Institution: Bournemouth University
Unit of Assessment: UOA17 Geography, Environmental Studies and Archaeology

a. Context

We address the global challenge of understanding past and present changes within natural, cultural and historic environments to develop sustainable solutions for their long term future. We achieve this by understanding how societies and nature have adapted to change, and by using this knowledge to predict the consequences of change in the future. Our research, spanning the breadth of UOA17, has wide-ranging beneficiaries including: Governments and government departments (e.g. UK, EU); environmental and cultural Non-governmental Organisations (NGOs) (e.g. English Heritage, National Trust, Society for Ecological Restoration); global environmental and cultural organisations (e.g. International Commission for Missing Persons (ICMP), International Criminal Tribunals (ICT), International Union for Conservation of Nature (IUCN)); industrial developers (e.g. housing, shellfishing, shipping, tidal barrages and wind farms). We achieve impact with global reach through mechanisms including: improved human wellbeing and justice (Cheetham, Hanson, Klinkner); increased environmental quality (Esteban, Franklin); improved professional practice (Britton, Cheetham, Diaz, Hanson, Klinkner); increased economic activity (Stillman); strengthened public policy initiatives (Gozlan, Newton); enhanced public awareness and understanding of culture (Darvill, Parham, Welham) and nature (Esteban).

b. Approach to impact

We have a three step approach to impact, founded upon long-term, iterative relationships with users and Bournemouth University's (BU) commitment to maximise societal impact (BU Strategic Plan – creating and sharing strategies). Our approach is supported by School and BU initiatives to fund networking, user engagement and the targeted communication of research (see REF5). We recognise how research underpins public policy and professional practice, and its wider benefit to enhance societal understanding.

Step 1. Target research towards key societal challenges. Our research gives unique insights into ancient monuments and societies (Darvill, Hambleton, Jenkins, Maltby, Schutkowski, Stewart, Welham), optimises humanitarian procedures (Case study 3), assesses threats to biodiversity (Case study 4) and heritage assets (Darvill, Palma, Parham), quantifies conservation effectiveness (Case study 1) and improves natural resource management (Esteban, Franklin, Case study 2). Peer review publication is central to our approach to ensure that impact is rooted in robust research and our case studies are based on publications in field-leading journals. Research funding (£874k p.a.; 156% growth since RAE 2008), supported by pump-priming and training initiatives to build impact, is obtained directly from users (e.g. Environment Agency, English Heritage, National Trust) or competitive bids (Heritage Lottery Fund (HLF) (Palma, Parham), AHRC (Jenkins, Maltby, Welham), Knowledge Transfer Partnerships (KTP) (Kneller, Newton), EU (Britton, Gozlan, Newton) and AHRC and NERC KTP (Staelens, Stillman)).

Step 2. Engagement and dissemination with key audiences, beneficiaries and users. Our applied research enables us to build long-term relationships with users, and to understand how their needs map onto key societal challenges. This allows us to identify the best way of communicating research outputs and facilitates the transformation of research into impact.

Support for engagement and building impact has been through initiatives including the School Staff Development Budget (£50k p.a.) and R-Budget (£40-50k p.a. derived from QR funding), the BU Fusion Fund, Higher Education Innovation Fund (HEIF) and Santander grants (see REF 5). BU's match-funded PhD scheme (see REF 5c) establishes strong links with non-academic organisations (e.g. Environment Agency, National Trust). The School has dedicated KTP staff to link opportunities to staff members and facilitate KTP bids (see REF5). We have established Archaeological (earning £50k p.a. and over £75k in 2013) and Environmental (earning £200k in its first 3 months) consultancies, providing excellent means of establishing close links with users.

Dissemination to beneficiaries has occurred through expert advice (e.g. Britton, Darvill, Diaz, Gozlan, Newton, Parham, Stillman), academic positions (e.g. EU (Gozlan), IUCN (Newton), European Food Safety Authority (Britton)), websites (e.g. Seeing Beneath Stonehenge, MAD about the Wreck, Poole and Purbeck Portal), research reports and bespoke workshops (e.g. Newton, Stillman). Hanson was seconded to the ICMP and participated in the ICT for the former

Yugoslavia. Cheetham, Hanson, Schutkowski and Smith assist Police Constabularies in criminal investigations. Ginige's research on the conflicting demands of EU directives on habitat protection and climate change for the proposed Severn Barrage was debated by a House of Commons climate change committee. To facilitate global dissemination of research to potential users, BU has an Open Access Budget (see REF5) for rapid publication, open to all staff, with 16 UOA papers funded (£22.8K) since 2011.

Wider engagement and communication has been facilitated through public events and short courses, with media communication supported by BU's Marketing and Communication team. BU signed the National Co-ordinating Centre for Public Engagement (NCCPE)'s Manifesto for Public Engagement in 2012, and we have a dedicated School Public Engagement Officer to organise events. In 2013 BU initiated an annual Festival of Learning as a focus for public engagement, with our events including biological recording, an Alfred Wallace themed weekend and archaeological excavations (Esteban, Hambleton, Herbert, Hodder, Newton, Welham). We improved public understanding of the Stonehenge World Heritage Site through a novel Google website (Welham) and our research on the site has informed the development of new visitor facilities. HLF projects include: the redesign of Hengistbury Head visitor centre; enhanced community engagement with Cranborne Chase and West Wiltshire Area of Outstanding Natural Beauty; the redesign of Swash Channel wreck displays at Poole Museum. Other events have included Café Scientifique talks (Bennett, Herbert, Schutkowski) and research outreach to schools such as Science Family Fun Days (Esteban, Jenkins). We support Nuffield Research Placements for Year 12 students whose work has been selected for the Best Young Scientist Award (2010 National Science & Engineering Competition), and won the Chartered Institution of Water and Environmental Management 's Youth Water Prize (2012).

Step 3. Monitor impact, refine research and dissemination in the light of emerging impact and societal challenges. Our approach to impact is iterative. We monitor the impact of our research through continued engagement with users to measure our influence on policy and practice, and wider societal concerns. This allows us to target research towards emerging societal challenges, to better tailor research to user needs, and to adapt communication and training to improve the uptake of research outputs. Our case studies demonstrate the value of this approach.

c. Strategy and plans

Maximising impact is core to our research strategy (REF 5b), building on our collective strengths of conducting societally-relevant research, and is consistent with BU's Strategic Plan. University funding will be streamed through societally-relevant research themes from 2014, with our research sitting within the Biodiversity, Environmental Change and Green Economy theme (led by Esteban and Newton), and the Communities, Culture and Conflicts theme (led by Schutkowski and Welham). Our impact strategy will build on our three step approach to impact, the best practice demonstrated by our case studies and the lessons learned collectively.

Maximise understanding of current and future societal needs. Gaining the best possible understanding of user needs, and how these may evolve, is central to our approach to impact. A key lesson we have learned is that often users of research results do not know they need the results until they come up against a problem for which we already have, or can develop, a solution. Researchers and users need to be brought into close contact to better enable impact opportunities to be identified. We will create external User Groups to facilitate subject-specific communication and the identification of impact opportunities. Horizon scanning, with User Groups and researchers sharing common interests, will be used to better understand how our research maps onto current and future needs. This builds on the model demonstrated by our case studies in which societal impact has been increased by long-term, iterative, engagement between researchers and users. We will create an Impact Database to monitor societal impact from the initial identification of need, through each of our steps to impact.

Maximise awareness and opportunities for societal impact. We will continue to encourage and facilitate networking with potential users across all disciplines within the UOA, support the development of good new ideas, and sustain established research domains which provide internationally recognised reference points (e.g. Stonehenge, Case studies). Impact Champions with a track record of high societal impact will mentor staff and ensure that best practice is adopted. The School will create a funding stream to facilitate user engagement activities,

supplementing the BU-wide funds already available. We will continue to target KTP, Heritage Lottery, EU, and RCUK funding, building on our success with these funding streams (see REF 5), and continue to build strong links with commercial organisations (e.g. Google). BU match- and fully-funded PhD studentships (see REF 5; University commitment to fund 50 per year to 2018) will continue to be targeted to undertake societally-relevant research and build strong links with users through joint PhD supervision. We will continue to invest in and develop our Archaeological and Environmental Consultancies (see REF 5), as a means of establishing close links with users and beneficiaries to better understand how research and its dissemination can be tailored to their needs. We will increase awareness throughout the UOA of consultancy potential so that staff have a better understanding of the ways in which research impact can be achieved.

Maximise wider engagement and communication. Recognising how research can enhance societal understanding, we will continue to prioritise public engagement and wider dissemination. We will identify Public Engagement Champions (e.g. Esteban - highly commended in national "Most Dedicated STEM Ambassador of the Year" award 2010 and runner up in Society of Biology Science Communication Award 2013) to ensure best practice throughout the UOA. We will build on existing public engagement activities (e.g. BU's Festival of Learning, National Science Week, Café Scientifique, contributions to public lecture series) and short courses (e.g. Stafford has won a NERC grant (£47K) to deliver short courses on aquatic ecology during 2014). We will encourage greater connections with the media through support from BU's Marketing and Communications team, to increase further the exposure of our research, building on previous high-profile media coverage such as Parham's widespread media coverage (e.g. BBC One Show, Times Science Magazine) of a 17th century ship wreck in Poole Harbour, and Darvill's series of international appearances (TV, radio, press, magazine) in relation to the investigation and interpretation of Stonehenge. We will further engage with beneficiaries by broadening the scope of the Poole and Purbeck Portal (Esteban), a website and networking initiative to facilitate research communication.

d. Relationship to case studies

As evidenced above, societal impact has been achieved throughout our UOA, and included enhanced public understanding and an improved evidence-base for cultural and natural policy and practice. From a wide range of possible case studies, the four submitted here were chosen as examples of the significance and global reach of our impact, and our iterative, three step approach to impact, honing research outputs to user requirements, and building long-term relationships.

Case study 1 (Newton, Diaz, Golicher & Hodder). This high-level research has influenced global nature conservation policy. Supported by two EU-funded projects, it addresses the societal challenge of assessing the effectiveness of biodiversity conservation and exemplifies our strategy of publishing applied research in high quality journals to maximise academic impact (Step 1). The research has been directly incorporated into international policy (Step 2). Refined understanding of user needs has been acquired by on-going engagement with policy processes (Step 3).

Case study 2 (Stillman & Clarke). This research has benefited on-the-ground biodiversity conservation within protected sites and balanced the needs of nature and society. It addresses the challenge of understanding the effect of environmental change on biodiversity (Step 1). Widespread user engagement has led to a thorough understanding of how to provide the evidence-base for conservation (Step 2). Understanding of user needs has been refined by application to 35 sites, and NERC and HEIF grants have tailored communication to users (Step 3).

Case study 3 (Cheetham, Hanson & Klinkner). This interdisciplinary research in forensic archaeology and anthropology, and criminal law improves justice for survivors of atrocities by the recovery and identification of missing persons (Step 1). The case study was conducted in close collaboration with humanitarian organisations to target research to improve standards and policies for mass graves investigations (Step 2). On-going engagement with legal and policy processes, and field excavations, ensures that procedures are suitable for new humanitarian crises (Step 3).

Case study 4 (Britton, Gozlan & Andreou). This research delivers the evidence base for managing non-native fish and has guided European policy. It addresses the global challenge of minimising the effects of invasive species on biodiversity (Step 1). It demonstrates the effectiveness of maintaining close links with key stakeholders to identify knowledge gaps and to best adapt our research to meet the needs of users (Step 2). Improved understanding of user needs is ensured through on-going networking and engagement with the policy process (Step 3).