Chapter 6. Habitat Conservation and Management Objectives

6.1 Relation of the Guidelines to the European Union "Nature Directives" and Natura 2000 Network (J. Jātnieks)

The major nature conservation legislation in the EU is Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (hereinafter - the Habitats Directive) and the European Parliament and Council Directive 2009/151/EC of 30 November 2009 on the conservation of wild birds (hereinafter – the Birds Directive). Both directives are the basis of conservation of natural habitats and wild species in the EU member states.

The Birds Directive is intended to protect all species of wild birds and their habitats in the EU. The Directive defines the protection of threatened bird species in the EU and the protection of foraging and resting sites that are most important for the migratory birds, placing special emphasis on Wetlands of International Importance. The Directive includes approximately 450 species.

The Habitats Directive is intended to promote biodiversity by protecting natural habitats, wildlife and plant species within the territory of the EU Member States. The Habitats Directive defines the necessity of protecting a total of 1,200 rare, endangered and endemic species in the EU. Annex I to the Directive includes 231 habitat types, out of which 71 are recognised as EU priority protected habitat types. In Latvia, there are 58 habitat types referred to in Annex I of the Habitats Directive, out of which 19 are protected as EU priority habitat types.

Intensive agriculture and forestry practices, change of land-use type, urbanisation and many other human influences have resulted in the critical condition of many natural and semi-natural habitat types in the EU and Latvia. The latest assessment of habitat conservation status was carried out in 2013, providing an overview of the years 2006 – 2012. Overall only 16 % of EU habitat types were assessed as being in a favourable conservation status. The conservation status of 23 % species was assessed as favourable. According to the report (Anon. 2013a), only 13% of the EU habitat types and 28% of species found in Latvia are in favourable conservation status.

The Habitats Directive requires the implementation of nature conservation measures in a way that maintains or restores the favourable conservation status of natural and semi-natural habitats, wild animal and plant species. In this edition the proposed guidelines include a set of techniques and methods for the promotion of favourable conservation status of the EU protected habitats in Latvia. However, it is only a part of a set of actions included in nature conservation (*see Chapter 4*)

According to the Habitats Directive, one of the ways of saving the habitats listed in Annex I and species listed in Annex II, is the creation of protected nature areas. Together with the areas established in accordance with the Birds Directive, they are an integral part of the EU protected area network Natura 2000. The establishment of protected areas is based on the scientific criteria provided in Annex III. Upon the planning and implementation of nature conservation measures in accordance with the Habitats Directive, for example, developing nature conservation plans, the economic, social and cultural requirements, as well as regional and local characteristics must be taken into account.

In 2016 in Latvia there were 333 Natura 2000 sites including seven protected marine areas. The total area of terrestrial Natura 2000 sites equals approximately 11.5% of Latvia's territory. Latvia has pro rate the third smallest area of protected nature areas in the country out of 28 EU Member States (compared to ten EU Member States, where Natura 2000 areas account for >20% of the country area).

Natura 2000 sites of Latvia vary in size. They are both small (up to 1 ha) and also reach areas larger than 90 000 ha, depending on features and conservation objectives of their species and habitats. The average area of Natura 2000 sites in Latvia falls within the range of 100 to 1,000 ha. Many of them are known to the public as popular natural heritage sites – national parks, nature parks and nature reserves, as well as areas which create and maintain our agricultural, forest, mire, water and coastal landscape – a significant part of natural and cultural history heritage.

Article 6 of the Habitats Directive defines the requirements for Natura 2000 area conservation and management. Article 6 provides that the protection regime corresponding to habitat and species conservation should be determined and implemented. It also provides for active measures for the prevention of degradation and adverse effects on species to prevent their deterioration, if the principle of "non-interference" and caution

is insufficient for the conservation of the particular species or habitats. These guidelines are a part of the measures set out in Article 6 and offer recommendations for habitat restoration, maintenance and creation in sites where they have been destroyed, taking into account the condition of EU habitats in Latvia and evaluating the real conservation opportunities.

6.2 The Common Objectives of the European Union for the Conservation of Habitats and Species (A. Priede)

One of the objectives of the EU Biodiversity Strategy to 2020 requires that by 2020 the Member States should restore at least 15% of degraded ecosystems in their territories (European Commission 2011). The restoration result includes not only the total area of the restored habitats, but mostly the conservation status – improvement of living and non-living environmental conditions. Considering the degree of human impact on ecosystems in Europe today, the elimination of all adverse effects and completely "fixing" their consequences would be too expensive, technically difficult and sometimes even impossible. Therefore a condition, where a considerable improvement has been reached, at least in the form of recovery of main functions, processes, structures, as well as species populations and suitable conditions, is defined as restoration. The reference point is the year 2006 – the year when the first report on the conservation status and areas of habitat types included in Annex I of the Habitats Directive was prepared (Lammerant and et al. 2013).

Actually this means that any habitat restoration in a specific area will at the same time have a favourable local effect (will restore the specific habitat area). Meanwhile, each restored area will be a mosaic piece that helps to maintain favourable habitat conservation status in the country as a whole. It is possible to gain insight into the total situation (desirable or real) by assessing and planning actions at a national level. Ideally, major restoration areas should be selected in the overall picture, taking into account the principles of landscape ecological planning. But even if we act at a local level and are not aware of the overall picture, any restored or properly managed habitat area will improve the overall situation a little.

In 2013 Latvia, as well as other EU Member States, prepared a Prioritised Action Framework for Natura 2000 sites. It is an action programme drawn up to achieve the objectives of biodiversity conservation, which makes provisions for the conservation of species and habitats based on their degree of risk. Meanwhile, these guidelines provide the instructions for the performance (or in some cases – on the contrary – non-performance) of certain activities aimed at implementation of the habitat and related species conservation objectives provided in the priority action framework.

6.3 Grassland Habitat Conservation and Management Objectives in Latvia (A. Priede, S. Rūsiņa, A. Auniņš)

According to the Law on the Conservation of Species and Biotopes[4] the objective of habitat conservation is to provide a set of factors that favourably affects the habitat and its characteristic species and promotes the natural distribution, structure and functions of the habitat, as well as long-term survival of its characteristic species. Habitat conservation throughout its range or – in a narrower sense – at a national level, is considered to be favourable if its natural range and areas where it can be found are stable or increasing, it has specific structure and functions necessary for the continued existence of the habitat, and it is expected that they will exist in the near future, as well as that the conservation of the characteristic species is provided.

The objective is to ensure a favourable conservation status for semi-natural grasslands. This means ensuring a sufficiently large area where the species and communities of the specific grassland habitat can coexist in the long term; maintaining the environmental conditions characteristic of the specific grassland habitat (including appropriate management) required to ensure the ecosystem processes; conserving and maintaining the species populations characteristic of the habitat type. The aims of semi-natural grassland habitat conservation and management are both the conservation of biodiversity and the provision of ecosystem services. Therefore, in the conservation and restoration of grassland habitats the ecosystem approach is important – by ensuring the functionality of the entire ecosystem, separate EU habitat types will also exist.

The following tasks have been set to ensure favourable conservation status for the EU protected grassland habitats in Latvia. This can be evaluated by using specific features.

[4] With the amendments as of 1 January 2016.

To stop the reduction of grassland habitat area and to increase area up to the minimum favourable conservation area (*see Chapter 4.3*):

- the total area of habitat in the country does not decrease;
- the number of habitat localities in the country does not decrease (with the decrease of habitat area or extinction of locality, also the potential of habitat and its characteristic species conservation in the whole region decreases, including a decrease in its range).

To provide the environmental conditions and ecological processes necessary for the habitat and restore them where required:

- there are optimum hydrological and soil conditions for the existence of the habitat;
- there are ecological processes important for the habitat (species distribution and landscape connectivity within the habitat, flooding activity, turf formation, organic matter circulation driven by grazing and mowing);
- structure (micro-terrain, life forms) characteristic of the habitat;
- contact area with natural or semi-natural habitats significant for biodiversity conservation (potential impact from adjacent areas).

To ensure the long-term survival of the species characteristic for the habitat:

- diversity and distribution of plant communities characteristic of the habitat on a national level;
- presence and distribution on a national level of species characteristic for the habitat and umbrella species; presence of rare, endangered and vulnerable (protected) species in the habitat and distribution in the country;
- presence of atypical species (species that indicate degradation), expansive and invasive species and their proportion in the habitat area.

When assessing the grassland conservation priorities from a species conservation point of view, less attention should be paid to the presence of locally or nationally rare species and regionally and globally endangered species should be prioritised. Species are often rare on a national level only because they are at the border of their range, while their populations on a larger scale are sufficient for their sustainable maintenance. For example, in Latvia populations of such species are more dependent on the processes in the core area of their range than on the habitat conservation or restoration measures carried out in Latvia. At the same time, species with relatively large populations in the country may be at risk on a larger regional or even global scale, increasing the responsibility of the country for the maintenance of their population.

Latvia has a number of grassland-related bird species, the populations of which in Latvia are an important part of their European or global populations. Such species are *Crex crex* (more than 20% of the EU population) and *Aquila pomarina* (approximately 20% of the global population of the species). The experience of creating the Natura 2000 network shows that the creation of protected areas for endangered species on an EU scale has helped to ensure the conservation of many other animal and plant species that are rare in Latvia (included in the Red Data Book of Latvia), while not included in the annexes to the Birds Directive or Habitats Directive, or protected in Latvia (not all species included in the Red Data Book of Latvia are protected) (Opermanis u. c. 2008).

The guiding principle of these guidelines is the assumption that it is always better to protect and maintain natural ecosystems by, wherever possible, eliminating the adverse effect and extensive pressure, rather than to damage and then try to "fix" them. Restoration of degraded ecosystems always involves the risk of failure and high costs. Many natural values may be irretrievably damaged, rare species, unique conditions, beautiful landscapes and resources required for the survival of nature and humans may be lost. Numerous examples from around the world confirm that investments required to restore natural ecosystems far exceed the resources needed for saving them. Moreover, the costs increase with the increase in degradation level. Thus proper conservation and maintenance of natural ecosystems is always a priority, and restoration or management is to only be used as a tool to "fix" already degraded ecosystems.

6.4 Setting Conservation and Management Targets in a Specific Area (A. Priede, S. Rūsiņa)

Defining the objective is the most important step prior to starting habitat restoration – what do we want to achieve with our activity? Knowledge of the natural or ideal condition of the habitat and ecological requirements of the species present are required to answer this question. In addition, the target status should include both the area and the quality of the habitat. In order to determine this, the understanding of the actual potential including the impacts and obstacles is required in each particular case. To define the target status in a par-

ticular area, the conditions in the area and next to it as well as the impacts that are long lasting and sometimes not avoidable by means of our effort, should be considered. Sometimes only improvement of the status is possible - a kind of compromise that is better than doing nothing.

Various errors are made when setting the objectives due to inadequate assessment of the current situation, causes of degradation, and background conditions. For example, the restoration of primary "wild" nature is not realistic even in Natura 2000 sites of Western Europe, which have been heavily modified by human activity, affected both by the pollution and climate change. It is definitely more useful to try to restore a functioning and self-regulating ecosystem instead of degraded ecosystem, even though it only vaguely resembles our imagined wild nature condition (Hilderbrand et al. 2005; Thorpe, Stanley 2011).

Achievement of habitat restoration and maintenance objectives often depends on outside conditions rather than the situation in the grassland itself. Therefore, a number of ecological and socio-economic considerations should be taken into account, when planning grassland restoration in a certain area.

Ecological considerations

- Connectivity in the landscape is very important for the long-term survival of grassland species. It ensures their movement from one grassland to another and maintenance of sufficiently large and genetically diverse populations. Thus, it is more important to restore grassland located in a system of other grasslands or a larger area rich in semi-natural grasslands than isolated grassland in a forested or intensive agricultural landscape. The restoration will also be more successful in this case as species will be able to easily disperse to the restored grassland from other grasslands (*see Chapter 24*).
- Grassland area is particularly important for birds, but a larger grassland is also more relevant for the conservation of plant and invertebrate species. Therefore, if other factors (see below) are similar, restoration of larger grasslands should be prioritised.
- Grassland biodiversity – the higher it is, the more important it is to restore such grassland.
- Presence of protected species – if a protected species has survived in the grassland, the conservation of such grassland should be prioritised over the grassland which has no such species.
- Changes of grassland environmental conditions: it is preferable to restore grasslands where the environmental conditions are less changed.

The biggest disappointment usually happens when one assumes that it is enough to restore the abiotic environmental conditions, and the set of characteristic species will establish soon. It can work out in conditions that are still little-affected, but the success can be poor when trying to restore habitats in heavily fragmented landscapes. If characteristic species are absent, they must sometimes be introduced artificially. Although the artificial reintroduction of the characteristic species is a rather common technique nowadays, it can be unsuccessful, even if seemingly suitable conditions have been restored or created (Hilderbrand et al. 2005). This is most likely because of an incomplete understanding of the ecological requirements of the species, inter-species relationship, soil properties, biogeochemical processes or other factors that do not allow species to adjust themselves in the new site, even if it has also existed there before.

Also, it is not easy to control the spread of "undesirable" species. Most often they are invasive species that, under the influence of global changes, are spreading more rapidly, taking the ecological niches of native species and causing significant, sometimes even irreversible changes to ecosystems and their functioning. These species usually benefit from changes in background conditions. Usually, conditions unfavourable for them exist in natural ecosystems, where they are unable to survive or at least mass-reproduce and create large populations. Changes in environment caused by human action – eutrophication, landscape fragmentation, artificially created dispersal routes – creates conditions favourable for them. The control of invasive species dispersal and influence is a difficult task, which locally requires permanent and patient work that may also be unsuccessful if these species are not combated at a national or regional level.

Assuming that we have acted correctly when restoring the ecosystem in some area and the result is successful, we cannot be sure that this is the perfect recipe that works for all similar cases (Hilderbrand et al. 2005). It is also unknown how each particular ecosystem will "behave" in the longer run after restoration. Only long-term observations can show whether the goal has been reached and even if it has not, whether the result can be considered as successful.

The background of the modern environment like climate change, pollution, changes in land use which, in turn, are related to human lifestyle changes, should be considered in ecosystem restoration planning. For example, European semi-natural grasslands in the second half of the 20th century have been affected not only by drainage and cultivation but also by climate change and eutrophication caused by air pollution, which is likely to promote the enrichment of grasslands with nutrients and restrict the species dispersal. It is erroneous to think that Latvia is still a country which has been relatively little affected by these changes. This background should be considered for realistic goal setting in the restoration of many habitats.

Socio-economic considerations

- Long-term management perspective: grasslands with a higher probability that they will be permanently managed after restoration should be prioritised. Restoration is only worth planning in places where long-term grassland management is expected. Otherwise, the financial means invested in restoration will be spent unsustainably and provide only a temporary benefit (or none at all) for the conservation of biodiversity (depending on the immediate success of restoration).
- Grassland multifunctionality: priority is grasslands where more diverse use is expected after restoration, for example, where management not only ensures biodiversity, but also provides animal feed for farming, the grassland is used for tourism, gathering of medical plants or environmental education. However, even if the grassland is not used to produce animal feed, its management is still considered to be production – production of nature values and biodiversity.
- The attitude of the local community, local municipality, the owner and manager: the more the local community appreciates biodiversity and its benefits, the better the prospect of maintaining restored grassland in the long term.
- Restoration costs in relation to the expected results: restoration of grasslands that can be restored with minimum investments and maximum benefit (the expected restoration success is very high) should be prioritised. Grassland maintenance costs should also be considered. In the planning stage, including financial planning, the cost or income related to the materials created in habitat restoration or management – wood, mown biomass, removed topsoil, etc. should be considered. It is hard to find a practical application for such materials if the cost of introducing them in the commercial production is too high. Furthermore, the removal and further disposal of such habitat restoration "side products" can lead to significant extra costs.

When setting a restoration or management objective for a specific area of habitat, it is important to thoroughly investigate the earlier (before impact, if any) and current situation, as well as the causes and factors of changes promoting habitat degradation or regeneration. This information should be considered when planning the restoration priorities and measures. Restoration and management should be carried out according to the individual restoration and management plan of every site (*see Chapter 7.1.2*).

If the objective is clear, the next step is to understand how to achieve it – the actions that will lead to its implementation. This requires detailed examination of the situation, including examination of site conditions, clarification and choice of the potential habitat restoration and maintenance techniques and assessment of their suitability for the particular situation and taking into account the available resources. Before planning the restoration, it is very important to find out what protected and rare plant and animal species are found. Already in the idea stage we should be able to assess the extent to which the objective can be achieved, and anticipate obstacles. This will help to decide whether the investments will meet the expected result. Otherwise, it is better to invest where it is more worthwhile.

There are two options for setting realistic restoration and management objectives – restoration of the earlier "ideal" situation and a restoration compromise.

Restoration of the earlier "ideal" situation is the restoration of the previous habitat area and functionally important processes required for the existence of habitat. This objective can be set, if reliable and detailed information is available on the previous area of this habitat, its environmental conditions and species composition. Restoration of the previous "ideal" situation is only possible if there are no irreversible or significantly degraded conditions in the area and surroundings that would make the restoration of habitat and its necessary processes impossible. For example, restoration of floodplain grasslands to their previous size and previous environmental conditions in a drained river floodplain is often impossible. Rewetting may

affect the adjacent areas, where it is not acceptable, as well as create environmental conditions that will render grassland maintenance too expensive and impossible due to current socio-economic reasons (for example, lack of human resources in remote areas to ensure manual mowing of wet grasslands).

Restoration compromise. If, for whatever reason, restoration of the previous "ideal" situation is impossible, the objective of restoration and management is the promotion of grassland biodiversity within the scope of current environmental conditions. In this case, the habitat will only be restored partially or even another type of habitat type will establish (for example, a mesic grassland will develop instead of wet sedge grassland in a drained floodplain, or a meadow will turn into a pasture habitat) however this will benefit biodiversity more than leaving the grassland to overgrow or transforming it into intensive agricultural land.

Thus, specific, precisely defined objectives should be pursued. Sometimes the priority objectives should be established among several possibly conflicting objectives (*see Chapter 7.1.4*).

When the objectives are defined, appropriate methods should be chosen to implement them (*see Chapters 20–24*) and results should be assessed (*see Chapter 7.4*).