Resolving the conflicts of the impacts of recreation on a waterway

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INTRODUCTION

1. "All we want to do is restore the canal!"

2. A laudable aim for any waterway restoration group, but an aim that cannot be pursued to the exclusion of all else. Many derelict canals may not have seen boat traffic for decades; perhaps not even within living memory. Once restored, the craft that use the waterway do so for recreation rather than the trade for which they were first designed and built. This recreational use of the waterway, and of the countryside through which it passes, brings with it a whole range of impacts; some of which may be not be desirable. It will be the restoration group's responsibility to tackle adverse impacts as they arise during the restoration process and thereafter.

3. Most abandoned waterways will readily return to nature, and become havens for wildlife. Restoration to navigation could possibly threaten the extinction of rare and declining species. The often repeated defence that "It was a waterway before it was a wildlife site" is probably factually incorrect; most canals were probably constructed through countryside that would now be considered a wildlife haven!

4. Modern restoration schemes take place within an entirely different environment and political climate from those prevalent at the time of their construction. That the waterway is not navigable and requires restoration will often mean that the restoration represents a legal change of use, which itself may require planning permission. But, whether or not a restoration scheme requires public scrutiny through the planning process, it is the responsibility of the restoration group to ensure that the scheme is truly sustainable. Sustainable development does not simply mean that the restored waterway can generate income to support its maintenance, but that the restoration is shown to be in the widest, long-term public interest.

5. If the restoration is successful, competing uses may well result in new conflicts and congestion. Congestion is not limited to physical overcrowding like having to queue to enter a lock, but is simply any form of competition for the same, limited space.

6. This chapter looks at the range of conflicts that arise from the moment proposals are put forward to restore the waterway. It cannot cover every eventuality, since individual circumstances will make every case unique. Instead its purpose is to try to help restoration groups recognise the potential conflicts and mitigate against them at the design stage before they become an issue.

Understanding the origin of conflicts between different user interests

7. Most adverse impacts of recreation result from conflicts caused by congestion. It is much easier to avoid a conflict developing than it is to put it right. So if a restoration scheme is to regulate and control competition, avoid congestion and thereby reduce conflict situations, the first stage in the process must be the acceptance that conflicts between different user interests will occur. To deal efficiently with them, conflicts must be identified and recognised before they develop, not allowed to fester until they cannot be ignored.

RECOGNISING SOURCES OF CONFLICT

8. Many sources of conflict occur as an impact of recreational use of the waterway and an exhaustive list would be impractical. The following paragraphs are not intended as a checklist. Instead the aim here is to give pertinent examples, across a whole range of issues and circumstances. Individual examples should be used as a pointer to help restoration groups begin to identify and recognise the full range and extent of conflicts which relate to their particular scheme.

On the waterway

9. Impact on protected species

   Some native species of birds, mammals and plants can be negatively impacted by external factors resulting from restorations projects. Changes to their environment impact their survival by altering their food supply and habitat and decreasing their population. UK legislation such as The Wildlife and Countryside Act 1981 gives protections to vulnerable species including Kingfishers (Alcedo atthis), Water Voles (Arvicola amphibious) and Bluebells (Hyacinthoides non-scripta) in order to prevent their populations from decreasing further. It is in our interests to protect these native species from habitat degradation and competition from non-native species to maintain biodiversity within ecosystems. Therefore, restoration projects need to take these vulnerable populations into consideration. It is imperative to identify the presence of such a species prior to work beginning in order to adapt project plans around the environment. Any person will be guilty of an offence if they intentionally cause harm to a protected plant, bird or animal and/or their habitat which could result in a 6 month prison sentence and/or a £5,000 fine per incident. Different species are covered by different legislation, a full list of which can be found at http://jncc.defra.gov.uk/page-3408.

   The presence of a protected species on a site can cause works to be halted or delayed. A full ecological and environmental appraisal (or audit) is becoming an essential element in managing a major restoration scheme, and a proactive environmental management plan is necessary if potential delays are to be minimised.

11. Introduction of invasive species

    Invasive Alien Species (IAS) are species which are non-native to an area and have been trans located through human activity. If the species are able to survive and reproduce within the habitat then they may persist and alter existing ecosystems, often causing loss of native species through competition. IAS can have serious economic and social impacts in addition to those on UK biodiversity. EU Directives and UK Government legislation are therefore created and implemented as part of a framework to tackle the problems arising from the presence of such IAS. The Wildlife and Countryside Act 1981 covers UK IAS and encompasses species such as Japanese Knotweed (Polygonum cuspidatum), Floating Pennywort (Hydrocotyle ranunculoides) and American Mink (Mustela vison). It must be considered during the restoration of a waterway that IAS can potentially take advantage of the new conditions and habitat features created. While native species may benefit from waterway restoration managers should be vigilant against potential IAS.

12. Impact from boats

    It is well known that the wash from powered boats causes physical damage, both to unprotected banks and to vegetation growing in the waterway. There is considerable scientific evidence that the extent of damage increases with increase in boat speed. Sheet piling is expensive and often obtrusive on a rural waterway, so physical speed limits are clearly a more environmentally friendly solution to potential bank erosion.

13. This does not mean that a slow boat will cause no damage, however, since bank erosion is not the only detrimental effect from a powered boat. As well as physical damage to water plants, the churning of the propeller dislodges silt from the bed of the waterway and returns it to suspension in the water. The resulting turbidity destroys the crystal clear appearance of water, making it cloudy, dirty looking and uninviting, and kills water plants by stopping light reaching them. So reducing speed can also improve the health of water plants.

14. High levels of nutrients in the water
    Nowadays, excessive weed growth is more common than crystal clear waters. In most cases, the problem is caused by algae. Algae grow rapidly in response to high levels of nutrients which enter the waterway both as agricultural runoff and the by- products of sewage treatment. The only true way of reducing the growth is by preventing the nutrients entering the system in the first place. Naturally, the nutrients will become locked up in the silts that fall to the bottom of the waterway. Waterway restoration that dredges, or otherwise removes, most of the silt will remove these nutrients at the same time. But silt deposition starts again as soon as the dredging is finished. The action of propellers in a shallow channel unfortunately stirs up any silt and returns the nutrient back into the water, where it can promote algal growth once again.

15. Competition between angling and water quality
    Algae are the natural food of Daphnia, the water flea. Fish in turn consume daphnia. Research by the Broads Authority has shown that artificially increasing the population of Daphnia will reduce the growth of weed, but only where the fish population is kept low. So to have a balanced wealth of aquatic wildlife, perhaps the best course of action is to avoid reintroducing fish. In two or three seasons, the balance between nutrient input, algal growth and Daphnia will become established and the water will clear. However, as soon as open water appears after restoration, fishing and anglers seem to follow. The temptation to encourage the sport and get an early financial return on expenditure means that the natural balance is unlikely to be re-established. Sport fishing brings with it both authorised and illegal introductions of large specimen fish and these produce an unnatural population structure. Large fish mostly eat smaller fish, or are bottom feeders sifting through the mud and further increasing turbidity. Birds and animals that feed on fish mostly rely on abundant, small fish rather than a small number of large specimens. Relatively few aquatic animals, an impoverished aquatic plant community, and poor bank side vegetation are the consequence.

On the towpath

16. Recreational uses of Towpath
    Walking, cycling and horse riding, along with their associated forms of informal recreation, are clearly attracted to the towpath because it is relatively flat and provides access to an aesthetically pleasing range of landscapes. But few towpaths are wide enough to offer segregated routes so, even here, the different forms of informal recreation can be in competition with one another. For example, towpaths are likely to be popular with local dog walkers. Less fastidious owners may not clean up after their pets making the canal environs less desirable for other users.

17. Large volumes of foot traffic will cause damage to footpath surfaces, damage that will then be accelerated by the weather. Damage is not evenly spread, either along or across a footpath, and is greatest where routes turn, separate or combine, pass through boundaries or change level. Where the majority of foot traffic is downhill, paths tend to be narrower and develop a characteristic single, deep rut. Conversely, where the majority of traffic is uphill, paths tend to become much wider and, since the volume of traffic is more dispersed, are less vulnerable to damage. Where routes are flat, people tend to try to walk "a-breast" rather than in single file, so routes tend to naturally widen to accommodate them. Damage to path edges or trespass onto adjacent land can become a serious problem where level paths are severely restricted in width. By understanding these factors, the standards of footpath surfacing can be varied, with high cost, high quality surfacing used only where the risk of erosion is the greatest. Similarly, pressure on a vulnerable section of footpath can be reduced, for example, by carefully considering the direction in which a circular route is interpreted or promoted.

18. Similarly, the tread of a cycle tyre and the solid shoe of a horse will physically rut and erode the surface of the towpath. But while cycle and horse may well cope with the mud and uneven surface resulting from mixed use, the walker is going to lose out and complaints and maintenance costs rise.

19. The more important considerations on towpaths are safety and public liability. Cycles and horses can be surprisingly quiet at times, and it is when a cycle or horse approaches a pedestrian from behind that the greatest danger is created. The risk of a fright, to a startled pedestrian or animal in close proximity to the water's edge, and in the confined width of the towpath, increases the likelihood of conflict or even a serious accident. Yet modern concepts of sustainable transport routes, and "Access for All", will naturally target the flat length of towpath as ideal for the purpose. Before such good intentioned initiatives are fully embraced, it is important to establish, not simply that the towpath is physically capable of accommodating the required width and surface treatment, but also who is liable in event of an accident.

Impacts on towpath verges

20. Most towpaths will have the added benefits of a verge. A verge between the towpath and the water's edge can greatly improve the perceived safety to the towpath user. Semi-natural vegetation, on either or both sides of the towpath, can also provide a very valuable linear habitat and benefit a host of wildlife. A soft, sloping verge will benefit animals that cross or fall into the waterway, ensuring that they are able to get out again. However, in all of these cases the value rapidly diminishes if the verge is not maintained. This does not mean that it should be manicured or tended like a lawn, but should be cut two, possibly three times a year. Not only does this keep the edges of the towpath and of the waterway visible, but also it ensures that shrubs and trees do not become established where they would damage or destroy the bank.

21. The presence of a wide verge will attract anglers. The amount of equipment used by the modern angler can take up a great deal of space and, if there is insufficient space or the bank slopes too much, excavation of the bank can often result. Where fishing is appropriate on the towpath, it may be necessary to resort to the construction of formal fishing platforms to rectify or limit the damage.

22. With fishing, there often follows the problems of access by motorised vehicles which, when compared to cycles and walkers, are likely to increase the physical damage to the towpath by at least an order of magnitude.

Impacts on the banks

23. Animal Impacts on the banks
    Animals tend to avoid crossing the waterway on bridges that are heavily used by humans. But this does not mean that animals will cross the waterway at any point or in an erratic or unpredictable way. Instead, there is a tendency to use regular routes at water level - routes that often result in a discernible animal track on either or both banks. If revetment or bank protection works are envisaged, animal ramps or similar access slopes should be included at existing crossing points.

The off-side bank

24. While anglers will sit and fish from the towpath, the source of their interest is likely to be found along the offside bank. Apart from the annoyance of fishing rods and lines threading across in front of moving boats, the main conflicts along this bank are likely to arise from the land uses on the adjacent properties. It is the offside bank that will usually be heavily reed-fringed, wooded, or merge imperceptibly into the surrounding countryside.

25. The offside bank is particularly important as the home of many terrestrial or semi-aquatic wild animals. Water voles, for example, used to be common along many rivers, canals and streams. Current rates of decline suggest that this species has been lost from 90% of its former sites. Habitat loss, including channel engineering and dredging works, is thought to make the vole more vulnerable to attack by predators such as wild mink. Consequently, the water vole has been recently given limited protection against intentional disturbance or intentional damage to its habitat.

26. It is the vegetation and the earth banks along the waterway edge that are essential to maintain healthy population levels of such animals. As a consequence, the natural profile and vegetation cover of the offside bank should be retained wherever possible. The simplest method of reducing conflict with wildlife interests is to stop engineering works about one metre from the off side bank. Any existing nest sites are retained intact, and the fringe of emergent vegetation is likely to rapidly recover to replenish the food plants removed through engineering operations.

27. Immediately adjacent to the canal, on the offside bank, there will often be productive agricultural land. Indeed, arable or pasture fields may lead right down to the water's edge. Run off from fertilisers will directly increase the nutrients in the waterway and lead to excessive weed or algal growth. Herbicides may damage bank-side vegetation but, if used correctly, should not cause serious concern. However, stock may use the waterway for drinking and this can result in extensive and highly visible damage caused by physical erosion or effluent. Physical damage can be reduced and localised by fencing which includes purpose- designed drinking points, while the damaging effects of effluent and agricultural run-off can both be reduced by increasing the depth of the reed fringe. Reeds will act like a cross between a filter and a sponge, soaking up much of the nutrient load, absorbing some into the plant material and releasing the rest only slowly into the waterway.

28. When dredging the waterway, the result should not be an engineered "U" shaped profile. In addition to stopping excavation a metre to the waterside of the bank, try to provide a gentle slope on the offside of the cut, or a wide earth bench that will be about 15cm below water level to encourage reeds and other emergent vegetation to thrive.

Bridges, tunnels and cuttings

29. The incidental structures, such as bridges, cuttings and tunnels, may well be protected for their historic or architectural importance but may also provide suitable habitats for many species of wildlife. The often dank and shaded micro-climate associated with these structures, coupled with the fact that difficult access will often keep such sites untouched for many years, means that they are highly likely to attract sensitive species. Due to the loss of similar habitats in the wider countryside, many of these species are likely to be classified as endangered or threatened, and may well be protected by law. Cool, damp and shaded sites are likely to hold ferns, mosses, liverworts and lichens which, while they may not be as spectacular as rare flowers or birds, are nonetheless a vital part of the countryside.

30. Abandoned tunnels, in particular, provide stable air conditions that may be ideal for roosting or breeding bats. However, similar concern should also be shown for cracks in bridge masonry, dry stonewalls, exposed rock faces within cuttings etc. Different species have quite different preferences, and the fact that some species of bat can be found in navigable tunnels does not mean that an existing bat colony will be unaffected by restoration. All species of bat are legally protected under British and European law, whether or not the particular structure is protected as a designated site. It is an offence to kill, capture or disturb such animals or to damage or destroy their breeding or resting sites. Therefore, there is a real concern that the conservation of a rare species of bat

may be in direct conflict with proposals to reopen a tunnel to boat traffic. It is not disturbance that is of concern here, but the physical changes to temperature and air flow within the tunnel. Although technically not an insurmountable problem, a solution may be expensive and protracted to negotiate since it is likely to involve the creation and safeguarding of a better alternative site for the particular species concerned. Indeed it may be cheaper or easier to make alternative provision for waterway traffic!

31. Tunnels and cuttings, where they expose the underlying bedrock, are also likely to be important as geological sites. Some geological sites are legally protected as Sites of Special Scientific Interest, but many more are recognised locally as Regionally Important Geological or geomorphological Sites (RIGS). Even the stones used in the built structures along the waterway provide a potential source of material for the interpretation and understanding of the origins of landscapes, and may well provide an added dimension in the promotion of a completed restoration scheme.

The boundaries

Access

32. Some of the most obvious 'physical' signs of conflict are often found along the boundaries of the waterway. Hedges, fences, and walls invariably marked the extent of the original ownership, so holes in the boundaries mark the evidence of both legal and illegal access. The pattern of incursion through the boundaries can be used to infer both the desires and the routes followed by both human and wildlife visitors. Blocking gaps is not necessarily the answer because it tends to simply move the problem somewhere else. Instead, the approach should be one of managing the access points - making some easier to use while making others harder to abuse.

33. The type of access provision can then be used to help regulate the types of visitor, although it must be said that the design of special access barriers only rarely achieve their intended purpose. Access provision for horses or deer will invariably give access to motor cycles. Stiles are for the able bodied, and may exclude those with mobility disabilities. Kissing gates may reduce access by mountain bikes or motorcycles but, without careful design, will stop wheelchair users as well. And if a wheelchair cannot pass, someone with a child in a pushchair will also experience difficulty. Clever designs, for example cycle chicanes wide enough for bicycles but too narrow for motorcycles, appear simply to challenge the inventive - there are known examples of motor cyclists getting around the problem by either cutting down the handlebars of their machines or fitting cycle handlebars instead.

Provision for wildlife

34. In the same way that provision needs to be made for animals to be able to climb out of the water, boundaries need to include access provision for animals as well as human visitors. Because few boundaries are either continuous or impenetrable, it is only the larger mammals that usually need special provision - badger gates and fox or dog stiles are obvious examples. However, animals will also use boundary features as corridors along which they will move, as boundaries or display points within their territories, and as the source of food. Food is not, of course, restricted only to obvious sources. In this case it extends to all plants (including those we might consider as weeds), fruits on trees or shrubs, invertebrates or small mammals, and dead or decaying wood, leaf litter etc. So in maintaining boundaries it is important to spread the impact of management by, for example, only cutting one side or part of the hedge in any one year. Similarly, excessive tidiness is to be avoided. Dead trees should be made safe but should not necessarily be removed from site or burned. And boundary walls, fences or hedges can be allowed to vary in height - even the occasional tall post can be introduced to provide a song or hunting perch.

Archaeological considerations

35. Because the boundary features were often erected as part of the construction of the waterway, they may also be features of landscape history and even archaeological importance. Scheduled monuments, listed buildings and conservation area regulations can all apply to boundary features, and the Hedgerow Regulations 1997 mean that unlawful removal of a countryside hedge may be a criminal offence. Legal responsibility for the boundary should be established or clarified before any boundary work is undertaken, or a case of criminal trespass may arise.

Protected Trees

36. Similarly, trees or woodland that may form or overhang the boundary may well be protected by Tree Preservation Orders. Felling trees requires appropriate licensing from the Forest Authority (part of the Forestry Commission). Lopping, pruning or even removing low branches may have to be carried out by the owner of the land on which they grow, and are certainly the responsibility of the owner if they are dead or dangerous. Beware of the public liability costs of dead, decaying or dangerous trees near public rights of way or any areas to which the public are invited to visit - if someone is hurt by a falling tree, the landowner is likely to be liable for costs and compensation.

The wider community

37. Development along the waterway will have an impact on a wide swathe of the surrounding land, including towns, villages, farms and individual properties. Trade in local shops, pubs, restaurants and overnight accommodation may increase, but the pattern of trade will change. While it is often implied in restoration documents that the recreational use of the waterway will generally be good for surrounding communities, the restoration may also produce a number of adverse impacts and hence potential conflicts. Local communities may well oppose facilities that appear to be in competition with existing local enterprises. Focussing on development or visitor facilities that generate income for the restoration scheme must not ignore their potential impact on the sustainability of local communities.

38. Restoration will often encourage tourism to the waterway and to the surrounding areas, supporting the local economies. Any plan for tourism though needs to consider not only how it supports the local economy but how there can be more off-peak visiting both to avoid congestion and damage to the resource through erosion and over use, and to spread the economic and other benefits.

39. Special attention should be given to access links to the wider countryside. While the public have rights of access along public rights of way, it is not necessarily appropriate for a waterway restoration scheme to actively promote the use of those routes through interpreted trails or promotional leaflets. Here the simple principle of neighbourly conduct is often the best approach. The routes may be along public rights of way but they will cross, or give access to, private land. If restoration scheme is to attract large number of visitors, it should be able to accommodate those visitors within the boundaries of the scheme. Solving visitor pressure problems by encouraging overspill onto neighbouring land is unlikely to win friends and may result in a claim for compensation. Those promoting a route should always consult widely with those owning land crossed by the trails and only include signage or other interpretation where neighbouring landowners are supportive.

40. Certain sites or facilities, by their very nature, will concentrate large numbers of people in one place. Such “honeypots” must be able to withstand the visitor pressure and construction details like surfacing and seating will need to be of the highest standard of robustness. Surfacing will also need to be sound at "pinch points"- any point at which visitors will be funnelled together. When siting new facilities, opportunity should be taken to identify sites that are naturally able to withstand the pressure. Indeed, honeypots and pinch points can be actively designed into schemes to control and manage the distribution of visitors more effectively.

CONCLUSIONS AND APPROACHES TO RESOLVING IMPACTS OF RECREATION

41. The most important aspect of conflict resolution is the recognition that a conflict actually exists or there is potential for conflict. The previous paragraphs should have raised awareness of the type and range of issues that increasingly generate problems. It should also serve to remind groups about the complex interrelationships that often exist between the different impacts resulting from recreational use. If key impacts can be identified and managed, then a range of potential future problems may be avoided.

42. As many problems can be predicted it is good practice to try to identify potential conflicts at the planning and design stage of any restoration project through an audit so that mitigation measures can be planned for and designed into the scheme. Conflicts, once recognised, can be prioritised and action taken to resolve them. To this end, all groups are encouraged to undertake a Recreational Impact Audit (RIA) to guide the course of future developments.

43. An RIA is a process of steps conducted to assess the potential impact of a series of activities on the built and natural environment as well on each other and broadly covers five key areas:

Impacts	**Implications**
Effects on people and between people	Will the scheme impact negatively and positively on the local community? Will there be potential conflict between different users of the scheme?
Effects on the landscape	How will the scheme impact on the natural and built environment?
Effects of pollutants on facilities	Will any recreation activities pollute the environment?
Effects of noise vibration etc on facilities/ communities	Will construction and operation of the waterway impact on local facilities in anyway? Will recreational use cause noise, vibration?
Creation of nuisance	Will any recreational activities result in nuisance (eg litter, anti-social behaviour)

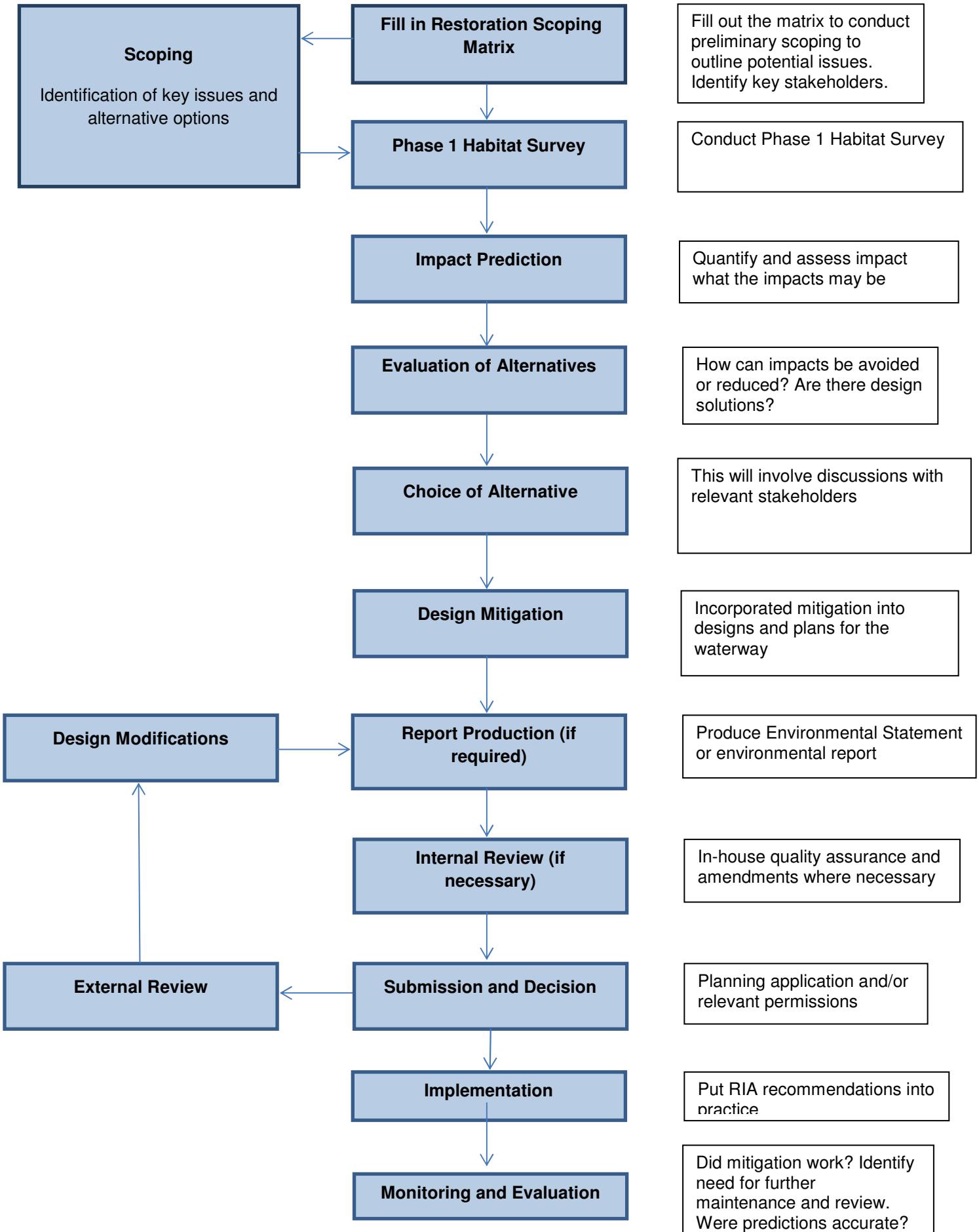
44. There is no set way for carrying out an audit. The steps for conducting a recreational impact assessment are set out in Fig 1. The scoping (appendix 1) should be carried out early in the project process alongside the scoping assessment of the natural and historic environment. A recreational impact assessment will go into different details and extend beyond different issues covered. It should be an iterative process throughout the design development- as design details may change the impact of this change needs to

be assessed. The audit should be completed with the support someone who has the relevant skills or experience, such as an environmental consultant but who also has a detailed understanding the users of waterways as well as the environment.

45. To assess environmental impact, all possible receptors and current features must be considered and acknowledged by the scope. This work than links directly to the an Environmental Impact Assessment and is likely to include conducting a 'Phase 1 Habitat Survey' which will establish what species and features are present on the site in its current form, in addition to what may potentially be there e.g. bats in historically recorded seasonal roosts. It is necessary to consider what habitat features will be lost during the restoration and what features will be added to the site as this will gauge whether the environmental impacts of the process are likely to be significant.

46. There are a wide range of handbooks, manuals and practical handbooks available to suggest solutions to particular problems – particularly on-line resources. However the best solutions will often come from those with direct local knowledge and experience. Therefore it is important that mitigation should include discussions with key stakeholders (persons or groups which either can affect or are affected by the activity) – local groups, landowners, site users, statutory and non-statutory environmental bodies, local residents and recreational users (particularly when managing the effects and pressures of recreation). Identifying and involving key stakeholders is key with any project to avoid conflict, improve the efficiency and further the effectiveness of the activity and is an important part of any audit.

Recreational Impact Assessment



Case Studies

A. Case studies

- Droitwich Barge Canal and Droitwich Junction Canal were first built in 1771 and 1854 respectively. They were abandoned and unused from 1939 until 2011 when they were reopened. This restoration was successful as ecological impacts were taken into consideration and mitigated. Reed beds were removed in the canal through dredging, disrupting the wildlife that had inhabited the area. Therefore, Coney Meadow Reed Bed Reserve was constructed within the catchment in 2007, 4 years prior to the reopening, to provide different habitats for the disturbed wildlife. Reed beds, scrub and meadows provide valuable habitats for a range of protected species including otters, grass snakes and many species of birds. Therefore, it is essential to identify environmental impacts prior to restoration as it prevents habitat degradation, maintains biodiversity and protects vulnerable species.
  https://canalrivertrust.org.uk/canals-and-rivers/droitwich-canals

- Regent's Canal, Islington, has incorporated the needs of the users into their management plans. The towpath was widened and signs explaining good canal etiquette were put in place to allow cyclists and pedestrians to enjoy the canal in unison. This however would leave little greenery. To combat this, a community garden has been installed with planters that are designed as seats and planters that bicycles can be parked and locked to. This shows that both user groups have been considered in management and are welcomed at the site. Therefore, conflicts will be prevented and all visitors can enjoy the canal.
  https://canalrivertrust.org.uk/volunteer/adopt-a-stretch-of-canal-or-river-near-you/creating-a-community-garden-in-islington

FURTHER READING

National Policy and the planning process
Chapters 13 and 14 of the IWA Technical Restoration Handbook

Environmental appraisal
Bedfordshire County Council/RSPB, A Step by Step Guide to Environmental Appraisal, Bedfordshire County Council, Bedford, 1996

English Nature, Strategic environmental assessment and nature conservation, English Nature, 1996

Wildlife
Legislation and Protected Species – refer to chapter 15 of the IWA Technical Restoration Handbook

Wildlife and Countryside Act 1981

Protection of Badgers Act 1992
http://legislation.data.gov.uk/ukpga/1992/51/data.htm?wrap=true

Appendix 1 Recreational Impact Assessment: Scoping Matrix

Potential factors that could be affected by the restoration ***How would these factors be affected by the restoration project?***		**Potential impacts that could occur during:**	
		Construction	**Operation and further maintenance**
WATER	• Surface water hydrology and quality • Channel morphology • Groundwater hydrology and quality		
LAND	• Landscape • Soil • Geology • Boundaries • Surfaces		
AIR	• Local air quality • Regional/global air quality		
ECOLOGY	• Aquatic ecology • Terrestrial ecology *Consider invasive and protected species*		
HUMAN ENVIRONMENT	• Architectural and archaeological heritage • Different user groups *e.g. cyclists, walkers, boaters* • Health and safety		
OTHER	• Site specific issues *What issues are present that are not covered in the other sections?*		