

Angling in the Rural Environment, 2007-2009

Ecological & Geomorphological Data

USER GUIDE

Angling in the Rural Environment: Social, Economic, Ecological and Geomorphological Interactions

(funded by the RELU Programme)

PROJECT OUTLINE

The project will analyse the complex network of natural and socioeconomic relationships around angling in the river environment, including institutions of governance and land use practices at a range of interconnected scales. The results will contribute to policy debates on the integrated development of the rural river environment. The project will be organised through a series of inter-linked work packages, which are linked both conceptually and practically to others through shared research teams to ensure interdisciplinarity.

Our objectives for the project are:

1. To assess the geomorphological, ecological and socioeconomic influences that angling has on the Esk, Swale and Ure river catchments;
2. To assess how the natural environment, the institutional context of management and cultural practices influence angling in these three river environments;
3. To identify the goods provided by the rivers to anglers and other users in the study catchments including links through urban users;
4. To critique current decision making practices in order to inform and strengthen the sustainable integrated management of rivers and their rural catchments;
5. To build interdisciplinary capacity through practice and reflection; and
6. To facilitate information and knowledge interchange between different disciplines and academics and stakeholders in the wider community, by developing collaborative processes and tools capable of generic application to policy development and implementation.

Background

Rivers and their catchments are the focus of legislative change, public use and land-use pressure: change that will increase given the EU Water Framework Directive (WFD), national and local Biodiversity Action Plans (BAPs) and the rural agenda of the Haskins report. The sustainability, integrity and ecological value of river catchments are also currently major issues for science. To manage freshwaters and their ecologies successfully, we need to address processes which work across the boundaries between the natural environment, economy and society through an increasingly 'joined-up' approach.

This research will focus upon these cross-cutting processes in an interdisciplinary, holistic assessment of river environments through the case of angling. Angling both benefits from and influences river quality, design and management. Angling also links urban and rural environments and is an economic driver for the rural economy (EA 2004b), involving about 4 million people in England and Wales (EA 2004a) and contributing £6 billion to the economy through freshwater angling alone (Radford *et al.* 2001). As key stakeholders, anglers can have both positive and negative effects on river environments. They often seek to enhance catchment integrity for the benefit of recreational fisheries, which can also benefit other wildlife and users. Habitat improvement schemes, often carried out or stimulated by angling interests, can enhance biodiversity. However, angling-related activities can damage habitats and landscape processes and may cause serious conflicts with habitat and wildlife value. Angling is also being promoted as part of a sustainable rural economy and for its social benefits (EA 2004b). This again requires a more integrated and a more consumption-based approach than previously and stronger links between urban and rural areas through the development of countryside leisure pursuits (Haskins 2003).

Recreation in the countryside has increased in socioeconomic, environmental and political importance and rivers are critical sites in this process. So, studying the links between angling and river environments provides insight into how environmental and socioeconomic drivers for rural change work. This project therefore aims to identify and analyse the complex network of influences and feedbacks around angling in the rural environment. These include natural and socioeconomic influences, necessitating thoroughly interdisciplinary research which will, as we show below, involve researchers from both natural and social science disciplines (aquatic ecology, geomorphology, anthropology, sociology, human geography), as well as stakeholders from government, NGOs and the local community, and it will conduct reflexive ethnographic research into interdisciplinary working and dialogue with stakeholders. This project will focus upon three rivers in northern England - the Esk, Ure and Swale – in the course of a holistic and fine-grained study. These are ideal sites, because while rural, they have experienced environmental degradation that has affected wildlife diversity including fishes, they support diverse fish species for recreational angling and they are used by various anglers from different socioeconomic groups.

Key areas of research

The project will involve five main areas of primary research, spanning the natural and social sciences within its interdisciplinary approach.

Environmental visions and angling

This part of the project investigates different views about river and still water environments and how these influence policy and practice, with particular reference to freshwater angling. Managing and using waters for angling is motivated by ideas of what rivers should be, particularly what fish they should contain, how the rivers and lakes should be maintained, stocked and accessed, who should own them and what they should look like. We will talk to anglers about their experiences of angling on rivers and stillwaters using indepth interviews and

focus groups, but also use participant observation to more fully engage with the way they fish in practice and in different times and places.

Angling and ecology

This part of the project investigates relationships between angling, the freshwater environment and its ecology, particularly in terms of biological diversity, a NERC priority. Angling interests have many influences, often positive, on ecological quality of river corridors and may encourage landowners to retain healthy river corridor environments. However, diversifying the rural economy to boost angling revenue may intensify resource use and damage the ecological value. Hence, this part of the project will, first, establish the influence of angling relative to other factors on the patterns of distribution and abundance of key species (based on their priority in biodiversity policies) along rural river corridors, including indirect effects such as habitat management and direct effects such as disturbance. Second, it will investigate whether (and how) angling and related land and habitat management can enhance habitat and wildlife conservation through their effects on these species. Third, it will contribute to determining mechanisms, risks of occurrence and effects of species introductions through angling and other factors such as floods, along river corridors. Fourth, it will explore how the ecological benefits and costs of angling can be translated into policy through inclusive decision making at local, national and international levels.

Angling and river processes

This part of the project investigates the relationships between angling and the physical river environment and catchments, especially through spatial variations in catchment silt pollution and vegetation changes caused by land use change and the actions of anglers along river corridors. Measuring and understanding differences in riparian and in-stream habitat in relation to angling and other factors is fundamental to fisheries, wildlife value and environmental visions, and is directly linked to sediment transfer. There are four main activities within this part of the project. Firstly, the variation of supply, transport and deposition of fine sediment within the three rural catchments will be determined. Secondly, the extent to which angling activity modifies the fine sediment flux within rural catchments will be explored. Thirdly, how anglers interact with bank and in-stream vegetation will be investigated. Finally the relationship between spatial variations in fine sediment transfer and biodiversity will be investigated.

Integrated rural development and angling as a leisure pursuit

This part of the project explores how anglers construct this leisure pursuit in the context of their household and social lives and how angling contributes to integrated rural development. Angler spending on permits contributes to landowners' incomes, while other spending by anglers (and their companions) may go to local businesses, or may take place outside the catchment altogether. The dynamics of angling as a leisure pursuit may conflict with other leisure uses of land, with land and river management, with habitat and with biodiversity. This part of the project will use angling as a nexus for identifying the opportunities for integrated rural development at a catchment scale and the obstacles to sustainability. It will identify the significance of the (gendered) social and economic constraints on different types of angling activity. We will apply the conceptual framework of Sen's human flourishing to understand consumption holistically by

seeing economic behaviour as embedded in an institutional context and questioning the sharp divide between consumption and production.

Angling and governance

This part of the project will examine structures of governance and practices in detail to determine the institutional factors that enable and constrain the activities of anglers and other major stakeholders within the river catchments. The analysis will be based upon a conceptual framework of environmental entitlements. 'Entitlements' describes the legitimate and effective command that stakeholders have over the natural resources of the catchment and depends upon the stakeholders' abilities to access and use resources and the institutional framework. 'Institutions' means not only the organisations which may affect governance of the river but also the 'rules of the game'. Legal institutions offer a formal framework for the management of the goods and services provided by the river and its catchment, but morals and customs will also play significant roles in everyday practices. The environmental entitlements approach thus allows the detailed investigation of how institutions work at different scales and the relationships between those scales.

Getting new science into practice

As well as the five areas of primary research, a sixth part of the project will integrate data, analysis and evaluation from the others to explore best practice in the delivery and implementation of the science and social science of angling in rural environments, given the wide range of influences upon angling and stakeholders involved. We will explore mechanisms for delivering sustainable angling policy, including conventional approaches led by regulatory bodies such as the EA and emerging approaches based upon stakeholder groups or NGOs, from the perspective of both environmental and socio-economic issues and with reference to achieving compromise. Using material generated from the five key research areas outlined above, it will map the spatial, temporal and substantive frameworks of the individuals, stakeholders and institutions that are involved in or affected by angling, both directly and indirectly, in the study areas.

References

- Environment Agency, 2004a. *Conservation, Access and Recreation Report 2003/04*. Environment Agency, Bristol.
- Environment Agency, 2004b. *Our Nation's Fisheries*. Environment Agency, Bristol.
- Haskins, C., 2003. *Rural Delivery Review: A Report on the Delivery of Government Policies in Rural England*. DEFRA, London.
- Radford, A.F., Riddington, G. & Tingley, D., 2001. *Economic Evaluation of Inland Fisheries*. R&D Project Report W-039/PR/1 (Module A) Environment Agency, Bristol.

River Esk sediment mass flux data documentation

The information below has been taken from the deposit form for the file `mass_flux_data.txt`

This data set contains measurements of the weight of sediment trapped (g) using Time Integrated Mass Flux Samplers (TIMS) at 22 sites in the River Esk, North Yorkshire, UK. Samplers consisted of 1 m length plastic polypipe tubes of 10 cm diameter fitted with a streamlined intake at the front end of the sampler and a streamlined exhaust downstream. The samplers were secured to the river bed by attaching the tubes with plastic grip ties to two metal supporting struts driven into the substrate. The upstream sampling intake was positioned at approximately 0.1 m above the stream bed. Water entering the intake nozzle was rapidly slowed in the main chamber where sediment settles out. Samplers were left in the river for a fixed period during which time they accumulated suspended sediment moving with the flow. Samplers were periodically emptied into 5 l containers which, on returning to the laboratory, were emptied into glass settling tanks to allow the sediment to settle out at room temperature. Excess water was then drawn off and the volume of liquid measured and filtered through Whatman glass fibre (GFA 1.6 μm) filter paper to determine the suspended sediment concentration (if any) of the water. The sediment in the settling tank was then washed into a suitably sized glass beaker using distilled water and oven dried at 105 °C. The dry sediment was weighed. The total sediment mass of the sample was then calculated by adding the dry weight of the sediment to the sediment mass calculated from the concentration recorded in the excess water.

The file contains coordinates for the location of each sampling site and dates at which TIMS were emptied and measured.