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Content

1. Introduction

Ecological restoration and interconnectivity are essential for maintaining and restoring healthy ecosystems in Europe, and even more so along the European Green Belt. By implementing good practices, we can create more resilient and more diverse ecosystems for the benefit of all.

Healthy ecosystems support biodiversity and provide a habitat for a variety of species. They also provide a range of benefits or ecosystem services, including clean water, flood protection, fertile soils, pollination, etc., as well as a pleasant environment for people to live in.

In recent years, there has been a growing recognition of the importance of ecological restoration and interconnectivity. The European Union has adopted a number of policies and initiatives to promote these practices, including the Biodiversity Strategy for 2030 and the Natura 2000 network of protected areas[1].

This handbook aims to provide a practical guide to good practices for ecological restoration and interconnectivity in Europe. The first chapter provides basic principles and a brief description of how to structure a restoration project/plan, and the second chapter gives an insight/more detail on the key considerations when creating the restoration project, while the last (third) chapter introduces two examples of good practices for restoration projects.

1.1. Basic principles

Ecological restoration is the process of deliberately improving an ecosystem to a more natural state or, in specific cases, slowing or stopping its degradation. This can involve a range of activities, such as:

- Restoring and conserving native plant and animal species
- Reconnecting fragmented habitats
- Protecting and enhancing natural processes
- Reducing or eliminating negative human impacts
- Reconstructing hydromorphological and physico-chemical components of ecosystems

The goal of ecological restoration is to create ecosystems that are healthy, resilient, and self-sustaining.

Ecological restoration is a rapidly developing field in which a great deal of knowledge and experience is already being applied. Information and recommendations from scientific publications can therefore be used in the preparation of such projects. Especially in terms of a general approach, we can recommend, for example, the comprehensive work by Gann et al (2019)[2]. The authors recommend following 8 basic principles in the preparation of ecological restoration projects:

1. Ecological restoration engages stakeholders

2. Ecological restoration draws on many types of knowledge

3. Ecological restoration practice is informed by native reference ecosystems, while at the same time considering environmental change

4. Ecological restoration supports ecosystem recovery processes

5. Ecosystem recovery is assessed against clear goals and objectives, using measurable indicators

6. Ecological restoration seeks the highest level of recovery attainable

7. Ecological restoration gains cumulative value when applied at large scales
8. Ecological restoration is part of a continuum of restorative activities.

1.2. Problem definition

First, describe the problem(s) that you want to tackle. This includes providing information about target habitat(s)/species, the locality where the project will be carried out, and wider potential consequences (e.g. what are the threats to the identified target(s), relevance to ecological connectivity, relevance to policy, etc.).

The site of interest

The site assessment should include a physical assessment of the site, as well as an assessment of the social, economic, and cultural context in which the site is located.

Location of the area of interest – priority may be given to sites that will guarantee their natural functions after the implementation of the measures, without the need for further intervention or permanent management. However, sites where permanent care is envisaged are not excluded, but the project should anticipate and work with this need from the outset. This is particularly true for traditional cultural ecosystems (most ecosystems worldwide have been shaped by human use). Sites that fill gaps in the connectivity of relevant ecosystems, or where there is a gap in habitat presence, should also be of high value. It is important to assess the overall environmental status of the wider region where the restoration is to be carried out, and to identify the main problems, i.e. missing habitat(s) for the selected species, lack of connectivity, etc.

Target habitat(s) / species

Define the habitat(s) or species targeted by the proposed measures, the status of which is to be improved. Precise knowledge of the initial state and the definition of the target state of a certain ecosystem or population also enables the control results, and allows ongoing monitoring.

Conservation status

Define the conservation status and the degree of threat to the target habitat(s) or species within a region, country, Europe, the world.

Connectivity

Ecological connectivity is the ability of organisms to move freely within a suitable habitat patch, and between separate habitat patches. This is important for the survival of many species, since they depend on moving safely throughout the environment to find food, reproduce, and migrate.

There are a number of ways to manage ecological connectivity, including:

- Restoring and connecting habitats
- Protecting and maintaining corridors and stepping stones

- Reducing, bridging, or eliminating barriers to movement
- Managing land use practices to promote connectivity

How will the connectivity of the target habitat or species population be ensured? Describe opportunities for connectivity with other areas of the species' range.

Connectivity does not always have to be the main issue/target in the proposed restoration project. If it is, describe why do you think connectivity does not concern your project, or just state that connectivity is not your main concern.

Policy relevance (European Green Deal, EU Biodiversity strategy for 2030, EU Nature Restoration Law, LULUCF)

Describe how your project fits into the current policy intentions or programmes at European, national, or regional level. This is key information for the various subsidy programmes.

The restoration plan should be developed in consultation with local stakeholders, including land owners, residents, and government agencies.

1.3. Setting goals

What is/are the goal(s) of the project

Define what the goal of the project is.

The goals of ecological restoration can vary, depending on the specific project, but they typically fall into one of the following categories:

- Protect and restore biodiversity: ecological restoration aims to restore and protect the diversity of life in an ecosystem. This can involve restoring native plant and animal species, creating or restoring habitats, and controlling invasive species.
- Improve ecosystem services: ecosystem services are the benefits that humans and wildlife receive from ecosystems. These services include clean air and water, fertile soil, flood protection, etc. Ecological restoration can help improve these services by restoring the health of ecosystems, and subsequently providing numerous benefits for both wildlife and human well-being, such as improved air and water quality, reduced risk of natural disasters, and increased recreational opportunities.
- Increase resilience: resilience is the ability of an ecosystem to withstand and recover from disturbances or climate change. Ecological restoration can help to increase the resilience of ecosystems by restoring their natural processes and functions.

You can indicate into which categories your goals fall, and give more details.

What to improve

What is to be improved or preserved by the project? Describe what issue(s) the project addresses, which habitat(s) or species is/are to be positively affected by the project...

Time frame

Indicate:

- When the individual phases of the project will take place.
- When the preliminary surveys will be carried out, and when the documentation will be prepared.
- When the stakeholder consultation will take place.
- When the implementation of the measures will start.
- What the expected time scale is for the effect of the proposed and implemented measures.

2. Solution procedures / Key considerations

2.1. Initial phase

Baseline surveys

It is likely that information on the target habitat or species, its population centres, and/or its biotope need to be added in the initial stages of the project. This may be to determine the current distribution or abundance of the species, the quality of its habitat, or its depredation. Research may also be carried out on historical and current land-use, various causes of threats, etc.

Restoration projects usually do not involve specific scientific research, such as genetics, ethology, etc. It assumes sufficient information on the causes of the threat, as well as considerable professional erudition of the project implementers.

Review of existing data, knowledge, practices, and site history

Often, there is sufficient information about the background to the problem; there is a wealth of previous data, knowledge, and experience. It is advisable to make the most of this evidence in order to increase the effectiveness of the proposed or planned measures.

Feasibility study

A feasibility study is a crucial component of any restoration project, as it assesses the viability and potential success of the proposed restoration plan. It involves a comprehensive evaluation of various factors, including ecological, social, economic, and logistical considerations.

Ecological Feasibility

The ecological feasibility study examines the current condition of the site, and identifies the desired ecological outcomes. It assesses the site's ability to support the restoration objectives, considering factors such as historical evolution, geomorphology, geology, soil type, hydrology, topography, and existing vegetation. Additionally, it evaluates the potential for restoring native plant and animal communities, as well as the ability to enhance ecosystem services.

Social Feasibility

The social feasibility study explores the potential social impacts of the restoration project, including stakeholder engagement, community acceptance, and potential conflicts with local land use practices. It involves consulting with local residents, community organizations, and government agencies in order to understand their perspectives and concerns. The study also assesses the project's potential to generate social benefits such as improved recreational opportunities, job creation, and cultural enrichment.

Economic Feasibility

The economic feasibility study examines the financial viability of the restoration project, including the costs of implementation, maintenance, and potential revenue streams. It analyses the project's overall cost-benefit ratio, considering both direct expenses and indirect benefits, such as enhanced ecosystem services and improved property values. The study also explores potential funding sources, such as government grants, private donations, and carbon credits.

Logistical Feasibility

The logistical feasibility study evaluates the practical aspects of implementing the restoration plan, including access to the site, availability of resources, and potential logistical challenges. It assesses the expertise and equipment required for the restoration activities, as well as the potential need for permits, licenses, and environmental impact assessments. The study also addresses the long-term maintenance requirements for the restored ecosystem.

Integrative Feasibility

The feasibility study should consider all of these factors in an integrated manner, recognizing that the feasibility of an ecological restoration project is not solely determined by ecological considerations, but also by social, economic, and logistical aspects. A successful restoration project requires a balance of these elements in order to achieve its ecological goals, while also addressing social and economic concerns, and being implemented in a practical and sustainable manner.

By conducting a thorough feasibility study, organizations can make informed decisions about the most appropriate restoration approach, ensuring that the project has a high likelihood of success, and contributes positively to the environment, communities, and the overall social-ecological landscape.

Identification of potential conflicts between protection subjects

In many cases, the individual interests of protecting specific animal or plant species or habitats go against each other. It is then the responsibility of the implementer to decide what is the conservation priority in a given place or region. It is desirable to implement restoration action in such manner as to not significantly harm untargeted species and habitats.

Identification of potential conflicts between/with stakeholders

Ecological restoration is a complex process that involves a variety of stakeholders, including landowners, government agencies, conservation groups, and local communities. As a result, there is a potential for conflict between these stakeholders due to differing priorities and values.

Planning/preparing the restoration project should include some mitigation measures to lessen the conflicts with the stakeholders.

Conflicts with Landowners

Landowners may be concerned about the loss of property rights or the potential for ecological restoration projects to interfere with their current land uses, and therefore their income.

Conflicts with Local Communities

Local communities may be concerned about the potential for ecological restoration projects to disrupt traditional land uses, cultural practices, and/or aesthetics. They may also be concerned about the potential for ecological restoration projects to lead to job losses and/or increased property taxes. Additionally, local communities may not have a voice in the planning or implementation of ecological restoration projects.

Conflicts with Government Agencies

Government agencies may be concerned about the cost of ecological restoration projects, particularly when they are mandated by law or regulation. They may also be concerned about the potential for conflicts with other land uses, such as agriculture or development.

Conflicts with Conservation Groups

Conservation groups may be concerned that ecological restoration projects are being conducted without adequate scientific research, or that they are failing to address the underlying causes of ecosystem degradation. They may also be concerned that restoration projects are being implemented in a way that does not benefit the species or habitats that they are trying to conserve.

Identification and communication with stakeholders/land owners

At this stage it is necessary to identify the main stakeholders in the area who can influence the course of the project. These are usually municipalities, larger landowners or land managers, state nature conservation organisations, NGOs, etc.

By working collaboratively with stakeholders/land owners, it is possible to develop ecological restoration projects that are both ecologically sound and socially acceptable. These projects can provide a variety of benefits to the environment, communities, and the economy.

At the beginning of the project, it is therefore advisable to define possible topics on which to work with stakeholders in the project.

It is advisable to set up a regime for communication with stakeholders, informing them regularly about the progress of the project and plans for the next period, and possibly directly involve them in the project realisation.

2.2. Preparation phase

Technical documentation / management plan / timetable

The technical documentation for an ecological restoration project should provide a detailed description of the project's goals, objectives, and methods. It should be written in a clear and concise way that is accessible to non-technical audiences. This is a key phase of the project, which in some cases can take quite a long time

Key elements that should be included in the technical documentation:

- Project description: a brief overview of the project, including its goals, objectives, and location.
- Site assessment: a description of the site's current condition, including its vegetation, and wildlife.
- Restoration plan: a detailed description of the methods that will be used to restore the site. This should include information on the specific restoration techniques, the timing of restoration activities, and the resources required.
- Monitoring plan: a plan for monitoring the progress of the restoration project. This should include information on the indicators that will be used to measure progress, the frequency of monitoring, and the responsible parties.
- Conclusion: a summary of the key findings.

The management plan for an ecological restoration project should provide a roadmap for implementing the project. It should outline the roles and responsibilities of the project team, the budget, the schedule, the contingency plans, the communication plan, monitoring, and evaluation. The management plan should be updated regularly to reflect changes in the project's scope or progress.

The timetable for an ecological restoration project should provide a detailed schedule for the project's implementation. It should specify the start and end dates for each phase of the project, as well as the estimated duration of each activity. It also should specify dependencies (list of activities that are dependent on the completion of other activities) and milestones (specific points in the project timeline that are used to measure progress).

The timetable should be realistic and achievable, and it should be updated regularly to reflect changes in the project's scope or progress.

Risk analysis

Risk analysis for ecological restoration projects is a critical step in the planning and implementation process. It helps to identify and assess potential risks that could impact the success of the project. By understanding these risks, project managers can develop mitigation strategies in order to minimize their impact.

There are a number of different types of risks that can be identified in an ecological restoration project. These risks can be broadly categorized into the following groups:

- Technical risks: these are related to the technical feasibility of the project. For example, there may be risks associated with the selection of restoration techniques, the availability of resources, or the potential for adverse abiotic conditions.

  Examples: the failure of restoration techniques to achieve desired outcomes (e.g. restoring wetland without taking out the drainage system in the immediate surrounding of the locality), lack of targeted material (e.g. regional seed mixture), unforeseen geological or hydrological conditions.

- Social risks are related to the social acceptability of the project. For example, there may be risks associated with stakeholder conflicts, community opposition, or the potential for the project to impact local land uses and/or livelihoods.

  Examples: the fear for restricted movement for the local community, misunderstanding project benefits (e.g. enhanced pollination) by stakeholders (farmers), change of traditional land use leading to spread of "pests" (from arable field to wetland with mosquitoes), ...

  Even one land owner who disagrees can significantly slow down the entire project. Another difficult case is when a community of heirs cannot reach a consensus.

- Economic risks are related to the financial viability of the project. For example, there may be risks associated with the cost of restoration activities, the availability of funding, or the potential for changes in economic conditions that could affect the project's profitability.

  Examples: unforeseen increases in project costs, loss or restrictions of funding sources, changes in economic conditions that affect project profitability

- Regulatory risks: involved compliance with environmental regulations and permitting requirements. For example, there may be risks associated with the need for environmental impact assessments, the potential for delays in obtaining permits, or the possibility of fines or penalties for non-compliance.

  Examples of risks: delays in obtaining permits from different authorities, difficulty complying with environmental regulations, potential fines or penalties for non-compliance.

Permissions and agreements

There are a number of legislative constraints and pre-determined procedures in each EU Member State (as well as in other countries) regarding permitting processes in nature conservation.

For all EU Member States, in sites protected under the European network of protected areas Natura 2000 (SAC, SPA), it is necessary to secure a statement of the nature conservation authorities excluding a significant negative impact of the project on the target species/habitats of the sites concerned. If the project is focused to improve the condition of the object of conservation, this should not be a problem.

But there may be various other restrictions arising from national legislation. This limitation may not only concern nature protection, but also other affected interests, e.g. the protection of water resources, forest protection, the protection of property relations, etc.

Communication with the public

Effective communication is essential for the success of any ecological restoration project. By engaging with stakeholders and the public, project managers can build support for the project, address concerns, and ensure that the project is aligned with community values.

Public support can help to secure funding, permits, and access to land. Open communication can contribute to address concerns about the project's impact on the environment and local communities. Effective communication can build trust and accountability among stakeholders.

Therefore, communication with public should be an integral part of preparing the restoration project from the start.

Financing

The best source of financing for a project will depend on the specific project, the amount of funding needed, and the project's stage of development. There are several sources of financing available for projects in Europe. Here are some of the most common:

- EU funding: the European Union provides a variety of funding opportunities for projects that meet specific criteria. Some of the most well-known EU funding programmes include the European Regional Development Fund (ERDF), and the European Social Fund (ESF).

  The LIFE Programme is the European Union's funding instrument for the environment and climate action. It aims to help Europe achieve its environmental and climate targets, protect the environment, and promote sustainable development.

- National funding: many European countries also have their own national funding programmes for projects that are of national interest. These programmes can be a good source of funding for projects that do not meet the criteria for EU funding.

  This includes various regionally focused funds in individual regions or other territorial administrative units.

- Private funding: private investors may also provide funding for projects in Europe.
- Debt financing: projects may also be financed through debt, such as loans from banks or other financial institutions.
- Grants: grants are another form of financing projects. Grants are often awarded by government agencies, charities, and/or foundations.

Concerning third-party funds in general, it is crucial for successfully raising funding sources that the requirements for the application process are met carefully. Most programmes provide application guidelines and forms for the applicants in order to develop a sound application, with all of the necessary documents.

Besides the detailed description of the planned project, several other documents, such as a budget plan, signed contracts and agreements, or letters of intent of associated project partners, etc. will be needed. Therefore, enough time must be considered before the submission in order to assure the timely compilation of all requirements.

During the planning phase, the applicant has to be well aware of the important deadlines for the steps of the funding submission, and consider enough time for final changes of the application form after potential feedback from representatives of the funding programme.

2.3. Implementation phase

Implementation of measures

Ecological restoration projects can be implemented using a variety of methods, depending on the specific goals and objectives of the project. However, some common measures that are used in ecological restoration projects include:

- Site preparation - clearing the site of bush or preparing the soil for planting.
- Management of the site - mowing, grazing, wild herbivores, etc.
- Reforestation and restoration of native vegetation - planting native trees, shrubs, and grasses to restore the ecosystem's structure and function.
- Reclamation of degraded lands - restoring degraded lands, such as mine tailings or landfills, to a healthy state.
- Watershed management - improving water quality and quantity by implementing measures such as stream restoration, drainage removal, and wetlands creation.
- Wildlife protection - protecting and managing wildlife populations to ensure their long-term survival.
- Fire management - managing fire and fire risks to protect ecosystems and communities.
- Soil conservation - protecting and managing the soil to prevent erosion and degradation.
- Invasive species management - controlling or eradicating invasive species in order to protect native plants and animals.
- Climate change adaptation - adapting ecosystems to the impacts of climate change.

Continuous monitoring

All project activities should be continuously monitored and evaluated. Particular attention should be paid to the effectiveness of the measures implemented.

Potential indicators for monitoring the progress of the project or achieved improvements through its measures can vary widely, depending on the targeted goals. They can include thresholds for e.g.:

- Number of tested and proven methods developed in the course of the project
- Number reintroduced individuals or species, with emphasis on habitat specialist and endangered species
- Number of removed invasive species
- Area of mowed/grazed/cleared, or in general, restored site
- Length and species richness of planted hedges for soil conservation
- Number of reached participants in workshops
- Number of published papers/leaflets/info panels/handbooks/guidelines/etc.
- Number of released articles on social media and/or in newspapers

- Number of people or stakeholders reached through communication outputs, or involved in measure implementation

Communication with stakeholders and the public

To increase the effectiveness of communication, the following helps:

- Beginning to communicate with the stakeholders and public from the early stages of the project planning process.
- Identifying the key audience – the different groups of people who will be impacted by the project, and tailor your communication to their specific needs and interests.
- Using a variety of communication channels to reach a wider audience, including public meetings, press releases, social media, and educational materials.
- Being transparent by providing accurate and up-to-date information about the project.
- Listening to feedback from the stakeholders/public.

Involvement of volunteers

Volunteers play a vital role in ecological restoration projects, providing valuable labour and expertise. They can help with a wide range of tasks, from planting trees or removing invasive species, to educating the public. Volunteer involvement can also help to build community support for restoration efforts, and increase awareness of the importance of ecosystem conservation.

Strategies for Engaging Volunteers

- Clearly defined goals and objectives: Volunteers need to understand the purpose of the restoration project in order to effectively contribute to it. Clearly defined goals and objectives will help them to focus their efforts and make a meaningful impact.
- Training and support: Volunteers should be provided with adequate training and support in order to safely and effectively perform the tasks assigned to them. This includes providing them with the necessary skills, knowledge, and equipment.
- Opportunities for learning and growth: Volunteers should be given opportunities to learn about ecological restoration and to develop their skills. This can be done through training sessions, workshops, and field trips.
- Sense of ownership and responsibility: Volunteers should feel like they are part of the project, and that their contributions are valued. This can be fostered by giving them a say in decision-making, and allowing them to see the impact of their work.

Public relations

Examples of Effective Communication Strategies to tackle with public relations

- Project website: provide a central location where the public can find information about the project, including project goals, objectives, and progress updates.
- Educational materials: create brochures, flyers, and other educational materials that explain the project and its benefits.

- Public meetings: host public meetings to discuss the project with stakeholders and address their concerns.
- Social media: Utilize social media platforms to share project updates, photos, and videos.
- Community advisory board: a community advisory board can provide input on the project, and help to build trust and collaboration.

2.4. Post-implementation phase

Impact assessment

Evaluating the effectiveness of ecological restoration projects must be an integral part of the project. Evaluation should be conducted at the end, or during of the restoration project, and should assess whether the project has achieved its objectives. Evaluation helps in planning the next steps in the area, transferring experience, and justifying the resources spent to the public.

Post-implementation monitoring

Monitoring should be conducted at regular intervals, and data should be collected on a range of indicators, such as the abundance and diversity of plant and animal species, or the overall condition of the ecosystem.

To improve public acceptance, we recommend that monitoring data be publicly available and professionally discussed.

Communication with public

Communication with the public in the post-implementation phase includes e.g. publication of results, positive benefits, sharing of experiences and evaluation, etc.

Sustainability

Restoration projects should aim to restore the ecosystem to its original state or a similar state that is resilient and self-sustaining. This may involve removing invasive species, replanting native vegetation, and restoring natural processes.

Specific strategies that can be used to make ecological restoration projects more sustainable:

- Using native species: native species are better adapted to the local environment; they enhance natural ecological networks and are more likely to survive and thrive in a restored ecosystem. Invasive species also tend to suppress the native ones, and disrupt ecosystem function.
- Low-impact construction: minimizing the use of non-native materials during the restoration process will help to reduce the environmental impact of the project.
- Community involvement: engaging local people in the planning and implementation of restoration projects will help to build support for the project, and ensure that it is sustainable over the long term.
- Sustainable financing: finding long-term sources of funding for restoration projects will ensure that they can continue to operate and deliver benefits over time.

However, it is clear that not all ecological restoration projects will be self-sustainable. Therefore, it is advisable to think and plan already within the project about further activities and financing methods after the end of the project.

2.5. Documentation

It is recommended to collect and keep documentation of the restoration planning and implementation, e.g.:

1) Documentation of initial state of the site: description of state, including the results of baseline surveys, problems identified, draft targets, stakeholders, and photos
2) Documentation of action preparation: minutes from meetings with stakeholders, final setting of targets, set of necessary permits and agreements (including notes about their obtaining and possible problems), description of the foreseen action (technical documentation or other plan), documentation of communication with local communities and public
3) Documentation of the implementation – construction/management diary, issues, approaches, communication during the implementation, involvement of stakeholders and local communities, and photos
4) Documentation of achieved results: description of the final state including results of monitoring surveys, photos, communication of results, perception of the results by stakeholders and local communities, evaluation of the whole action - best practices, proven and problematic approaches, successes and failures, etc.
5) Documentation of financing

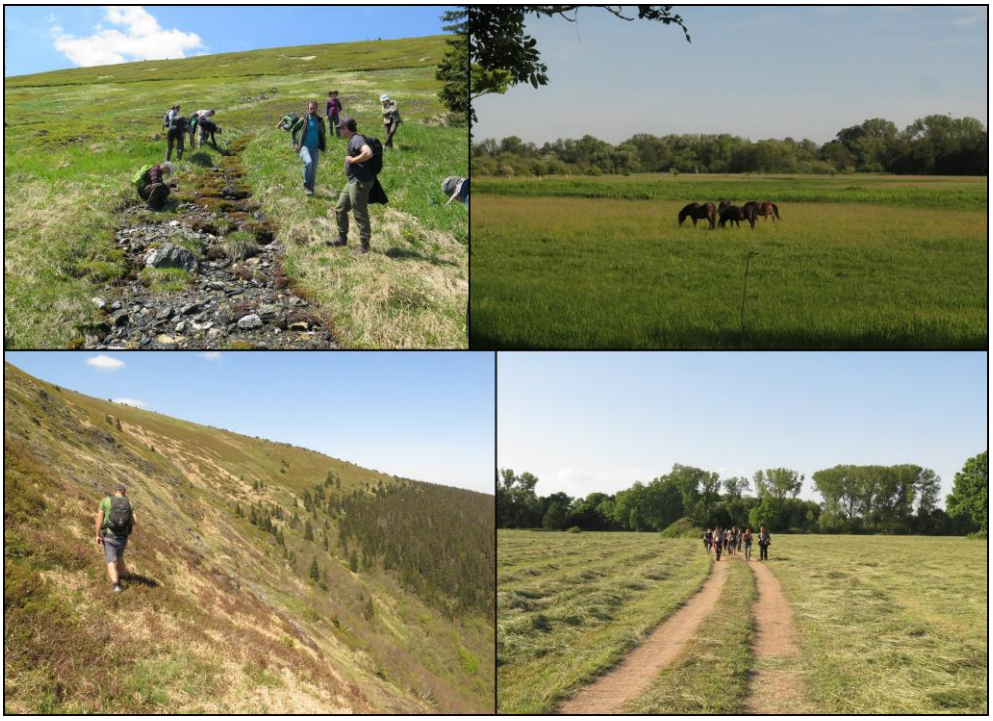
2.6. Overall evaluation

Each project should be evaluated in detail at or after its final stage. Ecological restoration projects can be evaluated using a variety of criteria, including:

- Environmental effectiveness: this evaluates whether the project has achieved its goals of restoring the ecosystem (habitats, species, etc).
- Social acceptability: this evaluates whether the project has been accepted and supported by local communities.
- Economic viability: this evaluates whether the project can generate enough revenue to cover its costs over the long term.
- Long-term sustainability: it evaluates whether the project can be maintained and continue to deliver benefits over time.

Projects of ecological restoration can be very effective in restoring degraded ecosystems and providing a variety of benefits to the environment and society. However, they can also be challenging to implement and manage, and there is always the risk of unforeseen problems.

3. Study visits: 2 examples of good practices



3.1. Sub-alpine meadows restoration in PLA Jeseníky

Basic information

Implemented by: the Nature conservation Agency of the Czech Republic (PLA Jeseníky Administration)

Years of realization: Since 2018 - ongoing

Type of measures: mowing, grazing, removal of non-native *Pinus mugo*

Grazing was a traditional management throughout the Jeseníky mountains for hundreds of years. Since the 1950s, this management has stopped, the pastures started to overgrow with blueberries (*Vaccinium myrtillus*), and the biodiversity decreased significantly. The negative trend was further deepened by planting of non-native mountain pine *Pinus mugo* to limit the occurrence of avalanches. As a result, a lot of plant species became endangered in the area, including several endemic species.

A specific feature of the alpine ecosystem in the Jeseníky Mountains is its considerable isolation. The Jeseníky Mountains are a true island of mountain nature in Central Europe, with endemic species. The nearest similar mountain systems are dozens, or even hundreds, of kilometres away (Krkonoše, the Carpathians, the Alps). Direct connectivity with similar areas is therefore not possible. It will always be an indirect connection through mobile organisms, such as birds, insects, or plant spores. Connectivity is therefore not a major consideration here.

Description of measures

Based on grazing experiences from other parts of the mountains, as well as from the other similar Alpine regions, the PLA Administration decided to restore grazing in the Conservation area of Praděd, which is one of the core areas in the Jeseníky mountain range.

In the first phase of the project, it was necessary to start with *Vaccinium myrtillus* removal, by repeated cutting out of the blueberry shrubs, and subsequent mowing. Grazing with sheep, cattle, and horses would be implemented afterwards.

From a smaller part of the target area, *Pinus mugo* was removed, to enable avalanches on the slopes. Avalanche tracks are very unique in the Jeseníky Mountains. They help to maintain primary forest-free areas, and thereby significantly increase the diversity of microhabitats.

There are also experimental spots where vegetation has been completely removed, and other sites testing different management types. These relatively small areas are used to test the germination of specialised endangered plant species, and their use by animals.

The project in Jeseníky had to face a major logistical challenge. The problem was the disposal of biomass during the cutting of blueberry shrubs. The harvested biomass could not be disposed of on site (by dumping, burning), it had to be transported outside the strictly protected area. In the end, the controversial route of helicopter transport was chosen.

Highlighting good practices

As the participants of the excursion agreed, the main positives of the project include:

- A consistently implemented and well-thought-out management plan that included different approaches in the restoration, ranging from grazing, through cutting, to mechanical destruction, which lead to creating specific conditions suitable for different types of plant communities, as well as the successful conservation of endangered species.

- The management is accompanied by intensive scientific research. This allows managing authorities to react to the newest scientific findings, and adjust the management plan immediately and specifically.
- A compromise was found between the interest of nature conservation and the interest of other stakeholders. There seems to be a good balance between the needs of nature conservation and socio-cultural needs, e.g. skiing on an existing slope is only allowed under certain conditions, when there is no harm for the habitat below the snow.
- Management of the area also incorporates the work of volunteers, and the project and its results are well communicated to public through installed information panels pointing out valuable species, as well as the history of the landscape and its management.

3.2. Bird Park Josefovské louky (Josefov meadows)

Basic information

Implemented by: the Czech Ornithological Society

Years of realization: Since 2006 - ongoing

Type of measures: land purchase, water management (using of old irrigation system), grazing by large herbivores (Exmoor horses, ancient ox), mowing of meadows.

The Bird Park Josefovské louky lies in eastern part of the Czech Republic, Northeast of the Josefov Fortress. Since 2006, CSO protects the environment suitable for waterfowl and other water-bound species. This non-state reserve of the Czech Society for Ornithology is the first such area funded and maintained by this NGO.

The park has no state legal protection, and is an example of the bottom-up approach to nature conservation. CSO started to purchase land in this area in 2006. Restoring shallow pools, bringing the water to areas by repaired historical irrigation systems, and reduction in vegetation cover has led to the nesting of rare, threatened, or elsewhere dramatically declining bird species [e.g. the Common Snipe (*Gallinago gallinago*), Northern Lapwing (*Vanellus vanellus*), Redshank (*Tringa totanus*) or the Spotted Crake (*Porzana porzana*)]. So far, over 180 bird species have been observed here, including the annually spotted Common Crane (*Grus grus*), and the wintering rare Short-eared Owl (*Asio flammeus*).

At the beginning, some people (esp. farmers) were against this activity, but after several years of work, the project has been accepted, and even praised, by most of the local people – the area is a frequent destination for visits from nearby settlements. Thanks to the success of this park, other similar localities have already been established.

Description of measures

CSO carries out various types of management here, especially that aimed at supporting the life of waterfowl: the creation of pools, regular irrigation, tree reduction, ungulate grazing (provided by Exmoor ponies, which are strongly related to the extinct wild horses of Europe), denudation of original surfaces, water sustainment, etc.

The most important measures are rewetting, using an old irrigation system, and introducing grazing by semi-wild Exmoor horses and ancient oxen.

CSO works with volunteers, and carries out a number of events for the public.

Highlighting good practices

Grazing by large herbivores is a very important part of reserve management, as it contributes to the overall ecological health and biodiversity of the reserve. Their grazing behaviour creates mosaic patches of short vegetation, their hooves disturb the terrain, and their dung attracts insects that feed on it. All of this provides an ideal foraging habitat for wading birds.

The area is privately managed and conserved. Area of 76 ha is being gradually purchased by the Czech Society for Ornithology with money kindly provided in the form of donations. Thanks to step-by-step land purchase, a closed area is being created for the unique purpose of nature conservation. It includes a high level of contact with the local public, who also learn of the need for such a project.

The incorporation of an over 100 year-old irrigation system connects the history of the place with the present and future as a valuable habitat.

The reserve is open to the public. There is an educational trail, observatory, and excursions are organised too.

4. Conclusion

The loss of biodiversity threatens our planet and our chances of survival. Europe's nature is in decline, according to the European Environment Agency; threatened by climate change, urban sprawl, unsustainable farming and forestry, and pollution, with more than 80% of habitats in poor condition. Protecting what we have left of nature is essential, but it is not enough to preserve biodiversity. We must also restore what we have already destroyed, and bring nature back outside protected areas. This means improving and restoring habitats decimated by human activity.

It is gratifying that our political representatives are aware of these fundamental problems, and are trying to address them. They are looking for solutions at regional, national, and European level. The EU's proposed Nature Restoration Law, adopted by Parliament in a vote with a razor-thin majority in July 2023, will set out a mechanism to halt and reverse the biodiversity loss of ecosystems in need by 2050.

The importance of ecological restoration projects is therefore exceptional, and is certain to continue to grow.

This handbook seeks to help facilitate the preparation of projects that can reverse, or at least halt or slow down, negative trends in our landscape. The handbook cannot be considered as completely comprehensive, it is just another possible tool for the complex issue of ecological restoration projects. It lists the prerequisites for the development of ecological restoration projects, describes common practices, and highlights possible risks.

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