

# The cultural ecosystem services of winterbourne streams: what do these dynamic ecosystems mean to people?

Tim Sykes, University of Southampton, UK.

t.j.sykes@soton.ac.uk, @RiversandPeople

Tim Sykes is a PhD researcher at the Southampton University, supervised by Drs Kelvin Peh and Robert Holland (University of Southampton), Dr Kayleigh Wyles (University of Plymouth), Tim Sykes is a PhD researcher at the Southampton University, supervised by Drs Kelvin Peh and Robert Holland (University of Southampton), Dr Kayleigh Wyles (University of Plymouth), and Dr Rose O'Neill (Campaign for National Parks), Tim's research is investigating how people perceive and value chalk winterbournes. Richard Chadd contributed to this research.

People's and societal relationships with rivers are complex, extending far beyond the direct use of rivers as a source of drinking water or for recreational activities such as fishing, to encompass a range of intellectual and emotional ties that support human wellbeing. My research uses the lens of 'cultural ecosystem services' (CES) to examine these complex links between people and rivers to inform catchment-scale management of chalk streams, which are among the UK's most iconic rivers. The term ecosystem services refers to the benefits people derive from nature. Government policy and

practice has a strong focus on optimising benefits from ecosystem services that represent tangible natural assets such as water resources and fish stocks. Complementing such 'provisioning' services, CES explicitly recognise the significance of non-material benefits that people obtain from nature. These benefits enrich our lives in many ways, such as by providing opportunities for reflection and inspiring creativity, the importance of which we are only just beginning to understand. CES constitute and reflect the values and histories people share, the cultural practices they engage in, and the landscapes they inhabit (Fish et al., 2016).

The headwaters of chalk streams naturally range in time and space between flowing, ponded and dry phases (Figures 1–2) in response to seasonal fluctuations in groundwater levels (Sear et al., 1999), giving rise to their name – winterbournes. Winterbournes are etched into our cultural heritage in place names such as Otterbourne, Lambourn and Winterbourne Abbas, villages which dot the rolling chalk landscapes of south and east England. To better



Figure 1. The River Swift, a chalk stream winterbourne in Hurstbourne Tarrant, Hampshire, in its flowing (A) and ponded (B) phases. In its flowing phase, a winterbourne has the biophysical characteristics of a perennial chalk stream. Photo credits: Maggie Shelton, Hampshire and Isle of Wight Wildlife Trust.



Figure 2. Two winterbourne streams: (a) the River Till, Wiltshire, in its ponded phase, and (b) the Candover Brook, Hampshire, in its dry phase. Photo credits: (a) A. House; (b) T. Sykes.

understand our relationships with winterbournes, I am conducting walking interviews with local people, alongside or sometimes even in winterbourne streams. With particular regards to wellbeing, I am asking what feelings (positive and/or negative) and relational and intrinsic values these ever-changing places stir in people. Relational values represent positive relationships and responsibilities between people or between people and nature, while intrinsic values recognise nature as important for its own sake. In their ponded phase (Figures 1b and 2a) winterbournes are often characterised by decaying vegetation and invertebrates, stagnant water, and stranded fish. This transition phase gives way to the dry phase (Figure 2b) of exposed riverbed silt and flints. Dry riverbeds can support considerable biodiversity (Bunting et al., 2020), as well as a wide range of ecosystem services that complement those provided by perennial chalk streams (Stubbington et al., 2020). However, these potential benefits appear to be missed by many people, due to negative perceptions of the dry phase. My preliminary results suggest that some local people are accustomed to and anticipate the natural rhythm in the transition between flowing and dry phases, as a marker of the season, comparing the drying phase to the fall of leaves in the autumn, and the rewetting phase to heralding spring. The dry phase is described by some as akin to the darkness of a new moon phase, and empty skies when swallows depart southern England: changes that are perceived as anticipated, rational and temporary.

Nonetheless, some people still feel a sense of boredom, sadness, loss, or even mourning when the winterbournes in their quintessential English villages and open Wolds landscapes become dry, a state some describe as empty, dormant, or even dead. They then report great excitement and joy when flows return, perceiving a subjective restorative effect on their mental wellbeing. These relational and intrinsic values are common amongst owners of chalk stream winterbournes and are associated with CES such as aesthetic beauty, social cohesion, and place identity. However, the prevalence of such perceptions towards chalk stream winterbournes and the extent of alternative perceptions, such as ambivalence, remain undocumented. Beyond the English Chalk, temporary streams are reported to create a sense of place, cultural identity, and nature stewardship (Datry et al., 2018). Temporary streams can provide cultural heritage and create indigenous knowledge and can be of deep spiritual significance. They provide extensive opportunities for research, and education could prove to be a key positive influence that improves recognition of their ecological and cultural values (Leigh et al., 2019; Stubbington et al., 2020). In drylands – where they dominate river networks – landowners perceive their temporary streams to be less important compared to landowners of perennial streams, and think parochially, prioritising local management over downstream interests (Witt et al., 2019). Such views and actions render temporary streams

vulnerable to mismanagement and unintentional or deliberate degradation. This is consistent with my observations of historic mismanagement of chalk winterbournes, most of which have been dredged, relocated, straightened and/or culverted (Figure 3). Understanding landowner and other stakeholder perceptions and values could inform catchment-scale management strategies (Armstrong et al., 2012, 2020; Steward et al., 2012) that enable temporary streams to substantially contribute to the biophysical integrity of river networks (Finn et al., 2011).

The passion and attachment of the local people I interviewed demonstrates the depth of appreciation for chalk streams and their winterbournes, making me hopeful for their stewardship for future generations. My next steps are to explore the extent to which the general public share experiences and values with owners and stakeholders of chalk winterbournes: does wider society benefit from the same CES? The recent Chalk Streams Restoration Strategy (Rangeley-Wilson, 2021) highlights the need to better protect chalk stream headwaters, and we hope that its implementation can tap into the energy and passion of local communities as a way of improving the health of chalk streams for wildlife and people.

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Figure 3: The Candover Brook at Preston Candover, Hampshire, looking downstream at the flowing winterbourne, which spreads diffusely across a field in which the channel was destroyed under the plough. © J.T.K. Roseboom (2021).

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