

Open Wilding Scientific Framework

The Open Wilding Project

—

Crystal Rosen, Tessa Lynn PhD, Fritha West MSc

Open Wilding Framework Overview

The Open Wilding Framework defines a new, innovative approach to conservation and (re)wilding supported by a foundation of science and encouragement of anthropic integration.

The Open Wilding Project provides opportunity for students in the environmental and health sciences to gain valuable field experience in a conservation project, providing space for research, study and collaboration

Functional restoration & biological outcomes

- Restoration and outcome goals are flexible and subject to continuous change as trajectories, rather than aiming for specific equilibrium in accordance with UK policy.
- Wilding does not consider trophic cascading in either direction as the only approach to trophic modelling, and instead, operates as cross-scale trophic integration, supporting the producers as well as top predators additionally to vacant niche management and ecological restoration.
- Rewilding considers re-establishing an area to its former wild format, whereas The Open Wilding Project (TOWP) approaches all wilding spaces with a view to encouraging biodiversity, and not necessarily to move back towards a prior state.

Scientific investigation and protocol

- From initiation, Open Wilding is in support of scientific investigation and opportunity and evaluates research opportunities at all intervals and milestones of the project.
- Scientific investigation operates under bylaws that are designed to protect wildlife, the areas, and the data [See Scientific Investigation & Protocol].

Socio-ecological aims

- The Open Wilding Principles considers public engagement fundamental to success. It is imperative that local fear narratives are managed and reduced, changing the perceptions of and relationships with wildlife and the project spaces through; volunteering, food forests, learning walks, citizen science projects, forest schools and working with local education and councils.
- Anthropic management of the space will be required as Open Wilding considers human interaction imperative, identifying the niche that humans fill in the system.

Functional restoration & biological outcomes

Open Wilding definition

The development of an area to encourage, facilitate and/or create ecological function, where humans are integral to success, including through the local engagement and public access of a site, developed by communities of student scientists with a research oriented management approach that operates through flexible trajectories, guided by science, passion and nature.

Outcomes & trajectories

Wilding an area is not determined as the end goal, and rather, Open Wilding Scientific Framework (OWSF) will identify key stages within the project where the outcomes are assessed, working on a flexible trajectory. In a changing world, it is imperative that the outcomes are flexible to change and that the next stages are developed with the experiences of the project so far determining the following steps.

Goals, and their associated trajectories will be affected by:

- Climate change
- Urbanisation and local development
- Societal circumstances

Developing diversity to encourage ecosystem function

Functional diversity as an overarching goal will be determined by many factors such as;

- Area of the project site and local species that are currently established
- Trophic cascade opportunities to restore function
- Legislation and regulations, with a focus on re-introducing or assisting endangered species, and species on the UK Priority List
- Niche opportunities

OWSF does not exclude species that are not indigenous, where such a species can provide positive ecological function to a site, filling potential gaps in ecosystems, as pertained in pleistocene (re)wilding. It is imperative however, that prior to the introduction of any species, that comprehensive research is completed to identify the potential disadvantages of introduction.

Keystone species that prove beneficial to an area will also be determined, such as beavers, who are bioengineers, adapting local hydrology and landscape, therefore affecting movement of nutrients in water and the movement of wildlife.

Again, keystone species will also be determined by legislature such as the UK Priority List.

Encouraging species richness

Reintroduction and support of diversity does not ensure species richness and effective monitoring is required to determine the richness of a species within the site.

For this, OWSF will determine the quantity needed for species richness through the following factors

- Gestation time
- Community groups
- Feeding opportunities
- Predator to prey ratio

Community and community diversity

To ensure species richness, it is imperative that the social constructs of all species introduced and currently within an area are understood.

Many mammals live within groups of families, where each member will have a role, and this is particularly true in canids. Additionally, members of communities may be cast out or will be encouraged to leave to develop its own group or join another.

Both of these factors must be considered when determining the richness required of a species to be sustainable.

Movement and social opportunities must be integrated from the outset.

Cores, corridors and carnivores (Soulé and Noss, 1998)

There is much literature and agreement that to effectively create sustainable wild ecosystems, that large, interconnected reserves are required. OWSF considers this a long term goal, and is a considerable factor in determining land which will be used in project areas.

On a smaller scale, OWSF will apply the three C's approach, where viable and to the benefit of the area. The three C's; cores, corridors and carnivores assist in the movement of species within an area. Cores and corridors provide movement spaces for a range of species, with many species such as the Hazel Dormouse and the European Water Voles preferring hedgerows and river banks for their habitats. Corridors supply this, whilst cores are utilised by larger species, particularly grazers, who may use corridors for safe movement within an area.

Carnivores are identified as one of the three C's for their long association towards positive (re)wilding outcomes in top down trophic modelling, a premise not adopted as a single process of trophic modelling within OWSF. Instead, it is a requirement of OWSF that carnivore richness is modelled in equilibrium with their prey to ensure that no species overpopulates, and that vegetation is provided with the opportunity to grow; thus creating further habitat and food resources for other species.

Additionally to this, OWSF encourages natural predation and succession, and will not intervene where unnecessary.

It may be required at times, that the numbers of a certain species are reduced, however, anthropogenic interaction will not fill the part of a carnivore niche and other forms of intervention, where it is understood that humans should play a role, will be used.

Land partition model & broad portfolio-based approach

Where size allows it, areas will be partitioned to allow for a range of approaches to conservation of ecosystems. For example; where positive application is accepted an area may be developed into a grassland or will include grazers. Allowing the free roam of grazers can have adverse effects on the development of an ecosystem, particularly in areas of developing forests. Research regarding the effects of grazers in an environment is welcome, and where possible land may be partitioned to allow for grazing cattle.

Additionally, to develop a broad portfolio of conservation and Open Wilding sites, different land statuses should be considered in particular, brownfield sites which cannot be built upon provides opportunity to wild an area and utilise an area that currently offers little in the way of local attraction or environmental function. This broad portfolio approach will offer further research opportunities and add to the developing knowledge of conservation and (re)wilding.

Hobbs, (2017) suggests different objectives might be set for different parts of the landscape requiring a broad portfolio based approach that considers the range of ecological conditions, conservation goals and ecosystem services in different areas.

To further this, connecting sites is imperative to the 'reintegration' of the 'wild' and TOWP will look to work with current (re)wilding sites to create land and water based connections to aid in the movement and conservation of species.

Passive systems

Passive systems are heavily debated within (re)wilding with many believing it to be an effective approach where nature is given the opportunity to 'take over' and restore. Opposing views believe that nature needs to be directed to avoid issues such as; the timely conversion of PNV (potential natural vegetation) associated with the edaphic conditions of a site, or the increased shrubby and dry vegetation that occurs during the first stages of nature's succession of an area, and the potential abundance of invasive species. Additionally, natural conditions may need to be restored such as habitats and niches.

It has been identified that the positives associated with passive (re)wilding are relevant to cultural views towards nature, with the notion of a human/ nature duality as the correct process.

TOWP does not favour passive systems due to its intrinsic separation of anthropic interaction and natural processes however, where applicable, passive approach can be used in areas where ecosystem functionality is already positive and intervention or management is not required, and monitoring only can take place.

Flora

Supported flora are listed under the Open Wilding Species Register which identifies all relevant information about each species. This register can be utilised to understand which flora are required to assist in developing a functional ecosystem in regards to the habitat and food they supply as well as functions such as seed dispersal, growth rates, carbon sequestration etc.

Where required, the removal of flora will follow sustainable practices and species specific disease management plans will be in place within the Species Register.

There is much opportunity for collaboration in naturopathic science and TOWP, and flora will be implemented to

support the ecosystem, but additionally to develop research in naturopathy.

Fauna

Supported fauna are listed under the Open Wilding Species Register which identifies all relevant information about each species including; habitat and ecology, lifespan, size, food sources. This register can be utilised to understand which areas of a web are under-represented within the ecosystem, which species rely on each other and required habitats among other information that allows the management of the TOWP sites to be successful.

Where translocation of a species is to occur, the welfare of the animal is the priority. The individual will be selected based on the effect it will have on the environment, ensuring no communities are disrupted and young abandoned. Prior to integration, each individual is checked for diseases and monitored for health. At all stages, where research is possible that is not to the detriment of the individual it will be encouraged that data is collected such as is identified in fauna monitoring. Each species will be translocated via passive reintegration, where they are placed within holding areas within their new environment to help establish themselves among other translocated individuals and develop their senses to the new environment. During soft release, or passive reintegration, it is imperative that the wildlife do not become dependent on humans, and therefore, food delivery and the administering of assistance must be delivered from a distance via pulley systems and immobilisation intervention. It is the responsibility of TOWP to ensure the practice applied is the most appropriate to reduce stress and risk of mortality, and to constantly review methods. Where illegal hunting occurs, it is imperative to identify local motivations, as determined in the socio-ecological approach below.

Biodiversity and forward movement

To effectively measure the success of an Open Wilding project, data will be collected at all relevant milestones. The monitoring will be measured at intervals relevant to the species monitored but will be extensive in the data collected.

Flora Monitoring

The monitoring of flora ensures the health of the species and stands and the supported wildlife.

Additionally, monitoring will provide information for further research and understanding.

Monitoring will include:

- Growth rate
- Chemical communication
- Disease Spreading and Management
- Supported Species
- Seed Dispersal rates
- Carbon sequestration
- Root Health
- Soil health and nutrients, PH

Fauna Monitoring

Noss (1990) states that biodiversity is presently a minor consideration in environmental policy. It has been regarded as too broad and vague a concept to be applied to real-world regulatory and management problems.

To rectify this, and to assist in the future consideration of biodiversity within environmental policy, TOWP monitors flora and fauna at multiple milestones, collecting a database of information to assist in future development and progress.

Monitoring is separated into two categories; health and wellbeing and ecological.

Health and wellbeing is used to ensure the welfare of the animals that are integrated and assist in our understanding of wildlife health, whereas ecological identifies the impact of the species in terms of restoration and ecological function.

Currently, no framework exists per species regarding the success of translocation and OWSF will begin to develop this from the outset through the monitoring system.

Health & Wellbeing

- Health
- Stress levels
- Physical observations
- Emotional wellbeing
- Mental development during lifetime
- Physical development during lifetime
- Deterioration rates

Ecological

- Movement patterns
- Community development
- Community niche/ roles within social groups
- Interactions with outside groups
- Topographical and hydrological effects
- Maternal and paternal instincts
- Seasonal effects
- Resilience to environmental change
- Resilience to translocation
- Predation/ Prey instincts
- Seed dispersal
- Decomposition and nutrient release

Considerations of ecological, trophic and vacant niche (re)wilding

There are many approaches to (re)wilding, each with their own merits. OWSF does not disregard any approach, but instead, identifies the applications of all approaches within each individual project.

Ecological (re)wilding allows for the restoration of an area through natural processes, which are encouraged in the OWSF but not in the format of being free from anthropy.

Trophic (re)wilding restores top down interactions to promote biodiverse ecosystems by introducing predators and

bioengineers. Again, this process is encouraged through the management and placement of key species; however, OWSF identifies the importance of all niches being filled, and not those only managed through top down trophic interactions.

Lastly, vacant niche (re)wilding, also described as reintroduction promotes the restoration of ecological function through reintroducing species that fill vacant niche, however, these not need be the reintroduction of the exact species, and similar species can be considered, such as that described in pleistocene (re)wilding (Corlett, 2016). Where a niche is vacant OWSF will work to fill the niche required for ecosystem functionality.

Site specifications or focal region

Land Acquisition

Open Wilding considers all land and will develop a broad portfolio in ranging degraded statuses to further research and understanding as well as to protect land and wildlife in a variety of areas.

The land may be acquired in different ways including purchasing land directly, receiving land gifted from legacies or working with public institutions (including Councils and Universities) to utilise unregistered and/or unused land. Land may be brownfield and/or polluted sites, but may also include areas that are already established environmentally; dependant on the research and opportunities that each presents.

Additionally to functionality, cost, access to urban areas etc., social perceptions change across the country and by demographic which must be considered when identifying a viable piece of land. Managing local perceptions is integral to the success of the project. Research has suggested that those who live within rural areas have a more utilitarian view of nature whilst those in urban areas favour a more emotional view. This is transparent across demographics also, such as the more elderly demographic favouring an arcadian image as opposed to the 'wilderness' image adopted by the younger generations (Durant, Du Toit and Pettorelli, 2019).

The standard land requirements are:

- An area must be over 3 acres (preferably 5+) in rural areas, and over 1 acre in urban areas
- It is beneficial for an area to have natural water sources in the forms of lakes, streams and estuaries nearby or the potential to place one, however, this is on a per site basis.
- Land must be suitable for planting
- Public access to the area must be available
- Where outbuildings or any buildings occur, these must not be to the detriment of the area and must be safe for use
- The land must not be used for any form of hunting or fishing and rights must be transferable to TOWP
- The land must not pose a flood risk
- The land must be freehold and not leased

Purchasing Land

TOWP may purchase land directly through funds raised during crowdfunding, in membership payments and through partnerships with organisations, universities and councils as well as monies raised from grants.

Gifting Land and Legacy Land

TOWP may acquire land through gifting from individuals, public institutions and through legacy donation. Where gifting land occurs, it is vital to ensure that the land transfers complete ownership to TOWP with all rights to actions on the land.

Restoration and Brownfield Sites

The quantifiable benefits of open wilding brownfield sites and areas requiring restoration are greater than the management or intervention in sites that are already established and within favourable conditions. Brownfield sites are open for consideration and provide many positives including lower purchasing costs and more likely to be gifted, unused and unlikely to be used for development in the future, therefore leading to faster results and likely access to urban areas for increased tourism. Additionally, there are many requests for brownfield sites to be developed into housing in the near future.

Brownfield sites however pose risks and require further work and development to restore to a naturally operational state. Research opportunities are affected, however provide alternatives relative to restoring brownfield sites.

TOWP will consider restoration and brownfield sites on a per site basis following research into the opportunities and threats posed.

Guiding Regulations

- Protected species list
- GAEC - Good agricultural and environmental condition policy
- Resolution on wilderness in Europe
- 25 Year Environment Plan - UK, including success indicator framework
- IUCN Red List

Threats

- Unwanted ecological interactions such as the introduction of alien species
- Outcomes not viable for smaller scale spaces
- Resilience undeveloped within given time frames leading to potential future stress increase
- Habitat invariability leads to reduced niche opportunity and affects the species it may support, such as steep topography deterring grazers
- Limited dispersal from plants
- Vegetation structures providing non favourable states
- Spreading of disease
- Predation of locally owned animals
- Increased complexity from expansion
- Diversion of succession into an unforeseen or unfavourable state from the desired trajectory, potentially preventing further successional development.
- Progressive diminution of ecosystems

Scientific investigation and protocol

Opportunity stages and milestones

As outlined, prior to any activity towards open wilding of a site, set opportunity stages and milestones will be determined with the view that all outcomes are flexible, and operate as a trajectory rather than a specific end state. Opportunities are considered for species, land, socio-economic research and science.

Human interaction

Open Wilding operates with humans as an integral component of biodiversity and ecosystem functionality.

For many years, humans have co-existed alongside 'nature' and worked in unison with it, and this is particularly true within areas of indigenous peoples.

The role that humans play within nature is heavily debated with many believing that humans have no place within the wild. However, this duality encourages further negative social views towards wild areas and wildlife itself. This is outlined further in the socio-economic aims.

This section regarding human interaction will identify the relationship between humans, and Open Wilding spaces within a scientific and research based orientation.

- Food Forests provide the opportunity to grow food whilst focusing on diverse planting to mimic ecosystems identified within forests
- Crop rotations for food growing; alternating crops to ensure productive capacity of the soils
- Polyculture systems to create areas with more adaptability to climate variability by mixing different plant species which supports local biodiversity
- Harvesting of rainwater through water butts around the area for use within eco-cabins and crop watering and where applicable, for grazing animals
- Manipulation of natural materials such as trees into structures; bridges and paths for humans and animals
- Irrigation and flood management
- Seed dispersal and planting
- Translocation of species to ensure biodiversity and species richness
- Controlled fire within sites to sustain grasslands
- Spiritual sites
- Foraging including monitoring of extraction
- Utilising all resources that may otherwise waste and not be to the benefit of the area
- Intervention of tilling reduction from grazing animals to reduce moisture loss in soil
- Encouragement of tilling from grazing animals
- Creation of grasslands, floodplains and other systems to encourage ecological restoration
- Barrier management
- Signs and path instillation
- Creation and management of water areas
- Extraction including minerals, botanical, translocation of fauna etc.

Student use and relationships with educational establishments

Developing our understanding is integral to ensuring that we assist in the functions of the Earth. OWSF believes that education is the foundation of this, and so operates by students in the environmental and health sciences.

Students who are members, or universities who are partnered with us can utilise the Open Wilding project for research, study and to participate in the conservation and Open Wilding of species and systems, providing needed and much sought after field experience.

Because of this, Open Wilding spaces must be fit for research and allow access to students. To use the space for independent research, a research proposal must be submitted for review, to ensure that it is not to the detriment of the area and the project.

Students are able to camp on the site in designated areas during their research, and where developed, use eco-cabins on the site.

During use of the site, students undertaking research must operate under the OWSF bylaws which have been developed to ensure that the ecosystem maintains functionality, and no undue stress is caused to the wildlife and the environment.

To assist in creating positive relationships with local communities, the spaces can also be used by local schools, under agreement and guidance with OWSF.

Where there is opportunity, forest schools, tracking and talks will be available, although no further detail is provided here within the framework as opportunities relating to this are relevant to the local community and the Open Wilding space.

The long term goals of The Open Wilding Project is to integrate into school curriculum to engage students with the environment and the sciences behind it.

Data sharing - Quantifying outcomes

Collaboration is key in the OWSF, and where research is undertaken on the site the data must be shared to help in the development of future conservation practice and our knowledge of the Earth, although it need not be shared until the paper is published.

In cohesion with the flexible trajectories and milestones, data and outcomes will be shared with the public and scientific community. This requires the results to be quantifiable and so this must be considered during the development of scientific protocols prior to research or activity beginning.

Bylaws

The bylaws are regulations to be followed to ensure the protection of the area, the members, the wildlife and the research undertaken. These bylaws are to be upheld across all Open Wilding sites

- The conservation and protection of all species are priority within any action undertaken and decisions are made regarding removal of species, both flora and fauna based upon the effect they have toward reaching the status of positive ecological function.
- Where a species requires removal, both flora and fauna, translocation to an alternative site is the desired outcome.
- Under no circumstances are fauna to be hunted or euthanised on the site.

- Where translocation of a species is required to restore ecological function The Open Wilding Project will communicate with local rescue centres and identify animals that will not be affected by translocation as a priority over removal from any current sites.
- Where translocation occurs, passive integration through the use of site located holding areas will be used.
- Where translocation occurs, all animals will be quarantined and checked for potential diseases and for health checks prior to release.
- For research purposes only, The Open Wilding Project can use tracking equipment in line with law and legislature.
- Extraction of minerals and flora are accepted as long as they are not to the detriment of the area and only done so for research and study and once removed, if possible, are returned to the site or shared for further research to reduce further extraction.
- All extraction of minerals and flora must be done with the permission of the Director, the Advisors and the Board Committee.
- Where items can be extracted from the site, such as within Food Forests, no items are permitted to be sold.
- Prior to undertaking any substantial or long term research within the site, a research proposal must be submitted and agreed upon by the Directors, Advisors and Board Committee.
- Human interaction with nature is encouraged however, affecting natural predation and succession will not be tolerated unless specifically associated with research.
- The public and local community are given free access to the Open Wilding sites but are required to follow instructions and designated paths to protect certain areas, research sites and the wildlife..
- Those operating under employment from The Climate Corner CIC and The Open Wilding Project are not able to partake in protests, as required under CIC regulation
- Tourism of a site can be developed to help sustain the organisation but never to the detriment of the project, the research or the wildlife. Potential tourism options include; camping, allotment rental, learning and team building days.

Research opportunities

The following research opportunities will be considered prior to development, and reviewed and added to throughout operation.

Where research is conducted, reference and acknowledgement must be made to The Open Wilding Project.

These lists are not exhaustive

Flora & Fauna Research Opportunities

- The ecological functions of different carnivores within anthropically rewilded landscapes
- Effects on plant growth patterns from the nutrient release of large fauna
- Chemical communication within flora upon the integration of herbivores
- Cross Trophic rewilding applications
- The communal developments of translocated canids
- Movement patterns of ranging species within corridors
- The returning of seed sources to denuded vegetation
- Utilising species for seed dispersal
- The role of pine martens in the conservation of red squirrels
- The naturopathic applications of endemic flora

- Translocation success within different species
- The transference of diseases from translocation
- The health outcomes of seasonal movement patterns restricted through barriers
- The effect on soil from ungulate species - soil richness, texture etc.
- Integration of an alternative species into a vacant niche (pleistocene rewilding)

Environmental Research Opportunities

- Carbon sequestration of an area
- Effects on carbon sequestration from varying species richness and diversity within an area
- Eutrophication of pollutants from neighbouring land and its effects on the ecosystem
- Revitalisation of brownfield sites as a conservation area
- Effect of past extensive agriculture in a rewilding site
- The benefits of natural and agricultural land mixes to an ecosystem
- Zero Emission building - Eco cabin/ office

Study Buildings and operations

As the project areas provide sites for study and research, there must be facilities to allow for residents to complete their study period.

Initially and where no alternative options are provided, camping will be encouraged to reduce the footprint of students using the site in designated and designed areas.

To provide field experience and opportunity, where applicable, the design and implementation of eco-cabins can be considered. These eco-cabins will offer students and universities the opportunities to design, fund and produce eco cabins for student use, as offices and potentially, as a source of funding through tourism booking.

The eco-cabins must be self sufficient and carbon neutral as well as ensuring there are no negative impacts on the local environment.

Where able, TOWP will develop relationships with local hotels to provide reduced rates for studying students.

Due to the above, facilities and irrigation are required.

Threats

- Biohazard regulations from the destruction of carcasses
- Animal protection and rights during translocation

Socio-ecological

Public engagement and management of fear narratives

- Public engagement will be carried out prior to any work taking place. This will include:
 - A longitudinal approach will be taken in order to monitor attitudes associated with wilding.
 - Developing an understanding of attitudes about the ‘open wilding’ project prior to development - a pre-project consultation to ensure active involvement from the local community. This will feed into the customisation of specific interventions and management actions where perceptions may be negative.
 - Visions and understanding of nature
 - Communicating potential restrictions on the use of the land and managing the feedback of that
 - Natural and cultural values will be collated to develop an insight into the human- nature relationship and perceived duality
 - An understanding that there are location based perceptions - e.g - those living in rural areas will generally have a utilitarian relationship with nature than those in urban areas.
- The methodology will be adapted according to the location of the site(s) but it is likely to include a survey and focus groups.
- Analysis of the data will uncover how different generations perceive nature and its relationship
- TOWP will work with expert advisors to ensure that the project is making best use of technology in collecting, analysing and sharing data

Citizen Science

The strengths of Open Wilding are within the community of student scientists and specialist advisors. To advocate for future generations to engage in the sciences, TOWP encourages Citizen Science and offers the local community the opportunity to partake in research, expeditions and to volunteer with the project.

Learning Walk

Throughout the The Open Wilding Project, sites are designated walking areas that provide guided routes through the project. These designated areas are designed in particular to ensure functionality can be restored in the early stages of the project, where simple processes such as trampling can have adverse effects on restoration and development. Once areas are more established, access areas can be adapted.

The Learning Walk will be presented via signs that offer insights into the area as well as sensory areas that utilise the senses for ALN visitors and schools. Additionally, the Learning Walk spaces will offer; worship and quiet spaces, viewing points, access routes for mobility impaired visitors, food forests and forestry learning areas, and potentially; lending libraries, allotments and botany greenhouses.

Food Forests

Food Forests are an integral component in developing the relationships between the local community and nature. Simply being in nature is known to have positive effects however, we must connect further than simply occupying space.

To encourage further engagement, in addition to learning walks are Food Forests, which are TOWP areas which provide extractable resources such as fruit trees, berries and herbs, all of which can be foraged and eaten by visitors for free.

Throughout the Food Forests signs are provided to inform visitors of the 'natural product', its flavours/ uses and the applications in naturopathy. The Food Forests will be designed and managed by students with a focus on naturopathy.

Collaboration with educational establishments

The mental and physical health benefits to being in nature are well documented such as that proposed by Keniger, L., et al, (2013), and it is encouraged more and more for children to spend time outdoors, particularly in school. Unfortunately, many schools do not have the facilities available for children and young people to engage with nature, and to assist, TOWP sites are available for schools to utilise for outdoor learning and engagement. Schools can also arrange forest school and learning days with TOWP and experience the World of nature through the live trail cams throughout the sites.

Removal of (re)

Rewilding, in literature, generally collapses nature and society into binary, disconnected terms where re refers to restoration to a previous state prior to human intervention. As OWSF identifies humans as integral to the system we do not identify the project as (re)wilding and only refer to it as such where it may be more understandable by certain audiences.

Additionally, it has been identified that public attribute the term (re)wilding with fear, negative aesthetic and loss of control (Höchtel, Lehringer and Konold, 2005).

Alternative phrasing used by TOWP are: open wilding and wilding.

Research opportunities

The following research opportunities will be considered prior to development, and reviewed and added to throughout operation.

Where research is conducted, reference and acknowledgement must be made to The Open Wilding Project.

These lists are not exhaustive

Socio-Economic Research

- The drivers shaping human relationships with 'wilderness' and the 'wild'

- Attitude mapping towards 'wilderness' and 'rewilding' to identify the key demographics and associated attitudes
- The roles of childhood experiences in the relationships formed towards nature
- The role of knowledge and education in generating attitudes towards nature
- The motivations towards rewilding and nature opposition
- Attitudes towards resurgence of wild animals
- The effect of terminology in creating negative perceptions of nature - i.e predator
- Mapping attitude change following engagement with wild places
- Influence on well-being within nature, and different types of nature such as tended, unattended
- Welsh attitudes towards rewilding in the context of culture and history
- Anthropic niche in a wild environment
- The importance of participation in changing local fear narratives towards wild spaces
- Incorporation of wilding into areas of new development
- 'Alternative' educational opportunities for children (i.e. forest schooling) and the impact on wellbeing, educational attainment and other indicators (longitudinal study)
- Intergenerational monitoring the changes in engagement with the natural environment
- Rights and responsibilities associated with the access and use of natural environments. An exploration into the democratic management of land (membership / public engagement). Responsibilities, i.e. and exploration into 'Who 'should' be the stewards of nature?'
- TOWP offers an opportunity to explore the revitalisation of the 'traditional commons' within a modern context through a potential application of Elinor Ostrom's commons management principles
- An investigation into the attitudes of TOWP, with a particular focus on planners, developers, farmers and other stakeholders who are involved with the future development of our land. How can TOWP be incorporated into future developments, Local Plans etc.?

Socio-ecological Threats

Fear narratives and development opposition

- Opposition towards site use
- Opposition regarding wildlife research
- Opposition towards increased tourism of an area following site development
- Opposition from those who have a utilitarian view towards wildlife and nature
- Local fears towards wildlife

Site misuse

- Dumping, fly tipping & littering on the site
- Crossing protected barriers
- Hunting or extraction on the grounds
- Property damage

References

Corlett, R., 2016. The Role of Rewilding in Landscape Design for Conservation. *Current Landscape Ecology Reports*, 1(3), pp.127-133.

Durant, S., Du Toit, J. and Pettoirelli, N., 2019. *Rewilding*. Cambridge University Press.

HM Government, 2018. *25 Year Environment Plan*. London: DEFRA.

Hobbs, R., 2017. Where to from here? Challenges for restoration and revegetation in a fast-changing world. *The Rangeland Journal*, 39(6), p.563.

Höchtl, F., Lehringer, S. and Konold, W., 2005. “Wilderness”: what it means when it becomes a reality—a case study from the southwestern Alps. *Landscape and Urban Planning*, 70(1-2), pp.85-95.

Keniger, L., Gaston, K., Irvine, K. and Fuller, R., 2013. What are the Benefits of Interacting with Nature?. *International Journal of Environmental Research and Public Health*, 10(3), pp.913-935.

NOSS, R., 1990. Indicators for Monitoring Biodiversity: A Hierarchical Approach. *Conservation Biology*, 4(4), pp.355-364.

Soule, M. and Noss, R., 1998. Biodiversity and Conservation Complementary goals for continental conservation. *Wild Earth*.