

**Reflective Fieldwork Management Plan for Chosen Recreational
Area**

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Llys-y-Frân Reservoir

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Executive Summary

This management plan aims to address the current issues at Llys-y-Frân Lake, a man-made reservoir in the Preseli Mountains. Some key issues that have been identified are conflicts between water sport users (kayakers and paddle boarders) and fishermen, damage caused by mountain biking, and from off-trail walkers causing damage to vegetation. Inevitably there is a collision of interests inherent with these areas (McCullough, et al, 2018). This management plan uses different frameworks and theories to suggest solutions that balance environmental conservation with high-quality outdoor recreation. By applying these solutions, Llys-y-Frân can continue to offer a diverse range of recreational activities while preserving the natural environment in accordance with the management matrices implemented from Manning, Anderson and Pettengill's (2017).

Introduction:

Background:

Llys-y-Frân is a man-made reservoir first opened in 1972, which was built to supply water to south Pembrokeshire, and it is said the dam is a feat of engineering. It has also preserved this landscape as a haven for nature and wildlife (Llys-y-Frân, 2024a). making it a critical resource for both recreation and utility.

Recently it has received a four million pound major investment, allowing it to reopen in 2021 with a refurbishment to the visitors centre and many new amenities (Llys-y-Frân, 2024b). The entire site covers 350 acres and serves as a hub for water sports, fishing, mountain biking, walking, and many other outdoor activities, it has been described as “A hub for health, wellbeing and recreation brought to you by Welsh Water” by Visit Wales (2024).

Llys-y-Frân has two main purposes: they provide outdoor recreation spaces for people to enjoy. As well as this these sites aim to protect natural resources and environments to allow nature to thrive. However, opening such areas to the public can lead to conflicts resulting in a lack of enjoyable and nature focused areas.

Brief Summary of Site Specific Problems:

Even though outdoor settings like Llys-y-Frân reservoir are great places for everyone to enjoy, Manning and Anderson (2012) warn that "too much recreation or inappropriate recreation activities can threaten the integrity and degrade the quality of the experience." Therefore, it is expected that places like Llys-y-Frân reservoir will face some issues.

During a visit to the site, two key issues were identified; The first issue identified is that there are conflicts between visitors. According to the Visitor Experience Manager, the biggest issue is conflicts on land between walkers and mountain bikers, and on the water between fisherman and water sports users. These conflicts of different opinions often end in arguments or disagreements about the use of the landscape around them.

The other main issue identified was soil erosion, compaction and damage to vegetation. This was caused by visitors on both walking and mountain biking trails. This physical damage to the natural environment creates a less scenic location and therefor a less inviting space for people to come and enjoy. This is highlighted through Manning and Anderson (2012) who state that “visitor activities like trampling, noise, and pollution can harm a park's natural and cultural resources.”

Management Plan Overview:

This plan ensures sustainable recreation through managing and maintaining a balance of visitor enjoyment and environmental preservation. Given the increasing popularity of outdoor recreation, it is important to address the site specific problems highlighted between environmental impacts and visitor conflicts, in order to maintain the area's integrity and appeal. Aly and Dimitrijevic, (2022) recognise that more efforts are being directed towards more engaging green spaces but are also aware there is a disjoin with regards to their upkeep and

management. Therefore to ensure a high level of engagement and excitement from visitors, Llys-y-Frân need to maintain high levels of maintenance and upkeep to make the area as inviting as possible.

Conflicts between visitors – Impacts on Overall Experience

It's not uncommon for there to be disagreements between different groups enjoying the outdoors, which may be frequent across the nation (Hubbard, 2019). It has been mentioned that conflicts between dog walkers and mountain bikers (MTB riders) are common at Llys-y-Frân. These conflicts affect how visitors feel about the place and their sense of care and responsibility for protecting the environment. For example, when dog walkers let their dogs off the lead (which is not allowed), the dogs may run in front of the MTB riders, causing stress for the dog owners and MTB riders. Another issue with MTB riders is that they might be going too fast on walking trails, as a result could potentially result in hitting walkers.

It has also been reported that there is conflict between fisherman and water sports users – such as kayakers, canoeists and paddle boarders. This results in a negative experience for both parties. An example of this is when a fisherman feels as though a water sports user has scared away the fish if they have paddled too close to his line. However, it could be interpreted that the fisherman's line is blocking the paddlers path or limiting them to certain areas of the lake without consideration. In both of these situations, it could lead to an unfriendly atmosphere between the two groups, as each one would feel as though they have been unfairly treated. Conflicts between different groups of outdoor recreation participants are well documented (Manning, 2011; Manning & Anderson, 2012).

Soil Erosion, compaction and damage to vegetation

Mountain Bikes

Soil erosion and compaction are often caused by mountain biking (MTB). When there are many trails, these impacts are spread out, but problems occur when one trail is used too much and can effect the quality of trails. This can be due to large ruts occurring on the paths and trails from bike wheels and which are further damaged by wet weather. To make this worse compacted soil doesn't let air and water through easily therefore it leads to muddiness, runoff, and further erosion. Once soil erosion starts, it's hard to fix, even if people stop using the trail (Manning & Anderson, 2012). It has also been noticed that MTB riders have been going off the designated trails, resulting in damage to the surrounding flora and vegetation (Welsh Water, 2024a). This would imply that there is a need for maintenance to be carried out on these trails to maintain clear trails to prevent off trail riding and deterioration.

MTB can harm the environment through soil erosion, soil compaction, changes in vegetation, and altering the landscape. This happens because mountain bikes have wide tires with aggressive tread for better grip (Goefit and Alder, 2009; Martin and Butler, 2021). Therefore, it's essential to plan dedicated bike trails and paths to prevent erosion caused by mountain bikers. However, building these paths can also harm the environment (Martin and Butler, 2021). A study by Symmonds et al. (2000) showed that mountain bikers often think other groups cause more environmental damage than they do and are unaware of their own impact. This can be seen through the quote “booted feet and hooves cause more damage to soil erosion when walking or riding off track than bike tyres.” (MBR, 2015). However, Pickering et al. (2010) noted that there is more research on the environmental impacts of hiking than mountain biking, making it hard to compare their impacts accurately.

Off-trail Hiking

Off-trail hiking is when people leave established paths to make their own way through an area. This type of walking can harm the environment by damaging the vegetation along the trails (Barros et al., 2020). It can lead to soil erosion, soil compaction, changes in soil nutrients, water flow alterations, and exposure of roots, rocks, and bedrock (Pickering et al., 2010).

As more people hike off-trail, these problems increase. The outdoor recreation and tourism sector is growing, adding more strain on ecosystems and wildlife (Fresque and Plummer, 2009; Office for National Statistics, 2021; Coppes et al., 2017). This makes it even more important to protect these natural areas. For example, off-trail hiking can damage the vegetation which can cause permanent damage resulting in a lack of biodiversity within Llys-y-Frân Lake.

Frameworks and Theories

Indicators and Standards of Quality:

Indicators are specific, measurable variables that show the condition of a resource or management area. When used with established standards for minimally accepted conditions (MAC) (Lime et al., 2004) for both the environment and visitor experiences they help managers measure changes and take appropriate actions. Resource indicators assess environmental impacts, while social indicators measure visitor experiences. These indicators are crucial for understanding environmental impacts and determining when change is needed. They also help define the limits of acceptable change.

Limits of Acceptable Change

The 'Limits of Acceptable Change' framework (Manning & Anderson, 2012) shows how increased visitor use leads to greater impacts on outdoor recreation areas. This framework helps identify when environmental and resource impacts become too severe. However, it has a limitation: it is subjective because the acceptable limits are set by the users, and setting the right limits can be tricky. Therefore, it's important for those setting these limits to be well-informed about the environment, its resources, and visitor opinions. As human activity increases, management strategies are needed to keep conditions within acceptable or tolerable limits (Pigram & Jenkins, 2006; Goodwin, 2019).

Carrying Capacity

Carrying capacity is a concept used in tourism and recreation studies since the 1960s to address the limits of tourism growth due to its impact. It is a crucial tool in site management for reducing the negative effects of visitors on the natural environments (Lime et al., 2004). Originally used in agriculture to find the optimal number of grazing animals for an area, the idea has been applied to a range of other fields. For example, in tourism, carrying capacity helps determine the maximum number of visitors a site can handle without harming the environment or visitor experience (Saarinen, 2006).

For Llys-y-Frân, considering carrying capacity is crucial to ensure visitors can enjoy the facility comfortably and without causing harm. Getz (1983) divides carrying capacity into six categories:

Physical: The maximum number of visitors the space can physically hold.

Economic: The impact of visitor numbers on the local economy.

Perceptual: The number of visitors that allows for a quality experience without feeling overcrowded.

Social: The effects of visitor numbers on social interactions and community.

Ecological: The impact on the environment and natural resources.

Political: The influence of visitor numbers on policy and management decisions.

By understanding and managing these categories, Llys-y-Frân can maintain a balance between visitor satisfaction and environmental preservation for many generations to come.

Recreation Opportunity Spectrum

The Recreation Opportunity Spectrum (ROS) provides a framework to help us understand the varied conditions found at recreational sites along a spectrum. Using this method allows the managers to evaluate different scenarios and their effects on outdoor recreation, integrating these settings into planning from the early stages. This system is particularly useful for large managed outdoor spaces that may lack detailed data about recreation use and characteristics, but are dedicated to maintaining environmental conditions. The ROS approach helps quantify and forecast outdoor recreation settings and opportunities (Harshaw and Sheppard, 2013).

This method highlights that even within the same user group, such as MTB riders, preferences can vary significantly. This means that a one size fits all approach is not effective. By using the ROS framework, managers can cater to different preferences and needs, ensuring a diverse and satisfying experience (Harshaw and Sheppard, 2013) for all visitors while maintaining environmental integrity.

Summary of Frameworks:

In summary, we can measure indicators and standards of quality by setting limits of acceptable change. These factors help inform management strategies, such as understanding the carrying capacity of different areas within a specific area on the site or the entire site. This information can then be used in the ROS, which interprets complex information about resource conditions, visitor experiences, and management practices. Essentially, the ROS reflects the results of various management strategies.

Strategies and practices to protect the area

Providing high-quality recreational opportunities while protecting the natural environment is very challenging. To address this, it is important to find valuable and creative solutions to the problems identified at Llys-y-Frân reservoir. This section will suggest strategies to resolve these issues, making recreation at Llys-y-Frân reservoir more sustainable and enjoyable for everyone.

Conflicts between visitors – Impact on Overall Experience

When managing interactions between lake-based watersports users and bank-side fishermen, several solutions can be put into place. One solution is to create clear boundaries between the two activities using buoy strings or similar markers to separate them. Additionally, specific areas of the lake can be designated for each activity to prevent interaction and potential conflict, though some enforcement would be needed to ensure compliance (Manning, Anderson, and Pettengill, 2017).

Another option is to introduce rules and regulations with penalties if the rules were broken. This could involve a membership agreement where members agree to follow the rules or face consequences such as suspension or exclusion from the site. This system would provide clear guidelines and help resolve conflicts by making everyone aware of their responsibilities (Levine, Taylor, and Best, 2011). Rules and regulations can effectively prevent conflicts by setting clear expectations for all users and ultimately giving clear boundaries for anyone using the site. These penalties for failure to follow the rules and regulations would be enforceable from any staff member of Llys-y-Frân's site.

Mountain Bike Erosion

Soil erosion and vegetation damage from mountain biking, both on and off trails, can be managed in several ways. One approach is to educate users about current conditions and areas of concern, advising them on how to navigate these areas without causing further damage (Manning, Anderson, and Pettengill, 2017). Using infographics and signs to show what areas are safe to ride and the consequences of damaging the environment can also help. This messaging aims to deter harmful behaviour towards the environment.

A study by Symmonds et al. (2000) found that many mountain bikers were unaware of their impact. Additionally, research by MBR (2015) indicated that water poses the greatest risk to trail erosion, especially on wet, steep trails where riders skid. An alternative solution is to design trail protection to fragile areas along the trails. This could involve installing wooden boards or using gravel to reinforce vulnerable spots of the trails.

The management plan must acknowledge that despite these measures, the sport's nature will still cause wear on the trails. Poor and wet weather can accelerate this erosion. Therefore, the plan should include regular maintenance to keep the trails in good condition, and trying to prevent riders from creating new paths by informing them of the damage they might cause.

Off-Path Walking

To address off-path walking, similar control measures as those for mountain biking can be implemented. Signposting paths and trails can educate walkers on the environmental impacts of going off-path. However, the effectiveness of these markers depends on their placement, clarity, and the length of the messaging. Information signs, such as 'you are here' maps and colour coded trail markers could also be implemented throughout the trails to provide an understanding of each specific area and direction to walk in. When these factors are done well, the chances of success are much higher.

Setting a carrying capacity can help reduce the severity of damage to the natural environment (Manning, Anderson, and Pettengill, 2017). This involves establishing sufficient indicators and standards of quality and limits of acceptable change. At Llys-y-Frân, a date/time booking system could be implemented to manage visitor flow effectively, especially for those wanting to MTB as it will mean the chance of damage will be reduced and overall more controllable.

Conclusion

This report has discussed several frameworks and theories, explaining how they have been considered and implemented to prevent the Llys-y-Frân landscape from deteriorating. The focus then shifted to the impacts of the various outdoor recreational activities in the environment. Reviewing these ideas showed potential solutions to the identified issues. However, it also highlighted that, despite implementing these measures, some harm to the natural area surrounding the lake is inevitable. Therefore, efforts must be made to minimise this impact as much as possible.

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