

WAVES, RIPPLES AND REFLECTIONS: CELEBRATING 70 YEARS OF THE FSC AT THE 2013 MALHAM TARN RESEARCH SEMINAR

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A short article introducing the Malham Tarn Research Seminar 2013, with an overview of past research.

INTRODUCTION

My thanks to Mike Cawthorn for inviting me to introduce this, the latest Malham Tarn Research Seminar. His brief to me was to put these seminars in context and to be both informative and light-hearted. I hope I can achieve all three! To establish my credentials for doing this: I've recently retired as Head of Centre at FSC Flatford Mill, but I was here at Malham Tarn for 11 years between 1975 and 1986. I started as a Tutor and was Acting Warden for a time.

The Council for the Promotion of Field Studies (later restyled as the Field Studies Council) was created at a meeting in the Natural History Museum (London) in December 1943 – a truly far-sighted decision, as those who came together were surrounded by the depressing realities of wartime. When peace did come, things moved fast. Flatford Mill was opened as the first Field Centre in 1946, with Malham Tarn and Dale Fort following a year later. My own time here from the mid-1970s to mid-1980s is around the mid point of FSC's 70 years and so is a good vantage point for looking both backwards and forwards along a timeline that tells this Centre's story.

If we base this view on the Centre's 'leaders' (whose job titles evolved in good Darwinian fashion from 'Wardens' to 'Heads of Centre' via 'Directors of Studies' and 'Centre Managers'!), there are nine people or points on the timeline: Paul Holmes (1947), Douglas Bremner (1965), Ian Mercer (1969), Henry Disney (1970), Edward Jackson (1984), Kingsley Iball (1984), Cory Jones (1999), Adrian Pickles (2001) and Mike Cawthorn (2011). Each in their various ways has initiated, carried out, overseen, reviewed, published, shared, uploaded and otherwise passed on our ever-accumulating knowledge about Malham Tarn and the surrounding area, promoting field studies in all its many facets and remaining true to the aspirations of the FSC's founders 70 years ago.

I came into the FSC by a circuitous route of being first a historian, but also an ornithologist and birder, who jumped ship and came across as far as I could into the sciences via a geography degree. As a newly appointed Tutor here, I was like the proverbial boy in a sweetshop, with so much to interest me and learn about. I obviously received much knowledge first-hand from my immediate colleagues, but I also read and absorbed information from plain-coloured offprint booklets, most of which came from the FSC's journal *Field Studies*. Seventeen of these had been published between 1955 and 1975, when I arrived. They were the formal records of the many explorations that had taken place since the Centre opened.

What was it like here in the 1940s and 1950s? By way of comparison, I was fortunate to visit Hungary just after the 1989 revolutions in Eastern Europe. I was invited as an FSC representative to join a group travelling into the far east of the country, adjacent to the Ukrainian border with its barbed wire barriers and watchtowers still much in evidence. We found a dramatic and extensive landscape, farmed in traditional ways for centuries, just waiting for its features and wildlife to be recorded. After 40 years of exclusion, these excited naturalists and scientists could finally hold up a pair of binoculars without the risk of being a possible target! Although obviously the last element did not hold true, I suspect that the same sense of excitement existed here on Malham Moor in those 'early days'. Here was an area of superb landscape, rich in wildlife, with a story of human occupation stretching far back into prehistory, full of information and secrets to be discovered and shared.

So, it is the work of passionate, knowledgeable but modest people that found its way into *Field Studies* and its offprints: people such as Paul Holmes, Charles Sinker, Jean O'Connor, Michael Proctor, Donald Piggott, John Lund, Arthur Raistrick, Henry Disney and more. They laid the foundations for all of my own and I guess many of your initial and subsequent explorations of this remarkable area, which in many ways I have come to regard as my spiritual home.

Between 1975 until 2003, when *Field Studies* ceased to exist in print, another 19 titles were published and made available as offprints. (One on water chemistry around the Tarn even has my name on it, which I suppose shows how far a historian can stray from his roots!). Although many are out of print, they are now all downloadable from the FSC Publications website. What all these authors should be extremely proud of is that their work and commitment underpins the many thousands of FSC courses in ecology, geography and all the related studies that generations of Tutors, Associate Tutors and University lecturers have delivered to our students through seven decades.

They should also be aware that these courses have frequently been life-changing experiences for many people. To give just one example: Tom Tew came as a sixth former on an ecology course here in 1979 and as he says in the 70th Anniversary memories section of the FSC website: 'I learned that orange squash *was* nice drunk hot' and that 'There were people who cared about the environment and studied it carefully – *and* got paid for doing it!' Thirty years later



Tom held the position of Natural England's Chief Scientist and moved on two years ago to be the first CEO of the newly created Environment Bank. His is just one of many careers that can be traced back to these special environments around Malham Tarn and the work that took place to research and document them.

RESEARCH THEMES AND OUTPUTS

Already part of the Malham-Arncliffe SSSI, the Tarn and its associated wetlands received much deserved National Nature Reserve status in 1992 and a year later was recognised as a globally valued wetland site under the Ramsar Convention. With ever increasing pressures on land, soil, air and water resources, even around 400 m in a relatively remote part of the UK, there were therefore even more reasons for continuing to research and monitor the landscapes, ecosystems, communities and species in and around the Tarn.

The first Malham Tarn Research Seminar was arranged in 1996 between Kingsley Iball here for FSC and National Trust staff. The Trust is landowner of the Malham Tarn Estate and a large surrounding area of upland farmland as well, leasing the Centre buildings and immediate grounds to FSC. Because of growing concerns about the possibility of nutrient enrichment, this first seminar specifically focused on 'The Malham Tarn catchment: a review of past, present and future research'. After a short gap, Cory Jones arranged a second seminar for autumn 2001 with the complementary theme: 'Monitoring and managing change at Malham Tarn'. In fact, this was to be one of the five seminar events overseen by Adrian Pickles, as he took over from Cory as Head of Centre that year. Mike Cawthorn has extended the suite with the seventh seminar in 2011 and now this current one.

I've done some research of my own looking into the character of these seminars to try to draw out some facts and trends. So here are a few numbers:

- There have been eight seminars so far, now run every two years;
- Between 10 and 26 papers have been presented each time, with a mean of 18, happily close to the 19 planned for this weekend;
- A total of 156 papers have been presented in all, with a significant proportion of these being rolling updates on situations that are evolving over time.

As someone who likes putting things metaphorically into boxes, I've also classified all these papers into a number of broad themes, which if nothing else reflect the sheer richness and complexity of the environment all around us.

- Geology;
- Landscape evolution and geomorphology;
- Climate;
- The Tarn: water chemistry, nutrient fluxes, hydrology, sedimentology, ecology;
- Tarn wetlands: the Moss, the Fen and the Mires;
- Other sites and habitats, including the dedicated Cowside Beck project;
- Lower plants;
- Higher plants;
- Invertebrate fauna;
- Vertebrate fauna;
- Local prehistory, archaeology and recent history;
- Conservation and management issues: on Malham Moor and the wider area;
- Research and education issues.

Summary papers from all seven previous seminars, in the form of expanded abstracts or longer papers, are available via a few clicks through the Malham Tarn section of the FSC website. However, each seminar proceedings is a pdf holding all the summaries in just one document. So, as a small contribution to improving access, I've created a list indexing the individual topics in all the categories above and linking them to their respective seminar year, which should make tracking them down easier (Appendix 1).

In 2005, The Craven Limestone Complex - which includes the Malham Tarn NNR - was designated as a Special Area of Conservation (SAC) under the EU Habitats Directive. This also owes a huge debt to the work carried out by generations of researchers working on this National Trust land and through the FSC and its Field Centre. Here is the list of habitats and species that are the 'Primary Reasons' for the selection of the site:

- Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp.;
- Semi-natural dry grasslands and scrubland facies on calcareous substrates;
- *Molinia* meadows on calcareous, peaty or clayey/silt laden soils;
- Active raised bogs;
- Petrifying springs with tufa formation;

- Alkaline fens;
- Limestone pavements;
- White-clawed crayfish *Austropotamobius pallipes*;
- Bullhead *Cottus gobio*;
- Lady's slipper orchid *Cypripedium calceolus*.

These citations are all justified by the comment: '*for which this is considered to be one of the best areas in the United Kingdom*'. This is an amazing tribute to the researchers who have discovered, documented and made all this information as widely available as possible: in other words to your mentors and now to you yourselves.

I read recently that successive generations tend to live with the level of biodiversity around them, simply because they can have no real first-hand experience of knowing what it was like before. This sort of cultural meme could have us, albeit unwittingly, accepting diminishing biodiversity without questioning it. But this is not true here. In the 1970s Brian Shorrock started to produce the Settle Bird Report, which also covered the Tarn Estate and Malham Moor. More recently he and Robin Sutton have turned this into an annual Malham Tarn Wildlife and Weather Report, continually expanding the frame of reference and the taxa covered. This commitment to monitoring both living and non-living things will undoubtedly be of great value to future researchers, especially those interested in phenology and how climate affects plant and animal populations.

This brings me to the 'waves, ripples and reflections' in my title. *Waves* on the Tarn can be both short and long-period ones. The shorter ones could highlight a particular situation, such as a new species discovery. The longer period waves represent the dedication to long-term monitoring of weather, macrophytes, other vegetation patterns and fauna such as birds, butterflies and dragonflies. *Ripples* are suggestive of how individual discoveries and information radiate outwards in all directions to inspire successive generations of inquiring minds. *Reflections* are metaphorically the ones I'm sharing with you now, but also I have in mind amazing views of a mirror image of Great Close Scar reflected on a flat calm Tarn or even sheet ice – you wait a long time for those days! This makes you see the world differently and sets you thinking in new directions.

So, I hope this review of past research has given a helpful context for the weekend's presentations. I'm looking forward to learning how many of you have been taking forward your interests and our knowledge of Malham Tarn and the surrounding area.

APPENDIX 1.

FSC at Malham Tarn: An index to the Eight Research Seminars 1996-2013.

1. Seminar titles

1996	Malham Tarn and its Catchment: A Review of Past, Present and Future Research.
2001	Past, present, future: Monitoring and managing change at Malham Tarn.
2003	Life in a Limestone Landscape.
2005	How much is there still to learn?
2007	Recording and Sharing Information about the Malham Tarn Area.
2009	Managing the Future – Building on the Past.
2011	Looking Forward.
2013	Celebrating 70 Years of the FSC.

2. Seminar themes and topics

Geology

Marion Dunn. Facies changes across the Asbian-Brigantian boundary on the southern part of the Askrigg block. 2005.

Marion Dunn. Insights into global climate change in Early Carboniferous sediments on the Askrigg Block. 2011.

Landscape evolution: pre-glacial, glacial and postglacial geomorphology

Helen Goldie and Margaret Marker. Pre-last glacial karst dolines: distribution and differences. 2001.

Helen Goldie. Erratic judgements: a re-assessment of landform based limestone erosion rates. 2003.

Helen Goldie. Observations on small to medium scale mature limestone landforms of North West England. 2003.

Margaret Marker. The evidence for palaeokarst in the Malham high country. 2003.

Peter Vincent. Re-thinking the origin of limestone pavements. 2003.

Allan Pentecost and Uli Franke. What Gordale Beck can tell us about the past 2 billion years of Earth history. 2005.

Margaret Marker and Helen Goldie. Interim results: Yorkshire Dales Karst Depression Survey. 2005.

Roy Alexander *et al.* The effect of grike orientation and depth upon microclimate. 2005.

Allan Pentecost. Quartz at Gordale. 2007.

Wishart Mitchell. Glaciation of the Yorkshire Dales. 2007.



- Helen Goldie. Relationships between karst and glaciation in the Yorkshire Dales & Northwest England. 2007.
Cynthia Burek and Peter York. Limestone pavements in a changing climate. 2009
Helen Shaw and Ian Whyte. Palaeoecology and landscape history in upper Ribblesdale, North Yorkshire. 2009.
Peter Standing. Grike erratics in the limestone pavements of the Silverdale AONB. 2009.
Margaret Marker. Large karstic depressions in the Yorkshire Dales. 2009.
Peter York and Cynthia Burek. Limestone pavements – microclimate matters. 2011.
Cynthia Burek and Peter York. Defining a grike holistically. 2013.
Peter Standing. Investigating limestone erratic boulders. 2013.

Climate

- Graeme Swindles. Palaeoclimatic significance of two major recurrence surfaces in Tarn Moss, Malham. 2009.
Glen George. The phenology of ice on Windermere. 2009.
Graeme Swindles and Andrew Baird. How should we interpret paleoclimate records from peatlands: the Malham Tarn Moss case study. 2011.

The Tarn: chemistry and water chemistry

- Pietro Coletta. Carbon flux in Malham Tarn: a study utilising stable isotopes. 1996.
Jack Talling. The chemical dynamics of Malham Tarn. 1996.
Pietro Coletta. Carbon cycling at Malham Tarn: a study using stable isotopes. 2001.
Jack Talling. Solute budgets of Malham Tarn. 2001.
Pietro Coletta. Changes in the Malham Tarn carbon cycle. 2003.
Andy Markwick *et al.* Comparative chemistry of water from the Malham Tarn system. 2007.
Allan Pentecost. Dissolved orthophosphate contribution of the Mountain Limestone in the Malham Tarn catchment. 2011.

The Tarn: hydrology, sedimentology and ecology

- George Hinton. Interpretation of recent changes in the macrophyte flora of Malham Tarn. 1996.
Allan Pentecost. Sedimentation in Malham Tarn: past and present. 1996.
Penny Johnes. The impact of catchment history on Malham Tarn. 1996.
Allan Pentecost. The postglacial history of Malham Tarn as recorded by its sediments. 2001.
Les Ruse. Fly-dipping to measure lake status. 2001.
George Hinton. Aquatic macrophyte surveys of Malham Tarn: 1994 to 2001. 2001.
George Hinton. Aquatic macrophyte ecology of Malham Tarn: 1994 to 2003. 2003.
Pietro Coletta. Sedimentary cores from Malham Tarn: a record of environmental change. 2005.
George Hinton. Aquatic macrophyte ecology of Malham Tarn from 1994 to 2005. 2005.
Allan Pentecost *et al.* Diatoms and Green Algae in the sediments of Malham Tarn. 2009.
George Hinton. Malham Tarn: long term monitoring cycles. 2011.
Emma Wiik *et al.* Malham Tarn: a marl lake recovering or degrading? 2011.
George Hinton. Twenty Years of Malham Tarn Macrophyte Surveys: what we have learned? 2013.
Jillian Labadz. Student investigations of water budget and nutrient status of Malham Tarn. 2013.
Allan Pentecost. Charophyte remains in the sediments of Malham Tarn. 2013.

The Tarn wetlands: Moss, Fen and Mires

- Elizabeth Cooper. Vegetation survey and predictive ecological options using the NVC. 1996.
Michael Proctor. Water analysis on Tarn Moss: sources of solutes and seasonal changes. 2001.
Bryan Wheeler and Sue Shaw. Ecohydrological characteristics of the Malham Tarn mires. 2005.
Roger Meade. Tarn Moss: can't we just enjoy it? 2007.
Roger Meade and Alex Jones. Ecohydrology of the Malham Wetlands. 2009.

Other sites and habitats

- Judith Allinson. Grassland monitoring at Malham Tarn Close: 1956-2001. 2003.
Douglas Richardson. In the footsteps of Oliver Gilbert: Thoragill Beck. 2005.
Sue Willis. Grassland succession at Malham Tarn NNR: preliminary findings. 2005.
Douglas Richardson. Thoragill: where next? 2007.
David Hodgson. Scoska Cave: a unique biological site in the Dales. 2007.
David Hodgson. An update on work in surrounding caves in the last two years. 2009.
Sarah Edwards. Holocene perspective on the ecology of moorland burning in the Yorkshire Dales. 2011.
Elizabeth Sullivan. Hay Time survey: comparing data from 20 years to present. 2013.
Don Gamble. Hay Time meadow restoration. 2013.
Ashley Lyons. North Yorkshire Upland Limestones: the impact of livestock grazing on vegetation. 2013.
David Hodgson. Littondale cave research. 2013.

Cowside Beck Project

- Adrian Pickles. Introduction. 2003.



- Helen Goldie. Cowside Beck: Geomorphology. 2003.
David Hodgson. The Cowside Beck caves. 2003.
Douglas Richardson. Cowside Beck: water chemistry. 2003.
Oliver Gilbert. Cowside Beck lichen survey. 2003.
Douglas Richardson. Cowside Beck: freshwater invertebrates. 2003.
Michael Proctor. Cowside Beck: bryophytes. 2003.
Douglas Richardson. Cowside Beck: diatoms. 2003.
Allan Pentecost. The algae of Waterfall Beck, Malham. 2003.

Lower plants

- Oliver Gilbert. The lichens of limestone streams. 2001.
Allan Pentecost. What has happened to the Fountains Fell *Cetralias*? 2011.

Higher plants

- Allan Pentecost. The new 5 km radius flora of the Malham Tarn area. 2001.
Paul Ashton. Variation in the Malham population of large yellow sedge *Carex flava*. 2003.
Paul Ashton. Malham's vascular plants: rarity, vulnerability and candidates for long-term monitoring. 2005.
Nigel Blackstock. The status of *Carex flava* in the British Isles. 2009.
Judith Allinson. The vegetation of Malham Tarn (Higher Plants): changes since Sinkers's 1960 list. 2013.

Invertebrate fauna

- Henry Disney. The scuttle flies of the Malham Tarn NNR. 1996.
Paul Bradley. White-clawed crayfish at Craven Limestone Complex SAC, North Yorkshire. 2001.
Douglas Richardson. Some lesser known Orders: Isopods, Chilopoda, Diplopoda, Opiliones, Hirudinea and Porifera. 2001.
Paul Bradley. A future for white-clawed crayfish in the Dales? 2003.
Adrian Norris. The mollusca of Malham. 2003.
Terence Whitaker. Butterflies of Malham Tarn: 50 years of change. 2003.
Terence Whitaker. New research on the dark green fritillary in the Yorkshire Dales National Park. 2005.
Adrian Norris. The mollusca of the National Trust Estate at Malham. 2005.
Paul Bradley. Ribblesdale Crayfish Conservation Project. 2009.
Sue Willis and Adrian Norris. The relationships between molluscs and limestone pavements. 2009.
Terence Whitaker. Mapping changes in the dark green fritillary in the Yorkshire Dales VC 64: 2000-2010. 2011.
Sharon and Peter Flint. Aquatic macroinvertebrate recording on the Malham Tarn Estate. 2011.
Sharon and Peter Flint. Caddis fly recording on the Malham Estate. 2011.
Sharon and Peter Flint. Caddis flies of the Malham NNR, with special reference to the Malham sedge. 2013.
Mike Rogan. New and rare trematode parasites in small mammals at Malham. 2013.
Terence Whitaker. Recent work on moths and butterflies in the Yorkshire Dales. 2013.

Vertebrate fauna

- Jon Payne. Brown trout and perch of Malham Tarn. 2013.
Emily Alderton. The diet of the Malham Tarn otters: implications for conservation and angling. 2013.

Local prehistory, archaeology and history

- Paul Bradley. The history of Malham Tarn. 2007.
Mike Spence. A dairy on Malham Lings, 1344-1362? 2009.

Conservation and management: Malham Tarn and Malham Moor

- Peter Worrall. Catchment parameters and design of the reed bed. 1996.
Richard Barnes. Reedbeds and water quality: set up and initial results. 1996.
Alistair Clunas. Malham Tarn Estate. 1996.
Peter Welsh. National Trust: current work on the Malham Tarn NNR and adjacent estate and future plans. 2013.

Conservation and management: the wider area

- Katherine Hearn. Droughts, floods and trying to conserve nature: recent National Trust initiatives in Malham and Upper Wharfedale. 2005.
Denise Loten. National Trust water policy. 2007.
Stephen Morley. National Trust Regional Conservation Strategy. 2007.
Cynthia Burek. Geodiversity and Geoconservation: relevance for limestone pavements. 2007.
Sue Willis. The holistic classification and management of limestone pavements: an endangered habitat. 2007.
Cynthia Burek and Sue Willis. The first holistic limestone pavement classification: where does Malham Cove fit in? 2011.
Paul Bradley. Applied Ecology Trust. 2013.

Research issues

- Douglas Richardson. Some thoughts on making raw data available to a wider audience. 2005.
Andy Markwick and Satvinder Nandhra. Sharing data and promoting collaboration. 2007.



Rob Lucas. Linking research and education. 2011.

Edward Jackson. Waves, ripples and reflections: Celebrating 70 Years of the FSC at the Malham Tarn Research Seminar. 2013.

Robin Sutton. Malham Tarn: Wildlife and Weather update. 2013.

Education issues

Steve Gill and Mike Samworth. Wider dissemination of information and the amateur/academic interface. 2003.

Tom Nash. Art and Science: is there surface tension? 2005.

David Hodgson. 60 Years of Environmental Issues: should we be looking back to guide us forward? 2007.

APPENDIX 2.

The (Malham Tarn) Research Seminar Song.

(To the tune of the Major General song from The Pirates of Penzance - with apologies and respect to Gilbert and Sullivan!)

The landscape all around us bears an imprint geological
With Horton slates and Great Scar Limestone lying unconformable
Without the fault (North Craven) there'd be no Tarn just out there you know
And dolines in the karst suggest a climate oh so palae-o

The ice in the Devensian was all around us here you say
Creating dales and scars and pavements 'till it wasted all away
It left a basin in the slates with water rather magical.....
Without that folks I'm sure you know we wouldn't be here now at all!

*These seminars each two years, oh indeed they are biennial
Bring everyone together sharing love of all things 'Tarnical'
And so in matters vegetable, animal and mineral,
They are the very model of a research periodical!*

Ten millennia we've come since then: this Tarn seems now so valuable
George Hinton's work on macrophytes records the changes one and all
Pietro's cores from down below are sedimentological
And moss and mires and fen depend on fluxes hydrological

Allan Pentecost for years researching all things algological
Down Gordale Beck, around the Tarn and even up on Fountains Fell
Not far from here he once disturbed a startled huge great eagle owl.....
Which shows you to expect a great deal more than you had bargained for!

*These seminars each two years, oh indeed they are biennial
Bring everyone together sharing love of all things Tarnical
And so in matters vegetable, animal and mineral,
They are the very model of a research periodical!*

Part of the wider scene are Cowside Beck, High Mark and Thoragill
David's underground again, but Helen's way up on the hill
Our white-clawed crayfish Paul has helped to not become a sad has-been ☺...
While Terry maps the dark-green frits from Scar Close, here and in-between

Robin Sutton and his friends create a monitoring almanac
Of weather, birds and bugs and other things: it truly is the craic
We're sure the scope for this will last all through the coming century.....
They'll monitor and monitor so trends are there for all to see!

*So Adrian and now Mike too and all of their supporting crew
They keep this show on track, sincerely hoping that you will do too
And so in matters vegetable, animal and mineral.....
It is the very model of a research periodical!*

Edward Jackson, November 2013

