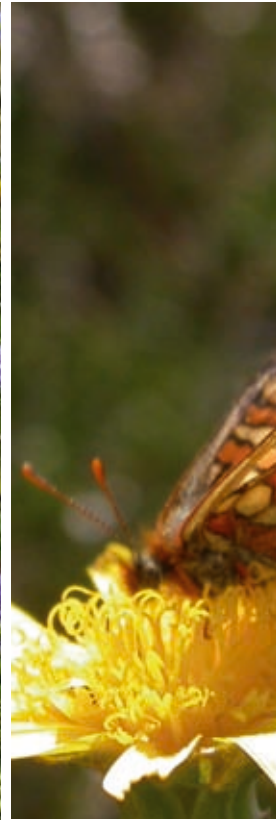
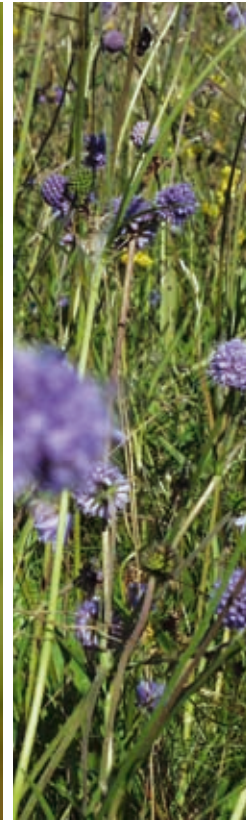


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DANISH MINISTRY
OF THE ENVIRONMENT

Forest and Nature Agency



Marsh Fritillary

– a LIFE-Nature project



Danish Forest
and Nature Agency
in Himmerland
2008

Text:

Peter A. Larsen

Editors:

Søren Kjær and Peter A. Larsen

Photos:

Flemming Helsing, Bjarke Huus Jensen and Peter A. Larsen

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This so-called layman's report is a step in the reporting of the LIFE-Nature project ASPEA. The project aims to preserve and expand the stock of the rare Marsh Fritillary butterfly (*Euphydryas aurinia*).

The project was implemented in the period 2005-2008.

The project was in 2005-06 conducted by North Jutland.

The project was continued and completed by the Danish Forest and Nature Agency in Himmerland in cooperation with the municipalities of Frederikshavn, Aalborg and Vesthimmerland.



Skov- og Naturstyrelsen
Himmerland



VESTHIMMERLANDS KOMMUNE



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Rare butterfly in trouble

The Marsh Fritillary butterfly (*Euphydryas aurinia*) is one of the treasures of Danish nature. The species used to be fairly common in Denmark, but now it is only found in six areas, all located in Himmerland and Vendsyssel. The Marsh Fritillary is also endangered in Europe so Denmark is committed under the EU Habitats Directive to follow it closely and preferably to increase its population and number of habitats – in other words to establish “a favourable conservation status”.

On paper, the Marsh Fritillary is subject to strict protection. It is comprised by:

- The Habitats Directive (Annex II)
- The Berne Convention on the protection of European wildlife and natural habitats
- The Danish Red List (as critically endangered)
- The species is protected by law
- In areas with Natura 2000 status most of the Marsh Fritillary’s habitats are part of their designation

In real life the Marsh Fritillary has turned out to be so endangered that it depends for its survival on nature management, including grazing or mowing. As a consequence of the acute need, the former County of North Jutland applied for project funds from the EU LIFE scheme to sustain the Marsh Fritillary.

The project was called ASPEA, which stands for “Action for Sustaining the Population of *Euphydryas Aurinia*”. It was launched by the County in 2005, and in connection with the

2007 structural reform where the County was put down, it was taken over by the Danish Forest and Nature Agency in Himmerland.

The main objects of the project was to plan and support nature management for the benefit of the Marsh Fritillary, to map and follow the development of the species and to spread awareness of the rare butterfly.

After the structural reform, the Forest and Nature Agency started working closely together with three municipalities in North Jutland that have all assumed responsibility for the future condition of the Natura 2000 areas where the Marsh Fritillary is found:

Frederikshavn with responsibility for the meadow area south of Strandby and the very large heath and mire areas of Tolshave, Jerup and Råbjerg that are currently the Marsh Fritillary’s main areas of distribution in Denmark.

Aalborg with responsibility for a large part of the Himmerland heaths, formerly an important site for the Marsh Fritillary and an area, where nature management presently is having a positive effect on the species.

Vesthimmerland with responsibility for the western part of the heaths, including a new occurrence area in the Bruså valley and a very large potential area on the Oudrup and Vindblæs heaths.

ASPEA will be concluded on 31 December 2008

Butterfly "on the edge"

The Marsh Fritillary is very fastidious about its food. This is one of the reasons the butterfly is so rare today. Its larvae only feeds on the Devil's-bit Scabious (*Succisa pratensis Moench*). A good population of Devil's-bit Scabious is therefore essential for the Marsh Fritillary's survival in a specific habitat. But the Marsh Fritillary also places other demands on its habitat: It should be sunny, provide shelter and lots of other flowering plants where the adult butterfly can find food.



The Devil's-bit Scabious is a perennial plant that grows on damp, open and nutrient-poor soil. It blooms in August-September and has beautiful blue flowers. The Devil's-bit Scabious grows to a height of 25-60 cm depending on the habitat. It has a leaf rosette near the ground and branchy flower stalks.



The Devil's-bit Scabious grows in many different plant communities. It is found on heaths, meadows, in marshes, on various types of grasslands, near beaches, etc. A common denominator of the habitats is that they are all "on the edge": between high and low, dry and damp, grazed and ungrazed, the edge of a farm road, etc.

Nutrient-poor soil conditions are important. With its low-set leaf rosette the Devil's-bit Scabious is highly sensitive to overgrowing and overshadowing as a result of, say, fertilisation. The plant is clearly associated with half-culture forms where extensive grazing or hay harvesting contributes to keeping the vegetation relatively low. And as these light open natural habitats are rapidly declining due to overgrowing caused by changes in the use of rural areas, it has a negative impact on the Devil's-bit Scabious, and therefore also on the Marsh Fritillary. When the height of the surrounding vegetation exceeds 25-30cm, it gets too cold and shadowy for the larvae in their webs on the Devil's-bit Scabious leaf rosettes. The Marsh Fritillary will disappear while the Devil's-bit Scabious will hold out for a while yet.

If targeted nature management regimes are implemented there is hope that the butterflies will return.



A battle using chain saws, posthole diggers and flame-throwers

The ASPEA project used a targeted approach in and around the few remaining Natura 2000-protected habitats of the Marsh Fritillary. On the basis of the ASPEA management plans, nature management regimes were launched in three major project areas:

- The Tolshave, Jerup, Råbjerg, Napstjert area
- The Strandby meadows
- The Himmerland heaths

The work was organised by the three affected municipalities that entered into agreements with the affected landowners where this had not already been done for protection purposes. The measures needed differed widely.

The large Tolshave, Jerup, Råbjerg, Napstjert area is from nature an marginal area for agriculture. It is characterised by closely spaced old beach ridges that are dry, overgrown by forrest or covered with heath and intersected by damp depressions with bogs or meadows or drained and cultivated areas. The Devil's-bit Scabious grows on the edge of the depressions.

The area has always been extensively used for peat extraction, grazing, hay harvesting, shooting, etc., and intensive farming occurs only sporadically. With the support of ASPEA, the local authority of Frederikshavn cleared 131 ha of overgrown natural areas to enable grazing or hay harvesting. 92 ha were fenced in and grazed down, and on 77 ha drains and ditches were abandoned to increase the areas of distribution of the Devil's-bit Scabious, among others. Experiments with controlled burning of smaller areas were conducted, but the effort was limited by weather conditions. The local authorities continue to work with the method based on experience from the ASPEA project.

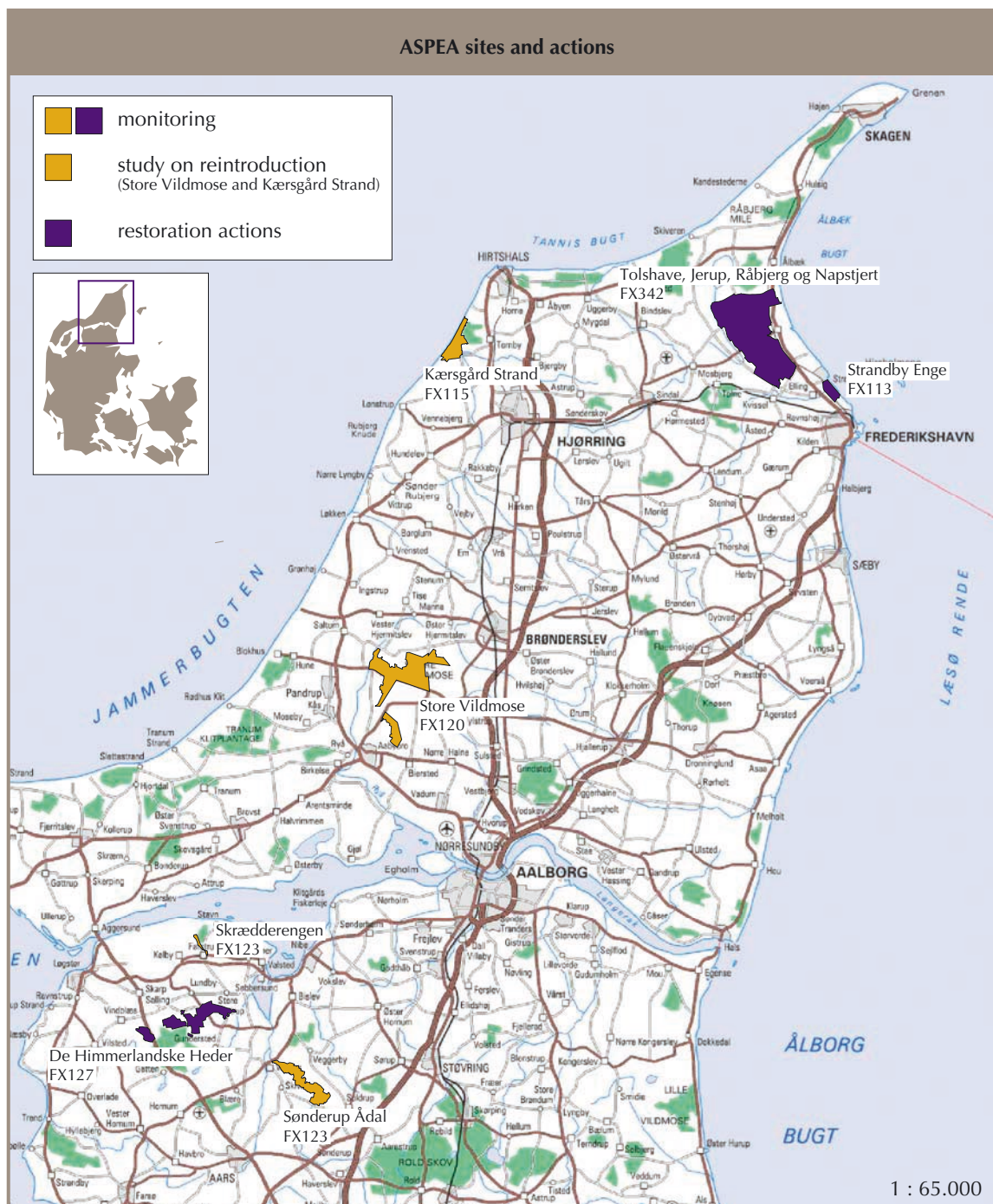
The Strandby area consists of the meadows north of the estuary of the Elling river. Parts of the area are characterised by newer beach ridges. The Devil's-bit Scabious and the Marsh Fritillary are found mainly on the edge of growths that provide shelter, and along fence lines where the vegetation has the right height. Here, 5 ha were cleared, and a minor (1 ha), but important overgrazed area was fenced off.

The Himmerland heaths are the remains of a large heath area that used to stretch from Rold Skov to the Liim Fiord towards the west. The heaths are one of the Marsh Fritillary's old core areas. ASPEA created the economic foundation for carrying out nature management after a revision of the protection made such intervention possible. Local municipalities of Aalborg and Vesthimmerland has totally cleared 108 ha and fenced 109 ha.

Overall, the ASPEA project comprised management of more than 500 ha with the aim of ensuring a favourable conservation status for the Marsh Fritillary. Approx. 250 ha were cleared, approx. 200 ha were fenced, and approx. 80ha were established as wetlands. In addition, the ASPEA information campaign increased awareness of agricultural support schemes that promote grazing and hay harvesting. As a result the incipient overgrowing was curbed on an additional approx. 500 ha of the project areas.



Action areas and distribution of the Marsh Fritillary



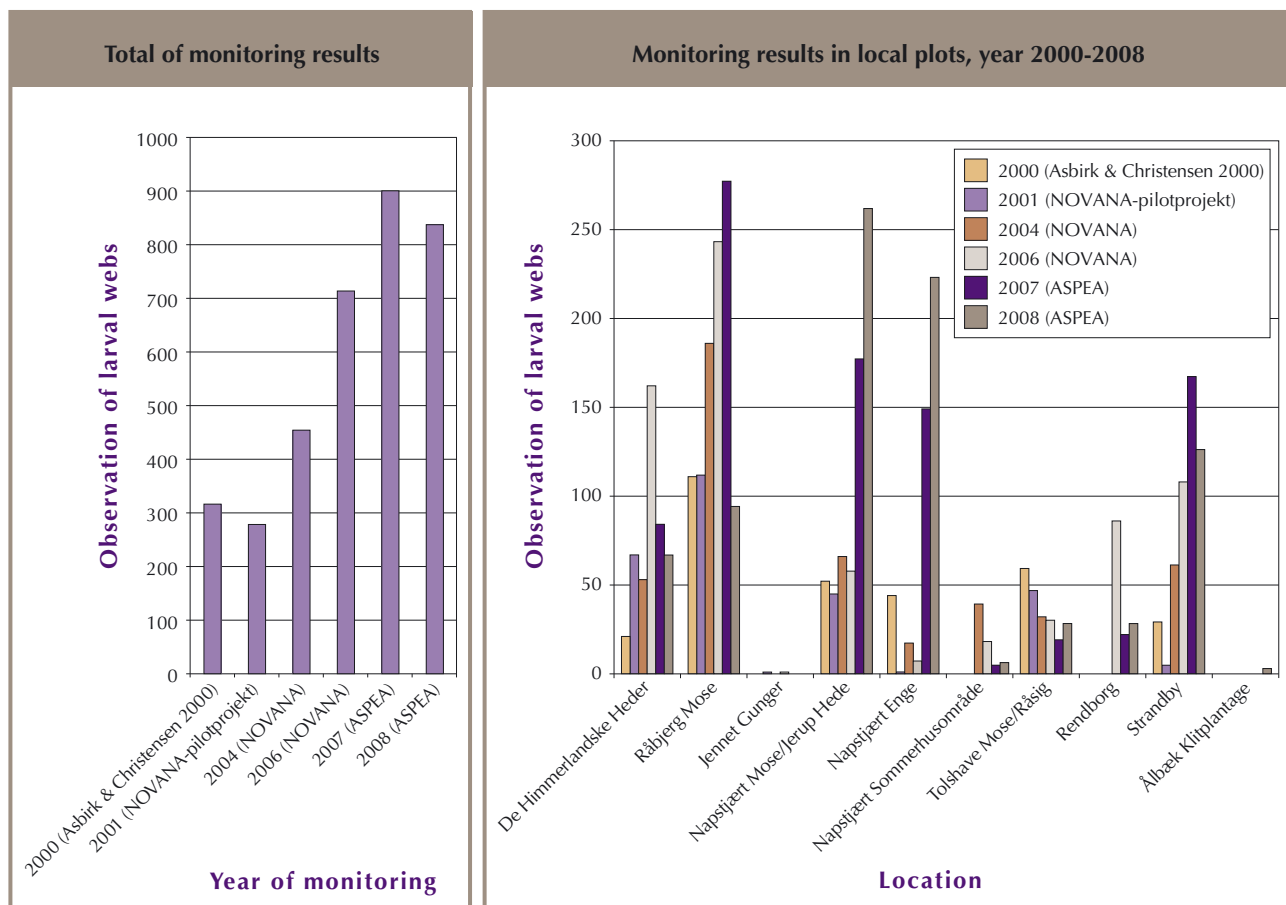
ASPEA hit the brake and stopped the decline

One of the objectives of ASPEA was to assess the Marsh Fritillary population in the project areas that must be regarded as the species' most important areas of distribution, and to get an idea of the development.

The chart below shows general progress, but also local decline. For example, an area like the Himmerland heaths covers five subareas, and although overall, the species declined somewhat in this area, you observe both a highly positive response to nature management resulting in a trebling of the population in one area, and a heavy decline in another area due to the dry summer of 2008 and resulting overgrazing.

This episode shows that the Marsh Fritillary is highly sensitive to even minor changes in grazing pressure.

Similarly, the significant decline from 2007 to 2008 in Råbjerg Mose reflects the importance of variable weather conditions. In 2007 and 2008 it was impossible to mow parts of the area because the terrain was too wet. As a result the vegetation became too high for the Marsh Fritillary, which led to a prompt decline in the number of larva webs.



Source: Monitoring of the Marsh Fritillary (*Euphydryas aurinia*) 2007-2008, Flemming Helsing for ASPEA



Overall, ASPEA enhanced the prosperity already begun. The slight decline from 2007 to 2008, as described, traced back to weather conditions, illustrating the vulnerability of the species' existence remains.

A much debated issue has been the reintroduction of the Marsh Fritillary in previous sites where the species is extinct. ASPEA analysed the issue and carried out field surveys, especially in the Store Vildmose area. It was concluded that a reintroduction was not to be recommended, because current conditions are not suitable for Marsh Fritillary, and extensive management measures are needed before such reintroduction is possible.

In the main, the Marsh Fritillary's area of occurrence seems to have stabilised or to be slightly increasing since 2000 – particularly in the last few years. However, with an area of occurrence of much less than 100 km² the species has stabilised at a very low level, and it must still be regarded as extremely vulnerable and completely dependent on continuous and targeted nature management – especially in the light of its high sensitivity to overgrowing, hydrology changes and even minor operational changes in the areas, e.g. changes in grazing pressure.

Thanks to the increased awareness of the species created by ASPEA in recent years, several new areas of occurrence have been discovered. In all probability, these new areas represent occurrences that were previously overlooked rather than newly immigrated populations.

Even though the many "new" sites do not represent emigration from known sites, the 2008 ASPEA surveys found Marsh Fritillaries flying in Napstjært Mose in new areas between existing subpopulations that were cleared of dense stands of trees and shrubs by the local authority of Frederikshavn.

The Devil's-bit Scabious is not yet established in these recently cleared areas, by the areas are available to exchanges of individuals and thus to genetic exchanges between previously more or less isolated populations that were in danger of inbreeding. Improvement of potential habitats is one of ASPEA's most significant results and it is expected to increase the Marsh Fritillary population in coming years.



Site designation

Hjeds Kær*
 Himmerlandske Heder
 Aalbæk Klitplantage*
 Strandby
 Tolshave-, Råsig Mose
 Rendborg
 Napstjært Mose and Jerup Hede
 Napstjært enge mv.
 Tranum-Sandmosen*
 Lodskovvad and Simon Skivers Klit*
 Jerup Strand*
 Jennet Gunger
 Råbjerg Mose

* Sites outside the ASPEA project areas

However, the total area still constitutes only approx. 375ha, including habitats.

How do we best improve conditions for the Marsh Fritillary?

One of the objectives of the project was to monitor the Marsh Fritillary and to acquire practical experience in order to find out how best to manage nature for the benefit of the Marsh Fritillary.

Key factors:

The Marsh Fritillary is dependent on ongoing management of its habitat, including extensive hay harvesting or extensive grazing (i.e. no supplementary feeding or fertilisation), possibly supplemented by clearing of trees and shrubs.

Hay harvesting

The area is to be mown to a height of about 10 cm. With a view to eggs and larvae sitting well above the ground, the best time for mowing is end-June, or in September if the vegetation is relatively high. As far as possible, mowing should be carried out in rotation, e.g. by mowing 1/3 of the area per year or by leaving a mosaic of small compartments that are not mown. The hay should be raked together and removed. Mowing is difficult on uneven ground and leaves vegetation of varying heights, but that is actually an advantage due to the importance of shelter.

Grazing

Extensive summer grazing by cattle or horses at low grazing pressure is recommended. The grazing pressure should be managed to ensure vegetation of varying – and not too low – heights (> 8 cm). Tough breeds of beef cattle and horses are

most suitable for grazing in low-productive, nutrient-poor habitats that may contain many biting and stinging insects. It is also an advantage to use animals that are used to the type of vegetation concerned. Sheep and goats should not be used on sites containing the Marsh Fritillary as their grazing is too hard on the Devil's-bit Scabious. Experience shows that grazing pressure that is too high can wipe out the Marsh Fritillary, while low grazing pressure promotes the distribution of soft rush and other undesirable species, thereby degrading the habitat.

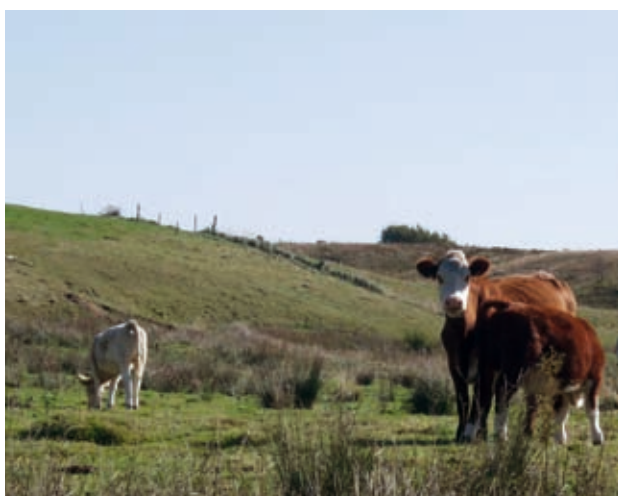
Clearing of trees and shrubs

Clearing should be done gradually and preferably in the period from October to February. Enough trees and shrubs should be left to provide adequate shelter from the wind. Older thickets may be biologically valuable, so it should be carefully considered what to clear.

Restoring potential breeding sites

Drastic measures are needed to restore suitable habitats, including clearing of coarse and dead plant vegetation, reducing the level of nutrients and regenerating natural hydrology conditions by establishing wetlands. Gradual restoration is to be preferred to see whether the measures provide the desired outcome and to ensure the necessary follow-up. It is important to follow up on the restoration with consistent nature management.

ASPEA's information campaigns have brought targeted management into focus in the affected Natura 2000 areas and given landowners the knowledge needed.



Did ASPEA achieve its goal?

Objectively speaking, ASPEA has managed and restored about 2-300 ha of Marsh Fritillary habitats, and as a result the negative trend for the Marsh Fritillary has been curbed! The outcome was documented through an intensive monitoring programme; practical experience was gained, and a comprehensive information campaign was conducted.

500 landowners in the action areas received eight newsletters each; several landowners' meetings were held in addition to multiple nature excursions, a seminar with 50+ participants, including experts and public authorities from across the country, and more than 100 individual meetings between landowners and the management authorities. The local authorities report that there is considerable local interest in the Marsh Fritillary and its environment.

The project website at www.hedepletvinge.dk is updated on an ongoing basis to maintain and impart knowledge about the Marsh Fritillary in an easily accessible format. On completion of the project, the website will be adapted and maintained by the Danish Forest and Nature Agency.

In connection with the 2007 structural reform the local authorities assumed responsibility for the management of privately owned protected areas, and from 2010 the local authorities will be responsible for ensuring a favourable conservation status in the Natura 2000 areas. These tasks were kick-started by three local authorities under the ASPEA

project with an outcome beyond expectations. Awareness of this commitment led to the management of much larger areas than originally stated to LIFE. The additional expenditure was paid by the Forest and Nature Agency and the local authorities. ASPEA has prepared a so-called "After LIFE plan" as valuable documentation of the local authorities' continued work.

Although ASPEA has reached the goals set, you may ask still yourself whether it is reasonable to spend DKK 4.2 million (0,5 million Euro) on a butterfly that is fastidious about its food?

Here it is important to remember that the Marsh Fritillary is not only a rare butterfly, it is also an indicator organism of a healthy natural environment. For example, the Marsh Fritillary's habitats also constitute excellent habitats for other butterflies and insects, and they are botanically interesting and valuable biotopes. A case in point is the Råbjerg Mose habitat where 14 butterfly species have been observed in addition to the Marsh Fritillary. Thus, when we do something good for the Marsh Fritillary, a large number of other organisms also benefit from the efforts. Moreover, the clearing of areas has a significant effect on the landscape, and the local authorities have received praise from landowners and visitors concurrently with landscape shapes and views emerging from the brush.

So even if the rare butterfly can only be seen during a few weeks in early summer, the habitats of the Marsh Fritillary offer plenty of other nature experiences.



