Results-based agri-environment schemes for support of broad biodiversity at landscape scale in Transylvanian High Nature Value farmland

Romania 2015-2019

Final Report

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EXECUTIVE SUMMARY

Geographical Context: this project is aimed at testing the application of results-based agri-environment schemes at grassland sites in Southeast Transylvania covering 150 ha, in two bio-geographical areas, Continental and Alpine. The project areas chosen offer HNV farmland at landscape-scale to a rare extent in Europe. The HNV landscapes are havens to a wide range of habitat and species, which often have differing management requirements. Around 20% of grassland is badly managed in the project areas: overgrazing / fertilising in easily accessible meadows and pastures, failure to clean encroaching thorny scrub in less accessible meadows and pastures - the result of years of neglect and collapse of traditional rural economy.

Policy context: recent experiences in the design of the next National Rural Development Programme (NRDP) have revealed some of the threats which can be represented by prescriptive species-based measures when operating at broad landscape scale. Biodiversity in these HNV farmed landscapes would be effectively maintained if their small-scale mowing and grazing regimes could be maintained. Results-based schemes seem ideal for maintaining these farming systems and related biodiversity. Conversely, prescriptive schemes that set fixed dates at landscape scale that are not responsive to conditions can often be counterproductive as they do not mimic traditional management; often threatening the species and habitats that are the object of the schemes, and the socio-economic viability of the farming systems that created them.

Project Description: the objectives of the project were to

- Use HNV areas in Transylvania, Romania, as pilot sites to test design, development and use of result-based remuneration schemes to conserve and enhance biodiversity;

- increase the understanding of factors that contribute to the success or failure of such schemes

- identify opportunities and conditions for increasing the use of such schemes in Romania and in the EU more widely, especially in future CAP Rural Development programmes demonstrate the potential of these schemes to achieve ecological targets, using monitoring of indicators in pilot measure participant and control grasslands

- increase the understanding of the benefits of RBAPS schemes within the rural community

- promote RBAPS schemes within the Ministry of Agriculture & Rural Development (MARD) and Ministry of Environment (MoE), based on results achieved.

Actions under the project can be summarised as:

1. **Designing the pilot:** the Preparatory Phase included the following

   a. select practical indicators

   Evaluation of the nature value of the grassland areas supported under this programme was carried out using a list of appropriate plant indicator species, which provide a pragmatic measure of habitat quality either alone or in combination with additional indicators, depending on the scheme aims. We established a list of 30 plant species and thresholds for each of the two project areas.

   b. design monitoring/control methodologies

   The monitoring methodology was based on a transect of 100 m along the longest diagonal of the parcel (excluding the first 3m from the edge of the parcel). The transect is divided into three equal sections (i.e. 33m each), and all indicator species occurring within 1m either side of the transect should be recorded in each section.

   c. make payment calculations

   The project partners decided on three levels of payment linked to 5, 8 and 10 indicator species detected. This graded payment scale would help to prevent decline of moderately species rich grasslands, and also provide an added incentive to maintain the most ecologically valuable areas in good condition. The number of indicator species present in a

grassland was assumed to decline if management becomes less "biodiversity-friendly", e.g. through earlier mowing or excessive application of fertiliser. Thus it was assumed for the calculation that the higher the number of species, the greater the cost incurred to the farmer. The calculations were based on income foregone and additional costs if ideal management was carried out, and transaction costs – the costs to the farmer of learning the methodology, plant identification, and doing his own controls, as required under the measure. This allowed a calculation of payments based on associated management, even if that management was not obligatory, since the species numbers were a fair indication of management carried out.

   d.   develop criteria for selection of grassland parcels

In early 2016, we announced the RBAPS scheme in a general farmers meeting attended by over 300 farmers, and a series of village association meetings in Târnava Mare area and Pogany-havas area. We announced the criteria, as below, and asked any interested farmers to contact us. The selection criteria included: must be legal users of the land (owner or rental contracts); commitment for 3 years; maximum 10 ha per owner; people employed in project cannot provide land; land may be under basic payments (SAPS) but not under agri-environment agreements; only haymeadows eligible, must be permanent grassland (older then 5 years).

   e.   select parcels for inclusion in the scheme.

In spring 2016 we selected farmers from those who responded to announcements. We carried out surveys of all parcels to establish eligibility, and the baseline for future monitoring, after which the contracts were signed with successful applicants as follows: Târnava Mare 16 farmers, 48 parcels, 72.91 ha; Pogany-havas 56 farmers, 157 parcels, 90.95 ha.

2. Implementation phase included the following

   a.   visits to selected RBAPS-participating farms, and control farms chosen, in order to monitor results and offer advice

We carried out surveys of all parcels to establish the baseline for future monitoring. We also carried out a questionnaire for farmers in order to build up a simple agricultural analysis of the participant farms: the level of viability of the farms, the average age of the farmers, their motivation to contract RBAPS. This helped establish why farmers are attracted to RBAPS schemes (not just the payments) and why certain farmers are not attracted to RBAPS (complexity, payments insufficiently attractive, etc.).

   b.   training of farmers and of paying agency staff

Each training day included: a questionnaire regarding the farming types of the individuals; presentation of the survey method and the changes compared to last year; presentation of the indicator plant species based on the prepared guide, and a field walk to the closest meadow to identify plant species. Plant identification was better in Pogany-havas area (10-12 species) than in Târnava Mare area.

We carried out training days for officers of the control in both pilot areas, in order to ensure that they understood the measure, and also to reassure farmers that the control agency was aware of the measure and supported it. The participant APIA experts were positive about the RBAPS system, and were of the opinion that RBAPS seems to be more suitable for small farmers than current packages.

   c.   annual monitoring of indicators and assessment of results.

All parcels were self–assessed by farmers, and also by the project specialists. If this scheme is adopted more widely, we would expect self-assessment and random checks of a percentage of parcels by payments/control agency. The 2017 and 2018 results compared to the 2016 results confirmed that the methodology is moderately robust. Combining the two areas, the majority of the transects (51%) showed no change or only 1 species difference. This is more likely to be controller error, rather than actual increase / decrease in species numbers.

   d.   comparison with other monitoring methods in order to check reliability of the methodology.

The methodology was tested for robustness against certain variables.

i. robustness of the monitoring methodology between contract years. We found on average more indicator species per transect in 2017 than in 2016. The change in indicator species was enough to cause change in category in 41% of parcels in Târnava Mare and 19% parcels in Pogany-havas.

ii. Checking of robustness of the monitoring methodology against alternative methodologies. Alternative methodologies were more time consuming and produced no significant changes in species numbers/payment categories

iii. Checking of reliability of the monitoring methodology when carried out by the farmer, compared to when carried out by a botanist/expert. The farmers recorded on average 1.8 fewer species on the transect than the experts. On average, the farmers correctly identified 65% of indicator species in their meadow parcels.

iv. Testing the indicator species list: testing frequency of different indicator species, in case of possible improvements to the list. The results of the tests did not suggest a need to change the indicator species list.

e. financial management of payments scheme

Payment rates and conditions were calculated with assistance from the Ministry of Agriculture and Rural Development. The fact that the calculations were carried out by them gives a high chance that they will be accepted if the measure is implemented in due course through the NRDP. The calculations were based on income foregone and additional costs if ideal management was carried out, and transaction costs – the costs to the farmer of learning the methodology, plant identification, and doing his own controls, as required under the measure.

f. information actions to publicise the scheme and its results through the National Rural Development Network, farmer organisations; other NGOs in Romania, local and national media).

We promoted the scheme and its results through the Romanian National Rural Development Network, farmer organisations, other NGOs in Romania, local and national media, and at a number of international conferences. We obtained widespread publicity when Prince Charles visited the Târnava Mare in June 2016, when he made a field visit to RBAPS grasslands and met the regional director of the Payments Agency, APIA.

DISCUSSION AND CONCLUSIONS

Farmer Attitudes: the farmers generally enjoyed learning the species, but there was natural variation in their ability to recognise them. There was a wide range in accuracy of the farmer surveys. The indicator species list must be practicable, but also appropriate to distinguish the most species rich grasslands.

Administrative Costs of RBAPS Compared with Management-Based Scheme: the monitoring methodology was designed to be the best compromise between accuracy and simplicity. Testing proved that it was practical for controllers, taking 30 minutes per parcel after training and experience, while at the same time it yielded robust results. Thus, time per check for controllers was not greater than for management-based measures. The of the Mures APIA payments agency responsible for control, whose staff had participated in training days during the project stated that the burden on control agencies was no greater under RBAPS-type scheme than it was under a standard management-based scheme.

Monitoring and Evaluation: There were fluctuations, in some cases of up to 7 species between years. This could have been caused by errors made in locating the transect. Future schemes should take into account the fact that that errors can occur.

The same indicator species are not always found on the transect. This is to be expected from a biological indicator that is sensitive to its environment and should be considered when designing the scheme requirements. It is important that there are categories rather than a continuous scale to allow for fluctuation within that category.

In 2018, we monitored 55 meadow parcels in TM and 162 in PH. The number of species detected varied slightly compared to last year (higher in TM and lower in PH), but this difference was not significant.

Problems Encountered:

- Area changes. There were several cases of land measurements being revised by the Payments Agency. This will occur less as land measurements improve.
- Changes in species category. Generally, species numbers have remained the same in the 3 years of checks. In some cases, species number has increased, in some decreased. This is more likely to be sampling error rather than an actual increase/decrease. Future implementation must allow for sampling errors.
- Additional payments linked to management. Should additional payments, such as for hand mowing, be considered? This to be discussed with the Managing Authority, before any eventual national roll-out of the scheme. However, this would create a hybrid rather than pure RBAPS scheme.

Representativity of Meadows Tested in the Pilot: the total area of HNV grassland in Romania is estimated as 2 million ha, of which about 25% can be estimated as haymeadow (based on the known proportions of haymeadow to pasture in the Târnava Mare and Pogany-havas areas). Although the total area and number of parcels tested in the Romanian RBAPS project was relatively small (Târnava Mare 48 parcels, 72.91 ha, Pogany-havas 157 parcels, 90.95 ha) we can be confident that the results obtained are representative and can be used to extrapolate scheme design to national scale. We base this on the fact that a single indicator list of 30 species provided reliable and robust data, showing links to general condition of habitats, and not being excessively sensitive to annual variations, controller error, and being effective in a range of habitats as found in the Continental and Alpine biogeographical regions in the two pilot areas.

Robustness of Link Between Number of Indicator Species and Wider Nature Values: the monitoring of parcels under RBAPS agreements, and control parcels, has revealed that the number of indicator species is strongly linked to **general nature value of the parcels, general species diversity of the parcels, and habitat condition of the parcels,** as explained in the *Control and verification of biodiversity quality* section above. This is reassuring that the indicator species can be used as a broader gauge of species diversity and habitat condition. Some species-based agri-environment schemes have been associated with unintended negative consequences: damage to condition of habitats of other species which do not share similar management requirements.

RECOMMENDATIONS FOR FUTURE ROLL-OUT

Key messages to be delivered are:

- RBAPS offer higher payments for HNV hot-spots

- RBAPS offer flexibility to the farmer to adjust to annual (year-to-year) weather variations, and differences in geographical aspect, altitude and soil type, which all call for management adjustments (e.g. cutting date)

- RBAPS are easier to control that management-based measures

- RBAPS are more defensible and cost effective in comparison to management-based measures because of the strong link between results which are paid for (number of indicator species) and habitat condition and species diversity.

RBAPS could usefully be linked with the Natura 2000 management, especially as the indicator species were clearly linked to Habitats Directive Annex 1 habitats.

To overcome the threat of reducing the volume of payments and generating extra administrative burdens, RBAPS should be designed not to replace the existent agri-environment schemes, but rather to complement them. Thus, normal regular agri-environment schemes could apply, but whenever/wherever key HNV indicator species or habitats are identified, the land could be eligible for RBAPS, such that farmers are able to choose RBAPS voluntarily.

RBAPS should be promoted as a higher tier of agri-environment, a tier where the HNV is proved before entering in scheme and proved before making payments, that the payments are higher and the control system is more reliable/defendable on audit missions and less time-consuming.

In terms of level of payments, the RBAPS should be at least attractive as the agri-environment.

In addition to agri-environment measures, RBAPS could be devised and offered under the 'eco-schemes' proposed under the new CAP. These bring the benefit of removing constraints in terms of payment calculation (going beyond income foregone/costs incurred).

POLICY CONTEXT

The project areas chosen in HNV Transylvania (Romania) offer HNV farmland at landscape-scale to a rare extent in Europe. These HNV landscapes are havens to a wide range of habitat and species, which often have differing management requirements. In such areas, an ecosystem approach (rather than species-specific approach) is ideal. The rich biodiversity of these landscapes has been created and maintained by land management that varies in space (small-scale management) and time (mowing times and grazing patterns vary year to year in response to annual weather).

This project aimed at testing the application of results-based agri-environment schemes at grassland sites in Southeast Transylvania covering 150 ha, in two bio-geographical areas, Continental and Alpine.

The project area has become a European focus area for the development of agri-environment schemes in support of HNV farming systems. It has been very well studied over a 10-year period: mapping, habitat and species inventories, socio-economic aspects linked to farm scale and farm management, and design of agri-environment schemes.

In addition, recent experiences in the design of the next National Rural Development Programme (NRDP) have revealed some of the threats which can be represented by prescriptive species-based measures when operating at broad landscape scale. Biodiversity in these landscapes would be effectively maintained if these random-staggered-small scale mowing and grazing regimes could be maintained. Results-based schemes seem ideal for maintaining these farming systems and related biodiversity. Conversely, prescriptive schemes that set fixed dates at landscape scale that are not responsive to conditions can often be counterproductive as they do not mimic traditional management; *often threatening the species and habitats that are the object of the schemes,* and the socio-economic viability of the farming systems that created them.

GEOGRAPHICAL CONTEXT: THE AREAS SELECTED

The project areas chosen offer HNV farmland at landscape-scale to a rare extent in Europe. The HNV landscapes are havens to a wide range of habitat and species, which often have differing management requirements. In such areas, an ecosystem approach (rather than species-specific approach) is ideal. Species-targeted measures can possibly benefit the target species over the short term, to the detriment of other species. Over longer term, the danger that imposing specific measures might undermine traditional local farm economy could create a general system collapse endangering, ironically, even the target species. The key need in these areas is to maintain and support traditional random/small-scale/mosaic management as much as possible – supporting the farming system requires building in the ability for managers to adapt to annual variability of seasons.

Conversely, prescriptive schemes that set fixed dates at landscape scale that are not responsive to conditions can often be counterproductive as they do not mimic traditional management; often threatening the species and habitats that are the object of the schemes, and the socio-economic viability of the farming systems that created them.

In the previous NRDP period 2007-14, farmers in the project area have experienced practical problems with the a-e scheme design, which may have reduced the uptake of the measures, and the economic viability of continued traditional landscape management, without necessarily improving biodiversity impact. *These known problems, which could be resolved by results-based schemes, make this a particularly suitable area for the RBAPS pilot scheme.*

Problems include:
1. mowing dates inflexible – the stipulate earliest mowing dates in the current HNV grassland schemes do not take account of altitude, and annual variations in grassland flowering times. This can cause greater economic losses to farmers in some years, unrelated to biodiversity results.
2. in the 2015-20 NRDP, the MARD has proposed a species-specific highly restrictive a-e measure (Crex crex) to replace a large area previously eligible for HNV grassland payments. For example, earliest mowing date will be moved from 1 August to 1 September. Making this very specific and restrictive scheme the only a-e measure available to farmers in these areas, irrespective of the grassland habitats, may well have negative consequences on biodiversity, as well as on traditional farm economy.

3. danger of conversion of meadow into pasture. In the 2007-13 NRDP, equal payments were given for pasture as for haymeadow, although the economic costs of the pasture management were much lower. This created a perverse incentive towards meadow loss, conversion of meadow to pasture.

Project areas

The project areas were in 2 bio-geographical regions, Continental and Alpine. See Figure 1 below.
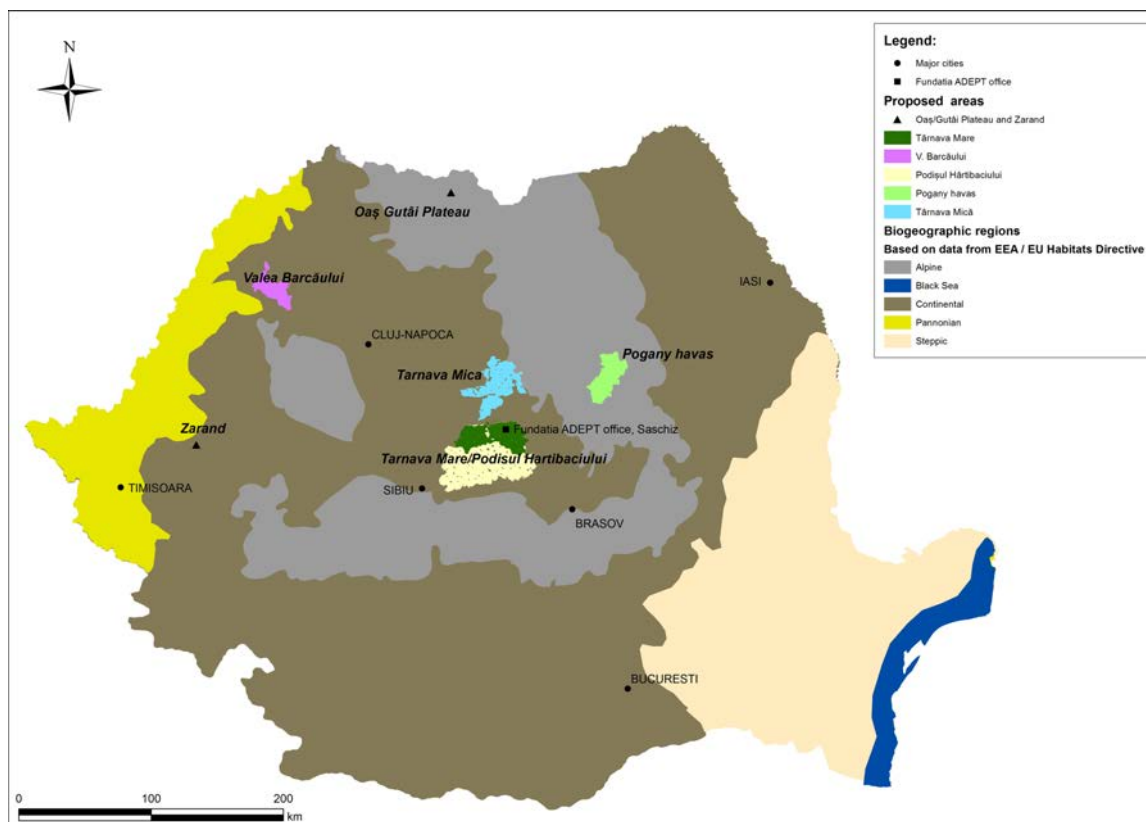
Figure 1: Map of Romania showing bio-geographical regions and location of the test sites.

The regions selected for the pilot measures were
1. Continental bio-geographical region: HNV grasslands in the Sighisoara-Târnava Mare area (maps Fig.1). The Sighisoara-Târnava Mare SCI (ROSCI0227) is proposed as the prime Continental bio-geographical region since there is a mass of baseline data already existing. It is 85,374 ha in area, of which 33,000 ha are HNV grassland habitats.

2. Alpine bio-geographical region HNV grasslands will be located in the Pogany-havas area. It has 18,353 ha of Utilised Agricultural Area (UAA) of which pasture 8,275ha and meadow 7,595ha. See Figure 2 below.

Main land uses and ownership status of the project areas

Transylvania offers some of the largest areas of High Nature Value Farmed Landscape in the EU. An estimated 10% of these habitats in the project area is poorly managed: overgrazing in easily accessible sites, abandonment of less accessible grassland (causing spreading of thorny scrub) - the result of neglect and collapse of traditional rural economy. These effects are obvious but still easily reversible by re-establishment of traditional management. The project is designed to bring these habitats under proper long term management regimes.

Land use across the area is approximately 35% grasslands (pastures 16,400 ha, meadows 17,250 ha), 43% forest (41,500 ha), and 6.5% arable (6,000 ha). The local agricultural economy has declined as a result of Romania's transition to a market economy. The economy is almost entirely dependent on agriculture. After land restitution, 90% of villagers have farms under 5ha. These are mostly used for subsistence farming, with milk and cheese often being the only source of cash

income. The active population has fallen from 35% to 28%, as a result of the ageing of the population and lack of jobs. The populations of the villages are of high average age with average incomes below the poverty line.

In these circumstances, any conservation programme that has an impact on land management will be viewed critically, and will only receive local support if the programme is seen to take local peoples' interests into consideration. Agri-environment payments have been generally well received in the area, and take up on eligible land varies between 50-80% depending on the nature of the area and the effectiveness of local extension services.
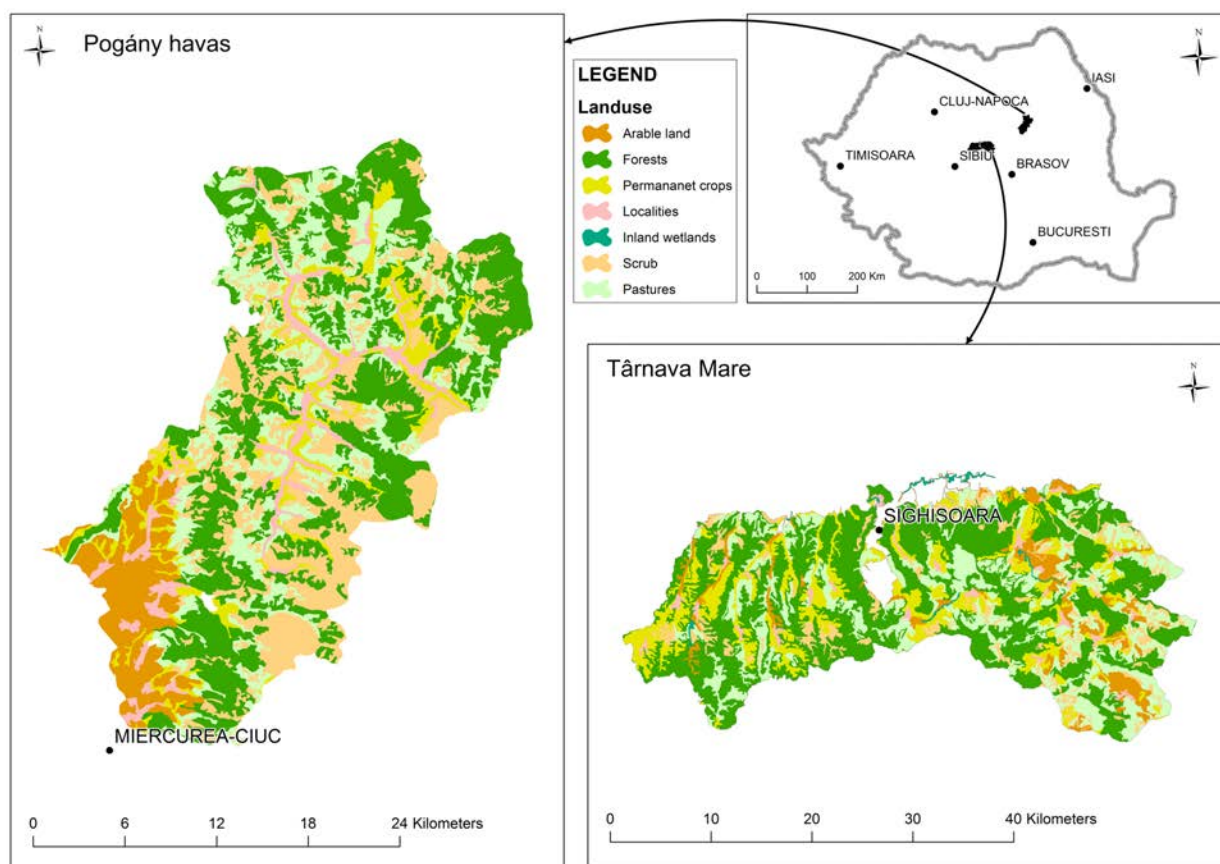
Figure 2: The project areas were in 2 bio-geographical regions, Continental and Alpine

Grassland floristic diversity

Traditional methods of grazing and haymaking have led to the development of the species-rich grasslands which cover much of the project area, which contain a mixture of Carpathian, steppic and Mediterranean flora. There is great species diversity, associated generally with low fertility as a result of constant mowing, application of little/no farm yard manure (FYM), artificial fertisers / pesticides.

Analysis in 2005 showed that typically, meadows near villages (occasional FYM) have a mean of 14.5 species per 0.25m2 quadrat and mean total species for all five quadrats per site of 29.2. The terraces and steep banks are more diverse, mean species per quadrat of 23.9 and mean total species for all quadrats per site of 43.

Threats

- **Loss of HNV grassland through poor agricultural management - intensification or abandonment**

Around 20% of grassland is badly managed in the project areas: overgrazing / fertilising in easily accessible meadows and pastures, failure to clean encroaching thorny scrub in less accessible meadows and pastures - the result of years of neglect and collapse of traditional rural economy. This process is relatively easily reversible if not allowed to continue for a long time. Scrub and thorn spread quickly in abandoned grasslands and a thatch of dead grass develops on top of the hay meadows smothering the plants underneath. This leads to accumulation of dead grass, gradual growth of bushes/thorny shrubs, and a massive reduction in plant diversity to be replaced by a matted grass and thorn scrub of much lower biodiversity value. Across Europe similar grassland areas have been lost through land abandonment. For example, in the Czech Republic the absence of grazing animals from species-rich grassland has led to these areas reverting to biodiversity-poor scrub and pioneer woodland.

- **Loss of priority habitats through lack of local support for conservation measures**

Lack of public knowledge and information about the economic, as well as ecological, value of the biodiversity of the region is one of the underlying causes of biodiversity loss. Inhabitants do not appreciate the potential international interest in the area, and the potential economic and quality of life advantages to themselves resulting from conservation, and therefore do not consider biodiversity loss to be an issue when they make land management choices. This threat will have increasing impact over the next few years under EU pressured for competitiveness, causing intensification in more commercially viable area and abandonment of less accessible/commercially viable areas.

DESCRIPTION OF PROJECT IMPLEMENTATION

This project tested results-based agri-environment schemes at selected grassland sites in Transylvania: both the practicality of application (in terms of attractiveness to farmers, and ability for proper controls by payment agencies, farmers and farm advisors: and also effectiveness in maintenance of biodiversity compared to two other control areas: areas under conventional a-e schemes, and areas under no schemes. To test the suitability and practicality of results-based agri-environment schemes to maintain the broad range of species and habitats in two bio-geographical regions in Romania's extensive High Nature Value farmed landscapes.

Objectives

- Use HNV areas in Transylvania, Romania, as pilot sites to test design, development and use of result-based remuneration schemes to conserve and enhance biodiversity;
- increase the understanding of factors that contribute to the success or failure of such schemes
- identify opportunities and conditions for increasing the use of such schemes in Romania and in the EU more widely, especially in future CAP Rural Development programmes demonstrate the potential of these schemes to achieve ecological targets, using monitoring of indicators in pilot measure participant and control grasslands
- increase the understanding of the benefits of RBAPS schemes within the rural community
- promote RBAPS schemes within the Ministry of Agriculture & Rural Development (MARD) and Ministry of Environment (MoE), based on results achieved.

The project was designed to be coordinated with, but not duplicate, prescription-based agri-environment schemes under the 2007-2013 and 2015-20 periods of Romania's National Rural Development Plan. Data gathered through the project will be made available to the MARD and MoE to assist with future agri-environment scheme design.

IEEP and DBU provided advice and support on scheme design and implementation issues relating to grassland ecology, methodology and design based on comparison with other EU schemes, and interpretation and application of EU rules.

To test the measure design, three-year farmer contracts, were implemented in the pilot regions with support from the RBAPS team. Payments to farmers were based on indicator species, identified and monitored by methodologies developed in year one of the project.

Farmers' attitudes were explored through a series of questionnaires and interviews, providing insight into how results-based approaches could appeal to the wider farming community.

3. **Preparation phase**
   The Preparatory Phase, 2015-2016, was used to design the basics of the RBAPS scheme
   f. select practical indicators
   g. design monitoring/control methodologies
   h. make payment calculations
   i. develop criteria for selection of grassland parcels
   j. select parcels for inclusion in the scheme.

4. **Implementation phase**
   The Implementation phase, 2016-2019, covered 3 vegetative seasons, 2016, 2017 and 2018. Implementation took the form of:
   g. visits to selected RBAPS-participating farms, and control farms chosen, in order to monitor results and offer advice
   h. training of farmers and of paying agency staff
   i. annual monitoring of indicators and assessment of results
   j. comparison with other monitoring methods in order to check reliability of the methodology
   k. financial management of payments scheme
   l. information actions to publicise the scheme and its results through the National Rural Development Network, farmer organisations; other NGOs in Romania, local and national media).

1. PREPARATION PHASE

1.a IDENTIFYING THE INDICATOR SPECIES

Evaluation of the nature value of the grassland areas supported under this programme was carried out using a list of appropriate plant indicator species, which provide a pragmatic measure of habitat quality either alone or in combination with additional indicators, depending on the scheme aims[1]. The objective was to establish such a list of roughly 30 plant species (or species groups)[2] and thresholds for each of the two project areas.

Methodology

Floristic inventories to create long list of species, from which to select indicator species.

We carried out botanical surveys to build up data from which to identify suitable indicator species which are relatively easy to identify, likely to be present in well-managed grasslands, and which show a robust link to responsible farm management and to the conservation status of HD habitats and species. Surveys were carried out in summer 2015: **see Annex 1.1.**

Parcels[3] of hay meadow and pasture were surveyed in each study region, aiming to sample all types of grassland vegetation, with sampling points spread evenly across each region. We did this by opportunistic sampling of a range of grassland types (pasture/meadow, wet/dry, intensive/extensive etc.) in most of the villages in Târnava Mare, and targeting efforts based on local knowledge in Pogany-havas to cover a range of grassland types.

162 transects were recorded in Târnava Mare, including 100 hay meadows and 62 pastures. 159 transects were recorded in Pogany-havas, including 105 hay meadows and 54 pastures. These were identified by stratified random sampling, assisted by our GIS expert.

After discussion with the project partners about the conservation priorities for the two areas, the indicator species were selected for **hay meadows** only (i.e. excluding pastures), because
- these are the grassland habitats with the highest plant species richness and at the greatest threat of land use change
- they have more homogeneous vegetation, making them more suitable for assessment with results indicators
- they are smaller and are generally single ownership (compared to communal ownership of many pastures), making them more suitable for the limited budget and intensive supervision of each owner/manager within this pilot scheme.

Parcels for testing were identified by stratified random sampling. In each parcel, we walked one transect of 100 m in length and 2 m in width along the longest diagonal of the parcel, excluding a buffer zone of 3 m at the edge of the parcel. We recorded the presence of taxa (i.e. species or species groups) from the list of potential indicator taxa. Transects were divided into 3 equal sections of 33 m on which species were recorded, in order to ensure evenness of distribution. In the case of small parcels, transect length was reduced[4] but still divided into 3 equal sections. Species were recorded in each section as either 1 (= 1-2 individuals), 2 (= 2-20 individuals) or 3 (>20 individuals).

Information on the vegetation type and structure and fodder and nature value were recorded by the surveyor for each parcel. For roughly 25% of transects, one 10 m² plot was placed at the start of the transect (or along its length) in which all vascular plant species were recorded. This was used to check the relationship between the indicator species and the total vascular plant species richness.

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[1] Keenleyside et al. 2014 Results-based Payments for Biodiversity Guidance Handbook: Designing and implementing results-based agri-environment schemes 2014-20. Institute for European Environmental Policy, London.

[2] Similar results-based schemes using plant indicator species have shown a list of approximately 30 to be practical in terms of ease of use by farmers and controllers, whilst maintaining sufficient detail and flexibility to show differences in quality over a range of grassland habitats. For example, the 8 schemes currently in place in the different German Länder use lists of between 24 and 36 species.

[3] i.e. areas of grassland managed as a single unit

[4] Based on experience with current results-based schemes with plant indicator species in Germany (Baden-Württemberg, Rhineland-Palatinate, Lower Saxony, Thüringen) and France (Massif Central) in which variable transect lengths are used.

Since the total dataset was 100 hay meadow transects in Târnava Mare and 105 in Pogany-havas, the absolute numbers given in the following are roughly equivalent to the **percentage** score.

Of the 74 preselected potential indicator species in Târnava Mare, 5 were ubiquitous (present in 50-100% of transect sections), 25 were frequent (20-50%), 15 were occasional (5-20%) and 29 were rare or not found (0-5%). Of the 81 preselected potential indicator species in Pogany-havas, 10 were ubiquitous, 22 were frequent, 22 were occasional and 27 were rare or not found (0-5%).

Based on these criteria, we developed a list of potential indicator taxa. Separate lists of potential indicator species were produced for each region: 74 taxa in Târnava Mare and 81 in Pogany-havas.

A single list of the highest scoring species was produced for the two pilot areas together in order to a) simplify the administration of the scheme, and b) test the flexibility of a single list for application under different regional conditions, with the intention of potentially extending this scheme to cover a wider area.

The group of highest-scoring indicator species was tested against the hay meadow transect data to check whether those parcels judged as being in favourable condition (for all habitat types) attained at least the 5 indicator species threshold per transect section, and that those judged in unfavourable condition contained fewer than 5 species. Based on the results of this test, the list was refined, removing or replacing species to minimise the number of falsely assigned transects until there was no further improvement. The final list is shown at **Annex 1.2.**

The project partners decided on **three levels of payment linked** to 5, 8 and 10 indicator species detected. This will help to prevent decline of moderately species rich grasslands, and also provide an added incentive to maintain the most ecologically valuable areas in good condition. A continuous payment scale linked to the exact number of indicator species is too sensitive to variability in weather conditions and surveyor error.

Figure 3 shows the number of hay meadow parcels (equivalent to %) that reach these indicator species thresholds. Note that Pogany-havas has a higher proportion of parcels above the threshold, since Pogany-havas grasslands have especially high species diversity.

Several parcels of habitat condition A did not reach the threshold, however, most of these could be explained when looking at the data in more detail (e.g. one transect section with an unusually low score meant that the threshold was missed).
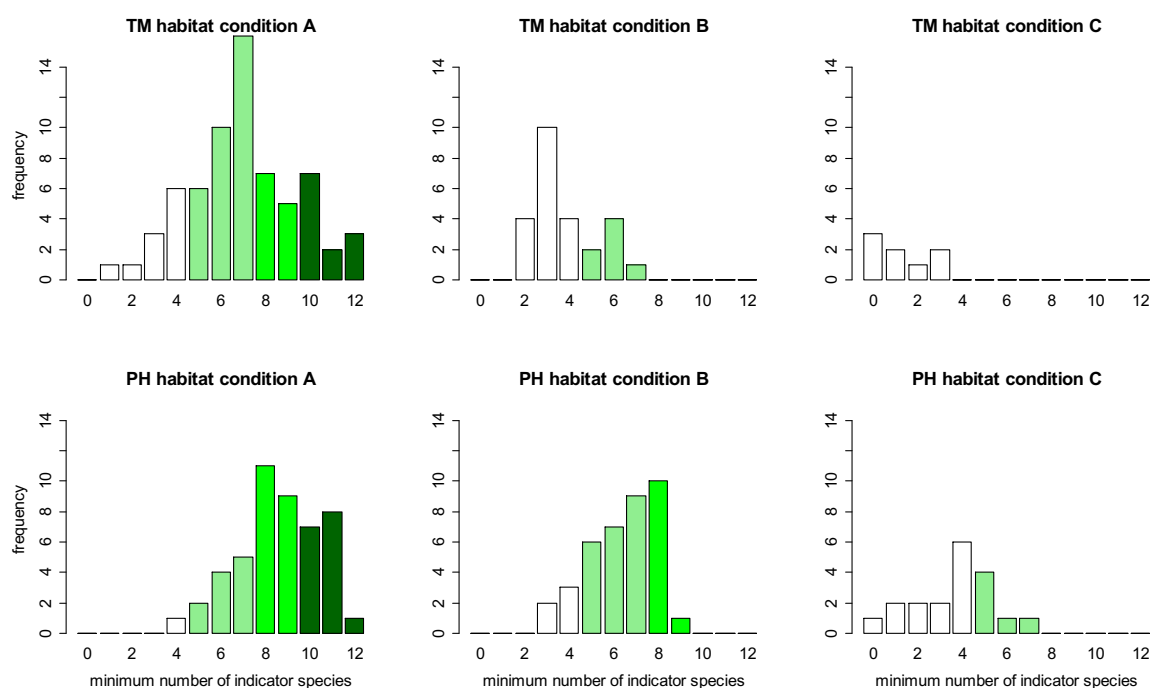

Figure 3: Histogram of the number of transects achieving the different indicator species levels according to habitat conditions status: A = favourable, B = unfavourable – insufficient, C = unfavourable – bad.

Developing the short-list of indicator species

From the above, we developed a list of 30 indicator species. The potential indicator species were assessed according to the following criteria:
- frequency, whereby very rare or very frequent species were scored lower (very rare species are not useful as indicators)
- correlation with subjective HNV score assessed in the field, and correlation with habitat favourability (CCA scores)
- fodder value (it is not realistic to encourage farmers to maintain poisonous plants)
- ease of identification and detection by farmers and control agency staff
- ensuring a range of wet, mesic and dry species were included.

Furthermore, the chosen species are sensitive to changes in management, and will disappear if:
- large amounts of synthetic fertilisers or manure are applied
- herbicides are applied
- cutting frequency increases
- the meadow is cut too early (usually before mid-June)
- heavy machinery is used to cut and collect the hay
- the meadow is grazed during the main hay-growing season
- the meadow is not mowed.

They have been selected because they only grow in hay meadows managed at low intensity, and are associated with high plant and animal species richness as well as good quality hay. All the species are easy to recognise, and are flowering in the spring and summer when the monitoring is carried out. Species that look very similar have been grouped together to avoid confusion. In the case of such species groups (e.g. different types of orchids), the group counts as a single indicator.

Indicator species chosen, suitable for assessment of both the pilot areas, were:

Indicator species for wet meadows:	Indicator species for mesic meadows:
• *Caltha palustris*	• *Anemone narcissiflora*
• *Geranium spec.*	• *Betonica officinalis*
• *Lathyrus pratensis*	• *Campanula spec,*
• *Lychnis flos-cuculi*	• *Dianthus spec.*
• *Lythrum salicaria*	• *Filipendula vulgaris*
• *Polygonum bistorta*	• *Fragaria spec.*
• *Sanguisorba officinalis*	• *Galium verum*
• *Trollius europaeus*	• *Gentiana/Gentianella spec.*
• *Valeriana officinalis*	• *Leucanthemum vulgare*
	• *Medicago falcata*
Indicator species for dry meadows:	• *Orchidaceae spec.*
• *Anthericum ramosum*	• *Primula spec.*
• *Coronilla varia*	• *Scorzonera spec.*
• *Scabiosa ochroleuca*	• *Trifolium ochroleucon/pannonicum*
• *Teucrium chamaedrys*	• *Tragopogon spec.*
• *Thymus spec.*	• *Trifolium montanum*

Table 1: list of indicator species

Annual monitoring over 3 years demonstrated that this list of indicators was reliable and robust: see Monitoring section below.

Assessment methods were designed and tested, checking verifiability and controllability. See **Annex 1.2**, and Figure 2 repeated below from Annex 1.2. See also monitoring instructions developed for the project, **Annexes 1.3 and 1.4**.

1.b MONITORING METHODOLOGY

The monitoring methodology followed the methodology used for assessment of applicants' parcels in year 1, namely a transect of 100 m along the longest diagonal of the parcel (excluding the first 3 m from the edge of the parcel). The transect is divided into three equal sections (i.e. 33 m each), and all indicator species occurring within 1 m either side of the transect should be recorded in each section.

Annual monitoring provided an assessment of the robustness of the methodology.

The parcel was judged eligible only if all sections pass the relevant threshold of indicator species. Where the longest diagonal was shorter than 100 m, then the transect took a V or a W shape.

Number of species per transect section

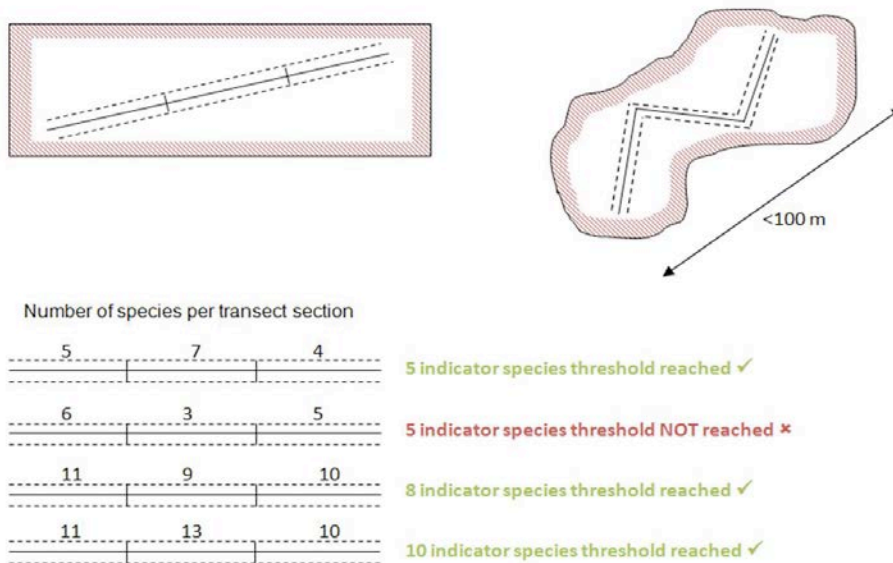| 5 | 7 | 4 | 5 indicator species threshold reached ✓ |
6	3	5	5 indicator species threshold NOT reached ✗
11	9	10	8 indicator species threshold reached ✓
11	13	10	10 indicator species threshold reached ✓

Figure 4: The monitoring methodology was designed to be the best compromise between accuracy and simplicity. Testing proved that it was both practical for controllers (taking 30 minutes per parcel after training and experience) and that it yielded robust results.

Figure 4.a: example of GIS recoding of transect

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1.c PAYMENT CALCULATION

The project partners decided on **three levels of payment linked** to 5, 8 and 10 indicator species detected. This graded payment scale would help to prevent decline of moderately species rich grasslands, and also provide an added incentive to maintain the most ecologically valuable areas in good condition (see e.g. Keenleyside et al. 2015 RBAPS Handbook page 27). A continuous payment scale linked to the exact number of indicator species was regarded as too sensitive to variability in weather conditions and surveyor error.

The histogram Figure 3 above illustrates why we chose the 3 steps in the payment levels at 5, 8 and 10 species.
  ➢ In the test parcels, few only 10-15% of parcels of habitats in favourable condition (condition A) had over 10 species. No habitats in unfavourable condition (B- insufficient) had 10 species.
  ➢ In Târnava Mare a small number of Condition B habitats had 5 species, none reached 8. In Pogany-havas, 10% of habitats in condition B has 8 species.
  ➢ In Târnava Mare no Condition C habitats had 5 species. In Pogany-havas, 8% of Condition C habitats had 5 species.

The number of indicator species present in a grassland was assumed to decline if management becomes less "biodiversity-friendly", e.g. through earlier mowing or excessive application of fertiliser. Thus it was assumed for the calculation that the higher the number of species, the greater the cost incurred to the farmer. The calculations were based on income foregone and additional costs if ideal management was carried out, and transaction costs – the costs to the farmer of learning the methodology, plant identification, and doing his own controls, as required under the measure.

For example, owing to management practices associated with species numbers:
  ➢ 5 species – 7 species was assumed to result in 25% loss of hay yield (low fertilizer use) and 33% loss of hay quality (late mowing)
  ➢ 8 species – 9 species was assumed to result in 28% loss of hay yield and 40% loss of hay quality
  ➢ 10 – 12 species was assumed to result in 32% loss of hay yield and 50% loss of hay quality

This allowed a calculation of payments based on associated management, even if that management was not obligatory, since the species numbers were a fair indication of management carried out.
  ➢ 5 species – 7 species: compensatory payment was calculated at **€213 / ha / year**
  ➢ 8 species – 9 species: compensatory payment was calculated at **€229 / ha / year**
  ➢ 10 – 12 species: compensatory payment was calculated at **€259 / ha / year**

These thresholds were used for the initial selection of the final indicator species list, and proved to show meaningful differences in meadow nature value so were not subsequently modified.

Payment rates and conditions were calculated with assistance from the MARD. Although this calculation has not received the official approval of the Ministry, the fact that the calculations were carried out by them gives a very high chance that they will be accepted if the measure is implemented in due course through the NRDP. **See Annex 1.5.**

Management recommendations

In order to test a pure results-based scheme (rather than a hybrid which includes management requirements), we included certain reporting rather than management conditions in the contract, order to promote good management. These will encourage farmers to mow sufficiently late to protect not only the flower species, but also other species in these habitats such as ground-nesting birds. They also gave a firmer base to the calculation of payment rates, which has reassured the MARD.

The contract with farmers stipulated that:
  • each year, before mowing, the farmer must record which of the indicator species listed on pages 9-14 are present and in flower, using the methodology described on page 6, and using the form on page 15. The farmer must record the indicator species before mowing, when the species are in the flower bud, full flower or flower seed stage, so that they can be

easily recognised, and to maintain the species by allowing some to set seed each year.
- each year the farmer must complete the annual farm record for the parcel, including the date of mowing.
- the meadow parcel should be mowed at least once each year, during the main growing period. Grazing on the meadow is excluded for the 10-12 week period during the main growing season, necessary to allow the hay crop to grow before mowing.

See **Annex 2.1** especially pages 4 and 5 for further details.
Although this was a pure, not hybrid design, the advisors and the farmers handbook gave (not strictly requirements) advice on how to manage their meadows in order to maximise the number of indicator species, to assure a good management and to be able to receive high(er) payment rates. Advice included:

- Suggested mowing periods. The RBAPS scheme offers the farmer flexibility in mowing dates, to account for annual variations in the time the hay is ready. However, if the farmer mows before the indicator species are fully in flower and beginning to set seed, he risks reducing the number of indicator species, and possibly losing his payments, in subsequent years. Later mowing also allows animals such as meadow-nesting birds to rear their young before the cover of the long grass disappears.
- The meadow parcel should be mowed at least once each year, during the main growing period. Grazing on the meadow is excluded for the 10-12 week period during the main growing season, necessary to allow the hay crop to grow before mowing.
- Mowing methods: on steep slopes, mowing by hand or by light machine with a cutting bar, will enhance species richness. Rotary mowing is more damaging to plant and animal diversity.
- Short periods of spring or autumn grazing can be beneficial for meadow plants, but it is important that there is a period of 10-12 weeks during the main growing period (May-August) when the hay crop is allowed to grow. It is also important that the meadow is not grazed too intensively, as this can damage the sward.
- Use of chemical fertilisers, or large amounts of farmyard manure as fertiliser, will cause loss of indicator species, as well as leading to problems with weeds (small amounts of farmyard manure given as fertiliser may be beneficial for the species richness).
- If possible, the farmer should inform his project advisor before he mows, when he considers that mowing is imminent, so that the advisor has an opportunity to record the flowers before mowing, when recognition is easier.
- The farmer should do all he can to ensure that the meadow is not grazed during the hay-growing period, either by his animals or abusively by others, because this will increase the risk of the indicator species not flowering, and the loss of payment for that year.

Penalties

It was stipulated in farmer contracts that if after the first year the farmer reports that, or if in a control he is found to have, lost indicator species such that he would move to a lower package, (s)he would receive the lower payment as appropriate, but would not have to pay back the previous year's payment. Conversely, a farmer may apply to move to a higher payment package for the remainder of the contract, if his management successfully produces more flower species. This flexibility may not be suitable for the final package if adopted, but was regarded as suitable in the pilot project, to reduce the level of uncertainty for the farmers.

1.d CRITERIA FOR SELECTION OF GRASSLAND PARCELS

Farmer participation

In early 2016, we announced the RBAPS scheme in a general farmers' meeting in Sighișoara (attended by over 300 farmers), and a series of village association meetings in Târnava Mare area and Pogany-havas area.

We announced the criteria, as below, and asked any interested farmers to contact us. The selection criteria were as follows:
- Must be legal users of the land (owner or rental contracts)
- Commitment for 3 years
- Max 10 ha per owner

- People employed in project cannot provide land
- Land may be under basic payments (SAPS) but not under agri-environment agreements
- Only haymeadows eligible, must be permanent grassland (older then 5 years).
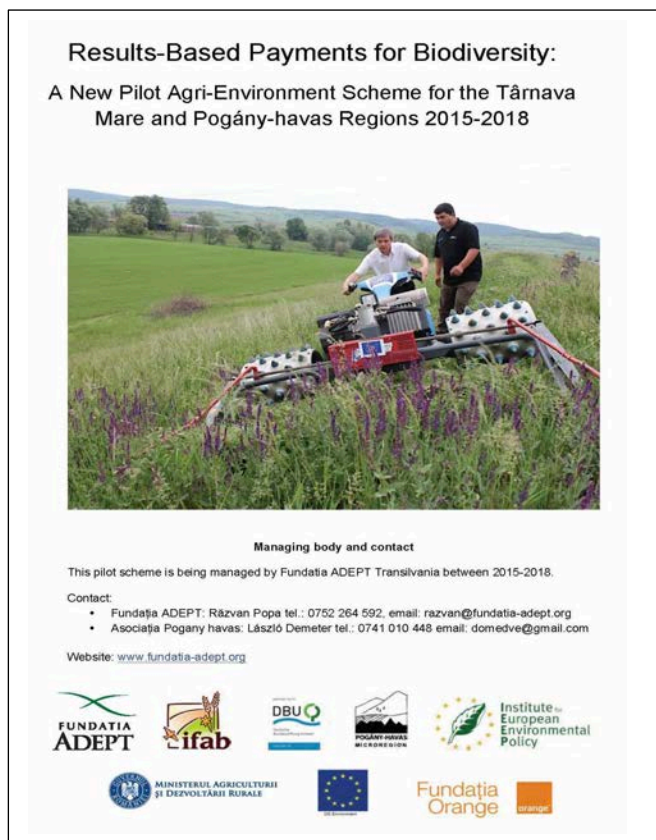
Annexes 2.1, 2.2 and 2.3 (EN, RO and HU versions of the farmer booklet) laid out the project concept and contract conditions.

We produced English, Romanian and Hungarian (for ethnic Hungarians in Pogany-havas area) language versions of a farmer booklet, laying out the project concept and contract conditions.

This helped farmers to understand the project aims, what kind of land it targeted, and their potential obligations and remuneration.

A copy may be downloaded at: https://fundatia-adept.org/wp-content/uploads/2018/03/ANNEX-E-EN-REDUCED-Farmer-booklet-RBAPS-5-May.compressed.pdf

Figure 5: The targets to be met by land managers to meet scheme objectives, and methodology to be followed, have been set out in booklets in Romanian, Hungarian and English: The booklet also describes the relationship between the desired biodiversity target and agricultural management. See Annexes 5, 6 and 7, especially pages 4-6.

1.e SELECT PARCELS FOR INCLUSION IN THE SCHEME.

Farmer participation and area under agreement

In period early spring 2016 we selected farmers from those who responded to announcements.

The farmers' eligibility was checked with a simple list of questions. We carried out surveys of all parcels to establish eligibility, and the baseline for future monitoring, after which the contracts were signed with successful applicants as follows:

➢ Târnava Mare 16 farmers, 48 parcels, 72.91 ha
➢ Pogany-havas 56 farmers, 157 parcels, 90.95 ha.

List of farmers and parcels can be seen at **Annex 2.6** – with farmers names replaced by numbers to protect personal data.

2. IMPLEMENTATION PHASE

The Implementation phase, 2016-2019, covered 3 vegetative seasons, 2016, 2017 and 2018.

2.a VISITS TO THE SELECTED RBAPS-PARTICIPATING FARMS, MONITOR RESULTS, OFFER ADVICE

We carried out surveys of all parcels to establish the baseline for future monitoring. Results are included in the Monitoring report 2016 and 2017, **Annex 2.8a**.

Farmer attitudes towards results-based approach

We carried out a questionnaire for farmers in order to build up a simple agricultural analysis of the participant farms: the level of viability of the farms, the average age of the farmers, their motivation to contract RBAPS. This helped establish why farmers are attracted to RBAPS schemes (not just the payments) and why certain farmers are not attracted to RBAPS (complexity, payments insufficiently attractive, etc.). We carried out the questionnaire on 12 farmers in TM area in 2017 (available on request).

Table 1 below offers an overview of the results, in which we list some interesting comparisons characterising the participating farmers. **See Annex 2.5**:

	Târnava Mare	Pogany-havas
Mean area hay meadow per farmer (ha)	18.7	5.3
Mean % hay meadow that the farmer rents	5.8	23.1
Mean area of land used per farmer, all land use types (ha)	52.7	12.7
Median age class of farmer (years)	50-60	40-50
% of farmers participating in AES on any of their land	71	83
Main type of animal kept on the farm (in %age of participating farms)	Cattle 57%	Sheep 48%
% of farmers cutting contracted meadow twice per year	50	50
Median date of first cut	June	July
% of farmers who fertilise their meadows (with manure or dung from aftermath grazing)	62.5	64.3

Table 2: overview of the farmer questionnaire data

2.b TRAINING OF FARMERS AND OF PAYING AGENCY STAFF

Design/printing of a pocket-sized indicator guide for convenience of farmers, control agencies (APIA) and project botanists to assist their training of farmers/APIA.

Figure 6: The folding guides were printed in Romanian, Hungarian and English language.

They have been well received by farmers. **See Annex 1.4, and Figure 7 below.** A herbarium has been also prepared by the botanists.
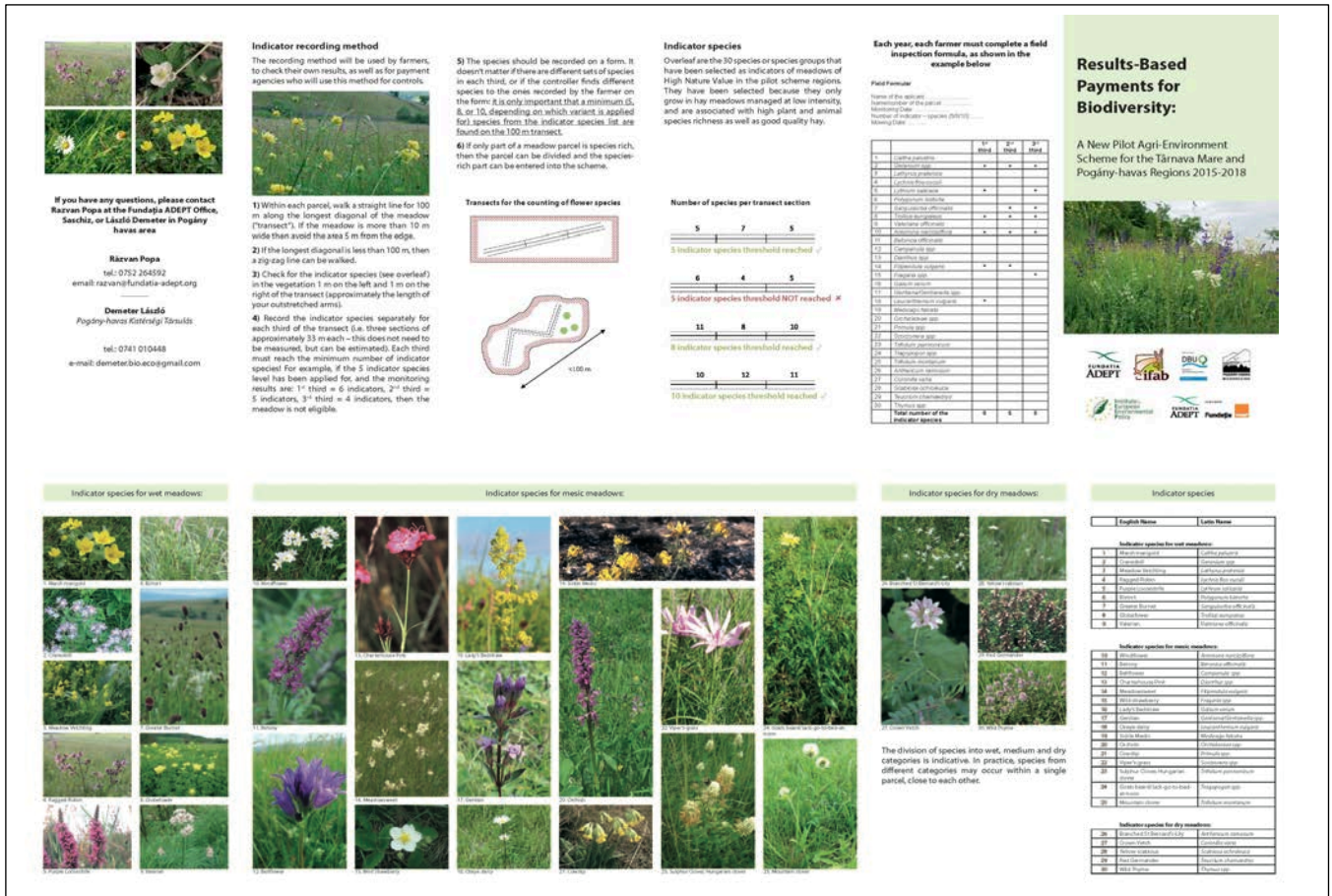
Figure 7: pocket-sized indicator guides

FARMER TRAINING

Training for farmers who had contracted parcels in the RBAPS project was carried out in both project regions to teach them to implement the survey methodology correctly and to identify the indicator species. 10 farmers in Târnava Mare (out of 17) and 40 farmers in Pogany-havas (out of 56) completed the one-day training.

Each training day included: a questionnaire regarding the farming types of the individuals; presentation of the survey method and the changes compared to last year; presentation of the indicator plant species based on the prepared guide (scanned images of freshly pressed plants – see Fig. 4), and a field walk to the closest meadow to identify plant species.

Plant identification was better in Pogany-havas area than in Târnava Mare area; in Pogany-havas area, most participants recognized the names of an average of 10-12 species (e.g. *Primula, Leucanthemum, Tragopogon*). They realized that they knew a further 8 species using the scanned images and talking about the habitats of species.

The prepared plant identification guide proved to be very useful. Using the scanned images of real plants (see Figure 8) the farmers recognized more of the indicator species than based on photographs. The farmers used the scanned images successfully when surveying their fields.

We also designed and used a feedback form, on the training the farmers had received, **Annex 2.7b,** to assess the opinion of farmers about their training on RBAPS and their opinion on the scheme.

CONTROL AGENCY TRAINING

We carried out training days for officers of the control agency (APIA, Agentia de Plati si Interventii pentru Agricultura) in both pilot areas, in order to ensure that they understood the measure, and also to reassure farmers that the control agency was aware of the measure and supported it.

In Târnava Mare three regional representatives of the national payments and control agency APIA (Agentia de Plati si Interventii pentru Agricultura) in June 2017. In Pogany-havas, a separate meeting with regional representatives of APIA took place in November 2017, in the APIA central office of Harghita county, Miercurea Ciuc, including 5 participants from APIA and 3 staff of Pogány-havas Association.

The training agenda included: presentation of RBAPS project, the differences between RBAPS and current agri-environment packages, survey methodology and the indicator species; and discussion about the possibility of implementing the RBAPS system at national level. The participant APIA experts were positive about the RBAPS system, and were of the opinion that RBAPS seems to be more suitable for small farmers than current packages.

Figure 8: scanned images of pressed plants used in training

2.c ANNUAL MONITORING OF PARCELS FOR CONTROL OF CONTRACTS / PAYMENTS AND ASSESSMENT OF RESULTS

Testing the monitoring methodology year to year

During the RBAPS project, all parcels were self–assessed by farmers, and also by the project specialists. If this scheme is adopted more widely, we would expect self-assessment and random checks of a %age of parcels by payments/control agency. The 2017 results compared to the 2016 results confirmed that the methodology is moderately robust.

Out of 51 parcels tested in Târnava Mare area

- 31 remained in the same payment bracket
- 16 moved to higher payment
- 4 moved to lower bracket.

Out of 157 parcels tested in Pogany-havas area
- 115 remained in the same payment bracket
- 43 moved to higher payment
- 11 moved to lower bracket.

Combining the two areas, the majority of the transects (51%) showed no change or only 1 species difference. This is more likely to be controller error, rather than actual increase / decrease in species numbers. Response of the meadows to results-based payments will only be realistically measurable after several more years of testing.

This is more likely to be controller error, rather than actual increase / decrease in species numbers. Response of the meadows to results-based payments will only be realistically measurable after several more years of testing.

Where changes in payment bracket were found, we paid the farmers according to the results. This will mimic the full implementation where species number increases. However, we have proposed that land be ejected from the scheme if species payment bracket goes down.

Control and verification of biodiversity quality

The monitoring of parcels under RBAPS agreements, and control parcels, has revealed that the number of indicator species is strongly correlated to:

➢ **Nature value**: the subjective appraisal (expert assessment based on considerable experience) by the surveyors of the nature value of the parcel
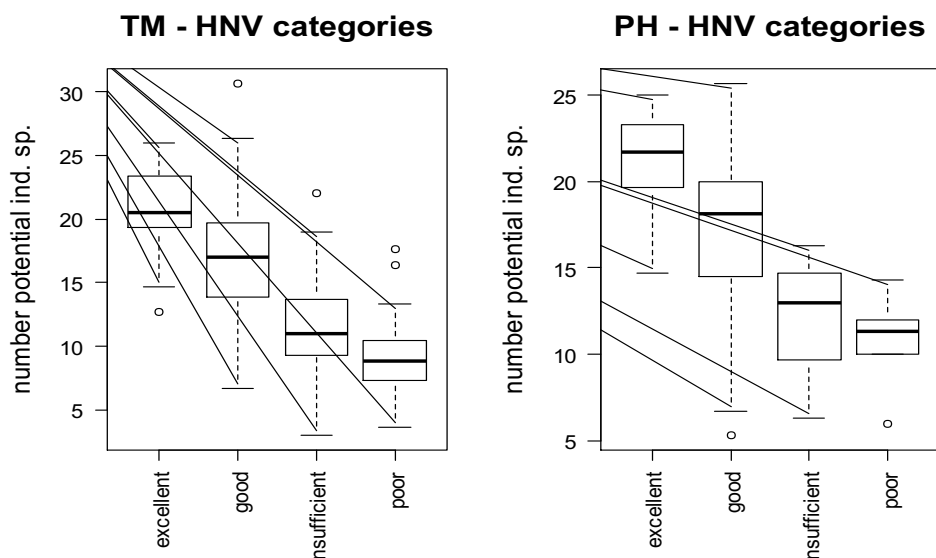
Figure 9: Boxplot of the number of indicator species in TM in each of the nature value categories (all grassland types). The categories were subjectively assessed at the parcel level based on nature value and fodder value (excellent and good = HNV, insufficient and poor = non-HNV).

➢ **General species diversity:** The number of vascular plant species recorded in the diversity plots was significantly correlated with the number of indicator species recorded on the transect. (Additional 10 m² diversity plots were recorded on 55 (34%) of the transects in TM and 46 (29%) of the transects in PH.)
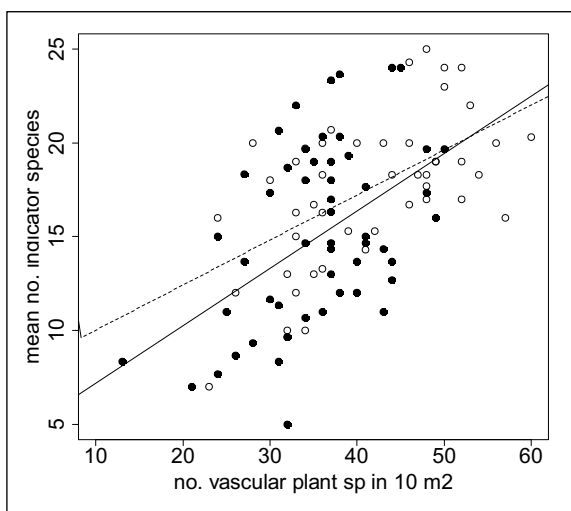
Figure 10: Linear regression of the number of vascular plant species recorded in a 10 m² plot with the number of indicator species in the corresponding transect, for all grassland types

Târnava Mare: filled circles and solid line

Pogany-havas: open circles and dashed line

➤ **Habitat conservation status:** the number of indicator species was strongly linked to conservation status in all the grassland habitat types identified in the project, most of which were Habitats Directive Annex 1 grassland types, based on the occurrence of character species, Gafta & Mountford 2008[5]. This will assist any policy proposals to link RBAPS with Natura 2000 management.
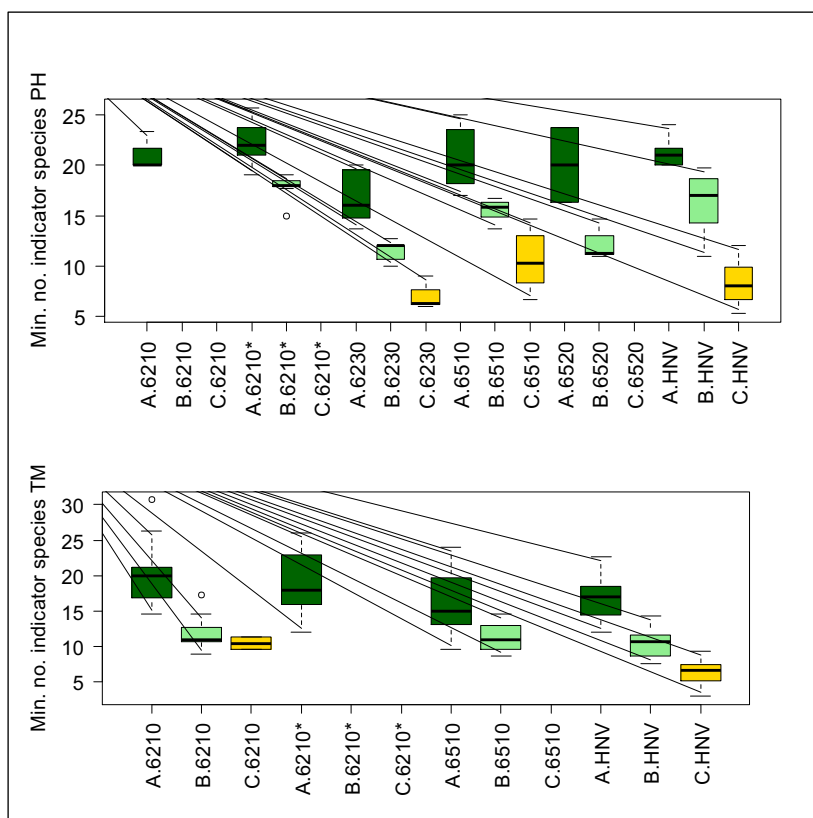
Figure 11: Boxplots of the numbers of potential indicator species in different habitat types and different conservation status in the two pilot areas.

– Dark green = Conservation status A

– Light green = conservation status B

– Gold = conservation status C.

Among the parcels surveyed in the Târnava Mare and Pogany-havas areas, the following Habitats Directive Annex 1 types were identified:
- 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometea*)
- 6210* (Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometea* with important orchid sites)
- 6510 Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) were surveyed.

[5] Manual de interpretare a habitatelor Natura 2000 din Romania. Risoprint, Cluj Napoca. 104 pp.

In the Pogany-havas region, in addition to the above,
- 6520 Mountain hay meadows
- 6230 Species-rich *Nardus* grasslands, on siliceous substrates in mountain areas (and sub-mountain areas, in Continental Europe)

Grasslands that did not clearly belong to any of the habitat types above were classified as "HNV".

2.d COMPARISON WITH OTHER MONITORING METHODS IN ORDER TO CHECK RELIABILITY OF THE METHODOLOGY

In 2017, the methodology was tested for robustness against certain variables. See **Annex 2.8** for details.

i. **Checking of robustness of the monitoring methodology between contract years.**
   Variations may occur by when checks are carried out by different experts (error or simply individual variation), or changes in the nature value of the parcel, or seasonal variation / variation in timing of checks.

We found on average more indicator species per transect in 2017 than in 2016 (7.9 vs. 6.8 in Târnava Mare, 7.8 vs. 6.8 in Pogany-havas). The change in indicator species was great enough to cause change in category in 41% of parcels in Târnava Mare and 19% parcels in Pogany-havas.
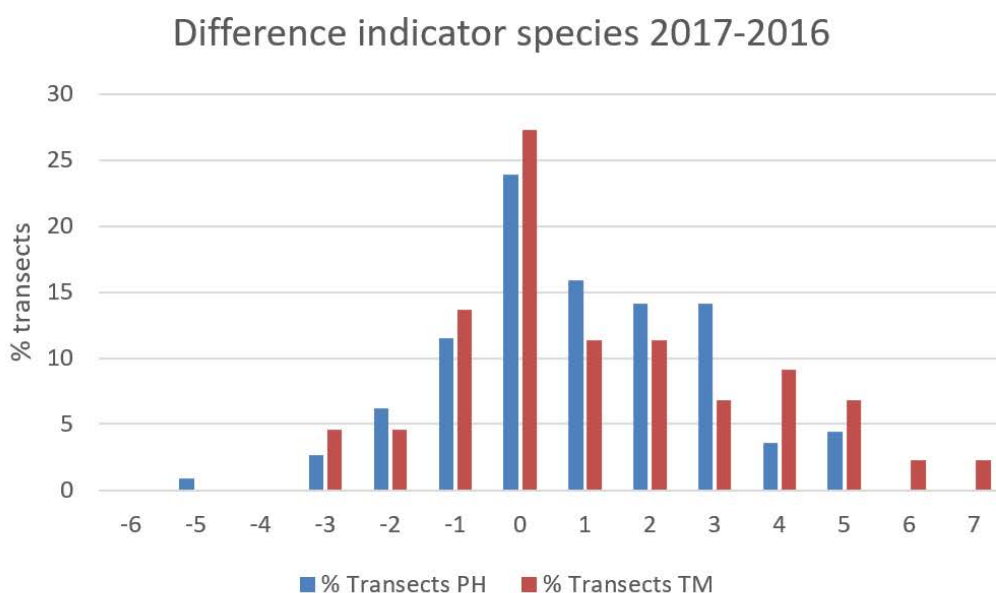
Figure 12: Histogram of the changes in minimum number of species found on the transects using the standard project methodology between 2016 and 2017 (N =44 TM, N = 113 PH).

ii. **Checking of robustness of the monitoring methodology against alternative methodologies.** This included the following checks (Figure 4 below illustrates the different methods):
   1. Standard transect methodology, carried out by an expert. This is a transect of 100 m in length and 2 m width, on which the predefined indicator species are recorded on each of three sections
   2. A transect of the same dimensions (100 x 2 m) carried out along the opposite diagonal in the meadow.
   3. A transect of variable length and 2 m width, carried out along the entire length of the parcel and divided into three sections of equal length.
   4. A repeat of the standard transect on the same day as (1), but carried out independently by a second expert with no knowledge of the score given by the first expert.
   5. A repeat of the standard transect, carried out by the parcel owner/manager ("farmer") on a different day to the expert survey (1).
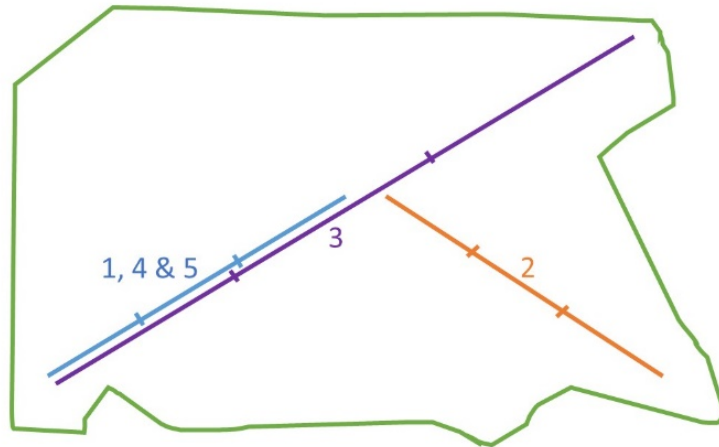
Figure 13: Schematic illustration of the positions of the transect types 1-5 on a meadow parcel (green outline).

Method 3 was significantly more time-consuming in Târnava Mare, owing to larger parcel sizes. The number of indicator species was significantly higher for method 3 compared to the other methods (average absolute difference of 2.5 species for Târnava Mare and 1.2 species for Pogany-havas). There was variation between different experts (method 2) and between transects on different parts of the parcel (method 4), but these were not statistically significant.

iii. **Checking of reliability of the monitoring methodology when carried out by the farmer, compared to when carried out by a botanist/expert.**
Farmers carried out transects on their own parcels in Pogany-havas only. We collected results for farmer transects on 86 parcels, which is 61% of all parcels contracted in Pogany-havas. The farmers recorded on average 1.8 fewer species on the transect than the experts (see Table 1, values ranged from 8 species more to 8 species fewer). On average, the farmers correctly identified 65% of indicator species in their meadow parcels (ranging from 100% to 22 %).

iv. **Testing the indicator species list: testing frequency of different indicator species, in case of possible improvements to the list.**
Only two indicator species that were not recorded using standard methodology (*Lythrum salicaria* and *Sanguisorba officinalis*) were in fact found in 2017 using other methodologies. The inclusion of these species on the list, in spite of low frequency, is justified by their importance for wet meadow habitats, which tend to be species-poorer despite their high nature value. *Anemone narcissiflora* is naturally absent from the Târnava Mare area, but included on the indicator species list due to its importance for the Pogany-havas area. The results of the tests did not suggest a need to change the indicator species list.

2.e FINANCIAL MANAGEMENT OF PAYMENTS SCHEME

Payment rates and conditions were calculated with assistance from the MARD: see **Annex 1.5**. Although this calculation has not received the official approval of the Ministry, the fact that the calculations were carried out by them gives a high chance that they will be accepted if the measure is implemented in due course through the NRDP. The calculations were based on income foregone and additional costs if ideal management was carried out, and transaction costs – the costs to the farmer of learning the methodology, plant identification, and doing his own controls, as required under the measure.

Penalties. We have explained in the booklet, and it will be clear in the contract, that if, after the first year, the farmer reports that, or if in a control he is found to have, lost indicator species such that he would move to a lower package, (s)he will be penalised. Conversely, a farmer may apply to move to a higher payment package for the remainder of the contract, if his management successfully produces more flower species.

2.f INFORMATION ACTIONS TO PUBLICISE THE SCHEME AND ITS RESULTS

We promoted the scheme and its results through the (Romanian) National Rural Development Network, farmer organisations, other NGOs in Romania, local and national media, and at a number of international conferences.

We obtained widespread publicity when Prince Charles visited the Târnava Mare in June 2016, when he made a field visit to RBAPS grasslands and met the regional director of the Payments Agency, APIA.

In 2016 promotion included:
- publicity given to RBAPS by Prince Charles visit in June 2016, when he made a field visit and met the regional director of the Payments Agency, APIA. **See Annex 4.11**).
- Promoting RBAPS systems at the seminar "Managing Nature, working together", an international seminar on nature management at Turku, Finland, November 2016. **See Annex 4.8.**
- Promoting RBAPS systems at the workshop "Agri-environment – climate Measures (AECM): Challenges of controllability and verifiability", a meeting at DG Agri in Brussels, December 2016, which many MS paying agencies attended including Romanian. **See Annex 4.4, for example page 11**.
- 27 and 29 September 2016 Laura Sutcliffe attended an AECM Conferences in Poland, International Conference "Biodiversity conservation on farmlands at the crossroads" (Pulawy 27-28.09.2016) and then International Workshop "European Agri-Environment Schemes Best Practice" (Kazimierz 29.09.2016), where she presented a poster on RBAPS. **See Annex 4.7.**

In 2017 we
- participated in the RBAPS conference in Brussels, 30 March 2017.   The conference was organised to allow the three recipients of DG ENV grants to present their results and impressions. From the Romanian project, presentations were made by Rainer Oppermann, Clunie Keenleyside, Laura Sutcliffe and Razvan Popa. with the farmer's perspective presented by Attila Sarig, a recipent from Pogany-havas. See **Annex 4.1**.
- The training materials (handbooks, field guides) produced in 2017 all clearly acknowledge EU DG ENV support, **Annexes 2.1, 2.2, 2.3, 1.4.**
- 12 June 2017 we attended the expert workshop "Revising the JRC/EEA EU-level HNV Farmland methodology" to review potential improvements of the JRC/EEA HNV farmland methodology in Vienna, **Annexes 4.5 and 4.6.**

In 2018 we
- attended the ENRD Seminar 'Supporting the Sustainable Management of Water and Soils through Rural Development Programmes', DG Agri, Brussels, specifically to speak about RBAPS, 14 June 2018. See **Annex 4.12**.
- attended the round table on Green Agriculture of the CAP and used RBAPS as an example, DG Agri, Brussels, 10 December 2018. **Annexes 4.9 and 4.10**.

5. STAKEHOLDERS

We have maintained regular contact with, and active interest and support of, stakeholders during the project. The level of interest in RBAPS has remained high or increased during the project. These stakeholders include:
- Government bodies (MARD and APIA)
- farmer participants and other farmers who are interested (many more farmers are interested than those participating in the scheme, as they had lost critical feed value of their hay in some years under conventional agri-environment schemes which specify an earliest mowing date).
- Local communities and NGOs.

6. PROJECT MANAGEMENT

- Overall project management was carried out by Nat Page. This has been done with meetings in Romania in 2017; and with regular skype meetings with the project team. Day-to-day management of the teams has been carried out by Razvan Popa in Romania.

- Financial management has been carried out by Cristi Gherghiceanu, in Romania (based in Saschiz).

- Technical expertise was provided as follows:
  - Policy advice and measure design advice was provided by Clunie Keenleyside
  - Methodologies and measure design advice provided by Rainer Oppermann (IFAB), Laura Sutcliffe (ADEPT). The field teams were coordinated by Laura Sutcliffe. Local experts include Laszlo Demeter who is in day-to-day management of the project field work in Pogany-havas.
  - GIS mapping including for stratified random sampling maps was by Cristi Malos.

Financial management

In February 2015 we received from the Commission €165,640, representing 40% of the total grant.

On 2 October 2015 Deutsche Bundesstiftung Umwelt (DBU) signed a contract to provide a significant financial contribution to the project, €124,937, through Institut fur Agrarokologie und Biodiversitat e. V. (IFAB).

By 31 December 2016, we had spent €190,042.68, of which 70% is EC contribution, €133,029.88. This represented 80.33% of the advance payment. We therefore requested the 2nd instalment of pre-financing.

In 30 May 2017 we received from the Commission €124,230 representing 30% of the total grant, the 2nd instalment.

By 31 December 2017, we had spent €351,337 of which 70% is EC contribution, €245,936. This represented 84.84% of the payments received from EU so far.

By 28 February 2019, we had spent €580,689.72 of which 70% is EC contribution, €406,482.80.

This represents 98% of the original contracted amount, which was for EC contribution of €414,100, 70% of total expected eligible costs of €591,571.

See **Annex 7.1** for breakdown of costs by budget category, and full list of payments. We have full records of all transactions available on request.

7. DISCUSSION AND CONCLUSIONS

a. FARMER ATTITUDES

The farmers generally enjoyed learning the species, but there was natural variation in their ability to recognise them. This should be considered in scheme design with regard to providing expert advice and farmer training. There are other means of supporting identification such as using a smartphone app to identify and record species (see Appendix 1 below). An app could potentially also be useful for inspectors.

The indicator species list must be practicable (i.e. it should not too long, nor should there be too many different regional lists), but also appropriate to distinguish the most species rich grasslands. This may require some optimisation of the selection, but we should also bear in mind that it is impossible to create a list that will categorise all grassland types perfectly according to habitat value.

b. ADMINISTRATIVE COSTS OF RBAPS COMPARED WITH MANAGEMENT-BASED SCHEME

The monitoring methodology was designed to be the best compromise between accuracy and simplicity. Testing proved that it was practical for controllers, taking 30 minutes per parcel after training and experience, while at the same time it yielded robust results. Thus, time per check for controllers was not greater than for management-based measures

The stepped payment structure proved to be financially efficient, since it allowed fine-tuning of payments linked to nature value of parcels, creating savings on lower scoring farms and incentives for farmers to increase species number and nature value.

Under management-based schemes, authorities need to invest time to ensure that management prescriptions are appropriate, taking account where possible of varied geographical and weather factors. The RBAPS scheme relied on botanists, ecologists and farm advisors to select indicators and design the monitoring methodology. Therefore, the pilot project demonstrated how RBAPS schemes can shift much of the burden of scheme design from national/regional authorities, who are not technically qualified for such tasks, to experts who are qualified.

Ovidiu Săvâsca, head of the Mures APIA payments agency responsible for control, whose staff had participated in training days during the project, when interviewed in early 2109, stated that the burden on control agencies was no greater under RBAPS-type scheme than it was under a standard management-based scheme.

c. MONITORING AND EVALUATION

Based on our experiences with the botanical monitoring over the last three years, the following points are worth highlighting:

o   There were fluctuations, in some cases of up to 7 species between years. These were only a few parcels and may be cases where errors were made in locating the transect. Nevertheless, it should be recognised that this is a real possibility, and future schemes should take into account the fact that that errors can occur.

o   The same indicator species are not always found on the transect: there are variations between years, between different survey times in the same year, between surveyors, and between transect positions in the same parcel. This is to be expected from a biological indicator that is sensitive to its environment and should be considered when designing the scheme requirements. For example, it is important that there are categories rather than a continuous scale to allow for fluctuation within that category. With hindsight, it was a good decision to use only hay meadows, as in pastures this fluctuation would have presumably been worse (due to larger size and generally poorer visibility of species).

o   In 2018, we monitored 55 meadow parcels in TM and 162 in PH. The number of species detected varied slightly compared to 2017 (higher in TM and lower in PH), but this difference was not significant. There was a wide range in accuracy of the farmer surveys. Farmers on average overestimated the number of indicator species on their parcels in the second year of training (they underestimated last year). See Annex 2.8b.

d. PROBLEMS ENCOUNTERED

One of the aims of the project was to identify actual or potential problems and devise solutions before wider implementation. This RBAPS pilot has usefully identified problems, all of which can be resolved to improve future design.

- **Area changes**. There were several cases of land measurements being revised by APIA. **Action:** in this pilot project, we did not penalise farmers for errors that are created in APIA system (LPIS), for example when parcel is changed by APIA with no fault of farmer. However, we discuss with APIA how to stipulate errors leading to penalties. Current rule is 2% error: but percentage error is a problem for small parcels, where tiny errors of 2 metres could lead to a penalty. We will discuss with APIA idea to propose an absolute area, not percentage, as a criterion for penalties. This is more realistic for small parcels, with acceptable levels of error in measurement (3 m or 5 m margins, perhaps).

- **Changes in species category** (parcels moving up or down from one payment category to the next – categories being 0-4 (no payment), 5-7, 8-9, 10 and above. Generally, species numbers have remained the same in the 2 years of checks. In some cases, species number has increased, in some decreased. This is more likely to be sampling error rather than an actual increase/decrease. **Action:** During this pilot, we did not penalise for falling from one category to another: we will pay farmers for the category they are in each year, but not remove them from the project or deduct previous year's payments if they move down. However, since rules currently stipulate that farmers may move up, but not down, in category, we have to examine how to manage this problem in future if the measure is implemented at national scale. How to we allow for sampling errors? Should we rephrase the rule, so that decreases beyond farmers' control are not penalised?

- One farmer in Târnava Mare and one in Pogany-havas quit RBAPS and entered the national scheme instead. In the case of Pogany-havas, this was because lack of communication between project and APIA - this could be improved. In the case of Târnava Mare, the farmer preferred the HNV contract because it offered a 5-year contract. **Action:** improve communication between APIA and farmers.

- Should we consider additional payments, such as for hand mowing? **Action:** to be discussed with the Ministry, MARD.

- In Pogany-havas, experts noted that the indicator species list does not clearly distinguish between meadows that are only 5-10 years old (previously arable) and the most valuable ancient meadows at high altitude. **Action:** If we wish to resolve this, we could remove some of the more ruderal indicator species for this region and replace with other species, or increase the highest payment category / or add another payment category, e.g. to 12 species (possibly adding more species to the list). This will not be done during this project period, but may be considered for the future.

e. REPRESENTATIVITY OF MEADOWS TESTED IN THE PILOT

The total area of HNV grassland in Romania is estimated as 2 million ha, of which about 25% can be estimated as haymeadow (based on the known proportions of haymeadow to pasture in the Târnava Mare and Pogany-havas areas).

Although the total area and number of parcels tested in the Romanian RBAPS project was relatively small (Târnava Mare 48 parcels, 72.91 ha, Pogany-havas 157 parcels, 90.95 ha) we can be confident that the results obtained are representative and can be used to extrapolate scheme

design to national scale. We base this on the fact that a single indicator list of 30 species provided reliable and robust data, showing links to general condition of habitats, and not being excessively sensitive to annual variations, controller error, and being effective in a range of habitats as found in the Continental and Alpine biogeographical regions in the two pilot areas.

f. ROBUSTNESS OF LINK BETWEEN NUMBER OF INDICATOR SPECIES AND WIDER NATURE VALUES

The monitoring of parcels under RBAPS agreements, and control parcels, has revealed that the number of indicator species is strongly linked to **general nature value of the parcels, general species diversity of the parcels, and habitat condition of the parcels,** as explained in the *Control and verification of biodiversity quality* section above. This is reassuring that the indicator species can be used as a broader gauge of species diversity and habitat condition. Some species-based agri-environment schemes have been associated with unintended negative consequences: damage to condition of habitats of other species which do not share similar management requirements.

g. RECOMMENDATIONS FOR FUTURE ROLL-OUT

As a result of the project, we can suggest various strategic proposals to improve the chances of national and broader EU-wide adoption of RBAPS measures, especially:

- **Promotion – key messages:**
  - ➢ RBAPS should be promoted as a higher tier of agri-environment, a tier where the HNV is proved before entering in scheme and proved before making payments, that the payments are higher and the control system is more reliable/defendable on audit missions and less time-consuming.
  - ➢ RBAPS should be presented and supported formally within the Consultation process for the elaboration of the NRDP 2021 – 2027.
  - ➢ Other means to promote RBAPS should be used in parallel, through:
    - Social media (articles posted by LAGs, NGOs, farmers from the pilot RBAPS, farmer organisations)
    - Presentations at workshops and conferences
    - Direct publicity made by "influencers/ambassadors" (key persons that may influence the decision making process).
  - ➢ In all cases, key messages to be delivered are:
    - RBAPS offer higher payments for HNV hot-spots
    - RBAPS offer flexibility to the farmer to adjust to annual (year-to-year) weather variations, and differences in geographical aspect, altitude and soil type, which all call for management adjustments (e.g. cutting date)
    - RBAPS are easier to control that management-based measures
    - RBAPS are more defensible and cost effective in comparison to management-based measures because of the strong link between results which are paid for (number of indicator species) and habitat condition and species diversity.

- It is important that the RBAPS is prepared in a clear and tangible way to present to policy makers at national level, using existing EU rules for agri-environment measures and templates as far as possible.

- RBAPS could usefully be linked with the Natura 2000 management, especially as the indicator species were clearly linked to Habitats Directive Annex 1 habitats – see *Control and verification of biodiversity quality* section above.

- To overcome the threat of reducing the volume of payments and generating extra administrative burdens, RBAPS should be designed not to replace the existent agri-

environment schemes, but rather to complement them. Thus, normal regular agri-environment schemes could apply, but whenever/wherever key HNV indicator species or habitats are identified, the land could be eligible for RBAPS, such that farmers are able to choose RBAPS voluntarily.

- ○ In terms of level of payments, the RBAPS should be at least attractive as the agri-environment.

- ○ In addition to agri-environment measures, RBAPS could be devised and offered under the 'eco-schemes' proposed under the new CAP. These bring the benefit of removing constraints in terms of payment calculation (going beyond income foregone/costs incurred).

8. CONCLUSIONS FROM STRATEGY PAPER

In December 2018, we completed a strategy paper, drawn up mainly by Romanian expert Mihai Constantinescu, formerly MARD agri-environment team and currently World Bank seconded to the Ministry of Environment (see **Annex 5.1**). The strategy paper proposed the following key actions:

- ○ **Preparing a nationally implementable RBAPS:** important that the RBAPS is prepared at national level for ensuring that the discussion is focused on something clear and tangible. EU rules for AE measures should be adopted and existing templates used, to ease the acceptance by Managing Authority. RBAPS should be linked with the Natura 2000 (habitats). To overcome the threat of reducing the volume of payments and generating extra administrative burden, RBAPS should be designed NOT to replace the existent AE schemes, but rather to complement it. Thus, normal regular AE schemes should apply, but whenever/wherever key HNV indicator species are identified, RBAPS should be eligible so that farmers are able to choose RBAPS voluntarily. In terms of level of payments, the RBAPS should be at least attractive as the existing AE packages.

- ○ **Consultation and promotion process:** The consultation process should be about gaining the stakeholder trust, step-b-step. As any change, it brings concerns It is therefore critically important to be understood that rushing for agreement at Central level, without validating the previous steps may be counterproductive. Thus, once the national RBAPS is prepared, it should enter a 5 stage consultation process, in this order:

  i. With specialists in grassland biodiversity, including to the most relevant research institutes (covering also the issue of payment calculation validation)

  ii. With local Paying Agency on-the-spot control inspectors – endorsing that the control is easier/faster

  iii. With farmers (potential beneficiaries), including to the strongest farmer organisations – seeking for confirmation that the farmers may identify the key HNV indicator species (brochures should be made available) and from their side key messages stimulated (e.g. farmers who manage HNV hot-spots deserve to be higher compensated)

  iv. With DG Agri and DG Env relevant staff (including those persons who may have to validate the RBAPS as included within RDP). This kind of meetings may be also informal.

  v. With Central Administration staff (starting with APIA, AFIR and, at the latest, the Managing Authority, but not neglecting the Minister/State Secretary Cabinets). At these meetings all the results of the previous meetings should be documented. After the meetings, the documented proves of the RBAPS advantages should be sent in a formal manner to the MARD representatives, offering in the same time the availability of supporting the ministry whenever necessary along the RDP negotiation and implementation process. High awareness should be on the implementation changes along the procedural steps.

- ○ **Leadership, commitment and continuity.** For a successful promotion of RBAPS, there is a strong need of leadership from NGO side. Somehow, despite the experience gained by NGOs, their engagement in various projects limits their time to address longer term post-project priorities. This also has an impact on capacity of NGOs to influence policy, since officials can view NGO interest as only short them. An NGO should commit to this priority by allocating a person to tale longer term interest in RBAPS, as a regular duty/task. This person should be free of other time consuming duties. His/her profile should meet the following requirements:

i. Biodiversity / agri-environment profound knowledge

ii. Experience in extensive farming

iii. Well familiarised with EU policies, especially on rural development policy

iv. Good networking within the key institutions (MARD and APIA).

○ **General considerations:**

i. whenever reasonable concerns are raised or suggestions are made – these should be tackled, coming back the those who raised the issues for explaining how the proposals where took on board. A table for tracking all the suggestions should be used.

ii. RBAPS should be promoted as a higher tier of AE, a tier where the HNV is proved before entering in scheme and proved before making payments, that the payments are higher and the control system is more reliable/defendable on audit missions and less time-consuming.

iii. Also, RBAPS should be presented and supported formally within the Consultation process for the elaboration of the NRDP 2021 – 2027.

iv. Other means to promote RBAPS should be used in parallel, through:

v. Social media (articles posted by LAGs, NGOs, farmers from the pilot RBAPS, farmer organisations)

vi. Presentations at workshops and conferences

vii. Direct publicity made by "influencers/ambassadors" (key persons that may influence the decision making process).

viii. In all cases, key messages to be delivered are: RBAPS offer higher payments for HNV hot-spots, are easier to control and are a more defendable control system.

9. ACHIEVEMENT OF MILESTONES / DELIVERABLES FROM CONTRACT

All milestones met. See table below, based on page 28 of agreement.

Date	Milestone/Deliverable	Final result
March 2015	Project Implementation Unit established, with contracts	Done on time
May 2015	First steering committee meeting	Done: Cluj, 24-25 March 2015
Sept 2015	Second steering committee meeting. Identification of suitable indicators	Done: Saschiz 3-6 June 2015
December 2015	Deliverable: list of indicators	Done: Annexes 1.1 and 1.2. November 2015
December 2015	Measure fiche developed with conditions, payments, control methodology	Done on time. Annex 1.1 and 1.5. Annex 2.8a monitoring
January 2016	Farmer agreements with target 150ha to enter BAPS. These will be in 2 bio-geographical regions, Continental and Alpine.	Done on time. 163.86 ha in 2 bio-geo regions.
January 2016	Agreements for monitoring of control farms, no payments, target 10 farmers/30 parcels/ 30ha in other a-e schemes, 10 farmers/30 parcels/ 30ha in no a-e scheme	Done: Plots identified and tested by transect and quadrat (same methodology as RBAPS plots) in May/June
March 2016	First report to the Commission.	Done on time. Annex 6.1.
March 2016	Deliverable: list of areas/farmers names	Done on time. Annex 2.6.
May 2016	Third steering committee meeting	Done: Saschiz 1 June 2016
May 2016	First workshops for farmer participants and other interested farmers. Training for IACS official control agency officers	Done: Saschiz 2 June 2016 Gymes / P Havas 3 June 2016
September 2016	First controls finalised	Done: Annex 3.1, 3.2, 3.3. June 2016
December 2016	Deliverable: first monitoring report	Done: Annex 2, June 2016, and included in Annex 16.
January 2017	Second report to Commission	Done: February 2017. Annex 6.2
May 2017	Fourth steering committee meeting	Done. Minutes available
May 2017	Second workshops for farmer participants and other interested farmers. Training for IACS official control agency officers	Done on time Annexes 2.7, 2.7a.
September 2017	Second controls finalised	Done on time. Annexes 3.1, 3.2, 3.3.
December 2017	Deliverable: second monitoring report	Done on time. Annex 2.8a, 2.8b
January 2018	Third report to Commission	Done, March 2018. Annex 6.3
May 2018	Fifth steering committee meeting	Done. Minutes available
May 2018	Third workshops for farmer participants and other interested farmers. Training for IACS official control agency officers	Done. Attendance lists /photos available
September 2018	Third controls finalised	Done. Report Annex 21
September 2018	Sixth/final steering committee meeting.	Done 11 Oct 2018. Minutes available.
December 2018	Final workshop for farmers and officials.	Done 20 December 2018. Photos / attendance list available
April 2019	Deliverable: Financial report	Done on time. April 2019. Annex 7.1

Table 3: Achievement of milestones / deliverables from contract

10. OUTPUTS FROM THE CONTRACT

1	Pilot results-based remuneration schemes conceived, designed, implemented, monitored, and assessed in comparison with conventional a-e schemes and areas outside schemes and reported upon within the duration of the grant	**Done**
2	Results for 2 bio-geographical areas, Continental and Alpine	**Done**
3	Reports produced documenting the different steps in the process (see Fig. 1 for indications on the main steps and possible elements under each step)	**Done**
4	Documentation of the results obtained in terms of conservation and enhancement of agro-biodiversity and their potential for replication in other contexts, thus improving knowledge about the conditions under which RBAPS can be used to conserve or enhance biodiversity in agro-ecosystems	**Done**
5	Outreach strategies at project level, including materials to disseminate project results to stakeholders and to the general public, also through the EU platform	**Done**
6	Publications on the project's approach and results, lessons learnt.	**Done**
7	The project results will be incorporated into web-based platform that will contain information about experiences and best practice results-based schemes in Member States across the EU, which will be online by the beginning of the project.	**Done**

Table 4: Achievement of outputs from contract

11. DIARY OF ACTIVITIES CARRIED OUT YEAR BY YEAR

2015

- botanical surveys to build up data from which to identify suitable indicator species
- developed a list of 30 indicator species. The project partners decided on three levels of payment linked to 5, 8 and 10 indicator species detected.
- Assessment methods were designed and tested, checking verifiability and controllability.
- The targets to be met by land managers to meet scheme objectives, and methodology to be followed, were set out in booklets in Romanian, Hungarian and English.
- Payment rates and conditions calculated with assistance from the Ministry of Agriculture and Rural Development (MARD). MARD agreement with our calculations was important to assist future implementation of the scheme by the Romanian Ministry
- Developing simple contracts

2016
- In January and February 2016, we announced the RBAPS scheme in a general farmers' meeting in Sighișoara
- In period March-April 2016, we selected farmers from those who responded to announcements. The parcels of applicant farmers were checked for quality in May/early June 2016
- Designing methodology for annual monitoring of species numbers
- We drafted a questionnaire for farmers in order to build up a simple agricultural analysis of the participant farms: this was finalized later in the project
- Overcoming problems with mapping and identification of individual plots which are often unmarked within large physical blocks
- Promoting RBAPS systems at the seminar "Managing Nature, working together", an international seminar on nature management at Turku, Finland, November 2016.
- Support for a German student in developing her master thesis with the title: "A report on Results – Based Schemes; Case study in Germany and Austria".
- Promoting RBAPS systems at the seminar "Agri-environment – climate Measures (AECM): Challenges of controllability and verifiability", a meeting at DG Agri in Brussels, December 2016, which many MS paying agencies attended including Romanian.
- On 27 September 2016 Laura Sutcliffe attended AECM Conference and separate workshop in Poland, where she presented a poster on the RBAPS project.

2017

- Designing/printing a pocket-sized indicator guide for convenience of farmers
- Continued meetings with farmers and with the MARD and Ministry of Environment (MOE)
- Annual monitoring of 208 parcels each year, 2016 and 2017. Involving the farmers and the paying agency from Mures county in the monitoring of the parcels.
- Contracting and paying 73 farmers on c. 170 ha (in 208 individual parcels) over 2 years, 2016 and 2017
- Testing alternative monitoring methodologies in order to gauge accuracy of the chosen methodology
- Carrying out farmer training workshops and payment agency workshops
- Identifying pilot measure design problems and proposing solutions
- Attending/contributing to RBAPS conference, and meeting between RBAPS projects, in Brussels in March.
- Attending the "Revising the JRC/EEA EU-level HNV Farmland methodology"/ expert workshop to review potential improvements of the JRC/EEA HNV farmland methodology; in Vienna 12 June 2017

2018

- We monitored 55 meadow parcels in TM and 162 in PH. The number of species detected varied slightly compared to last year but difference was not significant
- We assessed the accuracy of the farmer self-surveys
- 14 June 2018 we attended the ENRD Seminar 'Supporting the Sustainable Management of Water and Soils through Rural Development Programmes', DG Agri, Brussels, specifically to speak about RBAPS
- 10 December 2018 we attended the round table on Green Agriculture of the CAP and used RBAPS as an example, DG Agri, Brussels.

12. BUDGET AND FINANCE

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See **Annex 7.1** for breakdown of costs by budget category, and full list of payments. We have full records of all transactions available on request.

13. INPUT FROM THE COMMISSION

The 30-31 March 2017 conference in Brussels to present the project to MS, Commission, NGOs and others organised by DG ENV (Vujadin Kovacevic) was a very welcome and useful initiative. This was followed by a technical meeting between RBAPS projects, which was an extremely useful exchange of views.

14. TIMETABLE FROM THE CONTRACT

TIMETABLE FOR EACH STAGE OF THE ACTION SHOWING MAIN DATES AND EXPECTED RESULTS FOR EACH STAGE																
	2015				2016				2017				2018			
Activity \ Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. Preparation	█	█	█	█	█											
1.a. Choice of location and scale.	█	█														
1.b Assessment of baseline and reference level		█	█													
1.c Setting of biodiversity goals			█	█												
1.d Identification of suitable indicators		█	█	█												
1.e Assessment of expected costs / benefits and required capacities			█													
1.f Compatibility with existing legal framework			█	█	█											
2. Design and implementation					█	█	█	█	█	█	█	█	█	█	█	█
2.a Quantification of targets					█	█										
2.b Calculation of payment rates and setting of conditions					█	█										
2.c Design methods for assessing results					█	█										
2.d Criteria and process for selection of participants					█	█										
2.e Develop and sign farmer agreements						█	█									
2.f Provision of guidance and training					█	█	█	█	█	█	█	█	█	█	█	
2.g Financial management of payments scheme					█	█	█	█	█	█	█	█	█	█	█	█
3. Monitoring and evaluation					█	█	█	█	█	█	█	█	█	█	█	█
3.a Assessment and external verification of specific results					█	█	█	█	█	█	█	█	█	█	█	█
3.b Self-assessment					█	█	█	█	█	█	█	█	█	█	█	█
3.c Financial monitoring and budgetary control				█	█	█	█	█	█	█	█	█	█	█	█	█
3.d Monitoring of overall scheme performance					█	█	█	█	█	█	█	█	█	█	█	█
3.e Analysis, reporting					█	█	█	█	█	█	█	█	█	█	█	█
3.f Review and adaptation, communication and dissemination.					█	█		█	█		█	█			█	█
4. Provisions for possible future RBAPS implementation beyond end of contract											█	█			█	█

Table 5: Timetable extracted from the contract