Institution: University of Central Lancashire

Unit of Assessment: 17 Geography, environmental studies and archaeology

a. Context

Research is at the centre of our mission statement at UCLan, and with the growth of the impact agenda in the university sector, our research has expanded to deliberately incorporate elements of this into our work. We are committed to disseminating our research to as many audiences as possible. Our approach is:

1. to impact directly on the public. We aim to engage, inform and culturally enrich their lives by learning about our subject areas (the past and earthworm ecology).
2. to impact public institutions (the government, the heritage sector, professional bodies etc) by influencing their practice as well as policy.

This has been achieved in a number of ways:

1. Our research activity incorporates a public engagement component wherever possible.
2. We have created a series of open access webpages to enable interested parties easy access to our research.
3. We have engaged widely with the media which has reached broad audiences.
4. Legislative policy change has been informed by our research.
5. We involve the public in helping us generate research, so the public are engaged with the research process itself.

Thus, research over the period 2008-2013 has led to recognisable impacts at regional and national level in three areas: public engagement, policy debate including a change in policy direction and changed practice amongst professionals. Two detailed case studies are presented which detail this, one in Archaeology (Bones without Barriers), and one in Environmental Studies (Earthworm Applications).

b. Approach to impact

Public engagement

This UoA has benefitted from substantial financial assistance and workload relief so that we are able to engage with the impact agenda. The university has a Public Engagement Manager who assists individuals and/or projects with acquiring funding to help with this. The university also provides centralised funding which we can apply for: we have been successful in acquiring grants for a number of our projects (e.g. Sayer has received Public Engagement funding to support his community engagement work; Peterson, Robinson and Morris have acquired funding from the Undergraduate Intern Scheme, which has had a substantial public engagement element; Cummings has received the Harris Award to support the construction of websites aimed at the public: see http://www2.uclan.ac.uk/scitechmedia/cairnderry/cairnderry2006.html and http://www2.uclan.ac.uk/scitechmedia/bargrennan/whitecairn.html). Funds are also available at school level to support public engagement work. For example, Sayer has received school support to develop a webpage on his Oakington project (boneswithoutbarriers.org) as well as to fund open-access publication of a paper in *World Archaeology*. We also have social network feeds and blogs which enable people to follow our research (e.g. http://shelteringmemory.wordpress.com/). Financial support is also provided by the university in order to publicise our work at conferences, both home and abroad, for academics and non-academics alike. Peterson, for example, has spoken about his work at the Lancashire Archaeology Day (also run by, and held at, UCLan). He has been involved in the Forest of Bowland AONB's summer long Festival Bowland event since 2010. This has included organising guided walks, site visits and evening lectures for members of the public on the archaeology of the AONB. Sayer has spoken to Oakington and Westwic Archaeology and History Society and Cummings has presented her work to archaeology societies in Kintyre and Sligo. The university also received funding from the AHRC to train early career researchers in public outreach. A number of archaeology PhDs took advantage of this course and have been able to input their experience into on-going projects.

One key way of engaging the public with archaeology has been growing people's awareness of our

research. All projects undertaken by individuals have involved the local community. In some cases this has been through guided tours, but in other cases the community has had the chance to excavate as well. Local people have also had the chance to deal with the finds and post-excavation processes. They have thus been directly involved with creating and interpreting their own histories. For example, at the excavation of Peel Park, the former ground at Accrington Stanley, Lancashire, over 50 school children from the nearby primary school had the chance to excavate and the whole school visited the site. We had our own undergraduate students working with the excavated material in the school. In addition, the chairman of Accrington Stanley, two current players, one surviving player from the team who played at Peel Park and over 50 supporters visited the site, and, alongside the televised element of the project on BBC Sport's Late Kick Off programme, the excavations featured in the local newspaper and on BBC local television and radio. As well as the academic publication of the work at the site in *World Archaeology*, a popular article was published in national fanzine *When Saturday Comes* and in the German *11 Freunde* football lifestyle magazine. This particular project had an immediate impact on the local community and from the methods used for schools engagement at this site two of the team developed an event called 'The Archaeology of your School' for the annual Lancashire Schools Science Festival which ran in June 2011 and 2012.

In Ecology, the Earthworm Research Group (ERG) was instrumental in the production of a simplified key to the earthworms of Britain (see: http://www.opalexplorenature.org/node/2335), produced in collaboration with the Natural History Museum (London). This key has been used as a part of the Open Air Laboratories (OPAL) project http://www.opalexplorenature.org/ and has been sent out to 50,000 individuals, schools and community groups across the country. This will ultimately lead to a greater understanding of earthworm species distribution across Britain and help to encourage public engagement in science. At a more local level the ERG has been involved in numerous "Bioblitz" activities where experts and the public are brought together to investigate the biodiversity of a given area (e.g. a park) in a limited time frame (e.g. 24 hours). During this period the number of species found is recorded, but emphasis is also placed on demonstrations of collection techniques to the public and supervised display of the animals themselves (e.g. http://www.lancswt.org.uk/index.php?mact=News%2Ccntnt01%2Cdetail%2C0&cntnt01articleid=168&cntnt01returnid=15). In terms of making publications more accessible, the ERG has also begun to target open-access journals, particularly where the material might have a greater appeal. For example, a publication on "Basic research tools for earthworm ecology" is available online (http://www.hindawi.com/journals/aess/2010/562816/ref/).

Policy and practice

In archaeology we have a mandate to try and get as many different and diverse groups as possible to recognise the importance of the past. This is increasingly having an impact on decisions regarding cultural resource management as well as informing the heritage sector. For example, in California, Robinson's on-going archaeological project there has had a direct impact on the Wildlands Conservancy, the largest privately held non-profit land-holder in the American West with a focus on its 100,000 acre Wind Wolves Preserve and the 1.75 million acre Los Padres National Forrest. This project has resulted in: an integrated set of executive management reports; open access public material; local and national media coverage; public talks and public participation; fund-raising for Native American museum development; 'on the ground' site management, such as evaluation of the land management impact of archaeological sites and the preparation of a Native American Repatriation ground. Thus, this work has created a shift in how a whole range of private and public bodies and the general public view archaeological work and sites. We detail another example in our first case study: Bones without Barriers.

The Earthworm Research Group has been involved with soil restoration for more than two decades. Use of the Earthworm Inoculation Unit (EIU) Technique (e.g. http://link.springer.com/chapter/10.1007%2F978-3-642-14636-7_6) is now seen as a way that can enhance rehabilitation of degraded soils and has been included within the UK National Building Specifications (2011) (http://www.thenbs.com/) to enhance topsoil function. The EIU concept has been developed over a number of decades in agro-ecosystems, but more prominently on reclaimed landfill caps and disused industrial sites. Managers at one of the latter have promoted

the use of earthworms, and the EIU technique in particular, to assist the restoration of biological soil function at a National level.

c. Strategy and plans

This UoA and the university are committed to the impact agenda. We are invested in communicating our research to the public and public institutions. Our strategy is to continue to engage people through as many means as possible (site visits, talks, poster displays, social media, TV, radio, websites).

In archaeology, one of the case studies detailed here (Bones with Barriers) has been planned as part of an on-going project at Oakington with a specific public outreach agenda. This will continue for the next two years, with plans already underway for this to inform debate and policy beyond the UK. Informed by the experiences at Oakington, the archaeology team are now starting up a new research project on the Roman fort and settlement at Ribchester, Lancashire and one of the key elements of this is a public outreach programme. The 'Revisiting Ribchester' Project started in 2013 and we have already had university support for an undergraduate intern who made contacts with interested parties. The aim is to get this project to take over as our main public outreach project after the completion of the Oakington project. This will involve the whole academic team working there at different times of the year and include different parties, including school children (over 50 primary schools visit Ribchester each year), the local community and local museums. By increasing work there and the overall profile of the site, this project will also increase visitor numbers which will have an impact on businesses in the area: the project has been carefully timed to coincide with the return of the Ribchester helmet from the British Museum in 2014 (the centenary of the founding of the Ribchester Roman Museum). Finally, the scheduling at Ribchester is rather erratic, so we will be working in close collaboration with English Heritage and we will be able to inform policy regarding the scheduling of this site. The aim is to remove Ribchester from the 'Heritage Sites at Risk' list produced by English Heritage in 2012, which named the site as in the top 10 at risk sites in the north-west.

In ecology, immediate plans include a University-funded 'Distinguished Research Visitor' (Visa Nuutinen from MTT in Finland) who will spend time at UCLan in March 2014. In addition to a public lecture and direct local interaction with staff and research students in the laboratory and the field, a new field project will commence as a direct result of this. This will take place on the Isle of South Uist in the Outer Hebrides and is a development of the work already conducted by the ERG on the Isle of Rum. It will involve investigations of human influence (e.g. kelp addition to soils) on soil quality and soil fauna - specifically earthworms - at existing crofts, and some long since abandoned, to reveal isotopic carbon and nitrogen dynamics mediated by earthworms. This project will link up with the Blackland Research Group on South Uist, associated with the Scottish Rural College. This group is a pioneering academic and consultancy organisation, strengthening Scotland's support for sustainable agriculture, food production and land use. The crofting system is culturally significant and fundamental to their thinking and an area where we plan to add our expertise in earthworm ecology. Our commitment will grow from initial survey to long term monitoring over the next decade, combining assessment of working, disused and re-activated croft soils. The wider commercial implications of earthworm use are huge and potentially wide reaching, not just in the UK but internationally as well.

d. Relationship to case studies

The overall approach to impact outlined above is highlighted by both of our two impact case studies: 1) the desire to engage the public in our research and its outcomes, and 2) our desire to influence policy and practice. We have chosen these two case studies as they showcase this best. The Bones with Barriers case study highlights how academic research can impact not only on the local community, but also how archaeological material is perceived by the public and public institutions alike. This has effectively changed policy in England and Wales, and will inform policy elsewhere. The Earthworm Applications case study highlights the wide-reaching uses for earthworms not only in the commercial sector but to the public as well, and engages the latter in our on-going research in this area.