



## Status Report 2004 and Application for Continuation in 2005

For research projects financed by grants from  
The Directorate for Food, Fisheries and Agro Business  
under the Danish Ministry of Food, Agriculture and Fisheries

---

### 1. Research program

Research in organic farming 2000-2005 (DARCOF II)

---

### 2. Project title and number

III.5 Nature Quality in Organic Farming

---

### 3. Head of project

Jesper Fredshavn, Senior Advisor, Lic. agro., NERI, Department of Wildlife Ecology and Biodiversity, Grenåvej 14, DK-8410 Rønne, Denmark. tlf. 8920 1700, fax 8920 1515, e-mail: [jrf@dmu.dk](mailto:jrf@dmu.dk).

---

### 4. Participating institutes

DMU, National Environmental Research Institute, NERI,  
Dept. of Department of Wildlife Ecology and Biodiversity, Grenåvej 14, DK-8410 Rønne, tlf. 8920 1700, fax 8920 1515, ([jrf@dmu.dk](mailto:jrf@dmu.dk))  
Dept. of Policy Analysis, Frederiksborgvej 399, DK-4000 Roskilde, tlf. 4630 1200, fax 4630 1114 ([pfr@dmu.dk](mailto:pfr@dmu.dk))  
Dept. of Terrestrial Ecology, Vejløvej 25, DK-8600 Silkeborg, tlf. 8920 1400, fax 8920 1413 ([jaa@dmu.dk](mailto:jaa@dmu.dk))  
KVL, Royal Veterinary and Agricultural University, RVAU, Section of Organic Farming, Dept. of Agricultural Science, Agrovej 10, DK-2630 Tåstrup, tlf. 3528 3560, fax 3528 3580 ([vl@kvl.dk](mailto:vl@kvl.dk))  
Forest & Landscape, Denmark. Danish Centre for Forest, Landscape & Planning, KVL, Hørsholm tlf. 4576 3200, fax 4576 3233, ([kah@fsl.dk](mailto:kah@fsl.dk))  
DJF, Danish Institute of Agricultural Sciences (DIAS), Research Centre Foulum, PO box 50, DK-8830 Tjele, tlf. 8999 1900, fax 8999 1919, ([Egon.Noel@agrsci.dk](mailto:Egon.Noel@agrsci.dk))  
The Natural History Museum, (NHMA), Universitetsparken Wilhelm Meyers Alle 210 DK-8000 Aarhus C, tlf.-86129777 fax 86130882 ([thomas.secher.jensen@biology.au.dk](mailto:thomas.secher.jensen@biology.au.dk)).  
University of Aarhus, Dept. of Zoology, Universitetsparken B135, DK-8000 Aarhus C, tlf. 8942 2768

---

## 5. Other project staff

Senior Researcher Pia Frederiksen ([pfr@dmu.dk](mailto:pfr@dmu.dk)), Senior Researcher Pernille Kaltoft ([pka@dmu.dk](mailto:pka@dmu.dk)), Ph. D. Student Gregor Levin ([gl@dmu.dk](mailto:gl@dmu.dk)), DMU, Dept. of Policy Analysis, Frederiksborgvej 399, DK-4000 Roskilde, tlf. 4630 1200, fax 4630 1114

Senior Researcher Jørgen A. Axelsen ([jaa@dmu.dk](mailto:jaa@dmu.dk)) og Senior Researcher Paul Henning Krogh ([phk@dmu.dk](mailto:phk@dmu.dk)), Senior Researcher Marianne Bruus Pedersen ([mbp@dmu.dk](mailto:mbp@dmu.dk)), Scientific assistant Thomas Larsen ([thl@dmu.dk](mailto:thl@dmu.dk)) DMU, Dept. of Terrestrial Ecology, Vejlsøvej 25, DK-8600 Silkeborg, tlf. 8920 1400 fax 8920 1413

Senior Researcher Chris Topping ([cjt@dmu.dk](mailto:cjt@dmu.dk)), Senior Biologist Peter Odderskær ([po@dmu.dk](mailto:po@dmu.dk)); Senior Researcher Rasmus Ejrnæs ([rej@dmu.dk](mailto:rej@dmu.dk)), Senior Advisor Knud Tybirk ([kty@dmu.dk](mailto:kty@dmu.dk)) and Ph. D. Student Erik Aude ([eau@dmu.dk](mailto:eau@dmu.dk)), DMU, Dept. of Wildlife Ecology and Biodiversity, Grenåvej 14, DK-8410 Rønne, tlf. 8920 1700, fax 8920 1515

Senior Researcher Gabor Lövei ([Gabor.Lovei@agrsci.dk](mailto:Gabor.Lovei@agrsci.dk)), DJF, Dept. of Crop Protection, Research Centre Flakkebjerg, DK-4200 Slagelse, tlf. 5811 3436, fax 5811 3301

Associate Professor Vibeke Langer ([vl@kvl.dk](mailto:vl@kvl.dk)), KVL, Royal Veterinary and Agricultural University, RVAU, Section of Organic Farming, Dept. of Agricultural Science, Agrovej 10, DK-2630 Tåstrup, tlf. 3528 2382,

Senior Researcher Katrine Højring ([kah@fsl.dk](mailto:kah@fsl.dk)), Forest & Landscape, Denmark: Danish Centre for Forest, Landscape & Planning, KVL, Hørsholm Kongevej 11, DK-2970 Hørsholm, tlf. 4517 8202,

Senior Researcher Egon Noe ([Egon.Noel@agrsci.dk](mailto:Egon.Noel@agrsci.dk)), Research Assistant Lene Hansen ([Lene.Hansen@agrsci.dk](mailto:Lene.Hansen@agrsci.dk)), DJF, Danish Institute of Agricultural Sciences (DIAS), Research Centre Foulum, PO box 50, DK-8830 Tjele, tlf. 8999 1287

Director Thomas Secher Jensen ([thomas.secher.jensen@biology.aau.dk](mailto:thomas.secher.jensen@biology.aau.dk)) and Senior advisor Peter Gjelstrup ([pg@nathist.au.dk](mailto:pg@nathist.au.dk)), The Natural History Museum, Aarhus (NHMA), Universitetsparken, DK-8000 Aarhus C, tlf. 8942 5566

Associate Professor Søren Toft ([soeren.toft@biology.au.dk](mailto:soeren.toft@biology.au.dk)), University of Aarhus, Dept. of Zoology, Universitetsparken B135, DK-8000 Aarhus C, tlf. 8942 2768

## 6. Project period (month, year)

Start of project:	2001
End of project:	2005

## 7. Annual report of the project, its results and progress, and application for continuation in 2005

### A. Project summary

The work is organised in five work packages (WP 1-5, Table A1). Since the start in July 2001 the following work has been accomplished:

- WP 1. Starting up seminar and the annual seminars have served as a successful platform for project planning and cross-cutting activities. The general project co-ordination and planning of field work and selection of case study areas has been stimulated both at these meetings and in separate meetings with the WP responsible. The first cross-cutting (CC<sub>4</sub>) has been accomplished in close co-operation with WP 5 and all project scientists. An annual seminar was held in 2004 and the rest of the planned cross-cuttings were presented/discussed. In some cases, lack of data compatibility has made the cross-cuttings less ambitious. A homepage for the project is available.
- WP 2. Eleven case areas with high concentration of organic farmers have been selected and 347 - app. 10% of the organic farmers - have been interviewed. A database holding this information has been constructed. Analysis of density and management of landscape elements show a relationship to farm characteristics – especially size - as well as physio-geographic context of farms. A sociological study in the regions with highest density of organic farms showed that re-conversion to conventional farming was related to the development perspectives for the farm as well as to bureaucratic procedures (paper work), but also that farm management was not related to other aspects of their lifestyle.
- WP 3. Inventory data from 24 organic farms in two case areas with information on vegetation composition and arthropods has been analysed. New species for Denmark was found and arthropod indicators showed a good correlation to nature quality. Colonisation experiments showed that moss diversity is favoured by grazing and reduced by fertilisation. There was significantly higher plant diversity in hedges and field boundaries on organic farms than on traditional farms. This effect is evident after only 3-4 years of Organic Farming Period and further increased after 7 years.
- WP 4. Data from the same 24 organic farms and experimental fields of Foulum and Flakkebjerg has been collected in 2002 and 2003. Soil fauna diversity is influenced by soil type, tillage intensity and fertiliser use as well as crop and grazing history. In the experimental plots soil fauna and surface arthropods only showed little response to fertiliser use and catch crops. The attempt to establish nature quality index based on soil arthropods is under way. Crop rotations for organic farm types and scenarios for modelling were constructed in collaboration with WP2 (CC<sub>7</sub>). Crop rotations for conventional farmers were obtained from local farm advisors. Scenario modelling was carried out in the Herning landscape (10x10-km), and results were presented at the workshop meeting in June. A final report on the impacts of crop rotations, organic farm practices on selected mobile organisms is under preparation.
- WP 5. Results from the first project workshop (CC<sub>4</sub>) in 2002 on indicators for esthetical qualities show that a more professional use of the esthetical experience is difficult for many natural scientist. Serious illness did postpone work in 2003, but the work in 2004 has given good progress. The combination of researchers with a natural scientific approach and farmers attitude towards nature quality show some interesting differences in approach and it is a challenge to bridge this gap with good meaningful indicators.

**Table A.1: Work package list**

No.	Work package title	Participants*	Budget (1.000 DKK)	Start	End	Deliverable no(s):
1	Project management and interactions	<u>Jesper Fredshavn</u> , Knud Tybirk	0.6	2000	2005	D1-12
2	Localisation, diversification and extensification in organic farming	<u>Pia Frederiksen</u> , Vibeke Langer, Pernille Kaltoft, Gregor Levin	1.7	2000	2005	D13-22
3	Biological diversity and	<u>Rasmus Ejrnæs</u> ,	2.0	2000	2005	D23-30

	organic farming	Knud Tybirk, Erik Aude, Thomas Secher, Peter Gjelstrup				
4	Ecosystem diversity and function of the fields in organic farming	<u>Jørgen A. Axelsen</u> , Paul Henning Krogh, Marianne B. Pedersen, Peter Odderskær, Chris J. Topping, Søren Toft, Gabor Löwei	3.0	2000	2004	D31-39
5	Organic Farming and Landscape Quality – Perceptions and Practices	<u>Kathrine Højring</u> , Egon Noe Lene Hansen	1.7	2000	2005	D40-48

\* Responsible participants are underlined

## B. Objectives and expected achievements

The overall aim of the project is to identify the key components that ensure a continuous development of organic farming towards a closer integration of nature quality with food production. To accomplish this, the project will develop a common platform of understanding of how the localisation, diversity and intensity of organic farms influence landscape and nature quality (Driving forces and Pressure indicators). WP 2 will achieve this. This platform will qualify and give perspective to the discussion of how the three major components (State-Impact indicators) of nature quality as identified recently (Tybirk & Alrøe 2001) can be combined locally and regionally:

- biological diversity (WP 3)
- ecosystem functioning (WP 4)
- esthetical landscape perception (WP 5)

The project will develop relevant definitions and simple indicators to identify each aspect separately. However, the multi-disciplinarity of this project gives us an opportunity bring the separate analysis together and investigate how these potentially conflicting considerations can be integrated (WP 1) and suggest future pathways for the development of organic farming. The project will focus on identifying relationships between the three aspects separately and in combination, and scenarios will be used to show the consequences of organic farming practices for selected nature quality aspects.

The project is expected to achieve detailed information on the historic development of localisation of organic farms and the conditions that influence this. The organic farmers, their farming practices, their intentions and actual ability to conserve and promote biological and ecological as well as esthetical qualities will be characterised in details with the aim of identifying barriers and possible solutions for the development of organic farming. The project will be able to characterise organic farmed landscapes and their biological attributes and develop tools for communication of different conceptions of nature.

Relevant indicators will be developed to enable farmers, the public and the administrative bodies to set goals for an integration of nature quality considerations in the future development of a sustainable organic farming on the habitat, the farm and the landscape level. These indicators will also be appropriate to measure whether organic farming is actually approaching these goals.

## C. Annual results and progress

### C.1 Description (summary) of main results and conclusions

#### Localisation, diversification and extensification in organic farming

In 11 case-areas with relative high-density organic farming, 347 organic farmers have been interviewed on field management and the presence and management of small biotopes as well as non-farm activities. The 347 farmers represent approximately 10% of all Danish organic farmers in 2001, and this information has been combined with registry information on land use in 2001. Based on the information on management practice, one of the outcomes of the database will be an overall score of intensity of the individual farm. Preliminary analyses of 596 permanent grasslands show that almost

half of the permanent grassland fields on organic farms are more than 40 years old. The management is generally very extensive with only 7% of the fields being fertilised. Almost all fertilisation takes place on the young grasslands less than 40 years old.

A study on localisation has shown regional concentrations of organic farms. These concentrations are to some extent related to the regional specialisation of organic farms, which are similar to the general agricultural specialisation in Denmark. Other factors are regionally favourable conditions like county support, advisory services focussing on organic farming and access to structural fund support, as well as possible metropolitan area effects. At the local level it was found that 658 or one third of the Danish parishes consistently stay without organic farms. At this level intra-regional variations in concentration is strong, suggesting that local aspects contribute to the conversion process. Historical analysis of localisation showed that the localisation pattern in 1994 and 1997 continued in 2001, indicating that a local diffusion and concentration process is still active. There is no strong indication of a spatial rationalisation (re-conversion in periphery).

Three areas for qualitative studies have been selected with focus on areas with lack of conversion located close to areas with dense conversion, and re-converters vs. farmers who stay in organic farming.

Based on the interviews analysis of density and management of landscape elements (hedgerows, ponds and wildlife habitats as well as permanent grassland) have been carried out. The landscape elements were related to different aspects of the farm and farm household. The hedgerow density was related to farm management parameters like farm type, size and topography, while ponds were related to farm type and size as well as region and time used for agrarian purposes. Wildlife habitats did not respond as much to the parameters explored but was related to topography and farm size. The single most important parameter for all elements was farm size. As the variables were internally correlated results will be further explored by multivariate analysis.

The case study in Southern Jutland focussed on explanations for reconversion among organic farmers. Problems of marketing and lack of expansion possibilities for dairy producers was important and to a lesser degree the length of contract period, bureaucracy, problems with weed, and original drivers of organic farming. Most farmers did not perceive a large difference between organic and conventional farming and they did not relate their way of production with anything else in their daily life (no organic consumption, no meeting activity or social circle).

### **Nature quality in organically cultivated soil**

Soil fauna diversity, as well as total mite and springtail numbers was correlated with soil type, tillage intensity and fertiliser use as well as crop and grazing history and duration of the current state of the field. The 430 samples taken in 2002 on a wide range of organically farmed fields also showed that soil type interacted with crop type and grazing intensity. A higher number of mites and springtails were found in crops that included clover, almost independently of soil type. Higher numbers of mites were found at high grazing intensity compared to low grazing intensity on the same soil type. The results will be used to characterise the effect on soil fauna quality of each treatment, which again will contribute to a parameter characterising the overall soil fauna diversity on the farm.

In 2003, microarthropods were collected in spring, summer and autumn in Southern Jutland, Mid-Jutland and Sealand. In each region both cereal and vegetable fields were sampled to broaden the knowledge on the influence on agricultural practice on soil microarthropods. The attempt to establish a nature quality index on this basis has not quite succeeded yet, but more work will be done on the issue later this year. Information about microarthropod abundance, species numbers and Shannon-Wiener diversity index as measures of nature quality for the farms studied in CC3 has been extracted and sent to the CC3 task responsables.

### **Nature quality on organically farmed fields**

In crop rotation experiments on Foulum and Flakkebjerg research stations the effect of manure and catch crop were analysed. Flying as well as ground-active arthropods were collected in winter wheat, and soil micro fauna and fungal activity were recorded. Surprisingly, only weak effects of organic manure input and undersown catch crops were found in the 2002 data. The collembola density was very high in all treatment with averages around 60,000 per m<sup>2</sup> in Foulum and 20,000 per m<sup>2</sup> in Flakkebjerg. No effects on aphid control were recorded at the two locations. A field experiment in winter wheat evaluated the responses of the groundliving fauna to 9 mulching/fertilising treatments of different nutrient input and ground covering characteristics. Significant effects were recorded at three trophic levels: fungi, fungivores and predators. In 2003 an experiment to boost the prey fauna for the polyphagous predators was undertaken. This experiment excluded effects of microhabitat variation, and by adding a biochemical analysis to animals from three trophic levels in the field there is

an opportunity to investigate for the first time how nutrients (and especially the ratio between nutrients) are travelling through an agro-ecosystem. The results are not yet available.

### **Modeling the effect of organic farming on a landscape level**

A total of seven scenarios were constructed to model different aspects on the influence of organic farming practice in the Herning. The chosen scenarios aimed to describe different levels of organic farms present and different levels of crop management intensification on organic farms (mechanical weeding, density of live stock grazing, watering). Extensified conditions were a reduction of 50% in intensity compared to standard conditions. The effects of the scenarios were tested on: carabid beetle (*Agonum dorsale*), Linyphiid spider (*Erigone sp.*) and skylark as these species are expected to be the most sensitive species in relation to impacts following the agricultural changes described above.

Following main results were obtained:

- Organic scenarios indicated that organic farming was beneficial for all species considered. However, the impact varied depending upon the crops grown.
- The impact of the current organic farms on the landscape at large was measurable, but not large
- 100% organic farming led to a 9-120% increase in numbers depending on species.
- Extensification of management had clear beneficial impacts on spiders and skylarks, but not beetles.
- The 'nature' rotation ('nature optimised') was better for skylarks, but inferior to the standard rotations for beetles and spiders.

### **Nature quality on the uncultivated and permanently grassed areas**

A large biodiversity was found on the uncultivated and permanently grassed areas. In 885 plots on 24 farms a total of 561 plant species were found. Most plots were dominated by the same common species of the agricultural landscape. All uncultivated and permanently grassed areas were sampled on the farms, thus giving a statistically valid picture of the vegetation composition in the sampled areas. Meadows and dry grasslands cover most area, but the many linear hedges and field boundaries constitute a larger part of the samples. Only a minor part of the plots are EU Habitat types or protected areas according to Danish Nature Protection Act.

On a gradient of nature quality 100 plots were selected for registration of arthropods and plant biomass. Three new cicada and one new spider species of Denmark were found in these plots. A preliminary analysis shows that the arthropod species follow the same nature quality gradient found in the plant species. Thus, a natural area highly influenced by agricultural practice, poor in original plant species and dominated by common and opportunistic plant species is also poor in original arthropod species. And opposite, the rare and original plant and arthropod species are found on the same natural areas with only little intensive agricultural influence.

Natural Capital Index has been calculated for 10 selected farms. NCI includes a combination of the biological quality of the uncultivated farm biotopes ('probability of containing protected species' as a function of nutrient and humidity gradients). The preliminary calculations proved to be a good communicative tool across different research disciplines – and a promising concept to develop further.

Moss and plant species were recorded in an experimental study of the influence of grassing and fertilisation on plant colonisation in uncultivated areas. The moss data show that good conditions for mosses favours more species, as the number of species is strongly correlated to the total area of mosses. Moss colonisation is favoured by grazing and reduced by fertilisation.

Field studies showed significantly higher plant and fly diversity in hedges and field boundaries on organic farms than on traditional farms. This effect is evident after only 3-4 years and further increased after 7 years in the case of plants. The colonisation is in both cases primarily from common species, but the organic farms have more plant species from nutrient low biotopes.

Cross-cutting 1 (CC1) showed up to be very difficult, as the biological differentiation of grassland vegetation does not follow the areal units used in the farming legislation and databases. Therefore, it is not possible to relate data on farming practices to the biological information on the relevant areas. The intended functional interpretation of arthropod species composition to farming practices (CC5) has not yet been possible due to delayed data analysis.

### **The farmer as manager of nature quality**

The project shows that the organic farmer's conceptions of nature and nature values are distinctively different from the nature views guiding the natural scientists' investigations of nature quality. This is an important realisation, as the farmers and the natural scientists on the basis of their value conceptions aim at the creation of very different kinds of nature. The interviewed organic

farmers are in general very little aware of organic farming's potential to contribute to nature quality. They consider the initiative to reduce pollution, particularly water pollution, as organic farming's most significant contribution to environment and to sustainability. The incoherence in conceptions creates a serious impediment to the implementation of communal nature management goals.

On the basis of theories and experience concerning the significance of an emotional and aesthetic relationship with nature the project has investigated the potential of using aesthetic perception of the surroundings to bridge the differences in values and conceptions between farmers and experts. In relation to the farmers the aesthetic approach to understanding landscape and nature represents an absolutely useful basis for a dialog on nature quality. The development of a varied and qualified dialog does, however, call for a process leaving time to reflect on and observe the surroundings and ones own actions and impact.

To the researchers with a natural scientific background the utilisation of aesthetic observation in a professional context is quite unfamiliar. It provokes the scientist's professional self-understanding. However, through the process the researcher end up suggesting nature quality indicators, which through further development in a dialog with the farmers may lead to the creation of simple indicators, based on immediate observation. These tools are not only useful to experts, but may be utilised by the organic farmers themselves to evaluate the development of nature quality on their farm.

The farmer is the primary decision-maker and manager of nature quality on his farm. In the end his understanding and priority of nature quality decides the actual management on the farm. The project shows that to give the organic farmer the possibility to integrate considerations for nature values in his decisions-making processes it is important

- to establish the subject on his agenda,
- to establish a dialog between himself and holders of other value conceptions to enrich and qualify his reflections
- to give the farmer access to the biological expertise on nature protection in a way, which is relevant and functional in relation to his knowledge, his experience and his everyday practice
- for all parties to understand that the different value conceptions represent different discourses, equally legitimate, but based on different perspectives, knowledge and experience.

## C.2 Fulfilment of deliverables and milestones

*(To be completed for each work package)*

<b>WP 1 Project management and interactions</b>	<b>Time schedule according to application</b>	<b>Deviations, if any*</b>
<i>Task</i>		
1. Project co-ordination		
2. Cross-cuttings		
<i>Deliverables</i>		
1. Starting-up seminar	04.01	OK 09.01
2. Annual co-ordination meeting	01.02-04	OK 06.02, 08.03, 06.04
3. Annual status report	01.02-04	OK 11.01, 09.02, 09.03, 09.04
4. CC <sub>1</sub> Impact of farm localisation and character on biological diversity.	03.02 and 06.04	OK
5. CC <sub>2</sub> Farm management, ownership, collaboration, value conceptions and nature values.	10.04	
6. CC <sub>3</sub> Farmers conception of nature and actual biological quality of his farm.	12.03	10.04*
7. CC <sub>4</sub> : Workshop on the aesthetic perception of biological quality.	10.02	OK 06.02
8. CC <sub>5</sub> Functional interpretation of the response of arthropods to the organically farmed landscape.	03.04	probably not possible*
10. CC <sub>7</sub> Landscape scenarios.	03.04	OK
11. CC <sub>8</sub> Workshop on identified correlations.	05.04	10.04*
12. CC <sub>9</sub> : Workshop on Indicators.	09.04	05.05*

--	--	--

\* Deviations are to be further discussed in D

<b>WP 2. Localisation, diversification and extensification in organic farming</b>	<b>Time schedule according to application</b>	<b>Deviations, if any*</b>
<i>Task</i>		
1. Regional analysis of organic farms in Denmark		
2. Selection of case areas		
3. Local social and cultural context		
4. Production, diversity and nature practice on existing farms		
a. Descriptive analysis of management practises		
b. Analysis of farm characteristics and nature practises		
5. Structural farm characteristics and nature practise		
6. Changes in farm diversity		
7. Landscape changes following conversion to organic farming	late start due to ph.d. vacancy	
8. <i>Forms and levels of organisation for management of nature quality</i>	<i>relict from earlier project description</i>	<i>deleted in approved project</i>
<i>Deliverables</i>		
13. Regional localisation of organic farm – actual and historical development, regional specialisation(farm types)	05.02	OK
14. Regional variation in Danish organic production (Various diversity measures and intensity in a regional context)	04.04	OK
15. Social relations and spatial pattern: case area 1	03.03	02.05*
16. Social relations and spatial pattern: case area 2 and 3	12.03	02.05*
17. Integration of spatial and social processes in organic farming	11.04	
18. Database fully available for cross-cuttings	02.03	OK
19. Production, diversity and nature practise on existing organic farms in Denmark	12.03	
a. Farm management on organic farms		OK
b. Diversity and nature practises on organic farms		OK
20. Changes in farm diversity and nature practise with conversion to organic farming	05.04	02.05*
21. The impact of organic farming on landscape structure and –change	09.03	07.05*
22. <i>Potentials of among-farm collaboration for management of nature and landscape qualities</i>	<i>relict from earlier project description</i>	<i>deleted in approved project</i>
<i>Milestones</i>		
M1: National analysis of localisation and diversity completed	06.02	OK
M2: Landscape analysis completed	06.03	OK
M3: Historical analysis completed	12.03	OK
M4: Localisation of organic farms completed, two case areas selected	09.01	OK
M5: Additional case area(s) selected	06.02	OK
M6: Interviews with key persons, case area 1 and 2	03.02	OK
M7: In depth interviews completed, case area 1	08.02	OK
M8: In depth interviews completed, case area 2 and 3	09.03	12.04*
M9: Farm information from central registers retrieved	09.01	OK
M10: Survey scheme designed and tested	03.02	OK

M11 Survey in case areas completed	12.02	OK
M12: Data analysis completed a. Descriptive analysis completed b. Analysis of farm characteristics and nature practises	06.03	OK OK*
M13: Conversion data from applications for autorisation processed	03.03	10.04*
M 14: Supplementary interviews completed	06.03	11.04*
M15: Data analysis completed	12.03	12.04*
M16: Case area for pilot study selected		OK
M17: Pilot study finished, method adjusted		OK
M18: Selection of all case areas completed		OK
M18A: GIS analysis of landscape structure completed		08.04
M19: <i>In-depth interviews carried out</i>	<i>relict from earlier projectdescription</i>	<i>deleted in approved project</i>

\* Deviations are to be further discussed in D

<b>WP 3. Biological diversity and organic farming</b>	<b>Time schedule according to application</b>	<b>Deviations, if any*</b>
<i>Task</i>		
1. Floristic inventory of organic farms		
2. Experimental test of colonisation limitation		
3. Gradient analysis and modelling of biological diversity		
4. Synthesis – models, indicators and principles		
<i>Deliverables</i>		
23. The contribution of organic agriculture to biological diversity	07.02	OK
24. Manuscript: The importance of colonisation limitation for the diversity of grassland and hedgerows on organic farms	12.03	Manuscript in revision
25. Manuscript: Gradient analysis of plant and invertebrate communities in organic farms	<i>relict from earlier projectdescription</i>	<i>deleted in approved project</i>
26. Manuscript: Predicting plant and invertebrate diversity in grassland habitats of organic farms	03.04	12.04*
27. Manuscript: Functional interpretation of the distribution of arthropods in the agricultural landscape	05.04	probably not achievable*
28. Indicators for habitat quality in organic agriculture	09.04	03.05*
29. Impact of farm localisation and land use on biological diversity	<i>relict from earlier projectdescription</i>	<i>deleted in approved project</i>
30. Integration of biological conservation into organic agriculture	<i>relict from earlier projectdescription</i>	<i>deleted in approved project</i>
<i>Milestones</i>		
M20: 30-50 farms selected	06.01	OK
M21: Field inventory completed	09.01	OK
M23: Statistical summary for area, farm, and species data	03.02	OK
M24: Experiment established	09.01	OK
M25: Recording of first year establishment in experiment	10.02	OK
M26: Recording of second year survival in experiment	10.03	OK
M27: Statistical analysis of experiment completed	12.03	OK
M28: Selection of sample sites	03.02	OK
M29: Completed sampling of plants	09.02	OK
M30: Completed sampling of arthropods	09.02	OK
M31: Completed identification of arthropods	08.03	OK

M32: Completed sampling and analyses of environment	10.03	OK
M33: Gradient analyses and statistical models.	12.03	OK
M34: Tests for hypothesised relationships	02.04	10.04*
M35: Completed analysis of indicators and models for prioritisation.	06.04	02.05*

\* Deviations are to be further discussed in D

<b>WP 4 Ecosystem diversity and function of the fields in organic farming</b>	<b>Time schedule according to application</b>	<b>Deviations, if any*</b>
<i>Task</i>		
1. Development of indicators of nature quality on organic fields.		
2. A test of the hypothesis that increased biodiversity enhances the beneficial ecological mechanisms		
3. Modelling of consequences of crop rotations, tillage and landscape structures on mobile organism		
<i>Deliverables</i>		
31. Suggestion to indicator system	09.04	12.04*
32. Scientific paper on indicator system	12.04	
33. Suggestions for changes in management practice to promote desirable species in organic fields	12.03	12.04
34. Scientific paper on crop rotations and polyphageous predators	<i>relict from earlier projectdescription</i>	<i>deleted in approved project</i>
35. Scientific paper on the connection between soil fauna and polyphageous predators	12.03	12.04
36. Scientific paper on the relation between biodiversity and aphid control	12.03	12.04
37. Entry at the Danish Plant Protection Conference	Every March	Not accomplished*
38. Scientific paper on the impacts of various organic farm practices on the mobile organisms	09.03	12.04*
39. <i>Scientific paper on the impacts of farm location on the mobile organisms</i>	<i>relict from earlier projectdescription</i>	<i>deleted in approved project</i>
<i>Milestones</i>		
M36: Plan for low intensity sampling ready	03.02	OK
M37: Low intensity sampling finished	06.02	OK
M38: Low intensity data treatment finished	12.02	OK
M39: Tentative indicator system designed	03.03	OK
M40: High intensity sampling plan ready	03.03	OK
M41: High intensity sampling finished	09.03	OK
M43: High intensity data treatment finished	03.04	OK
M44: Detailed research plan for the year is developed	03.02-04	OK
M45: Additional extractors manufactured	06.01	OK
M46: The years experiments finished	03.02-04	OK
M47: Digitisation of new model landscape (revised title)	08.02	OK

\* Deviations are to be further discussed in D

<b>WP 5. Organic Farming and Landscape Quality – Perceptions and Practices</b>	<b>Time schedule according to application</b>	<b>Deviations, if any*</b>
<i>Task</i>		
1. Landscape analysis		
2. Analysis of the farmer's role in the production and maintenance of nature and landscape quality		

3. Development of methods for communication about nature and landscape quality		
Deliverables		
40. The aesthetic perception of biological quality	06.02	OK
41. The aesthetic perception of biological quality	12.02	OK
42. The aesthetic quality of organically farmed landscapes	02.04	OK
43. Nature and landscape quality – organic farmers value conceptions	12.03	OK
44. Value conceptions, farm maintenance and biological quality	08.04	OK
45. The contribution of farming practice to aesthetic quality	08.04	OK
46. Local participation in nature and landscape quality assessment	11.04	<i>deleted*</i>
47. Operational indicators in communication and decision-making processes	<i>relict from earlier project description</i>	<i>deleted in approved project</i>
48. Indicators for nature and landscape quality as instruments in awareness raising and decision-making	12.04	
Milestones		
M48: Selection and description of study areas	12.01	OK
M49: Landscape analysis	06.02	OK
M50: Basic interviews	06.02	OK
M51: Selection of production data from wp2	12.02	OK
M52: Selection of biological data from wp3 and 4	09.02	OK
M 53: Analysis and description of aesthetic landscape quality	03.04	OK
M55: Data collection – individual interviews	07.02	OK
M56: Data analysis – individual interviews	03.03	OK
M57: Data collection – focus group interviews	12.02-06.03-12.03-06.04	OK
M58: Data analysis – focus group interviews	11.04	
M59: Development of indicators	06.04	12.04
M60: Interviews with key persons, case area 1 and 2	11.04	OK
M61: Synthesis of objectives	11.04	

\* *Deviations are to be further discussed in D*

## D. Description of deviations and subsequent adjustments of plans

### WP 1

The progress in most of the Cross-Cuttings is considerable, but in some cases the original aim cannot be achieved. This may be due to incompatibility or lack of data in some cases and new combinations of data and experiences in other cases. Therefore some products have been delayed and changed somewhat in scope, but it is the intention that the individual cross-cutting reports will be gathered in a final project report reflecting the integrative nature of the project and some of the major achievements.

Delays in various WP's cause a postponement of the two workshops CC<sub>8</sub> and CC<sub>9</sub> till October 2004 and May 2005 respectively in order to integrate the delayed and late parts of the project in the final conclusions. The arrangement of workshop CC<sub>9</sub> after the originally planned project period implicates an extension of the project period.

### WP 2

Analyses of localisation, farm type distribution and pluriactivity has been carried out, as well as land use intensity. Through the data analysis considerable additional valuable empirical material has been produced, and intentionally will be published in various papers, as it holds much information on organic farming, farm and household character and activities undertaken by the farming household. It has been decided to collect this material in a report in which deliverable 14 will also appear.

The first case study in southern Jutland grew to a study in itself and was subsequently published in a conference paper, which is now being reworked to a book-contribution. This has delayed the second case study, but data collection for this has started, and will be reported before the end of the project. This concerns milestone 8 and deliverable 16 and 17.

Work for deliverable 20 has been further delayed, due to a heavier workload than expected related to the analysis of the interview-data. Work has however started, and is expected to be finalised in due time for presentation at the final workshop. This activity is not financed by the present project (but by V. Langers complementary project which finalises ultimo 2005).

The finalisation of the PhD thesis has been delayed 2 month due to long term disease.

### WP 3

Statistical summary of farm inventory was slightly delayed, but served as a basis for selection of farms and plots for arthropod sampling. Arthropod sampling in 2002 produced very high quality samples and the second sampling was omitted.

Deliverable 23 was submitted in Sept. 2002, but first published May 2003. This WP has contributed to numerous international papers closely related to the WP aims. More emphasis has been put on the impact of organic farming on vegetation and arthropods in hedges – a topic of high interest from farmers.

However, the WP-responsible has taken a sabbatical leave from NERI, and this means that the indicator development in deliverable 27 will be based on expert judgement rather than statistical data analysis – which will be sufficient for the aim of the project. Natural Capital Index has been proposed in a very preliminar form in 2004 and this will be further developed during project finalisation and contribute to the overall goals of the project.

### WP 4

The yearly Plant Protection Conference has terminated and the planned presentations will be considered in other fora. Digitising the model landscape has been more time consuming than first expected, and caused delays in scenario building. However, results from the scenarios are now available.

Identification and counting of microarthropods sampled in 2003 was delayed, and hence data analysis was postponed, but is now finished. As a further consequence of the delay the establishment of a nature quality index for microarthropods has also been postponed, but we expect to catch up by the end of 2004.

Del. 33, 35 and 36 will be finalised by the end of 2004. Del. 38 will constitute a detailed report of the scenario results to substitute a scientific manuscript.

### WP 5.

Most of the tasks in WP 5 have been delayed for almost a year due to serious illness. The group is now supplemented with an anthropologist to conduct the interviews in autumn 2003, and participate in the data collection, analysis and indicator identification. Data exchange and fulfilment of CC<sub>2</sub> and CC<sub>3</sub> will be as scheduled and all results will be ready for the workshop in October 2004 and the final workshop in May 2005.

Deliverable 46 was unfortunately to possible due to lack of participation from the interviewed organic farmers in the participatory process. For the same reason milestone 59 is delayed, as the development of indicators had to be carried out in a different target group, than originally planned. The process was in stead carried out in connection with M57.

## E. Project publications and other products

Number of eprints: 43.

### Submitted for peer-review but not yet accepted

#### English

Noe, Egon (2003) [Farm management, knowledge and multidimensional farming - some reflections from the perspective of farm enterprises as heterogeneous self-organising systems](#). Paper presented at XXth ESRS Congress: Working group 1.5, Labour skills and training for multidimensional agricultures, Sligo, Ireland, 18-22 August 2003, page 1-8.

Aude, Erik and Ejrnæs, Rasmus (2003) [Bryophyte colonisation and persistence in experimental grassland dominated by vascular plants](#). *Oikos*.

- Ejrnæs, Rasmus and Liira, Jaan and Poulsen, Roar (2003) [Discrimination of semi-natural plant communities from abandoned fields by ordination and neural networks](#). *Applied Vegetation Science*.
- Petersen, S. and Axelsen, J.A. and Tybirk, K. and Aude, E. and Vestergaard, P. (2004) [Effects of duration of Organic farming practice on vegetation in Danish field boundaries](#). [preprint]
- Stidsen, A.N. and Tybirk, K (2004) [Dispersal and habitat quality as constraining factors for herbaceous forest species in an ancient hedgerow network](#). [preprint]
- Tybirk, K. and Primdahl, J. and Olsen, H.K. and Holbeck, H.B. (2004) [The Fire-fighter's Law: a conceptual tool to include nature conservation in on-farm planning](#). [preprint]
- Tybirk, Knud and Alrøe, Hugo Fjelsted and Frederiksen, Pia (2002) [Nature quality in organic farming in Europe. Concepts, considerations and indicator development](#). [preprint]

### Peer-reviewed and accepted

#### English

- Frederiksen, Pia and Langer, Vibeke (2004) [Nature Management and livelihood strategies on Danish organic farms](#). Paper presented at Sixth European IFSA Symposium, Vila Real, Portugal; Published in Cristovão, Artur, Eds. *Proceedings of the Sixths European IFSA Symposium, European Farming and Society in Search of a New Social Contract - Learning to Manage Change 1*, page 361-374. UTAD; Portugal.
- Levin, Gregor (2004) [Styding the effect of organic farming on rural landscapes: Issues of methodology and scale](#). Paper presented at Sixth International Farming Systems Association (IFSA) European Symposium., Villa Real, Portugal, April 4-7, 2004; Published in Cristovão, Artur, Eds. *Proceedings of the Sixth European IFSA Symposium, European Farming and Society In Search of a New Social Contract - Learning to Manage Change 2*, page 325-334. UTAD, Portugal.
- Aude, Erik and Tybirk, Knud and Michelsen, Anders and Ejrnæs, Rasmus and Hald, Anna Bodil and Mark, Susanne (2003) [Conservation value of the herbaceous vegetation in hedgerows - does organic farming make a difference?](#). *Biological Conservation*.
- Aude, Erik and Tybirk, Knud and Pedersen, Marianne Bruus (2003) [Vegetation diversity of conventional and organic hedgerows in Denmark](#). *Agriculture, Ecosystems and Environment*:1-13.
- Frederiksen, Pia and Langer, Vibeke (2004) [LOCALISATION AND CONCENTRATION OF ORGANIC FARMING IN THE 1990'S - THE DANISH CASE](#). *Tijdschrift voor Economische en Sociale Geographie*.
- Tybirk, Knud and Alrøe, Hugo Fjelsted and Frederiksen, Pia (2004) [Nature quality in organic farming: A conceptual analysis of considerations and criteria in a European context](#). *Journal of Agricultural and Environmental Ethics* 17(3):249-274.

### Not peer-reviewed

#### English

- Kaltoft, Pernille and Risgaard, Marie-Louise (2004) [Has organic farming modernised itself out of business? An analysis of reverting organic farmers](#). Paper presented at IRSA XI World Congress of Rural Sociology, Trondheim, Norway, July 25-30, 2004.
- Højring, K. and Hansen, L. and Noe, E. (2004) [Organic Farming - Nature Conceptions, Management and Cross Compliance](#). *DARCOFenews*(2). Online at <<http://www.darcof.dk/enews/june04/nature.html>>
- Frederiksen, Senior researcher Pia and Langer, Associate Professor Vibeke (2004) [Nature Management and livelihood strategies on Danish organic farms](#). [oral] Presentation at *NJF international conference, No 357, Current status, and developments of part-time farming*., Billund, Denmark., 22-24 april, 2004.
- Levin, Gregor (2003) [A methodological framework for analysing landscape dynamics in relation to organic farming](#). [oral] Presentation at *Crossing the boundary between natural and social sciences*., University of Copenhagen, Department of Geography, August 18-20, 2003.\*
- Levin, Gregor (2003) [A methodological framework for analysing landscape dynamics in relation to organic farming](#). [oral] Presentation at *Crossing the boundary between natural and social sciences*, University of Copenhagen, Department of Geography, August 18-20, 2003.\*
- Levin, Gregor (2003) [A holistic framework for the analysis of landscape changes following organic farming](#). Department for Policy Analysis, National Environmental Research Institute.

- Levin, Gregor (2003) [The effects of organic farming on the landscape: Reflections on a Ph.D. project in the context of values and ideologies](#). Department of Policy Analysis, National Environmental Research Institute.
- Petersen, Sune (2003) [Effects of organic farming on flies in Danish field boundaries](#). [preprint]  
(2003) [Naturindholdet i hegn på økologiske og konventionelle bedrifter](#). Proceedings of 1. Danske Plankongres 2004, Herning, Januar 2004. *DJF-rapport*. Report no. 89 (2003).\*\*
- Fredshavn, Jesper and Tybirk, Knud and et al., (2003) [FØJOII-29: Nature Quality in Organic Farming. Midterm Status Report 2003](#). Report, Dept. Wildlife Ecology and Biodiversity, National Environmental Research Institute.
- Frederiksen, Senior researcher Pia and Langer, Associate Professor Vibeke (June 2004) [Spatial variation in the localization of Danish organic farms](#). Online at <http://www.darcof.dk/enews/june04/index.html>>. DARCOFenews no 2

### Deutsch - German

- Levin, M.Sc. Gregor and Frederiksen, Senior researcher Pia (2003) [Beschreibung und Differenzierung der dänischen Agrarlandschaft anhand von räumlichen Strukturindizes](#). [Description and differentiation of the Danish rural landscape with the use of spatial indices.]. Poster presented at IALE Struktur Workshop Landschaftsstruktur Analysieren, Verstehen, Modellieren, Salzburg, Austria, 16-17 April 2003.

### Dansk - Danish

- Tybirk, K and Ejrnæs, R and Elmegaard, N and Langer, V and Holmstrup, M (2003) [Naturkvalitet og biodiversitet](#), in Holmstrup, M, Eds. *Gør økologisk jordbrug en forskel?*, chapter 3, page 33-41. Miljøbiblioteket 1. Gads Forlag.
- Tybirk, K and Hald, A.B and Pedersen, M.B. and Sønderkov, M (2004) [Ukrudt i et kulturlandskab](#), in Madsen, K.H, Eds. *Ukrudtsbekæmpelse i landbruget*, chapter 12. DJF.\*\*
- Noe, Egon (2002) [Natur- og miljøforvaltning baseret på frivillige aftaler](#). Paper presented at Natur- og Miljøforskningskonference, København, 22. - 23. august 2002; Published in Bjørnsen, Peter Koefoed and Frich, Povl and Johansen, Pia, Eds. *Natur og Miljøforskningskonference - Resumé af foredrag og posters H.C. Ørstedinstituttet, den 22.-23. august 2002*. Miljøministeriet - Danmarks Miljøundersøgelser.
- Tybirk, Knud and Fredshavn, Jesper (2003) [Naturkvalitet i økologisk jordbrug – koncept og foreløbige resultater](#). [Nature Quality in organic farming - concept and preliminary results]. Paper presented at Dansk Planteværnskonference, Nyborg Strand, March 2003; Published in *DJF rapport* 89, page 189-198. Danmarks Jordbrugsforskning.
- Fredshavn, Jesper (2002) [Naturkvalitet i økologisk jordbrug](#) [Nature Quality in organic farming]. Poster presented at Økologi-Kongres 2002.
- Hansen, L. and Noe, E. and Højring, K. (2004) [Økologisk Jordbrug kan profilere sig gennem landskabs- og naturkvalitet](#). *FØJOenyt*(4). Online at <http://www.foejo.dk/enyt2/enyt/aug04/naturkvalitet.html>>
- Højring, K. and Hansen, L. and Noe, E. (2004) [Økologisk Jordbrug - Naturoplevelser, natursyn og Cross-compliance](#). *FØJOenyt*. Online at <http://www.foejo.dk/enyt2/enyt/juni04/natursyn.html>>
- Stidsen, A.N. and Tybirk, K (2004) [Gamle hegn bevarer skovbundsarter](#). In *Skoven*.\*\*
- Tybirk, K and Fredshavn, J. and Aude, E. and Petersen, S. (2003) [Naturen er bedre i økologiske hegn og skel](#). In *FØJO-e-nyt - Nyhedsbrev fra Forskningscenter for Økologisk Jordbrug*, Volume 5, page 1-2.
- Tybirk, Knud and Aude, Erik and Bruus Pedersen, Marianne (2003) [Mere natur i økologiske hegn](#) [More nature in organic hedges]. In *Vand og Jord*, September, Volume 10, No 3, page 93-96.\*\*
- Frederiksen, Pia (2004) [Lokalisering af økologiske bedrifter - regional specialisering og koncentration?](#) [Localisation of organic farms - regional specialisation and concentration?]. [oral] Presentation at *Facetter af landskabsforskningen, Danish Landscape Ecological Association*, National Environmental Research Institute, 16. september 2004.
- Frederiksen, Senior researcher Pia (2004) [Forvaltning af natur og landskab i økologisk jordbrug](#) [Management of nature and landscape in organic farming]. [oral] Presentation at *Facetter af landskabsforskningen, Danish Landscape Ecological Association*, National Environmental Research Institute, 16. september 2004.
- Noe, Egon (2002) [Folks oplevelser af naturen og ønsker til biodiversitet?](#) [Peoples experiences with nature and desires of biodiversity]. [oral] Presentation at *Status konference: Biodiversitet i det dyrkede land og dets omgivelser*, Nyborg Strand, Danmark, 6. marts 2002.

- Kaltoft, Pernille and Risgaard, Marie-Louise (July 2004) [Notat til Det Økologiske Fødevareråd om økologiske landmænds tilbagelægning til konventionelt landbrug](#). Policy Analysis, National Environmental Research Institute.
- Frederiksen, Senior researcher Pia and Langer, Associate Professor Vibeke (June 2004) [Lokalisering af økologiske jordbrug sker ikke jævnt hen over landet](#) [Localization of organic farms show spatial variation Denmark]. Online at <<http://www.foejo.dk/enyt2/enyt/juni04/index.html>>. FØJO enyt nr 3
- Frederiksen, Senior researcher Pia and Ejrnæs, Senior researcher Rasmus and Tybirk, Senior advisor Knud (2004) [Afrapportering af Crosscutting 1: koblinger mellem drift af vedvarende græs \(wp2\) og biologisk naturkvalitet \(wp3\)](#). Working Paper, Afd. for systemanalyse og Afd. f. Vildtbiologi og Biodiversitet, Danmarks Miljøundersøgelser.
- Hansen, L. and Noe, E. and Langer, V. and Ejrnæs, R. and Tybirk, K. and Bruus Pedersen, M. (2004) [Landmænds opfattelser af natur og aktuel naturkvalitet på bedriften. Cross cutting rapport for CC3](#). Working Paper.
- Højring, K. (2004) [Æstetisk sansning og naturvidenskabelig naturforståelse - et eksplorativt eksperiment](#) [Aesthetic sensation and nature understanding in the natural sciences - an explorative experiment]. Arbejdsrapport Skov & Landskab no. nr. 4-2004, publiceret, Urban and Rural Studies, Danish Centre for Forest, Landscape & Planning.

## 2. Oral presentations, public meetings, field days, etc.

- Baudry, J., Kristensen, S., Tybirk, K., Kristensen, L. S., Thenail, C., Busck, A.G., Le Du-Blayo, L., Luginbühl, Y, Kergreis, S. 2003. A comparison of hedgerow patterns and landscape connectivity. Oral presentation, IALE Congress, Darwin, July 2003
- Ejrnæs, R. 2003. Silent or stupidized?- Why is biodiversity low political priority? *Oral presentation at ALMA-annual meeting, Gilleleje Kursuscenter 14.-16. september.*
- \*Højring, K. og E. Noe (2004): Communicative approaches to involving farmers in protecting aesthetic and biological landscape quality. IRSA, XI World Congress. July 2004, Trondheim.
- Højring, K. og E. Noe (2004): Interessentworkshop: Naturkvalitet i økologisk jordbrug – status og perspektiver. 22. september 2004, Forskningscenter Foulum.
- Krogh, P.H. 2002. "Soil environmental applications of machine learning". Oral presentation at seminar on "Analysis of environmental data with machine learning methods" 22.-25. April 2002, Ljubljana, Slovenia.
- Krogh, P.H. Course on "Analysis of environmental data with machine learning methods" Ljubljana 22-25. April 2002.
- Levin, G., 2003: A methodological framework for analysing landscape dynamics in relation to organic farming. PPT-presentation at Ph.D. course: Crossing the boundary between natural and social science. August 18-20, 2003 in Copenhagen, Denmark.
- Levin, G., 2003: The effects of organic farming on the landscape: Reflections on a Ph.D. project in the context of values and ideologies. Assignment for Ph.D. course: Values, ideologies, science and organic farming. September 12-17, 2003 in Falkenberg, Halland, Sweden.
- Levin, G., 2002: A holistic framework for the analysis of landscape changes following organic farming. Assignment for Ph.D. course: Research Methodologies in relation to Principles and Practice of Organic Agriculture. October 7-11, 2002 in Tisvildeleje, Denmark.
- Tybirk K. 2002. How does agricultural production systems affect botanical diversity in semi-natural areas? Oral presentation at Danish conference on biodiversity in agricultural land.
- Tybirk, K. & Ejrnæs, R. 2003. Thematic day for journalists: Interaction of farming and nature conservation from Farm-Nature Conservation Plans to National parks. 12 Participants.
- Tybirk, K. 2002. How is agricultural production affecting botanical diversity in the agricultural landscape. Oral presentation at Seminar on Biodiversity, Nyborg Stand, March 2002
- Tybirk, K. 2003. Project homepage established ([http://www.dmu.dk/1\\_Viden/2\\_Miljoe-tilstand/3\\_natur/nk-oj/default.asp](http://www.dmu.dk/1_Viden/2_Miljoe-tilstand/3_natur/nk-oj/default.asp))

## F. Scientific education

### Ph.d. studies:

- Aude, E. (University of Copenhagen). Habitat quality and recruitment limitations in the agricultural landscape. Thesis defended March 2004. Partly financed by DARCOF.
- Gregor Levin: Landscape changes following conversion to organic farming: To what extent and how? Finalising 2005.

**MSc. projects:**

- Petersen, Sune 2003: Impact of Organic Farming Period on Flies and Vegetation of Field Borders  
M.Sc thesis (University of Copenhagen).
- Møller, Lene 2003.. The Effect of Different Types of Mulch Layers on Soil Fauna and Polyphagous Predators. M.Sc thesis (University of Aarhus).
- Stidsen, Anders N., 2004. Fordelingen af urter i et østjysk hegnsnetværk. M.Sc thesis (University of Aarhus).
- Risgaard, Marie Louise (Royal Veterinary and Agricultural University): Processes of Conversion and Re-Conversion (working title, terminates 05)
- Ackermann. H. Ø. 2003. Organic farmers' landscape management. Masters Thesis (University of Copenhagen, Dept. of Geography)

**G. National and international co-operation**

- WP 2: Vibeke Langer, RVAU was a guest researcher at Lincoln University, New Zealand Nov 2002 March 03. Through V. Langers development and implementation of the recent SOAR PhD course, contacts have been made to a British research project with similar objectives and methods. Common activities will be explored.
- WP 3: Collaboration with Jacques Baudry's group from INRA-SAD Armorique, Ecobio lab of CNRS/Rennes University on social and biological values of hedges in the organic and conventional landscapes.
- WP 4: Co-operation with the EU funded project [www.ECOGEN.dk](http://www.ECOGEN.dk) involving decision support experts: Sašo Džeroski, Damjan Demšar, Marko Bohanec, Jožef Stefan Institute, Department of Intelligent Systems, Slovenia.

**H. Critical reflection on the project**

New and interesting results in the project have brought attention to research areas not originally anticipated in the application. Delays in some of the work packages implicates a postponement of the two workshops CC<sub>8</sub> and CC<sub>9</sub> in order to have a full overview of ideas and results in the final identification of correlation's of nature quality and recommendations for the future work.

- Statistical information on organic farming in Denmark has given rise to new questions on the localisation and conversion of farms. Why are more than 1/3 of the Danish parishes without organic farms and why do farmers re-convert to conventional agriculture? The local socio-cultural context and dynamics may contribute to further understanding of these questions.
- Research in nature quality on the non-cultivated areas was reduced significantly in the final approval of the project. However, remarkable results on the interaction between these areas and the cultivated areas have shown that organic farming has a strong impact on the vegetation and the arthropods of field borders and hedges. Three to five years after conversion the differences are significant, and the impact is increasing after 10 -15 years. This indeed challenges the established theories on colonisation limitations in the farming landscape and will give rise to new speculations on the role of organic farming as a mean to protect nature in the agricultural landscape.
- From a nature conservation point of view the small uncultivated biotopes of the farming landscape are very important. From a quantitative point of view the large areas of cultivated land represents important nature quality. Both areas contribute to nature quality in the farmed landscape, and it is important to continue developing both aspects in the future organic agriculture. The Dutch Natural Capital Index combining quality and quantity on a farm unit has proven to be an interesting approach to the future indicator development.
- The delays in WP 2 and WP4 will be recovered in the last period of the project. A postponement of the two planned workshops (CC<sub>8</sub> and CC<sub>9</sub>) till October '04 and May '05 allow us to have a full overview of results and ideas to identify correlation's and indicators.

- Some of the intended cross-disciplinary data-treatments in the Cross-cuttings had to be modified or changed rather drastically during the project (CC1 and CC5). In CC<sub>1</sub>, the biological data collections were sampled on areas not covered by the statistical informations in the national databases. This situation was first evident after thorough investigations on the national database. On the other hand, the scientific acknowledgement of the differences in approach from two disciplines has given rise to new possible research questions. In CC5 better coordination of sampling techniques and analysis would have reduced the delays.

## 8. Budget

### A. Account for any change in budgets

Under each institutional budget, minor changes are described and the requests for each change are summarised into the budget for the whole project in 8.B.

In general some delays in specific activities interact on other activities and consequently budgetary adjustments have been necessary.

### B. Budget for the whole project (1.000 DKK)

Total consumption of funds from DARCOF and expected consumption this year and coming years

Year:	Consumption before 2004	Expected consumption 2004	2005	Total
Man-months				
Scientific personnel	74	43	5	121
Technical personnel	42	5	0	47

Year:	Consumption before 2004	Expected consumption 2004	2005	Total
Salaries				
Scientific personnel	3466	1656	189	5311
Technical personnel	1085	268	17	1370
Other operational costs	456	234	79	769
Equipment	38	12	0	50
Others (please specify)				
Direct costs	5045	2170	285	7499
Indirect costs (20% of direct costs)	1009	434	57	1500
Total	6054	2604	341	8999

#### Comments:

The project has accomplished with most of the deliverables but as described in the mid-term status report, the postponement of the final workshop and a few other activities described below (Wp 2, 3 and 5), a modest transfer to finalisation of the project in 2005 is requested.

## 9. Signatures and stamps

Name	Institute	Date	Signature
Head of project			

---

## Appendix I. Detailed budget

### A. Budget for each participating institute (1.000 DKr)

Name of Institute: NERI- Dept. of Wildlife Ecology and Biodiversity

Year:	Consumption before 2004	Expected consumption 2004	2005	Total
Man-months				
Scientific personnel	24	10	2	36
Technical personnel	7,5			7,5

Year:	Consumption before 2004	Expected consumption 2004	2005	Total
Salaries				
Scientific personnel	1307	418	87	1812
Technical personnel	225			225
Other operational costs	187	100	50	337
Equipment				
Others (please specify)				
Direct costs	1719	518	137	2374
Indirect costs (20% of direct costs)	344	104	27	475
Total	2062	622	164	2848

#### Comments:

The work in 2004 has been reduced and delayed as a key Senior Researcher has left NERI. We propose to fill the gap by buying external consultant to do some of the lacking data treatment and to contribute to deliverable 28 and possibly to del. 27. For this we request a translocation of 75 kkr of salaries from 2004 into other operational costs (external assistance). As a few parts of the projects has been slightly delayed, the final workshop and reporting will require a transfer of salaries as well into 2005 as specified above. A total transfer of 164 kkr for project finalisation is therefore requested.

**A. Budget for each participating institute (1.000 DKr)**

Name of Institute: NERI, Department of Policy Analysis

Year:	Consumption before 2004	Expected consumption 2004	2005	Total
Man-months				
Scientific personnel	9,5	10,1	1,5	21
Technical personnel	1	1		2

Year:	Consumption before 2004	Expected consumption 2004	2005	Total
Salaries				
Scientific personnel	742	352	62	1156
Technical personnel		53	8	61
Other operational costs	64	59	26	149
Equipment	38	12		50
Others (please specify)				
Direct costs	844	476	96	1415
Indirect costs (20% of direct costs)	169	95	19	283
Total	1013	571	115	1,699

**Comments:** NERI, Dept. Policy analysis request to transfer 115.000 kr to project finalisation and preparation of final workshop

Name of Institute: Natural History Museum, Århus

Year:	Consumption before 2004	Expected consumption 2004	2005	Total
Man-months				
Scientific personnel				
Technical personnel	7	1	0	8

Year:	Consumption before 2004	Expected consumption 2004	2005	Total
Salaries				
Scientific personnel				
Technical personnel	222			222
Other operational costs	18			18
Equipment				
Others (please specify)				
Direct costs	240			240
Indirect costs (20% of direct costs)	48			48
Total	288			288

**Comments:**

Name of Institute: NERI- Dept. of Terrestrial Ecology

Year:	Consumption before 2004	Expected consumption 2004	2005	Total
Man-months				
Scientific personnel	12	4	0	16
Technical personnel	10	2	0	12

Year:	Consumption before 2004	Expected consumption 2004	2005	Total
Salaries				
Scientific personnel	417	168		585 (556)
Technical personnel	233	150		383 (401)
Other operational costs	61	10		71 (65)
Equipment				
Others (please specify)				
Direct costs	711	328		1039 (1022)
Indirect costs (20% of direct costs)	142	66		208 (204)
Total	853	394		1247 (1226)

**Comments:**

In parenthesis the original budget is shown. In addition to this, 21 kkr were spent in TERI during 2002-03 as co-financing the activity.

Name of Institute: Aarhus University, Institute of Biology, Dept. of Zoology

Year:	Consumption before 2004	Expected consumption 2004	2005	Total
Man-months				
Scientific personnel	12,50			12,50
Technical personnel	5	0		5,00

Year:	Consumption before 2004	Expected consumption 2004	2005	Total
Salaries				
Scientific personnel	380			380
Technical personnel	120			120
Other operational costs	52			52
Equipment				0
Others (please specify)				
Direct costs	552			552
Indirect costs (20% of direct costs)	110			110
Total	662			662

**Comments:**

Name of Institute: DIAS, Danish Institute of Agricultural Science, Dept. of Plant Protection, Flakkebjerg

Year:	Consumption before 2004	Expected consumption 2004	2005	Total
Man-months				
Scientific personnel	6			6
Technical personnel	8			8

Year:	Consumption before 2004	Expected consumption 2004	2005	Total
Salaries				
Scientific personnel	215			215
Technical personnel	229			229
Other operational costs	35			35
Equipment				
Others (please specify)				
Direct costs	479			479
Indirect costs (20% of direct costs)	96			96
Total	575			575

**Comments:**

Forest & Landscape, Denmark: Danish Centre for Forest, Landscape & Planning, KVL, Hørsholm

Year:	Consumption before 2004	Expected consumption 2004	2005	Total
Man-months				
Scientific personnel	5,5	11	1	17,5
Technical personnel		0,25	0,25	0,5

Year:	Consumption before 2004	Expected consumption 2004	2005	Total
Salaries				
Scientific personnel	220	438	40	698
Technical personnel		9	9	18
Other operational costs	13	50	3	66
Equipment				
Others (please specify)				
Direct costs	233	497	52	782
Indirect costs (20% of direct costs)	47	99	10	156
Total	280	596	62	938

**Comments:** Forest and Landscape request to transfer 62 kkr. to 2005 to finish publications and prepare for final project conference

Name of Institute: DIAS, Danish Institute of Agricultural Science, Dept. of Agricultural Systems, Foulum

Year:	Consumption before 2004	Expected consumption 2004	2005	Total
Man-months				
Scientific personnel	4,25	8	0	12
Technical personnel	1,75	1,5	0	3

Year:	Consumption before 2004	Expected consumption 2004	2005	Total
Salaries				
Scientific personnel	184,75	309		494
Technical personnel	44	56		100
Other operational costs	26	15		41
Equipment				
Others (please specify)				
Direct costs	255,75	380		635
Indirect costs (20% of direct costs)	50,35	76		127
Total	306,10	456		762

**Comments:**

**B. Budget for each participating department (1.000 DKK)****C. Budget for co-financing from each participating institute (1.000 DKK)**

Name of Institute:

WP2 "Interdisciplinær forskning og undervisning i økologisk jordbrug – læring i et tværfagligt og målorienteret miljø" with RVAU, Dept. of Organic Agriculture

Year:	Consumption before 2004	Expected consumption 2004	2005	Total
Man-months				
Scientific personnel	14	4		18
Technical personnel				

Year:	Consumption before 2004	Expected consumption 2004	2005	Total
Salaries				
Scientific personnel	560	160		720
Technical personnel				
Other operational costs	250	90		360
Equipment				
Others (please specify)				
Direct costs	830	250		1080
Indirect costs (20% of direct costs)	166	50		216
Total	996	300		1296

**Comments:**