine sites where releases took place over 10 years ago:

- all sites were successful in the short term;
- two thirds of sites were successful in the medium term (5-10 years) and by this time one third had spread beyond the release wood;

- in the long term, four of the nine sites failed (extinct or declining populations) and dormice have only dispersed from the release wood at two sites.



Dormouse

The principal conclusions drawn from this review are that the reintroduction programme should not continue in its present form and the strategy should change from one of expansion to one of consolidation.

NECR113 - Higher Level Stewardship permissive access evaluation

The aim of the study was to evaluate the contribution of HLS permissive access options, and explore the potential for future voluntary provision of access. The research indicates that the majority of the access provided by HLS can be classified as 'new' access, while an estimated 42% of the access now under HLS permissive access options was already being used informally by the public in some way.

A wide range of benefits has been delivered through permissive access options in HLS agreements for both agreement holders and users, including:

- improved relationships between agreement holders and local communities;
- higher levels of contact between farmers and the public;
- greater accessibility to a range of sites of interest;
- improved safety by getting horses and/or people off dangerous roads; and in some cases

- permissive access agreements enable access to specific sites of interest, or creation of links with public rights of way.

A significant proportion of farmers and land managers are providing access, not for financial gain (although a minority indicate this is an important factor), but to fulfil a recognised local demand. Promotion of HLS permissive access was identified as an area where improvements could be made. The study also revealed that of agreement holders currently providing access:

- slightly more than half indicated they might continue to provide the existing access on a voluntary basis;
- only 20% indicated they would not continue to provide the existing access;
- the remainder were uncertain.

Improving our approaches to monitoring and evaluation

As well as assessing specific interventions we also consider how we can improve our monitoring and evaluation methods. A number of reports in 2013/2014 looked at potential new approaches to monitoring, including:

NERR055 - Framework for monitoring environmental outcomes in protected landscapes

This report describes a national framework for monitoring environmental outcomes in National Parks and AONBs.

NERR048 - Agreement holder participation in the self-assessment of Higher Level Stewardship agreements

This evaluates a trial of using self-assessment for individual agreement holders (farmers) to report on environmental outcomes of land under HLS.

NECR115 - Potential for joined up marine monitoring and data collection between Statutory Nature Conservation Bodies and industry

This describes the potential for, and benefits from, greater join-up and partnership-working to monitor in the marine environment.

Understanding the state and trends of our natural and cultural environments and the pressures upon them

At both a national scale and at more local levels, we undertake or support projects that help to gather and maintain our evidence about key aspects of the natural environment, its value and how it is changing. The focus is on filling the gaps that have been identified as a priority in our evidence base. In 2013-2014 examples of this included:

- **NECR122 - Monitor of Engagement with the Natural Environment: The national survey on people and the natural environment: Annual report from the 2012 - 2013 survey**
- **NECR112 - Testing the effectiveness of climate change adaptation principles for biodiversity conservation**
- **NECR134 - A review of the scarce and threatened beetles of Great Britain**
- **NERR042 - A review of the revision of the Ancient Woodland Inventory in the South East**
- **NECR139 - Upper Teesdale: changes in upland hay meadow vegetation over the past twenty to thirty years - results presented from botanical surveys**
- **NECR140 - New Forest SSSI Geomorphological Survey Overview**
- **MCZ027 Natural England's advice to Defra on proposed Marine Conservation Zones for designation in 2013**

NECR122 - Monitor of Engagement with the Natural Environment: The national survey on people and the natural environment: Annual report from the 2012 - 2013 survey

This annual report presents the headline findings for the fourth year of MENE fieldwork from March 2012 to February 2013. It contains information regarding visits taken to the natural environment and related behaviours and attitudes. Amongst a wealth of data, headline findings included that between March 2012 and February 2013, an average of 41 per cent of the English adult population had visited the natural environment in the previous seven days. In total:

- 47% of visits to the natural environment were taken to the countryside;
- 43% were to green spaces within towns and cities;
- 10% were taken in coastal locations.

NECR112 - Testing the effectiveness of climate change adaptation principles for biodiversity conservation

Perhaps the most striking result in this study was that the community composition of birds and butterfly species has been changing over recent decades and is consistent with impacts of a changing climate.

Both groups show a shift towards species typical of warmer climates, but the underlying causes for this differs. In birds there has been a significant decrease in the abundance of birds adapted to cool climates, whilst for butterflies, there has been an increase in the number of warm-adapted species. These findings support the evidence that climate change is having important ecological impacts and illustrates how these can be both positive and negative.

This work is part of a process of developing the evidence base to help develop ecological networks in ways that promote their resilience to climate change and thereby ensure their long-term value. The finding that species typical of cooler climates have survived better in areas where semi-natural habitat predominates, reinforces the importance of protected areas and for maintaining extensive land management systems. The findings support one of the basic tenets of climate change adaptation: that we need to reduce other pressures on species.

NECR134 - A review of the scarce and threatened beetles of Great Britain

Good decisions to conserve species should be based on an objective process of determining the degree of threat to the survival of that species. This report was commissioned to update the threat status of 114 beetles, from work originally undertaken in 1987, 1992 and 1994 respectively. The IUCN methodology for assessing threat was used because it is the recognised international approach and it assigns species to one of the IUCN threat categories.

NERR042 - A review of the revision of the Ancient Woodland Inventory in the South East

The survey in the South East has provided a detailed and thorough revision of the Ancient Woodland Inventory, and has secured considerable external funding and support. The overall success of the project was its wide partnership engagement and the high degree of accuracy with which ancient woodlands have been identified and mapped.

The survey's thorough methodology, with the use of both desk-based and field work, and digital mapping technology, makes it the most complete and detailed update of the inventory yet undertaken at the regional scale. The report shows a 15.8% increase in the recorded area of ancient woodland in the survey area.

The revised inventory has enabled a better assessment of the extent and quality of the ancient woodland resource to be made and has ensured that planning decisions affecting this habitat can be made on the basis of a robust evidence base.

NECR139 - Upper Teesdale: changes in upland hay meadow vegetation over the past twenty to thirty years - results presented from botanical surveys

Upland hay meadows are one of the rarest grassland types in the UK. Upper Teesdale holds some of the best examples of MG3b *Anthoxanthum odoratum* – *Geranium sylvaticum* upland hay meadow habitat and has been well studied over the years, but the resulting botanical data has never before been gathered into one place.

The results presented in this report show that overall Upper Teesdale upland hay meadows have declined in botanical quality over the past twenty to thirty years, despite management interventions such as agri-environment schemes. The findings suggest that the declines in botanical quality may be associated with increases in soil fertility, and they are being used to advise on the future management of hay meadows, SSSIs and the future development of agri-environment schemes.

NECR140 - New Forest SSSI Geomorphological Survey Overview

This report provides the basis for site specific restoration plans and gives an overview of the geomorphological and ecological survey of several New Forest SSSI units conducted in the autumn/winter of 2012. The project focuses specifically on the stream network and modified mire systems of the New Forest SSSI.

One of the key factors of concern in the New Forest is the damage caused by historical drainage activities and contemporary engineering/management of the mire systems and modification of rivers and streams. These all impact on the eco-hydrological functioning of the interlinked systems. This report provides the basis for site specific restoration plans.

MCZ027 Natural England's advice to Defra on proposed Marine Conservation Zones for designation in 2013

Marine Conservation Zones (MCZs) are an important tool in England's protection of the marine environment and support the Government's requirements under the Marine and Coastal Access Act 2009.



This report provides Natural England's analysis and advice for each of the 25 MCZs proposed for designation in 2013 using 76 new datasets. It provides an assessment of the scientific confidence in the evidence for feature presence and extent. The report recommends conservation objectives, based on an assessment of feature condition, and certainty in those conservation objectives for each feature, including Natural England's assessment of the

relative risk of damage or deterioration to each site.

The report advises changing the conservation objective for 14 features in six sites whilst 254 conservation objectives remain unchanged. The report identifies that seven sites out of the 25 are at higher risk of damage or deterioration.

Making the most of what is already known

For some questions about the natural environment the most effective starting point is to review the nature and strength of the evidence that has already been produced. In 2013/2014 Natural England published the results of a systematic review of some key aspects of upland land management.

NEER007 – Natural England review of upland evidence: Assurance Group report

This major review programme was undertaken to help ensure that Natural England uses the most robust evidence available when formulating advice and taking decisions in the uplands. The review concentrated on the evidence relating to biodiversity and ecosystem services in the uplands and the impact of land management activities upon them. It considered five priority topics in depth, each of which is covered in a separate report:

- **NEER002 The impacts of tracks on the integrity and hydrological function of blanket peat.**
- **NEER003 Restoration of degraded blanket bog.**
- **NEER004 The effects of managed burning on upland peatland biodiversity, carbon and water.**
- **NEER005 Upland Hay Meadows: what management regimes maintain the diversity of meadow flora and populations of breeding birds?**
- **NEER006 Impact of moorland grazing and stocking rates.**

The results of the review are being used to improve our upland land management advice.

NECR137 - Greening Dementia: a literature review of the benefits and barriers facing individuals living with dementia in accessing the natural environment and local greenspace

Key findings of this work include evidence that suggests that social interaction and access to the outdoors and nature is important for people living with dementia and that these activities have an important role in their quality of life. However, there is little evidence to link the severity of the dementia condition to the benefits from access to the natural environment. That is, there have been no studies that compare those people at different points along the continuum of the dementia condition (ie those people with early onset compared to those with advanced dementia) that would help to better inform the type and timing of interventions more appropriately to the needs of the client.

This gap in our current understanding makes the targeting and design of interventions very difficult. The report findings will help a partnership project to:

- address the barriers that prevent people with dementia from enjoying the natural environment;
- enable more people living with dementia to enjoy the benefits of the natural environment;
- advance the policy and practice in Natural England's Outdoors for All programme.

Making evidence more accessible

Technical Information Notes

Where there is demand to understand more about particular aspects of our work and the evidence behind it, we publish short technical information notes, which are designed to be accessible to non-specialist audiences. Examples include:

TIN147 - National Vegetation Classification: MG5 grassland

Unimproved neutral grassland, including hay meadows, known under the National Vegetation Classification (NVC) system as MG5 grassland, was once the ubiquitous type of old meadow and pasture in the English lowlands. Since the late

1960s it has sustained large losses due to drainage, ploughing and re-seeding, and from the use of high rates of fertilisers. There is now less than 6,000 ha remaining in England. This technical note was developed to explain the characteristics and value of MG5 grassland and to consider how further losses can be prevented.

TIN120 - Establishing marine Special Protection Areas

Special Protection Areas (SPAs) are classified under the EC Birds Directive to protect rare, vulnerable and migratory birds. The suite of SPAs on land in England is well established, but further work is needed to complete a network at sea. The UK government has committed to identifying a network of SPAs in the marine environment by 2015. This information note has been written for stakeholders to explain the processes and responsibilities for establishing marine SPAs.

Making our evidence available to others

Most of our evidence is published on our **Publications and products catalogue**. In 2013 – 2014 this was viewed by around 20,000 unique visitors each month, and over 935,000 documents were downloaded. The number of downloads has been rising steadily and the figures are now four times higher than they were for the previous catalogue in 2010.

The site is regularly indexed by the major search engines such as Google and Bing, and individual catalogue records typically rank high in the results. New records usually show up very quickly, and a significant proportion of downloads are driven directly from search engine traffic. This has increased the audience that is exposed to our published evidence, and not limited it to people who know about Natural England.

English Nature Research Reports

An almost complete list of English Nature Research Reports (ENRRs) was added to our Publications and products catalogue in 2012. However, many of the ENRR records on the catalogue only listed the title and details of how to obtain hardcopies of the reports.

Customer feedback identified that more information on these reports would be useful. Therefore, between January and March 2014 the abstract details for 75 reports and digital copies of 70 reports were copied from our internal library to the external catalogue. This is work is ongoing and even more abstracts and reports will be added to the catalogue in 2014-2015.

Cataloguing historic research and monitoring on National Nature Reserves

Many of our National Nature Reserves (NNRs) have a long history as sites used for environmental research. The back catalogue of many of our reserves stretches back many decades and includes hundreds of reports. These are mostly paper copies sitting in filing cabinets in NNR reserve offices. The NNR team have a project to catalogue what work has been done, what reports are available and how they can be obtained.

In 2013-2014 we worked with the NNR team to make information about this back catalogue available to Natural England colleagues and to a wider external audience. As part of this work we published the **Evidence Register** as a spreadsheet that includes details of the historic NNR projects that have been recorded on the Evidence Projects Database.

Natural England Evidence Register

As well as providing information on completed and historic projects, the **Evidence Register** lists our current research, monitoring and evaluation projects by project type, evidence-based programmes and site designations. The Register is updated twice a year and was last updated in March 2014.

Further information

Full lists of the evidence publications published in 2013-2014 can be seen in Appendices 1 to 5 below. For further information on evidence published contact David Askew, Manager, Access to Evidence

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Appendix 1 - Natural England Research Reports (NERRs) published between April 2013 – 31 March 2014

Research reports contribute to our evidence base and have been written by Natural England staff. This year the focus has been on assessing consequences of, and adapting the natural environment to, climate change.

NERR045 - Assessing the potential consequences of climate change for England's landscapes: South East Northumberland

NERR047 - Less management prescription, more outcome focus - Making Environmental Stewardship More Effective (MESME) trialling project

NERR048 - Agreement holder participation in the self-assessment of Higher Level Stewardship agreements

NERR049 - Assessing the potential consequences of climate change for England's landscapes: Sherwood

NERR050 - Assessing the potential consequences of climate change for England's landscapes: Humberhead Levels

NERR051 - Assessing the potential consequences of climate change for England's landscapes: the South Downs National Park

NERR052 - Assessing the potential consequences of climate change for England's landscapes: North Kent

NERR053 - Improvement Programme for England's Natura 2000 Sites (IPENS) Programme Scoping: identifying key issues affecting Natura 2000 sites and priorities for the IPENS project
(Two editions)

NERR054 - National biodiversity climate change vulnerability model

NERR042 - A review of the revision of the Ancient Woodland Inventory in the South East –
(second edition)

Appendix 2 - Natural England Evidence Reviews (NEERs) published between April 2013 – 31 March 2014

These reports review the nature and strength of the evidence that has already been produced to help inform delivery, and where appropriate identify gaps in evidence and priorities for generating new evidence. In 2013 and 2014 the methodology for undertaking reviews was developed and the evidence related to managing the uplands was reviewed.

NEER001 - Natural England Evidence Reviews: guidance on the development process and methods

NEER002 - The impacts of tracks on the integrity and hydrological function of blanket peat

NEER003 - Restoration of degraded blanket bog

NEER004 - The effects of managed burning on upland peatland biodiversity, carbon and water

NEER005 - Upland Hay Meadows: what management regimes maintain the diversity of meadow flora and populations of breeding birds?

NEER006 - Impact of moorland grazing and stocking rates

NEER007 - Assurance Group Report

Appendix 3 - Natural England Commissioned Reports (NECRs) published between April 2013 – 31 March 2014

Natural England Commissioned Reports (NECRs)

Commissioned Reports are written by contractors or partner bodies on behalf of Natural England. The remit this year was very wide ranging.

NECR111 - A guide to assessing and managing anthropogenic impact on marine angiosperm habitat

NECR112 - Testing the effectiveness of climate change adaptation principles for biodiversity conservation – (second edition)

NECR113 - Higher Level Stewardship permissive access evaluation

NECR114 - Monitoring the outcomes of Higher Level Stewardship: Results of a 3-year agreement monitoring programme

NECR115 - Potential for joined up marine monitoring and data collection between Statutory Nature Conservation Bodies and industry

NECR116 - Engaging children on the autistic spectrum with the natural environment: Teacher insight study and evidence review

NECR117 - Evaluating the impacts of limiting free choice in management option selection by Entry Level Stewardship (ELS) applicants

NECR118 - An evaluation of the Walking for Wellness project and the befriender role

NECR119 - Assessing and enabling climate change adaptation in Nature Improvement Areas (Two editions)

NECR120 - Climate change farm resilience planning

NECR121 - Measuring the extent to which greenhouse gas emission savings achieved by Environmental Stewardship are displaced on-farm

NECR122 - Monitor of Engagement with the Natural Environment: The national survey on people and the natural environment: Annual report from the 2012 - 2013 survey

NECR123 - Monitor of Engagement with the Natural Environment: The national survey on people and the natural environment: Technical Report from the 2012 - 2013 survey

NECR124 - Report on 2011 Isles of Scilly Zostera marina survey

NECR125 - Offshore monitoring of Annex I reef habitat present within the Isles of Scilly Special Area of Conservation (SAC)

NECR126 - Green Infrastructure – Valuation Tools Assessment

Natural England's evidence published in 2013/2014

NECR127 - Kaleidoscope: Improving support for black, Asian and ethnic communities to access services from the natural environment and heritage sectors

NECR128 - Assessing and evaluating the cultural services of the South Pennines ecosystem services pilot

NECR129 - Monitor of Engagement with the Natural Environment: The national survey on people and the natural environment - Wellbeing and the natural environment

NECR130 - The ecology of grass-wrack pondweed *Potamogeton compressus* (Two editions)

NECR131 - The economic impact of Natural England's National Nature Reserves

NECR132 - Literature review and analysis of the effectiveness of mitigation measures to address environmental impacts of linear transport infrastructure on protected species and habitats

(Two editions)

NECR133 - Monitoring the Impacts of Entry Level Stewardship

NECR134 - A review of the scarce and threatened beetles of Great Britain

NECR135 - Cereal invertebrates, extreme events and long-term trends in climate

NECR136 - Results of the 2012/13 visitor survey on the Thames Basin Heaths Special Protection Area (SPA)

NECR137 - Greening Dementia: a literature review of the benefits and barriers facing individuals living with dementia in accessing the natural environment and local greenspace

NECR139 - Upper Teesdale: changes in upland hay meadow vegetation over the past twenty to thirty years - results presented from botanical surveys

NECR140 - New Forest SSSI Geomorphological Survey Overview

NECR141 - New Forest SSSI Ecohydrological Survey Overview

NECR142 - Geomorphic and Ecohydrological Monitoring and Prioritisation Report

NECR143 - Latchmore Brook Restoration Options Appraisal

NECR144 - The Dormouse Reintroduction Programme: A review

Appendix 4 – Technical Information Notes (TINs) published between April 2013 – 31 March 2014

TINs contain evidence-based information related to scientific and technical subjects.

TIN120 - Establishing marine Special Protection Areas - (second edition)

TIN129 - Proposals for a Special Protection Area between Falmouth Bay and St Austell Bay - (second edition)

TIN164 - Slavonian grebe: species information for marine Special Protection Area consultations

TIN147 - National Vegetation Classification: MG5 grassland

Appendix 5 - Natural England Joint Publications published between April 2013 – 31 March 2014

Where we have worked jointly with one or more partner organisations we may publish documents as joint publications, for example with Defra, the Big Lottery Fund and other partners such as the Environment Agency.

DATA005 - Monitor of Engagement with the Natural Environment (2009-2012): Visits to the natural environment - variations in characteristics and behaviours of social groups within the adult English population

MCZ027 Natural England's advice to Defra on proposed Marine Conservation Zones for designation in 2013

MCZ028 to MCZ049 – Factsheets with information on the 22 proposed inshore Marine Conservation Zones

Access to Nature learning paper: Let nature feed your senses

Access to Nature final evaluation report

Local Access Forum National Conference 2013