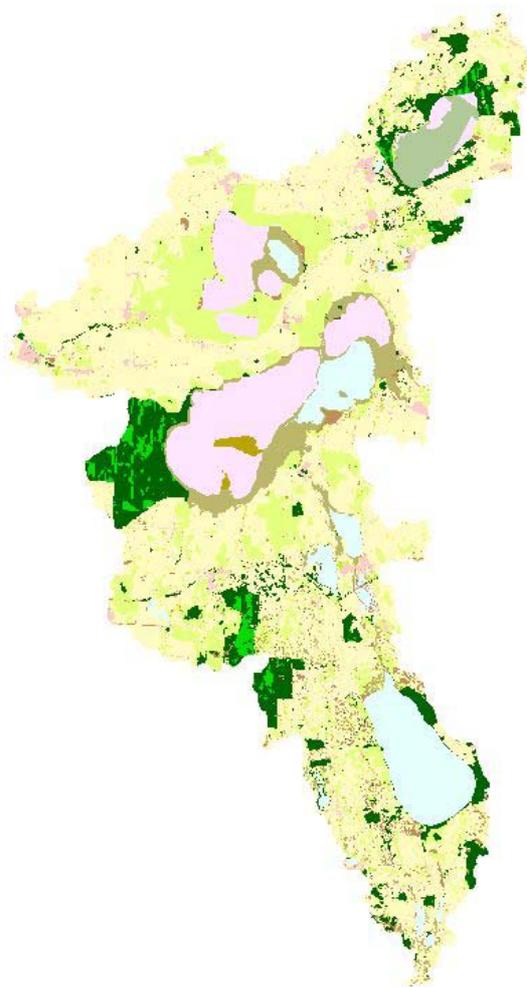


Agri-environment Measures for Žuvintas



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dienst landelijk gebied
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1. Introduction

In accordance with the EU Rural Development Regulation (1257/1999) all Member States have been obliged to develop and implement agri-environment schemes and programmes (Articles 22-24) that offer payments to farmers who voluntarily adopt more environmentally-friendly farming practices. This was the only obligatory measure under the Rural Development Regulation and also applies to the accession countries that have recently joined the EU, including Lithuania.

Lithuania began working on a (draft) agri-environment scheme in the late 1990s and it was hoped that a pilot scheme including a wide range of measures beneficial to biodiversity and the protection of natural resources would become operational under the SAPARD pre-accession programme. Unfortunately, this objective was not achieved – but a relatively simple national programme with four horizontal measures was introduced in 2004 after EU accession.

Although the European Commission criticised the Lithuanian national agri-environment programme for being a rather limited response to the environmental and biodiversity problems in Lithuania's rural areas, it did approve the programme (after several adaptations) for implementation in the short programming period of 2004-2006. It was stressed however that the national agri-environment programme needed to be strengthened for the forthcoming programming period 2007-2013.

The Dutch-funded project “Strengthening capacity for agri-environmental programming and implementation in Lithuania” began in 2003. The purpose of the project was to support the development of the institutional capacity (at national and local level) that is necessary for the full and effective implementation of EU-funded agri-environment measures in Lithuania. The project also included a component supporting: a) further development of the pilot agri-environment measure (and its implementation) under SAPARD and b) draft proposals for the next programming period (2006 - 2013). This report is a product of this final project component.

1.1. Focus on Žuvintas Area

The Dovine Basin, including Žuvintas, was selected as a case study because it offers excellent opportunities to explore the opportunities for integrate a “horizontal” and “zonal” approach within future agri-environment measures in Lithuania. In particular, this case study clearly demonstrates the opportunities to use agri-environment measures to support other EU directives (notably Natura 2000) and thereby contribute to increased policy integration for environmental protection and nature conservation.

This case study aims therefore to deliver the following outputs:

- Provide ideas for new agri-environment measures, tailored to the Dovine Basin but - at the same time - contributing to national programme development;
- Deliver a contribution to the Management and Restoration Plan for the Dovine River Basin.



1.2. Relation to the Dovine River Basin Project

The PIN/MATRA project 'Management and Restoration of Natura 2000 sites through integrated river basin management plan of the Dovine River' is being implemented by International Agricultural Centre (IAC, The Netherlands) and the Nature Heritage Fund (Lithuania). It aims to produce a Management and Restoration Plan for the Dovine River Basin.

Although the Dovine River Basin project focuses mainly on hydrological modelling, water management practices and restoration of important wetland areas, land use options are considered to be an important topic. However, there are few supporting activities within the project to examine how to achieve the necessary changes in land use. It was therefore agreed that this case study on land use in relation to agri-environmental zoning in the Žuvintas area should also contribute to achieving the objectives of the PIN/MATRA project.

1.3. Project Activities

The following activities were therefore undertaken to complete this case study:

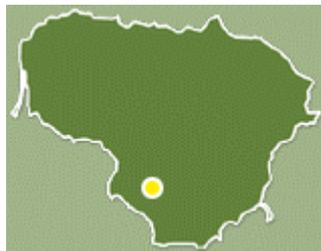
1. Assessing the need for additional agri-environment measures in the Žuvintas area, with respect to the obligations following from the Biosphere reserve Management Plan, the Natura 2000 obligations and (other) legal obligations.
2. Collecting information on legal obligations and data on farming, biodiversity and existing compensation schemes for damaging birds.
3. Elaboration of draft proposals and discussing them with local stakeholders (two workshops) in close cooperation with the director of the Biosphere Reserve.
4. Finalising the programming proposals for the study area.
5. Provide recommendations on the relation and importance to other Lithuanian regions and to the implementation of Natura 2000.



2. The Žuvintas Area

2.1. Description of the Area

General



The Žuvintas area is situated in the south of the central Lithuania lowlands, southeast of the city of Marijampole. The 'core' is the shallow 975 ha Žuvintas lake and the extensive complex of mires and bogs, totalling almost 7,000 ha. This area, that has been a strict reserve area for many years, is surrounded by farmland (grassland as well as arable land) and forest. Several rivers flow into the Žuvintas lake; the Dovine river carries the water out in a northwest direction. In 1968, a dam was built at the source of the Dovine River, raising the lake's water by 30-40 cm. The sluice enables artificial regulation of water level in the Žuvintas lake.

In the second half of the 20th Century large parts of the surrounding raised bogs were drained, influencing the lake's water level and increasing eutrophication. Of the neighbouring Amalvas mire, two-third was drained and transformed to farmland.

Biodiversity

The Žuvintas nature reserve is famous for its rich biodiversity:

- as to the flora, it is the only site in Lithuania where one can see widely stretching reed-beds, large raised-bog with plant species preserved since the glacial period, floating vegetation islands in the lake and very rich underwater vegetation. The floating vegetation covers about 60% of the lake surface. There is also abundant heath, cotton grass, marsh tea, and cranberry. In the bordering Bukta woods remain areas of old broad-leaved forest of ash and oak, but there also grow mixed groves of alder, ash, asp, birch and spruce;
- however, the main attraction are the Žuvintas birds: 256 species are recorded, of which 135 breeding. This is one of the few sites in Europe where we find globally endangered species like aquatic warbler and ferruginous duck. Migratory birds include numerous geese and cranes. 85% of all the wading bird species found in Lithuania are recorded in the Žuvintas strict nature reserve;
- as to the mammals, notable are elks, beavers and sometimes even wolves;
- finally, the area is also rich in amphibians, reptiles and fish.

Agriculture

Data on farming in the region originate from the project "Conservation of Inland Wetland Biodiversity in Lithuania", including a 2001 survey of local municipalities (Uždavinienė 2002). Table 1 indicates that there are over 2,000 full-time farms in the area, using 75% of the farmland with an average farm size of 8.5 hectares. The number of households using farmland is even bigger, over 3,000, but as the average size of their land is only 2 hectares, their share in the total area is much smaller: 25%.



Table 1. Farms and farmed area around the Žuvintas wetland in 2001

	Name of local municipality					Total
	Gudeliai	Igliauka*	Liudvinavas*	Simnas	Krosna	
Number of farms	389	184	205	1,263	194	2,235
Area used by farmers (ha)	3,170	2,406	3,213	8,284	1,731	18,804
Number of households	446	418	777	1,322	293	3,256
Area used by households (ha)	1,178	966	1,894	2,280	656	6,974
Average farm size (ha)	8.1	13.1	15.6	6.6	8.9	8.42

* as only half of these municipalities are included in the study area, half of the total number of farms has been included here

Source : Uždavinienė 2002.

Land use, habitats and protected status

The Žuvintas lake at its direct surroundings consist merely of natural habitats: water habitats (among others the famous floating islands of vegetation), fens and mires - relatively undisturbed raised bog habitat. Because of its biodiversity values, a 5,442 ha state strict nature reserve was established already in 1937. In 1993, a somewhat larger area of 7,500 ha was proclaimed a RAMSAR site (wetlands of international importance). This area consists mainly of peatland.

In the direct vicinity, north and south of the strict reserve, there are valuable grassland and sedge habitats, although partly drained. These areas, where the soil turns to clay and loam, are included in the relatively recent designation of the 18,490 ha Biosphere Reserve. The same area has now been designated under the EU's Birds Directives (SPA). The Habitats Directive (PSCI) includes the strict reserve area and some smaller areas in the south part of the Dovine River Basin, around the Dzukija Lakes. Here, where the soils are more sandy and the altitude increases, a Regional Park is established.

2.2. Existing Protection Obligations

Žuvintas biosphere reserve has several zones. These include agricultural zone, forestry zone, ecosystem restoration zone, protective zone and nature reserves (botanical and botanical-zoological). Practical legal restrictions exist only for the territories that have status of nature reserve (both botanical and botanical-zoological). These requirements are set in the Special Provisions on Land and Forest Use (Lithuanian Republic Government Order No. 343 of May 12, 1992, as amended by the Government Order No 1640 of December 29, 1995). Other zones do not have real restrictions related to zoning.

Lithuanian Republic Government Order No. 399 of April 8, 2004 proclaims Žuvintas reserve as SPA (Žuvintas, Žaltytis and Amalvas wetlands). Environment Ministers' Order No. D1-223 of April 29, 2004 proclaims Žuvintas lake and Bukta forest as SAC. The whole territory of the Žuvintas reserve is subject to legal requirements and recommendations for Natura 2000 territories (Birds Directive), in accordance with the species list approved by the Ministry of Environment. However, these requirements and restrictions can be applied only in case of start of some activities. These will require projects to be co-ordinated with the administration of Žuvintas biosphere reserve.



Special Provisions on Land and Forest Use set a number of restrictions and prohibitions for botanical and botanical-zoological reserves. Most of them concern forests, hydrological regime, water bodies, construction works, etc., and are not relevant for this case study. The ones that are of relevance can be summarised as follows. In both types of the reserves, land use structure may be changed only in accordance with projects approved by the Ministry of Environment. It is prohibited to change water level of rivers and lakes, to change hydrological regime, to drain the land, to afforest glades, natural meadows and pastures, to fertilize and improve natural meadows and grasslands, to convert them into other land uses, to apply pesticides. Land owners and users in botanical-zoological reserves can not prevent visitors from access to the protected objects.

Transposition of the EU legal requirements regarding Birds and Habitats Directives and Natura 2000 territories in Lithuania included amendment of existing, or preparation of new legal acts, the total number of which exceeds 25. Main requirements for the Natura 2000 territories are set in Lithuanian Republic Government Order No. 276 of March 15, 2004, on General Regulations on Important Territories for Habitats and Birds Protection (SPAs and SACs). According to this Order, regime for protection and use of the SPAs and SACs should correspond to the protection and management needs of the natural habitats and plant or animal species occurring in concrete territories. When SPAs and SACs are designated in state nature reserves, state parks or biosphere reserves, implementation of protection and management measures is organised by administrations of these protected areas.

Protection and management requirements for SPAs and SACs are set in 2 Annexes. Requirements set for different habitat types or species consist of two types of provisions - prohibitions and measures that should be encouraged. While prohibitions have to be followed obligatory, and therefore, farmers can not get compensations by agri-environment payments (however, compensations can be paid through the LFA measure), the measures to be encouraged and promoted can be used in designing additional agri-environment measures. Below we summarize the protection and management requirements for SPAs and SACs that are relevant to the Žuvintas area.

In *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils, it is prohibited to plant forest, single trees or bushes, to change natural grasslands, sow cultural grass, fertilize, to cut humps, to plough grasslands or alter habitats on other ways. Promoted activities include mowing and grazing in stock densities set by planning documents of the protected areas. In Lowland hay meadows, it is prohibited to drain, plough natural grasslands, sow cultural grass, fertilize, lime soils or alter natural grasslands in other ways, as well as to plant forest. Mowing, grazing and regulating of shrub spreading are promoted types of actions. In alkaline fens, it is prohibited to change hydrological regime of territories and water bodies connected to the fen; while mowing with intensity set in the planning documents is to be promoted.

In the habitats of rare amphibian species it is prohibited to apply fertilizers and pesticides, and creation of new ponds is promoted.



In SPAs, farming practices (set in the planning documents) that maintain proper state of birds habitats are to be promoted. In territories important for Corncrake protection it is prohibited to change main land use, except conversion into conservation zone, to convert grassland into arable land, to change hydrological regime, if this would have negative impact on feeding habitats, to plant forest. Activities for restoration of earlier drained biotopes, organic farming, ecological mowing techniques (start mowing from the centre of the field, scaring birds before mowing), removal of scrub and reeds, not applying pesticides, extensive grazing (1-2 LU/ha) and hand mowing is encouraged. Recommended mowing date - after July 1, grazing date - June 15. In Great Snipe territories, prohibitions and promoted actions are similar to those applying for the Corncrake territories. The difference is in later mowing date - July 15, and animals should not be left in grasslands overnight. Similar conditions apply also for Aquatic Warbler sites, but recommended mowing and grazing dates are the latest of all - both mowing and grazing should be started after July 20.



3. Motivation and Approach

3.1. Motivation for Action

The following arguments are presented as justification for the elaboration of a series of new, tailored agri-environment measures and packages for implementation in the Žuvintas area:

1. The measures in the existing National Agri-environment Programme are insufficient to fully protect and enhance the biodiversity and landscape value of land managed by farmers in the Žuvintas area. There are three ways in which an adequate package of measures could offer better protection:
 - By decreasing the actual and potential negative effects of farmland on the strict nature reserve. The existing packages deal with this to some extent, but (for example) a package for the conversion of arable land to grassland (which in other countries has proven to be relatively effective in reducing nutrient leaching and run-off) is lacking;
 - By better protecting the biodiversity and landscape value of the adjacent farmland itself. The farmland contains important biodiversity (botanical and ornithological) and landscape values;
 - By better accepting the effect of the reserve area on adjacent farmland. For this reason, packages for accepting damage by foraging birds are included.
2. The rather general measures in the existing National Agri-environment Programme do not fit the Žuvintas farmers very well and uptake is rather low. A package of measures that was better tailored to the specific characteristics of the Žuvintas area would greatly increase the scheme's uptake and benefits.
3. The current packages include prescriptions (especially on mowing and grazing) that - from an ecological point of view - seem to be more strict than is necessary. This increases the farmers' reluctance to join the scheme and limits the uptake and benefits.
4. As the Lithuanian environmental and conservation legislation has been drastically changing, it seemed useful to carry out an exercise to sharply determine which measures are legally obliged and which ones are voluntary and can be paid for under an agri-environment scheme. This especially applies to the relation between the Natura 2000 obligations and the implementation of an agri-environment scheme.
5. It is very important to anticipate the new Rural Development Regulation (2007-2013) and to contribute to the process of innovation and generation of ideas that will be necessary for development of the future National Agri-environment Programme for Lithuania.
6. Although the proposals for Žuvintas are specific to the region, they can be presented as an important example to other regions in Lithuania.



3.2. Justification for a Zonal Approach

The existing agri-environmental measures implemented under the 2004-2006 RDP are “horizontal” measures which are available to farmers in the whole territory of Lithuania and their aim is to give support for environment-friendly production and farming methods in all land-use types.

In contrast, “zonal” or “regional” agri-environment measures provide support in designated areas or regions for the adoption of environment-friendly farming practices or agricultural land-use systems that deliver specific benefits for the protection of natural resources (e.g. control of severe soil erosion), nature conservation (e.g. maintenance of high nature value pastures and meadows) or landscape management.

Zonal measures are commonly targeted at areas which have special requirements in respect of nature conservation and landscape management. One category of these special target areas are Natura 2000 areas.

The Lithuanian government has international obligations to implement Natura 2000 and the main conservation obligations are established in the EU Birds and Habitats Directives.

The Bird Directive requires Member States to take appropriate steps to avoid pollution or deterioration of habitats or any disturbances (particularly during the period of breeding and rearing) affecting the birds in specially established protected areas.

The Habitats Directive requires EU Member States to establish priorities in the special areas of conservation for the maintenance or restoration (at a favourable conservation status) of natural habitat types in Annex I or a species in Annex II and for the coherence of Natura 2000, and in the light of the threats of degradation or destruction to which those sites are exposed. For special areas of conservation, Member States have to establish the necessary conservation measures involving appropriate management plans specifically designed for the sites or integrated into other development plans, and appropriate statutory, administrative or contractual measures which correspond to the ecological requirements of the habitats or species. They also have to take appropriate steps to avoid, in the special areas of conservation, the deterioration of natural habitats and the habitats of species as well as disturbance of the species for which the areas were designated.

Measures taken in accordance with the Habitat Directive should take into account economic, social and cultural requirements and regional and local characteristics. Member States should endeavour in their land-use planning and development policies and, in particular, with a view to improving the ecological coherence of the Natura 2000 network, to encourage the management of features of the landscape which are of major importance for wild fauna and flora. Such features are those which, by virtue of their linear and continuous structure (such as rivers with their



banks or the traditional systems for marking field boundaries) or their function as stepping stones (such as ponds or small woods), are essential for the migration, dispersal and genetic exchange of wild species.

The draft Council Regulation on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) that will replace the existing Rural Development Regulation makes a clear link between agriculture and rural development policies and Natura 2000. It says that:

“The programming of rural development should comply with Community and national priorities and complement the other Community policies...Support for specific methods of land management should contribute to sustainable development by encouraging farmers and forest holders in particular to employ methods of land use compatible with the need to preserve the natural environment and landscape and protect and improve natural resources. It should contribute to the implementation of the 6th Community Environment Action Programme and the Presidency conclusions regarding the Sustainable Development Strategy. Key issues to be addressed include biodiversity, NATURA 2000 site management, the protection of water and soil, climate change mitigation including the reduction of greenhouse gas emissions, the reduction of ammonia emissions and the sustainable use of pesticides”.

The general objectives of current Lithuanian agri-environment programme refer to biodiversity and important ecological areas, but specific measures do very little about them. Zonal measures proposed in this report will specifically address biodiversity protection in Natura 2000 areas.



4. Suggested Agri-environment Measures

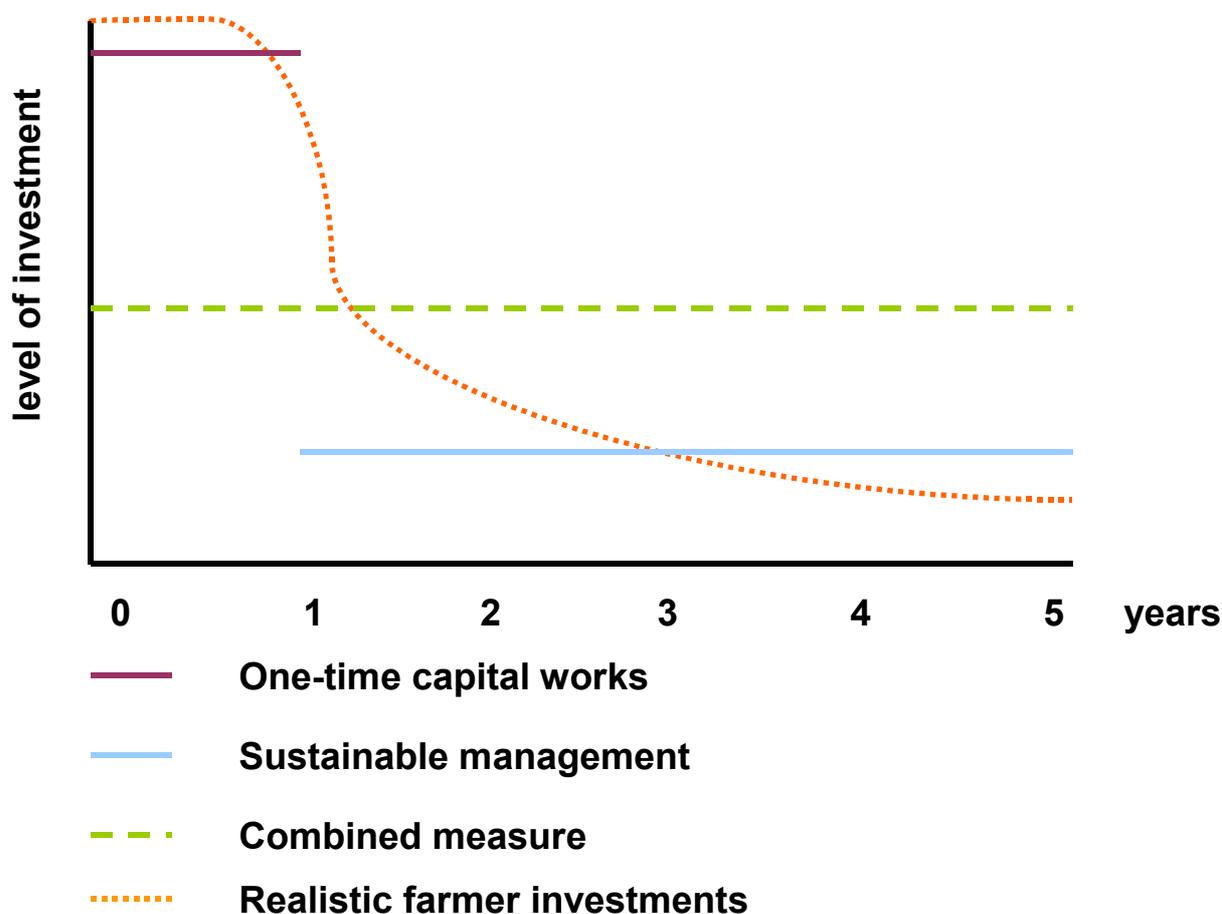
In this chapter, we will describe and motivate the additional agri-environment measures that could - to our opinion - benefit the Žuvintas area as well as larger parts of the Lithuanian countryside. We make a distinction between:

- On-going (maximum 10 years) measures for regular/periodical management (§ 4.1);
- one-time capital works or investments (§ 4.2).

This distinction is made because:

- it not always needed to use the one-time capital works to be able to join one of the sustainable management measures;
- and when it is needed the length and area differs from one farm to another;
- it is more attractive to the farmer, because his expenditures in the first year are being paid immediately.

Figure 1. Farmer's expenditures for implementing agri-environmental measures





Before we go into more detail, we will summarise the measures in the scheme below.

Table 2. Proposed agri-environmental measures for Žuvintas area

Type of measure	Measure	Packages
Sustainable management	A. Natural grassland management	A1. Grassland A2. Wetland
	B. Grassland bird management	B1. Mowing after 1 July B2. Mowing after 15 July B3. Grazing after 15 June B4. Leaving parts not-mown (year-round)
	C. Special feeding areas for cranes and geese	C1. On grassland C2. On arable land
	D. Conversion of arable land to grassland	D. Conversion of arable land to grassland
	E. Management of reedbeds	E. Management of reedbeds
	F. Landscape elements	F. Landscape elements
	G. Fence maintenance	G. Fence maintenance
One-time capital works	A. Removal of shrubs and trees	A. Idem
	B. Idem in buffer strips along watercourses	B. Idem
	C. Establishment and restoration of landscape elements	C1. Trees / woody elements C2. Ponds
	D. Fencing	D. Fencing

Note: we proposed measure on management of Landscape elements as a measure suitable for Žuvintas area. However, this measure is a horizontal measure by its nature, and, therefore, can be applied throughout the country. We think that the best option would be to include landscape elements in the horizontal general measure that is currently being drafted by the Lithuanian Water Management Institute. This way the protection of landscape elements would be secured everywhere, and the payment for the general measure would increase making agri-environment more attractive to farmers.

4.1. Measures for On-going Management

A. Botanical management for natural meadows

Natural meadows are threatened and important habitats, as they support a rich mix of grasses and flowers. The acreage of natural and semi-natural grazing land which does not have fertiliser added and it is not ploughed has fallen dramatically, and the remaining acreage of mown meadows only amount to a fraction of the original area. Such traditionally cultivated land has largely been abandoned in favour of more rationalized, high-yielding production on arable land or fertilized agricultural land in general. It is of vital importance for the conservation of biodiversity values in the agricultural landscape.



According to the Special Provisions on Land and Forest Use (Lithuanian Government Decision No 343), natural meadows and pastures are meadows and pastures that have not been drained and ploughed for no less than 25 years and in which natural grass species are prevailing.

Some of the wet grasslands and sedge vegetations adjacent to the strict reserve area have outstanding botanical value. Although part of this land is state-owned, the farmers or companies using the land are able to join the agri-environment scheme if they have a contract for at least five years.

The objectives of the measure are to conserve natural grasslands by maintaining traditional grazing and hay-cutting patterns, to maintain and enhance the species-richness of meadows, to restore neglected areas by reintroducing management, and prevent possible future introduction of intensive farming systems.

Obligations include:

- mowing after 1 July (good farming practice requires mowing every year);
- remove the mowed material;
- grazing is allowed up to 0.7 livestock units per hectare (normal grazing season is 130-140 grazing days per year). In case of grazing, an additional incentive (payment) is foreseen;
- start grazing not earlier than 15 June;
- no ploughing and seeding;
- no application of fertilisers and pesticides;
- maintenance of existing landscape elements like solitary trees;
- no drainage of grasslands, wetlands and ponds.
- where fencing is needed, see below (separate measures and payments - , (§ 4.1, measure G and § 4.2, measure D).

Additional explanation:

- *from the codes for Good Agricultural and Environmental Condition (GAEC), mowing or grazing (active management) is obliged and cannot be paid for under an agri-environment scheme. The payment compensates for (a) postponing mowing dates (lower fodder quality), and (b) removing the mown vegetation (additional labour);*
- *the current schemes (agri-environment and LFA) set very late mowing dates. However, the ecological importance of such dates is not proven, as the important species have already been flowering en seeding. In addition, the interest of farmers is low, as the yield (quantity and quality) are lower than necessary, thus enhancing to leave the fields unmown or to not remove the mown grass;*
- *for this one package, there will be two payment levels: one for grasslands and one for wetlands. On wetlands, the production will be even lower and the labour costs for removal will be higher.*



B. Grassland bird management

After regaining independence, with decreased agriculture and increased fuel prices, use of meadows and pastures has significantly decreased. First of all the less favoured, most often wet areas that were at further from farms were abandoned, and these areas were the most valuable ones from the biodiversity point of view. In such wet areas that were mowed and grazed, rare species of waders and other meadow birds that are protected in Lithuania and the EU were breeding. Currently successional processes are taking place in those abandoned areas, and the open areas are becoming overgrown with bushes and tall grasses. Such conditions lead to local losses of these habitats, and thus of the rare bird populations. At the same time, early mowing destroys many nests and young birds.

Objective of this measure is preservation and restoration of breeding and feeding habitats of meadow birds.

Table 3. The list of rare meadow bird species will be covered by protection action

Bird species	Bird Directive 79/409	National Red list	Mowing start
Great Snipe (<i>Gallinago media</i>)	X	X	VII.01
Curlew (<i>Numenius arquata</i>)		X	VII.01
Black-tailed Godwit (<i>Limosa limosa</i>)		X	VII.01
Common redshank (<i>Tringa totanus</i>)		X	VII.01
Quail (<i>Coturnix coturnix</i>)		X	VII.15
Corncrake (<i>Crex crex</i>)	X	X	VII.15
Aquatic Warber (<i>Acrocephalus paludicola</i>)	X	X	VII.15
Spotted Crake (<i>Porzana porzana</i>)	X	X	VII.01
Ruff (<i>Philomachus pugnax</i>)	X	X	VII.01

General obligations:

- only fields designated as suitable bird habitats and marked on a farm map are eligible (the fields have to be in a designated SPA);
- minimum field size (meadow+wetland) – 3 ha;
- no use of mineral fertilisers and pesticides;
- in case of mowing: start mowing from the centre of the field to the edges.

Specific packages:

B1. Mowing no earlier than 1 July in meadows

B2. Mowing no earlier than 15 July in wetlands

B3. Grazing no earlier than 15 June in densities up to 1 livestock units per hectare. In wet meadows, more intensive grazing should be applied.



Table 4. Recommended stocking density on wet grassland during a normal grazing season, 130-140 grazing days/year

Stock type	No of livestock per ha
Cattle	
Cattle (0-1 year)	2,2
Cattle (1-2 years)	1,6
Cattle (> 2years)	1,6
Cattle with calf	0,7
Horse	
Horses	1,0
Ponies	0,5
Sheep	
Ewe (60 kg) with 2 lambs	3,0

Where fencing is needed, see below (separate measures and payments - , (§ 4.1, measure G and § 4.2, measure D).

Additional options to the packages B1, B2 and B3:

B4. Leaving 10-20% of the grassland area not-mown until the year after. This area must rotate over the farm area on a yearly basis.

Additional explanations:

- *here again, the late mowing dates as included in the current agri-environment and LFA schemes do not seem to be scientifically sound. On the contrary, very late mowing dates are detrimental to a number of bird species and their chicks, that cannot properly move in very long vegetation;*
- *bigger than in the current programmes minimum eligible field size is introduced because the number of breeding bird species increases with the size on the managed wet grassland.*

C. Special feeding areas for geese and cranes

Foraging birds like geese and cranes are causing increasing damage, to grassland as well as to arable crops like cereals (wheat) and potatoes. The numbers of foraging birds in the Žuvintas region are now:

- greylag geese (*Anser anser*); up to 1,500;
- white-fronted geese (*Anser albifrons*): up to 5,000;
- cranes (*Grus grus*): up to 1,300.

Greylag geese feed in cereals, preferring flat crops (wheat, barley), white-fronted geese feed in stubble and sprout, and cranes feed almost everywhere, even in potato fields. The birds follow the yearly crop rotation.

Hunting or scaring the birds off is the usual practice, but is not a sustainable solution: the problem will only be replaced to adjacent fields and the birds are using more



energy. For this reason, it is suggested to introduce a payment to temporarily allow the birds to forage.

The aim of this measure is to protect populations of geese and cranes through management of their feeding sites.

Only fields that are within designated SPAs are eligible. The farmers are paid for feeding fields for the cranes and geese.

C1. Grassland sites

- minimum area - 0.5 ha.
- no grazing is permitted
- no pesticides can be applied
- tree or hedge planting and fencing are not permitted
- use of bird scarers or other equipment to disturb feeding cranes and geese is not permitted

C2. Arable crops sites

- minimum area - 0.5 ha.
- cereals or potatoes should be established by normal cultivation practices
- no grazing is permitted
- pesticides and growth promoters can not be applied
- tree or hedge planting and fencing are not permitted
- use of bird scarers or other equipment to disturb feeding cranes and geese is not permitted

D. Conversion of arable land into grassland

In Žuvintas area there are big areas of arable land, that cause environmental problems like nutrient leakage, land erosion and fragmentation of habitats.

The aim of this measure is to enhance ecological land use structure that would lead to decreasing leaching of nutrients, protection of arable land from erosion and create networks of uncropped grass margins and areas of wildlife seed mixtures, to provide wildlife habitats and corridors to buffer habitats and features from agricultural operations.

We proposed the following conversion options:

1. Buffer strips
2. Corridors
3. Entire field

Buffer strips

On boundaries where cultivated fields meet with non-cultivated land area (road, forest etc.), an uncultivated margin with perennial vegetation (minimum width of 1,5 metres from the field boundary) should be left and sown with a seed mixture.



Corridors

In fields bigger than 20 ha an uncultivated mid-field strip (minimum width of 3 metres) should be established. This should be sown with an approved seed mixture of perennial species.

Entire field

Grassland can be created to increase habitat diversity in predominantly arable areas, protect and extend existing important grassland habitats. One of the options could be sowing a basic grass mix to help with weed control and to allow grazing to be established. Where sites have suitable soil for re-creation of species-rich grassland, a locally-supplied seed source should be used (ideally sourced from within the same natural area). In these situations, a supplement will be available to cover the costs of grasses and wildflowers.

The grass should be sown in early September.

For buffer strips and corridors, the prescriptions are:

- The sward should be cut frequently, usually three times, between May and September in the first year to encourage establishment. Thereafter top only once every three years to allow a dense sward to develop
- The sward should be maintained without the use of pesticides or herbicides,

For the entire field, the emerging sward is likely to require periodic cutting in the first year to control weeds and encourage tillering. After conversion, the land should be managed like semi-natural grassland. Management by grazing and/or cutting should follow guidelines for grassland management.

E. Management of reed beds:

Reed-beds are important habitats quite common in Žuvintas, that need regular management. The aim of this measure is to preserve and enhance biodiversity through management of the reed-beds.

Reed-bed habitats mainly (minimum 90%) consists of:

- Common Reed (*Phragmites australis*);
- Reed Canary-grass (*Phalaris arundinacea*);
- Common Club-rush (*Schoenoplectus lacustris*);
- Grey Club-rush (*Schoenoplectus tabernaemontani*);
- Lesser Bulrush (*Typha angustifolia*);
- Bulrush (*Typha latifolia*);
- Sedges (*Carex spec.*).

Management prescriptions:

- the element shall be properly maintained: grazing,
- use of fertilisers and pesticides are not allowed;



- at most two third of the reed shall be mown every year. At least one third of the reed will stay over to the year after;
- mowing or other activities take place between 1 September and 1 April.

F. Management of landscape elements

The objective of this measure is to maintain the countryside and agricultural landscape, to promote diverse mosaic landscape structure and to enhance biodiversity through establishing wildlife habitats. The measure is orientated towards preservation of valuable elements of landscape (natural strips and islands of woods, individual valuable trees, springs, ponds, bouldered areas, individual valuable boulders and mounds).

Landscape elements are listed in the Law of protected Areas as Heritage Objects. They are normally marked on the maps made by State Land Survey Institute.

Valuable landscape elements are:

- a. linear 'wooded' elements (tree rows, lanes);
- b. solitary trees;
- c. springs
- d. ponds;
- e. stones and boulders (geomorphology);
- f. mounds (archaeology / cultural heritage).

General requirements:

- the valuable elements shall be marked on a farm plan to be eligible;
- the elements shall be maintained and not damaged in any way;
- the protection zones around the elements as laid down in national legislation shall be respected (with regard to the use of fertilisers and pesticides);
- proper management shall be assured.

Specific management requirements for different elements:

- mowing around springs, boulders, mounds and their slopes 3 times a year, no trespassing by mechanisation;
- fencing of springs if livestock is pastured around;
- trees and woody elements should consist of native tree and shrub species;
- regular management of trees and woody elements - removal of dangerous branches;
- management of ponds - surrounding shrubs and trees shall be cut on a regular basis, This especially applies to branches hanging over the water (in order to avoid eutrophication by leaves);
- if necessary, the pond should be cleaned between 1 September and 15 October.



G. Maintenance of fences

- the measure is eligible if fencing benefits conservation efforts, resp. is useful when applying for one of the other packages (e.g. to facilitate grazing for botanical or bird grassland management, or to protect adjacent valuable landscape elements from damage by livestock);
- the measure compensates for the regular maintenance of the fence (poles, wires, battery) and the cutting of branches to keep the fence free from vegetation.

We suggest a separate capital works measure for the one-time establishment of fences and gates (§ 4.2, measure D).

4.2. One-time Investments / Capital Works

A. Removal of shrubs and trees

Scrub consists of woody shrubs or trees such as hawthorn, willow and birch which are pioneer or opportunist species. Areas of grassland that are not used have a tendency to become invaded by scrub, a process called natural succession, which can be held in check by mowing, grazing or burning. Scrub needs to be controlled and/or removed where it threatens to replace more valued wildlife habitats, cause damage to archaeological remains.

In Žuvintas area, like in other parts of Lithuania, many valuable grassland areas are overgrown by scrub, and sustainable management measures can not be implemented without clearance of scrub first.

Specifications of the measure:

- as a one-time investment for two years;
- all work (cutting and mowing) should be done mechanically (no use of chemicals, no burning) (NB: burning is forbidden by law);
- existing solitary landscape elements (to be shown on a map) shall be maintained;
- this package is only eligible if coupled to one of the packages for active management (botanical or ornithological - Measures A and B in § 4.1) after clearing the field.

Argumentation:

- *this activity is of the utmost importance for farmland in order to be properly classified as farmland and to be eligible for 'regular' agri-environment (or other rural development) support*
- *similar to "Bracken eradication" measure (capital works) under the UK Rural Stewardship Scheme (RSS) and to measures in the AE schemes of some other new member states.*

Payment calculation: on the basis of the necessary input of labour and machinery (costs incurred) for cutting/sawing/mowing, removal and processing of the vegetation (two years in a row).



B. Removal of shrubs and trees in buffer strips along watercourses

The current agri-environment scheme includes a measure on buffer strips along water courses. In some cases, as we have seen in the field, these contain shrubs and trees that complicate their management and increase eutrofication (falling leaves etc.). More important, shrubs and trees are damaging water bird habitats. For this reason, a one-time measure to remove this vegetation is suggested. However, this measure should be applied only in areas designated by administration of Žuvintas reserve. As for the above measure A, all clearance shall be done mechanically. Old and/or valuable landscape elements, to be marked on a map, shall be maintained. Payment calculation: similar to measure A.

C. Creation and restoration of landscape elements

From the landscape elements existing in the Žuvintas area, trees (or: woody elements) and ponds are the only ones for which restoration or new establishment are possible and/or worthwhile.

C1. Trees or other woody elements (tree rows, lanes),

The objective of the measure is to promote a diverse mosaic landscape structure and establish wildlife habitats whilst at the same time minimising the risk of wind/water erosion. The measure has particular value in areas with intensive agriculture and large fields.

The package could include following prescriptions:

- the species used should be native;
- Plant hedge(s) planted should contain minimum of 4 different plant species (see list of recommended plant species) with at least one tree present every 25 metres. In the selection of the sites the natural conditions and need for the hedge has to be considered.
- in case of grazed land: the trees planted should be properly fenced to avoid grazing damage;
- the element shall be properly managed in the years after its establishment (obligation to apply for measure F in § 4.1).

Eligible for support are:

- the costs of the plant material;
- the costs of labour and machinery;
- the costs of tree guards and stakes;
- additional costs of weed control in/around the trees
- if appropriate: the cost of fencing (also see measure D).

C2. Ponds

Payments can be available towards the cost of restoring ponds by de-silting, clearance of overgrowth in and around the pond, and for creation of new ponds in suitable locations.



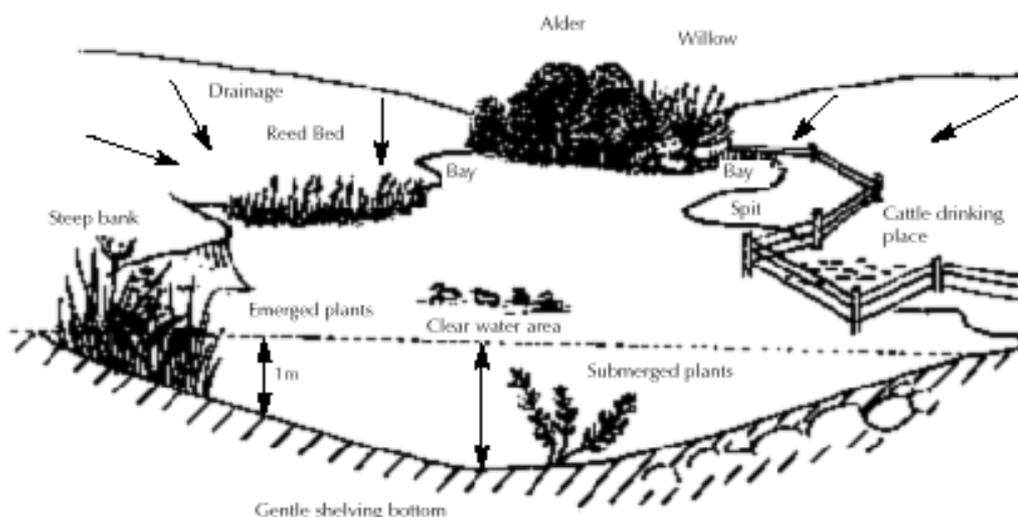
New ponds can create significant benefits for wildlife, but this is unlikely to take place if construction involves the destruction of wildlife habitat such as marshy grassland. Pond construction and maintenance are skilled operations and detailed discussions with specialist advisors will bring both long term and short-term benefits.

The objective of the measure is to improve biodiversity and introduce new landscape features by taking neglected areas of farmland with little potential for profitable agricultural use (combined with appropriate hydrological characteristics) and convert them to wetland areas or ponds. Measure is particularly targeted at intensive agriculture regions where the loss of small-scale landscape features and habitats has been greatest

Support will only be available in conditions where the creation of wetlands and ponds is technically feasible. This feasibility should be assessed by an engineer with special skills in hydrology/hydro-geology. Design plan approved by the engineer has to be added to the application.

Agreement for this measure should be made for 10 years.

Figure 4. Diagram - cross section of pond



The package includes:

- a minimum size (e.g. 5 m²) and maximum size (e.g. 500 m²) of the pond;
- at least 80% of the pond shall contain of open water;
- between 1 October and 1 April, the water depth should be at least 50 cm;
- the element shall be protected from grazing and from the use of fertilisers and pesticides (*already legally obliged*);
- no water shall be extracted other than for watering livestock;
- cleaning (if necessary) should take place between 1 September and 15 October;



- the element shall be properly managed in the years after its establishment (obligation to apply for package F).



D. Fencing

In addition to the structural payment for the periodical maintenance of fences (see § 4.1), it is recommended to introduce a separate measure for the establishment of fences and gates. This measure is only eligible if:

- grazing is taking place for conservation purposes. That is to say: this measure only applies if the farmer is also applying for one of the grazing packages under the measures A and B in § 4.1;
- fencing is needed to protect valuable landscape elements on or adjacent to grazed land. These elements should be marked on a farm map and should be properly managed under one of the landscape packages (category E in § 4.1).

The type of fence will vary according to its specific purpose. Trees and shrubs must not be used as strainers or fencing posts nor may they be used to support fencing wire, staples or netting. Fencing timbers, line wire, netting and staples used to construct approved fencelines must always consist of new materials.

Post and Wire Fencing

Post and wire fencing must comprise at least three lines of wire made up of either galvanized mild steel wire (4mm gauge) or two ply twisted barbed wire (2.5mm gauge). The top wires of any fencing erected next to public access routes must consist of plain wire or an additional line of plain wire must be affixed to the outside of the posts closest to the route in question.

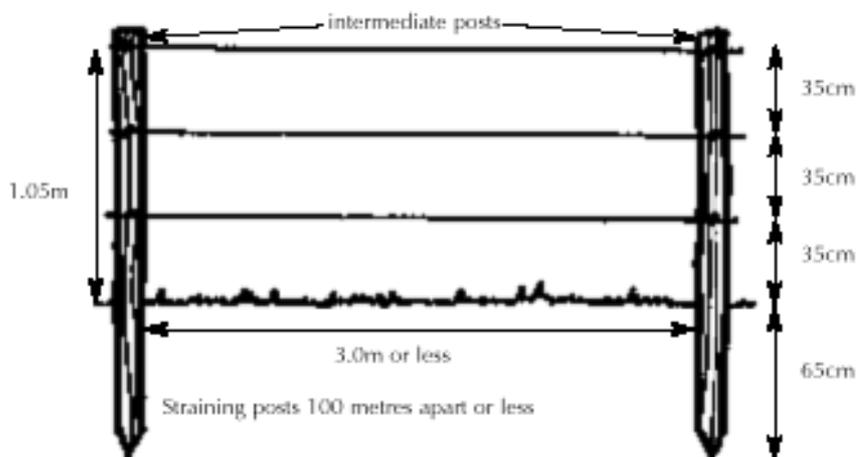
Straining posts must be a minimum of 12.5 cm cross section and at least 2 metres long of which 1 metre must be below ground level unless otherwise agreed with the agri-environment advisor. Straining posts must be placed at either end of the fence line and at centres of 100 metres or less as well as at every horizontal or vertical change of direction. Straining posts must be strutted at each end of the fence line and at all changes of slope and direction. Struts must have a top diameter of at least 6.5 cm and must be supported with either a base plate or a suitably positioned intermediate post.

Intermediate posts must be not less than 6.5 cm diameter (round posts and sawn timber) and at least 1.7 metres long. Half round posts are acceptable provided they measure at least 6.5 cm from the mid point of the sawn side to the mid point of the round side. Intermediate posts must be set at centres of 3 metres or less.

All wire must be affixed to the posts with galvanized staples with the distance from the ground to the top wire no less than 1.05 metres.



Figure 3. Diagram of Three line wire fence



Electric Fencing

This description provides preliminary guidance prior to obtaining approval from agri-environment consultant for the use of a particular system. Agreement holders are advised to consult manufacturers literature to determine the most appropriate system for specific circumstances.

Electric fencing layouts normally comprise a 'main line' system with branch lines running off. Isolation and cut out switches should be installed at the start of each branch and every few hundred meters thereafter to assist with fault finding. Straining posts must be erected in accordance with the standards set out for other forms of fencing and at least three lines of wire must be installed. Live wires must be taken over or under gateways.

Underground systems represent the best long term solution as overhead systems can snag in high machinery. Trenches should be at least 45cm deep with a double insulated galvanized wire installed within a plastic pipe, the ends of which should be turned down to prevent water entering the pipe.

Further information on electrified gates is available from manufacturers and suppliers.

All electric fencing must carry appropriate warning signs, even when located at a distance from routes used for public access.

Additional prescriptions could be made to:

- the distance to valuable landscape elements (e.g. 1 m).

Eligible for support are the costs of poles, wires, gates and (if appropriate) batteries, as well as work.



4.3. Payment Calculations

We do not provide detailed payments calculations, as this is a specialist job and requires agronomic data that we don't have. However, the calculations can be carried out on the basis of the measures as described, including any 'income foregone' component and any 'costs incurred' aspect. In general, we could say that:

- a. the measures A to C include income foregone as well as costs incurred elements:
 - income foregone for mowing later (loss of fodder quality) in the measures A and B, for the damage by foraging birds in measure C;
 - costs incurred for the removal of the grass or sedge vegetation in the measures A and B, for additional cost to make the fields attractive to geese and cranes in measure C;
- b. measure D mainly includes the income foregone component: lower profits of grassland compared to those of arable land;
- c. the measures E and F include mostly costs incurred elements: the costs of labour and required machinery or equipment.

The examples on calculations for different measures provided below can be used as guidance, but additional aspects may be taken into account.

A. Botanical management for natural meadows

BASIS OF CALCULATIONS:

1. Later mowing dates
2. Lower stocking rates.
3. x% of the habitat could be agriculturally improved by ploughing, reseeding and fertilising
4. Grazing requires additional labour of shepherding

INCOME FOREGONE

Income foregone due to not agricultural improvement

Less:

- Additional fertiliser costs
- work for improvement

Income foregone due to later mowing dates

Income foregone due to reduction in stocking rate under agreement

ADDITIONAL COSTS

Cost of grass removal (in case farmer does not need the grass)

Cost of additional hay

Cost of compound feed

Labour for shepherding



B. Grassland bird management

BASIS OF CALCULATIONS:

1. Later mowing dates
2. Lower stocking rates.
3. x% of the habitat could be agriculturally improved by ploughing, reseeding and fertilizing
4. Leaving 20% unmown
5. Grazing requires additional labour of shepherding

INCOME FOREGONE

Income foregone due to not agricultural improvement

Less:

- Additional fertiliser costs
- Additional pesticide costs
- work for improvement

Income foregone due to later mowing dates

Income foregone due to reduction in stocking rate under agreement

Income foregone due to leaving parts unmown

ADDITIONAL COSTS

Cost of grass removal (in case farmer does not need the grass)

Cost of additional hay

Cost of compound feed

Labour for shepherding

C. Special feeding areas for geese and cranes

BASIS OF CALCULATIONS:

1. Farmer leaves fields of grass or arable crops for feeding birds
2. Grazing is not permitted - the displaced stock are moved to land intended as hay cutting area

INCOME FOREGONE

Average arable or grassland gross margin

Less:

- Harvesting costs saved
- pesticide costs saved

ADDITIONAL COSTS

Cost of additional hay



D. Conversion of arable land into grassland

BASIS OF CALCULATIONS:

1. Loss to farmer is average gross margin based on a rotation of combinable crops (winter wheat, 2 x winter barley, potatoes) but less cultivation and harvesting costs saved.
2. From the figure above allowance must be made for the income that the grazing / hay cutting regime will earn.
3. If grassland should be managed as meadow bird habitat, compensation for additional management costs should be calculated as for Measure B.

INCOME FOREGONE

Average arable gross margin

Less Cultivation and harvest costs saved

Plus Grass establishment costs

INCOME

Grazing income 1.7 LSU (or other densities)

Less Haymaking costs

ADDITIONAL COSTS

Mowing 3 times during first year (labour and machinery)

E. Management of reed beds:

BASIS OF CALCULATIONS:

1. Permanent management under management prescriptions.

CALCULATION

- Additional costs - removal of unwanted vegetation (small trees, branches of adjacent trees etc) - labour and machinery
- Additional costs - mowing and removing the reed - labour and machinery (1-ax tractor/mower, removal, costs of 'dumping' the reed)

F. Management of landscape elements

Since this a proposed horizontal measure based on whole farm approach, the income foregone calculations should be and made for an average sized farm. The rates then would vary with farm size. The rates should be calculated per ha taking into account all categories of landscape elements.



TREES AND LINEAR WOODY ELEMENTS

ASSUMPTIONS

1. Tree management includes safeguarding saplings during hedge trimming as well as 'marking out' prior to trimming, hand cutting of hedge adjacent to sapling, 'siding off' and other maintenance operations. It also includes cost of managing mature trees, in particular 'siding off' dangerous branches
2. Care must be taken to avoid spray drift and other damage resulting from machinery use
3. Assume one tree/sapling in every xx m of tree line or hedge.
4. Assume xx other trees per ha around farm
5. Total trees = xx trees
6. Assume xx% of trees are saplings = xx saplings + xx mature trees
7. Annual maintenance of xx% saplings - xx hours
8. Annual maintenance of xx% mature trees - xx hours
6. Hedge trimming costs xx EUR/hour
7. Tractor covers 1200m/hour, but makes four passes = 300metres/hour
8. Tree care will increase conventional cost of fertilising, spraying and harvesting by 5% on the 10% of improved land

CALCULATION

Sapling maintenance
Tree maintenance
Additional cost of hedge trimming
Tree care during spraying etc

PONDS

ASSUMPTIONS

1. One pond per xx ha
2. Maintenance work includes cleaning inlets, debris, fallen trees, scrub clearance and bank repair

CALCULATIONS

Pond/lake maintenance (3% capital cost)
Saving in fertiliser costs

SPRINGS

ASSUMPTIONS

1. One spring per xx ha
2. Maintenance includes fencing from livestock

CALCULATIONS

Fencing
Saving in fertiliser costs



STONES AND BOULDERS

ASSUMPTIONS

1. In most cases this involves protection of stones and boulders and surrounding buffer zones
2. xx ha of bouldered areas per farm (xx%)
3. xx% of this area adjoins improved land

CALCULATION:

Income loss in the buffer zone - gross margin
Savings in fertilizer
Additional work - maintenance (mowing)

OBJECTS OF CULTURAL HERITAGE

ASSUMPTIONS

- 1 Assume 1 site per xx ha.
2. Maintenance for scrub clearing and repairing erosion on 50% sites per annum. x hours per site per annum

On xx% of sites, productivity of improved land could be increased by fertilising, and on further xx% by drainage. These activities would be restricted by the management prescriptions.

CALCULATIONS:

INCOME FOREGONE

Income foregone due to not draining
Income foregone due to not fertilizing xx% sites (restrictions on use of machinery)

ADDITIONAL COSTS

Scrub/Erosion repair



5. Monitoring and Evaluation of Proposed Measures

5.1. The Need for Monitoring and Evaluation

Monitoring and evaluation are important aspects of the normal 'cycle' of agri-environment policy programming and must be given a high priority by all Member States as part of their obligation to implement agri-environment programmes under the Rural Development Regulation No. 1257/1999. Under the proposed new EARDF Regulation that will replace Regulation 1257/1999 there is a requirement¹ that:

“Member States shall establish a system of ongoing annual evaluation for each rural development programme. The Managing Authority for the programme and the Monitoring Committee shall use ongoing annual evaluation to:

- (a) examine the progress of the programme in relation to its goals by means of result and, where appropriate, **impact indicators**;*
- (b) **improve the quality of programmes and their implementation**;*
- (c) examine proposals for substantive changes to programmes;*
- (d) prepare for mid-term and ex-post evaluation.” [emphasis added]*

It is expected that the Commission will revise their current list of evaluation questions for Member States to use from 2007, and that the new list will relate more closely to EU priorities such as the management of Natura 2000 sites.

Monitoring and evaluation of agri-environment programmes by national authorities has both an 'internal (national or regional)' and 'external (EU)' function. At the 'internal' level, the main aim of monitoring and evaluation activities is to provide feedback to policy-makers and programme managers on how well an agri-environment scheme or measure is functioning and whether it is actually achieving, on the ground, the objectives and targets that have been established for it.

5.2. Relationship between Monitoring and Evaluation

It is important to avoid confusion between the two separate activities of monitoring and evaluation, and the distinction can be easily summarised as follows:

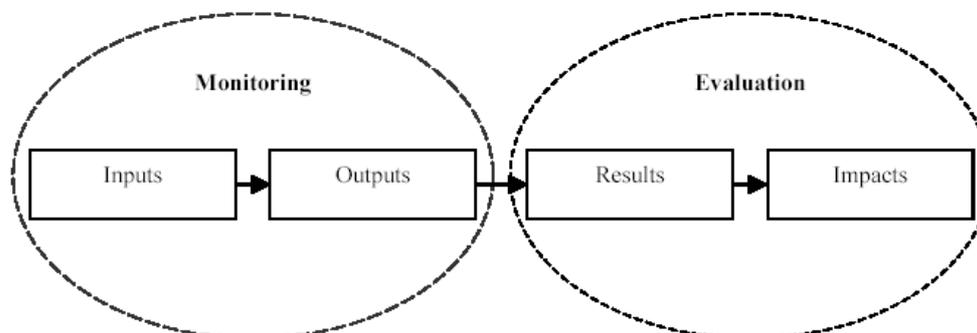
Monitoring provides information on the progress of programme implementation by collecting data on the use of programme resources (**inputs**) to create activity (**outputs**) amongst the intended programme beneficiaries.

Evaluation goes beyond monitoring and reporting to assess the performance of a programme by collecting additional information on the **results** and **impacts** of a programme to answer key questions on how effective the programme is in terms of achieving its objectives.

¹ COM (2004)490 final, Article 90



Figure 4. Relationship between monitoring and evaluation



To be able to monitor a programme's implementation and to evaluate its performance against the objectives set it is necessary to use **indicators**. These must be decided at the stage of designing the measure so that systems can be set up to collect the data needed, especially baseline data from farms entering agri-environment schemes. In most cases these indicators should also be given **target levels** that quantify the objectives of the programme. There are four different types of indicators, corresponding to the four stages of monitoring and evaluation shown above.

Input indicators refer to the **resources allocated to the programme and measures** – budgets, staff and services (such as mapping and data collection and storage). Financial indicators (e.g. amount of public expenditure) are commonly used to monitor progress in terms of the annual commitment and payment of the funds to farmers for specific measures and/or activities within the programme.

Output indicators refer to **activity which happens as a result of the inputs** – they are usually measured in physical or monetary units (e.g. number of new contracts with farmers, number of hectares supported etc.)

Result indicators refer to the **direct and immediate effect** brought about by a measure/scheme and provide information on changes to the activities of the beneficiaries (e.g. area of land not receiving pesticides, number of animals of each rare breed supported, length of new protection shore belts).

Impact indicators refer to the **longer-term effects of the measures beyond the immediate results, and should be directly related to the objectives and quantitative targets for each measure**. Such indicators might, for example, be changes in habitats, in populations of animals, or in frequency and management of landscape features; they could measure progress against targets such as a (specified) percentage of the habitat to have reached and maintained a certain (specified) species composition and structure after a (specified) number of years of applying the measure. Measurement of impact indicators is more complex than measurement of the other 3 types of indicator and often requires detailed on the ground survey work on a sample of farms when they enter the scheme and after a number of years.



5.3. Monitoring and Evaluation in the Žuvintas Case Study Area

Monitoring and evaluation procedures can be quite complex, and their implementation usually requires collection of baseline environmental data as farms enter the scheme. For this reason monitoring and evaluation must be planned alongside the design of agri-environment measures and data collection systems, not added later. They are therefore considered as an integral part of this case study. It has been assumed that in the Žuvintas case study area targets and data collection systems for **input**, **output** and **result indicators** would be put in place as part of the administrative arrangements for the whole Lithuanian agri-environment programme.

Therefore we consider below only **impact indicators** for the proposed new measures for Žuvintas. These are particularly important because from 2007 the Commission will expect the Lithuanian government to be able to demonstrate the positive contribution which agri-environment measures are making to the implementation of Natura 2000 management plans.

Many Member States have specialist ‘agri-environment evaluation programmes’ with funding for research projects distributed to many different organisations (often on a competitive basis) – this a highly recommended approach. In the case of Žuvintas and other Natura 2000 sites in Lithuania it may be possible to co-ordinate the collection of data for agri-environment impact indicators with that required for Natura 2000 site monitoring.

The table below illustrates **impact indicators** which could be used for the proposed agri-environment measures in the case study, and suggests some possible **targets** (it should be emphasized that the numerical values given to these targets are for illustration only; actual values should be assigned to targets by Lithuanian specialists in habitat/species and landscape management, in consultation with agri-environment policy staff and taking into account the Natura 2000 management plans.



Table 5. Impact indicators for agri-environment measures in the case study area

Measure	Objectives	Impact indicators	Basis for comparison and possible targets NOTE: <i>the numerical values given to targets are for illustration only; actual values should be assigned to targets by Lithuanian specialists in habitat/species and landscape management, in consultation with agri-environment policy staff, taking into account the Natura 2000 management plans</i>
A. Natural grassland management	To guarantee the preservation of biological and landscape diversity as well as valuable cultural heritage by promoting the management of semi-natural habitats of grasslands and fen meadows using traditional methods.	Structure coverage and species richness of: - grassland - fen meadows	Time series data for a sample of fields under this measure surveyed in year of entry and again 5 years later. Target: 75% of sample fields to have: - more than 10 species characteristic of the habitat, covering in total at least 70% of the area - fewer than 5 species regarded as undesirable in that habitat, covering in total no more than 10% of the area - no reduction in number and %age coverage of desirable species between entering the AE agreement and resurvey 5 years later - no increase in number and %age coverage of undesirable species between entering the AE agreement and resurvey 5 years later
B. Grassland bird management	To create and preserve the reproduction conditions of endangered grassland birds (list target species).	Trends in breeding populations of (list target species)	Time series data for a sample of fields under this measure surveyed in year of entry and every year for 5 years. Target: mean values for whole sample to show no reduction in numbers of breeding pairs/nests per hectare of target species over 5 year period (adjusted if necessary for trends in whole Lithuanian breeding population over same period) 75% of fields with fewer than x breeding pairs/nests per hectare of target species when entering the AE agreement to show an increase to at least y breeding pairs/nests per hectare of the target species by year 5.



<p>C. Special feeding areas for cranes and geese</p>	<p>To support the local community in providing conditions for the continued and undisturbed use of agricultural fields as feeding grounds for migrant bird (list species) so as to supply the birds with the food they need and maintain the employment level necessary for the local community.</p>	<p>Proportion of annual population of geese and cranes in Dovine Basin/Žuvintas area which are feeding on sites undisturbed.</p> <p>Trends in damage on fields without agri-environment measure for foraging birds.</p>	<p>Time series data, taken each year, for whole feeding population in area, with location of feeding sites in relation to location of agri-environment agreements for foraging birds.</p> <p>Record of total number of hectares where farmers report damage to crops and grass on fields not in agri-environment agreements for foraging birds.</p> <p>Target:</p> <ul style="list-style-type: none"> - 75% of population of geese and cranes in Žuvintas area feeding on undisturbed sites by year 5; - 50% reduction over 5 years in total reported hectarage damaged on land not in agri-environment agreements for foraging birds
<p>D. Conversion of arable land to grassland</p>	<p>To establish areas of new semi-natural grassland on former arable land:</p> <ul style="list-style-type: none"> - to protect existing semi-natural habitats from pollution by agricultural chemicals; - to provide wildlife corridors linking 'islands' of existing semi-natural habitats 	<p>Trend in 'linked patch size' of habitat types linked together by semi-natural grassland (e.g. if two 'island' patches of woodland each 0.5ha are linked by a new grassland strip their 'linked patch size' increases from 0.5ha to 1.0ha).</p> <p>Impact indicators used for protection shore belts in existing Lithuanian agri-environment programme could be used for this measure too</p>	<p>Land-use data taken from agri-environment agreement maps and/or remote sensing data in year of entry and again 5 years later.</p> <p>Target:</p> <ul style="list-style-type: none"> - increase in linked patch size of selected habitats over 5 years (Note: it will be important to distinguish between positive effects of the agri-environment measure and possible negative effects of agricultural restructuring and reuse of temporarily abandoned land which may destroy some wildlife corridors on non-agreement land)
<p>E. Reed-beds</p>	<p>Preserve and enhance biodiversity through management of the reed-beds</p>	<p>Trends in bird populations breeding in reed-beds (list target species).</p>	<p>Time series data for a sample of reed-beds under this measure surveyed in year of entry and every year for 5 years.</p> <p>Target:</p> <p>mean values for whole sample to show no reduction in numbers of breeding pairs/nests per hectare of target species over 5 year period (adjusted if necessary for trends in whole Lithuanian breeding population over same period)</p>



<p>F. Landscape elements</p>	<p>Maintain and create habitats and improve biodiversity; diversify agricultural landscapes; reduce wind and water erosion.</p>	<p>Change in landscape structure in terms of point, linear and land cover elements which are influenced by farm management.</p>	<p>Landscape data recorded by time series photography (from fixed points on the ground and/or aerial photographs)</p> <p>Targets to be determined by Lithuanian landscape experts</p>
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6. Expected Impact

Nature protection aims at conservation of live and lifeless natural values and their systems. One of its main objectives is the preservation of the biological diversity, the basis of which is to preserve natural and close-to-natural biotopes in functioning condition. However the protection of biotopes can not be limited to the biotopes situated in protected areas, but should be expanded to all types of biotopes that are important in nature protection terms. Many important biotopes of high nature protection value was created and maintained as a result of human activities and agriculture. Many important biotopes, especially meadows and pastures have been cultivated for centuries. On most of our valuable nature areas the maintenance and the improvement is inseparable from the agricultural utilisation. Therefore it is important that in areas where – irrespective of whether it is under nature protection or not – valuable biotopes remained, or their original status can be restored, an agricultural utilisation must be secured that has the primary objective of the protection of these values rather than production. The means of a nature protection, based solely on legal protection and prohibitions, are limited and a far more efficient system could be developed through the combination of the existing means with economic incentives (subsidies) - agri-environmental payments.

From the aspect of landscape protection, the primary objectives are the introduction of new forms of multi-purpose landscape management, the protection of complex landscape potentials that can be achieved through the improvement of landscape protection approach and the integration of landscape protection issues into the system of general and sectoral policies. For the efficient utilisation of resources, for the adaptable land use practices, for the protection of the aesthetic values of the landscape and for the stopping of unfavourable tendencies measures that are effective even in the short run have to be taken. The aspects of landscape protection, the protection of values and the limits of carrying capacities have to be considered more stringently and consequently throughout the whole country. Since agriculture is the largest user of land, the aspects of complex land management and protection of the esthetical values of the landscape should be given greater emphasis.

Existing Lithuanian RDP agri-environment measures are not really designed for biodiversity protection. In the areas like Žuvintas, agri-environment measures should address specific conservation objectives that are defined by the problems.

Žuvintas biosphere reserve, being also a Natura 2000 area, needs an active nature management that should be addressed in the future management plan of the Reserve. This plan will be completed by the end of 2005, and should take a stakeholder participation approach in planning and management of the area. Farmers, being important land owners and users, can play an essential role here, but incentives are necessary in order to encourage their participation. Agri-environment payments are such incentives.

The measures proposed in this case study were elaborated after consultation with relevant stakeholders and in close co-operation with the administration of Žuvintas



biosphere reserve, that is in charge of organising proper management of the site. Therefore, the measures are designed specifically to address environmental, and especially biodiversity-related, problems in the area. Measures are especially needed, among other important habitats, in wet fen meadows overgrown with bushes. Bird damage on arable land was not addressed anywhere else, either.

Special undertakings required of participants are expected to preserve and, where necessary, lead to restoration of these important nature areas, preservation and restoration of landscape elements; and conservation and enhancement of protected birds populations.

We believe that these measures proposed for different zones of the area, will be part of the future management plan of the entire territory.

Agri-environment measures, introduced in Žuvintas area, can be easily applied in other protected areas in Lithuania, including Natura 2000 sites.

Natura 2000 territories in Lithuania have been selected according the national criteria for selecting the Sites of Community Importance (SCI) and Special Protected Areas (SPA). By Order No. 219 of 20 April, 2001 of the Minister of Environment the criteria for selection of SCIs were adopted. By Order No.22 of 9 January, 2001 of the Minister of Environment the criteria for selection of sites for protection of birds (SPAs) were adopted. At this moment all together 77 Natura 2000 territories for protection of wild birds have been selected in Lithuania.

24 of 77 sites (or certain parts of these sites) are designated to protect nesting birds in meadows - Corncrake (*Crex crex*), Great Snipe (*Gallinago media*), Aquatic Warbler (*Acrocephalus paludicola*). The locations of these protected habitats of birds were approved by the order No. D1-270 of Ministry of Environment in May 17, 2004. Protection of these bird species requires keeping the possibly higher percentage of meadows and pastures. Therefore it is planned to preserve existing meadows and pastures through the establishment of new protected areas or introduction of new restrictions relevant for protection of meadow's birds in existing protected areas. The total area of meadows and pastures to be saved in these 24 sites is approximately 30 000 ha. Since proposed agri-environment measures for Žuvintas include several schemes for wetland and meadow habitat and birds, their applicability in other protected areas would be very high. Also, planning of agri-environment measures for Žuvintas could be a pilot case of integration of agri-environment measures in the planning documents (management plans) of protected areas in Lithuania, bringing farmers into active management of high nature value agricultural habitats.



7. Implementation of Proposed Measures

It is assumed that the measures currently included in the National Agri-environment Programme will be revised for the new programming period (2007-2013) and that a more comprehensive package of measures will be implemented when the new EARDF Rural Development Regulation (RDR) comes into force.

The measures proposed in this report could be implemented at any time (provided they have EU approval), including as part of the current national programme, but they have been designed with particular consideration to the new RDR.

Some important points to note are:

1. The LFA scheme may offer compensation for maintenance of the status quo in terms of land use (preventing grassland from being ploughed or converted to arable land) and water tables. As these kind of prescriptions are also included in the obligations arising from the status of Strict Nature Reserve and Natura 2000 designations, there seems to be only limited basis for financial compensation in large parts of the Žuvintas area. In addition, the obligation to mow all LFA areas after 15 August is a serious handicap for adequate active management and undermines the basis for agri-environment payments. It is recommended to delete this obligation from the LFA scheme.
2. The same RDR article includes a measure that enables payments for damaging effects of Natura 2000 designations. This measure will be 'upgraded' in the new RDR and be a separate element in priority axis 2: land use. It is recommended to:
 - carefully determine which of the measures and packages being proposed here, would fit under this RDR measure (e.g. damage by foraging birds);
 - as for the LFA scheme: delete the current prescription on mowing dates.
3. The new RDR will also create a basis for payments for 'public amenity'. Although this element is still somewhat vague, it might provide a basis for payment of landscape elements and cultural heritage in the Žuvintas area.
4. LEADER will become an integral part of the RDR and the national Rural development Plans, with a fixed budget share. This programme can function as a 'binding element;' between agri-environment measures and other diversification activities like rural tourism in the Žuvintas area.
5. The capital works can be financed under the investment part of the RDR. For clearance of land from shrubs and trees, the European Commission has proven to be reluctant to provide approval. However, this measure is very important to increase the area of well-managed farmland and to increase the area eligible under the agri-environment scheme.



6. The new RDR will allow support for non-productive investments that enhance the public amenity value of the NATURA 2000 area concerned (this could be used for funding fencing measure).
7. For capital works to the benefit of traditional landscapes and cultural heritage, the state aid rules have recently been loosened (Exemption regulation 1/2004).

The most appropriate framework for implementation of the measure proposed in this report for the Žuvintas area would be as part of a “package” of zonal measures similar, for example, to the Environmentally Sensitive Areas (ESA) Scheme implemented in England.

The purpose of the ESA Scheme is to protect the landscape, wildlife and historic interest of specific areas of England:

- a) which are of national environmental significance, and
- b) where changes in farming methods pose a threat to the environment and where environmental conservation depends on adopting, maintaining or extending particular farming practices.

There are now 22 designated ESAs in England with specially-tailored zonal measures offering farmers support agri-environment payments currently co-financed by the Rural Development Regulation 1257/99.

The zonal measures prepared for each ESA typically have 4 or 5 clear environmental objectives depending upon the circumstances and characteristics of each ESA. These objectives are set for a 5 year period and are agreed through a process of consultation with farming and conservation bodies. The objectives apply to the entire area within the boundary of the ESA.

The requirements of the zonal measures obviously vary, but typically may include:

- protection and management of existing features
- maintenance of stockproof walls and hedges
- traditional management of hay meadows
- maintenance of high water levels in wetland habitats
- establishment of arable field margins
- reversion of arable land to grass
- enhancement of heather moorland.

An example of the zonal measures applied in one ESA – the Somerset Moors and Levels (an area similar to Žuvintas) – is included in Annex 1.

Under the ESA Scheme, farmers may enter 10 year management agreements with an option of termination after five years. Each zonal measure commonly offers farmers one or more “levels” of entry which vary a) in the requirements for the



agricultural practices that must be followed, and b) the annual payments paid on each hectare of land entered into the scheme.

All land accepted into the ESA Scheme must be within the boundaries of the designated ESA. The boundaries of each ESA are legally defined by a special regulation. The location of the farmstead does not affect eligibility. There is no minimum or maximum amount of land which can be entered into the scheme - except where farmers are required by the zonal measures to enter their “whole farm” into the scheme.

An interesting feature of the ESA Scheme is that it was first introduced on a pilot basis in 1985 and was then gradually built-up in phases as follows:

- Stage 1: 5 ESAs designated in 1987
- Stage 2: 5 additional ESAs designated in 1988
- Stage 3: 6 additional ESAs designated in 1993
- Stage 4: Final 6 ESAs designated in 1994

In total, these cover approximately 10% of the agricultural land in England.



Annex: Somerset Moors ESA

BACKGROUND TO THE ESA

The Somerset Moors Environmentally Sensitive Area (ESA) is a Stage 1 ESA that was designated in 1987 and currently covers over 29,260 hectares of the central Somerset lowland moors in south-west England.

The moors comprise an extensive area of very low-lying basin peat, with a few remnants of raised bog, surrounded by alluvial clay and silt. The peat is overlain by riverine clay. To the west of the moors lies an extensive area of slightly higher estuarine alluvium, a proportion of which is also included in the ESA. Grassland is the predominant agricultural land use and traditionally has been used for summer cattle grazing and hay cutting.

The whole area forms the largest remaining lowland wet grassland system in Britain and is consequently of outstanding environmental interest. The ecological interest is associated with the wet, often species-rich pastures and meadows and the surrounding network of ditches with their aquatic flora and invertebrate interest. This wet grassland area supports overwintering wildfowl and breeding waders for which part of the area is designated as a Ramsar/SPA site.

The landscape value lies in the rectilinear pattern of traditionally managed fields and drainage channels within a low-lying wet and expansive grassland area. In addition, there is a wealth of archaeological interest, ranging from prehistoric wooden trackways to more recent buildings and structures.

In the 1970s and early 1980s the drainage of large areas of the Moors was improved. This, along with the increased use of chemicals and fertilisers resulted in the grassland being improved or converted to arable. This threat has now been counteracted by the designation of significant areas as Sites of Special Scientific Interest (SSSIs) and the establishment of the area as an ESA.

OBJECTIVES OF THE ESA

The Somerset Moors ESA aims to protect and enhance the wet permanent grassland that is characteristic of the area (together with its landscape, wildlife and historic interest) through the maintenance and adoption of extensive pastoral farming systems and appropriate water level management.

Specific objectives of the ESA are:

- To maintain and enhance the nature conservation interest of extensive permanent grassland



- To maintain and enhance the nature conservation interest of the wet grassland by sustaining and extending the area under extensive management, by managing ditch water levels, and by increasing the area of land attractive to waders and wildfowl
- To maintain and locally enhance the wet grassland landscape character of the area by sustaining and extending the area of permanent grassland, and through the management of elements such as pollarded willows and ditches
- To protect archaeological and historic features

MANAGEMENT REQUIREMENTS

The zonal measures implemented in the Somerset Moors ESA offer farmers several different “levels” of management requirement, together with some additional supplementary payments (e.g. a new buffer strip supplement has been introduced for arable land to create fertiliser-free grass buffer strips adjacent to water courses. These are designed to reduce the run-off of agricultural inputs into the ditches, thus protecting the diverse, aquatic plant and insect communities).

LEVEL 1 - PERMANENT GRASSLAND

The objective of Level 1 is to sensitively manage the grassland and water levels in the surrounding ditches. Farmers must comply with the following requirements:

- Maintain grassland, do not plough, level or reseed land. You may use a chain harrow or roller but no other form of cultivation is allowed.
- Graze with cattle or sheep but avoid poaching, under-grazing or over-grazing.
- If you cut the grass for hay or silage, graze the aftermath.
- Do not exceed your existing level of inorganic fertiliser and in any case do not exceed 75kg of nitrogen, 37.5kg of phosphate and 37.5kg of potash per hectare (60 units of nitrogen, 30 units of phosphate and 30 units of potash per acre). Do not exceed your existing level of home produced organic fertiliser and do not apply any other organic fertiliser.
- Do not use fungicides or insecticides.
- Do not apply herbicides except to control creeping buttercup, soft rush, nettles, spear thistle, creeping or field thistle, curled dock, broad-leaved dock or ragwort. Apply herbicides by weed wiper or spot treatment
- Do not apply lime, slag or any other acidity reducing substance.
- Do not install any new drainage. Do not substantially modify your existing drainage system.



- Maintain all existing ditches and field drains free of weeds by mechanical means, not sprays. Do not install additional surface piping.
- Do not irrigate any land, including with dirty water from livestock enterprises.
- Maintain hedges, trees and pollarded willows in accordance with local custom.
- Do not plant any additional trees or allow natural establishment of additional trees/ bush without prior agreement.
- Do not damage or destroy any features of historic interest.
- Obtain written advice on siting and materials before constructing buildings, roads or any other engineering operations which do not require planning permission or prior notification determination by the Local Planning Authority.
- Maintain existing gates with fencing, but do not erect any additional permanent fencing without prior consent.
- Water levels in ditches must be maintained with at least 15 cm in the bottom of the ditch during the winter months from 1 November – 31 March

LEVEL 1A - EXTENSIVE PERMANENT GRASSLAND

Level 1A aims to protect and enhance the semi-improved, improved and unimproved species rich grassland on the Moors by encouraging the reduced use of agro-chemical inputs. Farmers must follow the requirements under Level 1, plus the additional requirements below:

- Do not use a chain harrow or roller between 31 March and 1 July.
- Do not exceed your existing level of inorganic fertiliser and in any case do not exceed 25kg of nitrogen, 12.5kg of phosphate and 12.5kg of potash per hectare each year.
- Unless traditionally the land has been used for grazing each year mow at least one third (or one year in three) of the land but not before 1 July and do not graze the land prior to leaving it for mowing.
- Do not cut or top the grass after 31 August.
- Do not graze with sheep from 1 September to 1 March.
- Do not use herbicides to control creeping buttercup.



LEVEL 2 - WET PERMANENT GRASSLAND

Level 2 aims to protect and enhance the semi-improved, improved and unimproved species rich grassland on the Moors by encouraging the reduced use of agro-chemical inputs, plus it imposes additional restrictions upon water level in order to maintain the wet grassland.

Farmers must follow the requirements under Levels 1 and 1A, plus the additional requirement below:

- Water levels in ditches must be maintained a) at a depth of no more than 45 cm below average field level during period 1 April – 31 October and b) with at least 30 cm in the bottom of the ditch from 1 November – 31 March

LEVEL 3 - PERMANENT GRASSLAND RAISED WATER LEVEL AREAS

Level 3 aims to protect and enhance the semi-improved, improved and unimproved species rich grassland on the Moors by encouraging the reduced use of agro-chemical inputs, plus it imposes additional restrictions upon water level in order to create areas of shallow flooding during the winter months.

Farmers must follow the requirements under Levels 1 and 1A, plus the additional requirements below:

- Do not carry out mechanical operations between 31 March and 1 July.
- Apply no inorganic fertiliser and do not exceed your existing level of organic manure provided it is only home produced cattle farmyard manure and does not exceed 25 tonnes per hectare (10 tones per acre) per annum. No slurry should be applied.
- Graze only with cattle but do not graze before 20 May in any year.
- Do not exceed a grazing density of one animal per 0.75 hectare (one animal per 1.8 acres) from 20 May to 8 July. Do not cause poaching, over-grazing or under-grazing.
- Do not make silage. Unless traditionally the land has been used just for grazing each year mow at least one third of the land (or mow one year in three) but not before 8 July. Do not graze the land prior to leaving it for mowing.
- Water levels in ditches must be maintained a) at a depth of no more than 30 cm below average field level during the period from 1 May – 30 November and b) at no less than average field level from 1 December – 30 April so as to cause conditions of surface splashing.