

# Restoration of Dune Habitats along the Danish West Coast

LIFE02/NAT/DK/8584



## SECOND PROGRESS REPORT

**Covering the period**

1 November 2003 – 31 October 2004

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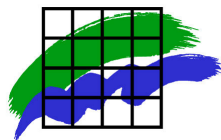
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## 1.1 Background

In Denmark and in the rest of Europe, dunes and coastal dune heaths are considered threatened and vulnerable habitats. The first monitoring of the Danish coastal priority habitats has shown that the conservation status of these habitats is not favourable. This project aims at rehabilitating and improving the conservation status of coastal dune habitats. 11 Sites of Community Interest, covering more than 24000 ha within the Natura 2000 network, are included in this project. The sites have mainly been selected for the presence of the priority habitat types 2130\* (Fixed grey dunes) and 2140\* (Decalcified fixed dunes with *Empetrum nigrum*).

The three general threats identified are:

1. Invasion of non-native species, particularly *Pinus mugo* and *Pinus contorta*
2. Lack of natural dynamic processes (over-stabilisation of dunes)
3. Ammonium deposition/eutrophication.

The threat from overgrowth has been divided into 5 categories (from over-stabilised dunes to different percentages of overgrowth). Overgrowth by trees may change the ecology of the dune heaths completely, in particular due to the shadowing effect of the tree canopy and forest climate induced changes of nutrient circulation and microclimatic conditions.

Furthermore, site specific threats have been identified, such as drainage, pressure from tourism, and land-ownership related barriers to habitat management.

## 1.2 Overall and specific objectives

The overall objective of the project is **to regain a more favourable conservation status of the Danish dune habitats**. The 11 sites included in the project represent 65% of the total sand dunes FFH resources in Denmark.

The specific objectives of the project, as outlined in the project document, are:

- Restoration of 264 ha of dune heath habitats, i.e. conversion (by clearing) of non-indigenous conifer forest to priority habitat types 2130\* (Fixed coastal dunes with herbaceous vegetation, “grey dunes”) and 2140\* (Decalcified fixed dunes with *Empetrum nigrum*). These are categorised as overgrowth degree IV-V
- Clearing of 542 ha of dense overgrowth (overgrowth degree III)
- Removal of tree encroachment on 3452 ha (overgrowth degree II)
- Management activities on more than 2800 ha in order to counter threats from nutrient enrichment and lack of natural dynamic processes (overgrowth degree I)
- Restoration of natural hydrology on sites 72 (Lyngbos Hede) and 78 (Fanø), and restoration of dune heath on site 184 (Stenbjerg)
- Performance of land swaps on roughly 36 ha, in order to remove land-ownership related barriers to habitat management on site 78 (Rømø)
- Securing of viable populations of amphibians, primarily *Bufo calamita* and *Rana arvalis*, in the project areas containing decalcified fixed dunes with a mosaic of humid dune slacks.

## 2.1 General remarks on project progress

The management activities are progressing well and at the end of the third project year a total of 1859 hectares had been managed. However, private landowners have been reluctant towards entering agreements on habitat management.

There seems to be various reasons for the reluctance of private landowners to participate. One reason mentioned is a general negative attitude towards co-operating with authorities. The current uncertainty surrounding the reforms of the Common Agricultural Policy is also mentioned, as is the fact that the subsidies obtainable under the EU Land District Programme are much more attractive economically. Furthermore, leasing out hunting rights is often a very profitable business for private landowners. As trees provide good cover for species like roe deer and red deer, removal of tree cover is not an attractive management option in hunting areas.

According to Departmental Order no. 951 of September 16<sup>th</sup> 2004 under the Protection of Nature Act the County Council *has a legal right* to carry out restoration and management activities in protected areas (including Natura 2000 areas) which are not owned by the Government. However, this requires the consent of the owner and users of the property or permission granted by the Nature Conservation Board.

If an agreement cannot be reached between the authorities and the owner or user of the area subject to the management plan, the owner is entitled to have his rights tried at an independent Nature Conservation Board. This is however a very time-consuming political process that is very rarely used by the counties in everyday management.

Obviously in future projects it will be of advantage if written and binding management agreements with private landowners have been ensured prior to project commencement.

Due to the reluctance and unwillingness among private landowners to participate in the project the Commission has been asked to approve several project modifications. The project modifications are not presented in this report, but in a letter forwarded to the Commission separately.

As the project progresses the experience gathered shows that the originally planned management action in some areas does not seem to be the most appropriate one to apply. This has led to the redefinition of action types in various areas. But the overall project objective is not altered in any way by these modifications. Tables 1 and 5-11 reflect these modifications to some extent as the number of hectares managed to date exceeds the original target.

The restoration of natural hydrology at Lyngbo Hede (activity C4) has been delayed, but the activity is now in progress. The authorities have not yet given the permissions required (no difficulties are foreseen), and it is expected that the action will be finalised in early summer 2005.

## 2.2 Summary of activities during the reporting period

*Table 1: Actions (area related management) per site (hectare) to date. "Targets" include changes approved in connection with the mid-term report.*

Action	C.1		C.2		C.3		C.7		D.1		D.2	
Site	Target	To date	Target	To date	Target	To date	Target	To date	Target	To date	Target	To date
78	78,8	85,4	28,3	18,3	162,2	41,8	265,6	81,5	94,8	15,0	270,3	65,0
73	1,4	17,2	227,9	96,9	1062,8	818,6	0	0	1262,0	476,7	0	0
72	0	0	0	0	237,8	241,6	0	0	237,8	154,0	0	0
184	97,1	100,8	20,3	15,5	567,9	441,0	34,3	11,4	321,1	310,8	11,2	10,3
26	7,6	0	17,5	0	151,6	134,6	71,5	41,4	299,0	240,9	24,4	21,5
185	5,5	4,5	0	0	330,6	229,1	30,1	1,0	60,1	5,0	62,1	70,7
16	8,5	6,0	95,4	50,0	328,0	316,2	28,2	29,0	22,1	20,0	38,1	21,3
13	0	0	3,7	3,7	94,4	94,4	25,3	21,5	0	0	3,2	8,5
193	0	0	4,9	0	600,8	203,0	0	0	63,2	0	0	0
2	65,2	48,9	116,9	80,7	333,1	305,4	0	0	0	0	0	0
10	22,3	22,3	7,1	3,2	26,7	3,7	0	0	0	0	0	0
<b>Total</b>	<b>286,4</b>	<b>285,1</b>	<b>522,0</b>	<b>268,3</b>	<b>3895,9</b>	<b>2829,4</b>	<b>455,0</b>	<b>185,8</b>	<b>2360,1</b>	<b>1222,4</b>	<b>409,3</b>	<b>197,3</b>
<b>%</b>	<b>100</b>	<b>99,6</b>	<b>100</b>	<b>51,4</b>	<b>100</b>	<b>72,6</b>	<b>100</b>	<b>40,8</b>	<b>100</b>	<b>51,8</b>	<b>100</b>	<b>48,2</b>

Considering the problems with the participation of the private landowners the area related management is progressing well, and 62,9% had been managed by the end of the third project year.

*Table 2: Milestones during reporting period*

Product/Milestone	Action no.	Deadline	Date of completion
Preparatory project "Restoration of natural hydrology at Lyngbo Hede"	A.1	01.06.04	01.08.04
Tender: "Restoration of natural hydrology at Lyngbo Hede"	C.4	31.01.03	17.12.04
Finalised "Restoration of natural hydrology at Lyngbo Hede"	C.4	31.12.04	01.06.05
Land swaps at Rømø	B.1	31.06.03	24.09.03

*Table 3: Statement of expenditure (overview).*

Budget item	Accepted budget (second progress report)		Cost to date (01.11.2001-31.10-2004)		
	EURO	DKK	EURO	DKK	% of budget
1. Personnel	2.314.037	17.216.435	1.548.259	11.519.048	67
2. Travel	77.176	574.189	55.610	413.739	72
3. External assistance	844.874	6.285.863	355.139	2.642.236	42
4. Durable goods	20.162	150.005	21.472	159.749	106
5. Land purchase/lease	94.677	704.397	54.764	407.450	58
6. Consumable material	1.010.376	7.517.197	332.849	2.476.397	33
7. Other costs	12.352	91.899	8.171	60.796	66
8. Overheads	302.143	2.247.944	65.963	490.768	22
<b>TOTAL</b>	<b>4.675.797</b>	<b>34.787.929</b>	<b>2.442.229</b>	<b>18.170.182</b>	<b>52</b>

Exchange rate: 1 EURO = 7.44 DKK (January 6<sup>th</sup> 2005)

Table 4: Statement of expenditure per action

Action	Accepted budget (mid-term report)		Costs to date (01.11.2001 – 31.10.2004)		
	EURO	DKK	EURO	DKK	% of budget
A.1	8.065	60.098	10.994	81.799	136
A.2	8.724	65.009	8.776	65.293	101
A.3	16.510	123.028	16.453	122.410	100
A.4	3.616	26.946	3.617	26.912	100
B.1	94.677	705.505	61.195	455.287	65
C.1	613.048	4.568.250	604.235	4.495.512	99
C.2	967.886	7.212.396	323.392	2.406.038	33
C.3	1.633.200	12.170.116	860.910	6.405.168	53
C.4	67.204	500.784	0	0	0
C.5	2.742	20.433	0	0	0
C.6	22.848	170.257	5.155	38.357	23
C.7	98.257	732.182	32.497	241.780	33
D.1	277.785	2.069.971	130.566	971.413	47
D.2	56.243	419.106	44.612	331.913	79
E.1	67.204	500.784	42.616	317.063	63
E.2	40.000	298.068	946	7.038	2
E.3	33.602	250.392	13.092	97.404	39
E.4	22.245	165.763	11.655	86.715	52
E.5	8.065	60.098	5.698	42.395	71
E.6	3.360	25.038	658	4.896	20
E.7	1.344	10.015	77	573	6
E.8	5.824	43.399	0	0	0
E.9	3.360	25.038	815	6.067	24
F.1	135.662	1.010.913	90.021	669.759	66
F.2	119.086	887.393	61.170	455.103	51
F.3	23.790	177.276	0	0	0
F.4	341.448	2.544.368	113.076	841.285	33
<b>TOTAL</b>	<b>4.675.797</b>	<b>34.842.637</b>	<b>2.442.229</b>	<b>18.170.182</b>	<b>52</b>

Exchange rate: 1 Euro = 7,44 (January 6th 2005)

## **2.3 Amendments to the project**

### **Requested project modifications**

A total of 27,9 hectares has to be withdrawn from the project area of Viborg County as the county has not been able to reach management agreements with the private landowners. The 27,9 hectares include 4,4 ha in SCI 16, 18,4 ha in SCI 184 and 5,1 ha in SCI 5,1.

### 3.1 Progress on preparatory actions

#### **Action A1 – Restoration of natural hydrology at Lyngbo Hede, preparatory project**

The consulting company Johansson & Kalstrup A/S completed the preparatory project in July 2004. Groundwater measurements at 22 sites within the project area have shown that the drainage trench does not seem to drain the lower situated houses in the holiday cottage area except from during extreme weather conditions with high levels of surface water. The drainage trench therefore does not have the effect that was expected when the trench was made some 40 years ago. The measurements also showed that the south-west part of the dune heath area is subject to drainage by the drainage trench. When surface water levels are high— especially during winter season - the drainage trench drains the heath so that flooding is much less extensive than it would be under “natural” conditions. The lowered water level during winter result in an increased lowering by the drainage trench of the ground water table during summer, and as a result wet areas dry out more quickly or lack completely in spring and early summer. It is estimated that the effect of the drainage trench on the dune heath at certain sites could be as much as a 1, 5-m lowering of the ground water table.

The actual project outline of restoring natural hydrology at Lyngby Hede must consider a declaration of intent that was made to ensure that the holiday cottage area will not be affected by the counteracting of the effect of the drainage trench. Therefore the aim of the restoration project will be to obtain a water level slightly less than maximum and to ensure that water can be diverted/drained off under extreme weather conditions. By leading the water through pipes and closing the trench on a distance of 630 meters natural hydrology can be partly restored and the effect will be neutral within the holiday cottage area.

This action has been finalised with a total cost of 10.994 Euro (81.799 DKK).

#### **Action A2 – Kick-off seminar and training of personnel involved in the project**

This action took place in May 2002.

The action was finalised with a total cost of 8.776 Euro (65.293 DKK).

The surplus of 7.404 Euro was allocated to action C6 in connection with the First Progress Report.

#### **Action A3 – Work plans for the management of herpetofauna**

This action was finalised in April 2003 with a total cost of 16.453 Euro (122.410 DKK).

The surplus of 3.194 Euro was allocated to C6 in connection with the First Progress Report.

#### **Action A4 – Training of project personnel on the management of herpetofauna habitat**

This action took place in May 2002.

The action was finalised with a total cost of 3.617 Euro (26.912 DKK).



### **3.2 Progress on purchase of land**

#### **Action B1 – Land swaps on Rømø**

This action involved land swaps of long and narrow privately owned land lots in order to remove barriers to coherent management of the dune heath areas. The land swap is part of a larger land consolidation scheme. The Directorate for Food, Fisheries and Agricultural Business (DFFE) under the Ministry of Food, Agriculture and Fisheries have holdings outside the SCI. As part of the land consolidation scheme the Directorate swapped with land lots within the SCI. The National Forest and Nature Agency then purchased these land lots and other land lots owned by the DFFE. The acquired areas constitute a total of 176,37 hectares. For details, please see maps in annex A (CD-ROM with full-size maps enclosed).

The new title deeds were registered on September 24, 2003 but the accounts were not settled before the third project year.

Calculated costs after three project years amount to a total of 61.195 Euro (455.287 DKK ).

### 3.3 Progress on non-recurring management

#### Action C1 – Conversion of non-indigenous conifer forest

With the approved mid-term changes in areas managed a total of 286,4 hectares of woodlands and forest stands will be converted through felling, chipping and removal of material. This is done as part of an overall strategy to gradually increase the area of priority dune habitats where it is socio-economically feasible and where the multiple uses of these areas permit such actions. Targets are revised according to changes approved in the mid-term report.

Table 5: Summary of activities to date under action C1

<b>Action</b>		<b>C1</b>		
Site	Organisation	Project target	Complete to date (ha)	Comments
78	SNS	78,8	85,4	Revised according to mid-term report
	SJA	0	0	
73	SNS	1,4	1,5	
	OKS	0	0	
	RIA	0	15,7	
72	SNS	0	0	
184	SNS	95,8	99,5	Revised according to mid-term report
	VIA	1,3	1,3	
26	SNS	2,1	0	Revised according to mid-term report
	VIA	5,5	0	
185	SNS	5,5	4,5	
	VIA	0	0	
16	SNS	8,5	6,0	
	VIA	0	0	
13	SNS	0	0	
193	SNS	0	0	
2	SNS	40,7	33,0	
	NJA	24,5	15,9	
10	SNS	22,3	22,3	
<b>Total</b>		<b>286,4</b>	<b>285,1</b>	

Calculated costs after three project years amount to a total of 604.235 Euro (4.495.512 DKK)

**Action C2 – Clearing of dense overgrowth**

A total of 522 hectares subjected to severe encroachment, in particular by non-indigenous conifer species will be cleared. The target of 522 hectares includes changes approved in the mid-term report.

*Table 6: Summary of activities to date under action C2*

<b>Action</b>		<b>C2</b>		
Site	Organisation	Project target	Complete to date (ha)	Comments
78	SNS	18,3	18,3	
	SJA	10,0	0	
73	SNS	133,5	19,0	
	OKS	16,0	0	
	RIA	78,4	77,9	Revised according to mid-term report
72	SNS	0	0	
184	SNS	0	0	
	VIA	20,3	15,5	
26	SNS	0	0	
	VIA	17,5	0	
185	SNS	0	0	
	VIA	0	0	
16	SNS	95,4	50,0	Revised according to mid-term report
	VIA	0	0	
13	SNS	3,7	3,7	Revised according to mid-term report
193	SNS	4,9	0	Revised according to mid-term report
2	SNS	40,8	28,3	
	NJA	76,1	52,4	
10	SNS	7,1	3,2	
<b>Total</b>		<b>522,0</b>	<b>268,3</b>	

Calculated costs after three project years amount to a total of 323.392 Euro (2.406.038 DKK)

**Action C3 – Removal of tree encroachment**

This action involves the removal of tree encroachment by non-indigenous conifer species on more than 3800 hectares of dune heath landscape. The number of hectares in “project target” includes changes approved in the mid-term report.

*Table 7: Summary of activities under action C3*

<b>Action</b>		<b>C3</b>		
Site	Organisation	Project target	Complete to date (ha)	Comments
78	SNS	137,4	41,8	Revised according to mid-term report
	SJA	24,8	0	
73	SNS	236,1	236,1	
	OKS	456,2	399,9	
	RIA	370,5	182,6	
72	SNS	237,8	241,6	
184	SNS	515,1	398,5	
	VIA	52,8	42,5	
26	SNS	79,2	92,8	Revised according to mid-term report
	VIA	72,4	41,8	
185	SNS	326,5	225	Revised according to mid-term report
	VIA	4,1	4,1	
16	SNS	311,8	300,0	Revised according to mid-term report
	VIA	16,2	16,2	
13	SNS	94,4	94,4	Revised according to mid-term report
193	SNS	600,8	203,0	Revised according to mid-term report
2	SNS	147,0	120,5	Revised according to mid-term report
	NJA	186,1	184,9	
10	SNS	26,7	3,7	
<b>Total</b>		<b>3895,9</b>	<b>2829,4</b>	

Calculated costs after three project years amount to a total of 860.910 Euro (6.405.168 DKK)

**Action C4 – Restoration of natural hydrology at Lyngbo Hede**

The action involves restoring natural hydrology at the humid dune heath habitat at Lyngbo Hede by filling a long drainage trench that was dug out approximately 40 years ago in order to drain off water from an adjacent holiday cottage area.

On a 630-metre stretch the drainage trench will be led through pipes. In accordance with the declaration of intent that ensures the restoration effect on the holiday cottage area to be neutral, these pipes will be equipped with outlet mechanisms that allow for regulation of the upstream water level under extreme weather conditions. Bentonite plugs applied at four different places will prevent a draining effect of the pipeline.

The outcome of the restoration project is an increase in the water level in the southern part of the dune heath. The water level is expected to be very similar to the original water level prior to the establishing of the drainage trench.

The restoration project requires permission by the local Nature Conservation Board and relevant authorities. The project still awaits the permissions, however it is expected that the permissions will be granted. It is expected that the restoration project will be finalised in spring 2005.

For a detailed project description, please see Annex B (In Danish).

No costs have been incurred under this action during the first three project years.



*A 630-metre stretch of the drainage trench will be led through pipes. (From the report: "Lyngbo Hede – undersøgelse af grundvandsforhold. Johansson & Kalstrup A/S, 2004)*

**Action C5 – Restoration of natural hydrology, closing of drainage trenches**

This action involves the closing of one drainage trench on Fanø (site 78) and several drainage trenches at site 184, west of Stenbjerg Plantation.

The expected result is an extension of wet habitats on the dune heaths. On the island of Fanø water will be retained in the small lakes and dune slacks for a longer period during summer season.

At site 184 several drainage trenches have been closed. For details, please see map in Annex C.

No costs have been incurred under this action during the first three project years.

**Action C6 – Restoration of breeding localities for herpetofauna**

Due to overgrowth in many areas with decalcified fixed dunes with *Empetrum nigrum* there has been a significant decrease in available foraging habitats for *Bufo calamita*.

The action involves cutting or burning vegetation, scraping, digging new ponds, mowing and establishing grazing in order to improve living conditions for natterjack toad. These management methods are also expected to improve the living conditions for *Rana arvalis*, *Pelobates fuscus* and *Triturus cristatus*.

Table 8: Overview of status of amphibian habitat restoration activities

Site	Action planned	Action completed
78	Scraping (2 areas, Rømø)	New pond (1 site)
73	Scraping (8 sites), vegetation cutting (2 sites), digging (1 area)	Scraping (3 sites)
72	None	
184	Scraping (1 site), vegetation cutting (8 sites), burning (3 sites)	Scraping or vegetation (9 sites), burning (3 sites)
26	Scraping (2 sites), grazing (1 site), vegetation cutting (2 sites)	Vegetation cutting (2 sites)
185	Grazing (1 area), mowing (1 area)	
16	Scraping (2 sites), grazing (1 area)	Grazing (1 site)
13	Scraping (2 areas)	
193	Scraping (4 areas), vegetation cutting (4 areas)	
2	Clearing (1 area), digging (4 areas)	
10	None	

Calculated costs after three project years amount to a total of 5.155 Euro (38.357 DKK).

**Action C7 – Establishment of grazing**

This action involves grazing with sheep, cattle and horses. Grazing pressure is kept at a low level and no extra nutrients in terms of fodder are supplied.

Private landowners at several sites have shown reluctance and unwillingness to participate in the project. Especially the uncertainty surrounding the subsidy schemes for permanent grazing areas within the EU Common Agricultural Policy is mentioned as a reason for the unwillingness to participate. Several areas owned by the beneficiary were added to the project in the mid-term report.

*Table 9: Summary of activities under action C7*

<b>Action</b>		<b>C7</b>		
Site	Organisation	Project target	Complete to date (ha)	Comments
78	SNS	115,6	81,5	
	SJA	150,0	0	
73	SNS	0	0	
	OKS	0	0	
	RIA	0	0	
72	SNS	0	0	
184	SNS	11,4	11,4	Revised according to mid-term report
	VIA	22,9	0	
26	SNS	66,4	41,4	Revised according to mid-term report
	VIA	5,1	0	
185	SNS	26,0	1,0	
	VIA	4,1	0	
16	SNS	19,8	25,0	Revised according to mid-term report
	VIA	8,4	4,0	
13	SNS	25,3	21,5	Revised according to mid-term report
193	SNS	0	0	
2	SNS	0	0	
	NJA	0	0	
10	SNS	0	0	
<b>Total</b>		<b>455,0</b>	<b>185,8</b>	

Calculated costs after three project years amount to a total of 32.497 Euro (241.780 DKK)



### 3.4 Progress on recurring management

#### Action D1 – Mosaic burning

Areas dominated by old heather and uniform crowberry are identified and burned in mosaics of small areas (20 x 20 metre to 50 x 50 metre). Burning results in rejuvenation of the vegetation and in the process of burning nitrogen compounds and mineral nutrients are lost to the air. Hereby the impact of atmospheric deposition, which is a major threat to dune heath habitats, is reduced.

The weather conditions during the burning season have caused some delays.

Table10: Summary of activities under action D1

Action		D1		
Site	Organisation	Project target	Complete to date (ha)	Comments
78	SNS	49,2	15,0	Revised according to mid-term report
	SJA	45,6	0	
73	SNS	340,9	161,5	
	OKS	472,2	152	
	RIA	448,9	163,2	Revised according to mid-term report
72	SNS	237,8	154,0	
184	SNS	316,1	305,8	Revised according to mid-term report
	VIA	5,0	5,0	
26	SNS	299,0	240,9	Revised according to mid-term report
	VIA	0	0	
185	SNS	60,1	5,0	
	VIA	0	0	
16	SNS	22,1	20,0	Revised according to mid-term report
	VIA	0	0	
13	SNS	0	0	
193	SNS	63,2	0	Revised according to mid-term report
2	SNS	0	0	
	NJA	0	0	
10	SNS	0	0	
<b>Total</b>		<b>2360,1</b>	<b>1222,4</b>	

Calculated costs after three project years amount to a total of 130.566 Euro (971.413 DKK).

**Action D2 – Cutting vegetation and removal of material**

In this action cutting vegetation and removing the material is done by using a tractor-mounted harvester.

*Table 11: Summary of activities under action D2*

<b>Action</b>		<b>D2</b>		
Site	Organisation	Project target	Complete to date (ha)	Comments
78	SNS	70,3	0	
	SJA	200,0	65,0	
73	SNS	0	0	
	OKS	0	0	
	RIA	0	0	
72	SNS	0	0	
184	SNS	10,3	10,3	Revised according to mid-term report
	VIA	0,9	0	
26	SNS	24,4	21,5	Revised according to mid-term report
	VIA	0	0	
185	SNS	62,1	70,7	Revised according to mid-term report
	VIA	0	0	
16	SNS	38,1	21,3	Revised according to mid-term report
	VIA	0	0	
13	SNS	3,2	8,5	Revised according to mid-term report
193	SNS	0	0	
2	SNS	0	0	
	NJA	0	0	
10	SNS	0	0	
<b>Total</b>		<b>409,3</b>	<b>197,3</b>	

Calculated costs after three project years amount to a total of 44.612 Euro (331.913 DKK)

### 3.5 Progress on public awareness and dissemination of results

#### Action E1 – Mounting of map tables/notice boards

The activity includes mounting of information boards on 30 key localities at the 11 Sites of Community Interest. The action comprised graphic work and drawing, printing of 60 tables, production of 40 table standards, translation work, text writing and mounting of map tables. This has taken place in close co-operation between the counties and the state forest districts involved.

The boards were mounted in the early spring of 2003.

Calculated costs after three project years amount to a total of Euro 42.616 (317.063 DKK).



*Photo: Bjarke Huus Jensen, Nordjyllands Amt*

#### Action E2 – Production of video

Dissemination of the project objectives and results is the target of this action and in 2002 a contract was signed with the regional TV station TV/Midt-Vest. The TV station is well known for its high-quality nature and environment programmes.

During the third project year numerous takes were made. These includes takes of cranes, red deer, restoration of breeding localities for herpetofauna, establishment of grazing, and blooming heather in areas that were clear cut earlier during the project.

So far 12 TV-programmes covering different aspects of the project have been aired. Enclosed is a CD-ROM showing a selection of takes from the twelve programmes (4 minutes 20 sec.).

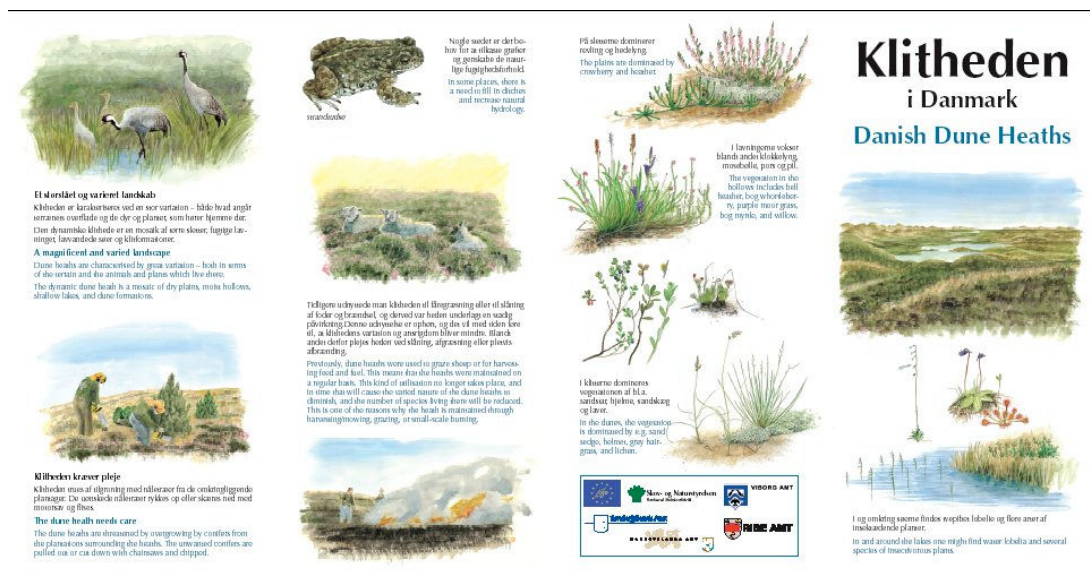
Calculated costs after three project years amount to a total of 946 Euro (7.038 DKK).

Co-operation with local communities and dissemination of information about the project objectives and results is seen as a crucial means to achieve the overall objectives of the project.

There were no project costs in connection with the TV programme.

Forty people from five different countries participated in the workshop that took place at Vigsø, Denmark in September 2003.

One folder covering the whole project area was produced and printed in 30,000 copies in January 2004. The folder was produced in close co-operation with the participating forest districts and counties. The text is written in Danish and English.



Calculated costs after three project years amount to a total of 5.698 Euro (42.395 DKK).

**Action E6 – Guided visits and events**

Guided tours will be performed continuously during the project period.

*Table 12: Summary of guided visits during the third project year*

Forest district	Number of tours	Number of participants
Nordjylland	1	15
Oxbøl	2	50
Thy	6	70
Lindet	3	45
<b>Total</b>	<b>12</b>	<b>180</b>

Calculated costs after three project years amount to a total of 658 Euro (4.896 DKK).

**Action E7 – Production and maintenance of project web site**

A statistics report has shown that during the third project year there was 6.564 visits to the project web site. More than 50% of these visits were international visits. 673 (10,3%) visitors spent more than 10 minutes at the web site.

Visits to <a href="http://www.skovognatur.dk/foralle/projekter/klithede/">www.skovognatur.dk/foralle/projekter/klithede/</a>		
1	Denmark	3.080
2	United States	2.022
3	Netherlands	346
4	Germany	184
5	Norway	163
6	Sweden	143
7	United Kingdom	124
8	Korea (South)	110
9	France	28
10	Belgium	25
11	Spain	25
12	Italy	22
13	Canada	21
14	Poland	17
15	Finland	17
16	China	17
17	Australia	15
18	Latvia	14
19	Europe	12
20	Austria	12
<b>Total</b>		<b>6,397</b>

*(From the report: Besøgsstatistik SNS Klithede – ekstern, prepared by CfK-Informatik, Miljøministeriet, Januar 2005)*

Calculated costs after three project years amount to a total of 77 (573 DKK).

**Action E8 – Production of layman’s report**

No activities under this action planned during the third project year.

**Action E9 – Networking with other projects**

The project is included in the LIFE CO-OP project “Dissemination of ecological knowledge and practical experiences for sound planning and management in raised bogs and sea dunes”. The project beneficiary is Stichting Katholieke Universiteit Nijmegen, the Netherlands.

The First Workshop of the LIFE CO-OP project that hosted 65 participants from 12 countries took place on October 5-8 2004 in Aalden, the Netherlands. Besides presentations of various LIFE projects the workshop included group discussions as well as excursions to dune habitats and raised bogs. The workshop provided excellent opportunities to gain information on other LIFE projects and a great forum in which to discuss practical experiences, problems and solutions. A presentation of the project was given at the workshop.

Calculated costs after three project years amount to a total of 815 Euro (6.067 DKK).



*Participants of the LIFE CO-OP workshop at the Island of Armeland, The Netherlands (Photo: Bjarke Huus Jensen, Nordjyllands Amt).*



### **3.6 Progress on overall project operation and monitoring**

#### **Action F1 – Monitoring of coastal dune heaths (extensive monitoring)**

The National Environmental Research Institute, Department of Terrestrial Ecology, undertakes this action. The purpose of the extensive monitoring is to:

- give at status of selected project areas
- test and evaluate the suggested parameters defining “favourable conservation status” for the coastal habitats included in the project
- investigate whether the proposed conservation objectives for the coastal habitat types is or will be fulfilled
- develop, test and evaluate a common standard for monitoring

To test the robustness of the vegetation-monitoring programme of the four localities (Lodbjerg, Stenbjerg, Fanø and Rømø) the monitoring of plant composition as well as plant nitrogen content has been repeated in 2004. Further, to test a possible influence of seasonal variation in nitrogen content a sampling of vegetation was done in the early part of the growing season and repeated in the late part of the season. It is expected that the nitrogen content vary a lot over the growing season. One way to avoid too much seasonal variation is to restrict the monitoring programme to a certain time period.

Another way to avoid seasonal variation is to seek an indicator that is more robust. In Lodbjerg dune heath the vegetation has been analysed for phosphorous and nitrogen in June and September.

Data for the pinpoint registration have been organised in a spreadsheet. An average number of 30 vegetation plots repeated 6 times per locality have been performed. A total of 720 pinpoint registrations have been performed.

Calculated costs after three project years amount to a total of 90.021 Euro (669.759 DKK).

#### **Action F2 – Monitoring of coastal dune heaths (intensive monitoring) and preparation of Best Management Practice Guidelines**

This action is undertaken by the University of Copenhagen, Botanical Institute, Department of Physiological Ecology. The purpose of the intensive monitoring is to;

- Gather and optimise the use of botanical experiences in relation to management of coastal heaths in Denmark
- Provide an overview of acceptable management methods seen from a plant ecological standpoint
- Define clearly the rationale behind the choice of management methods
- Clarify plant ecological demands to the practical implementation of management methods, i.e. their time pattern, frequency and subsequent follow-up measures

During the third project year botanical inventories were done at 8 project sites as a prerequisite for correct positioning of the permanent plots representing the different management methods. Based on these inventories, more permanent plots were established and analysed. Emphasis was on the effect of burning on vegetation development but also registration of particularly sensitive sites and

analyses of plant communities with ice-age relicts (like *Flavocetraria nivalis* and *Ochrolechia frigida*) were made.



*Flavocetraria nivalis*. (Photo Ib Johnsen)

Provisional results indicate that;

- depending on the level of overgrowth and distance to intensively managed farmland the restoration of dune heath habitat takes at least between five and fifteen years
- succession after clearing of *Pinus mugo* typically has three stages; a) open vegetation with pioneer species of lichens and mosses, b) dominance by *Carex arenaria* and *Salix repens*, c) dominance by *Calluna vulgaris* and *Deschampsia flexuosa*
- ice age-relict species such as *Flavocetraria nivalis*, *Ochrolechia frigida* and *Cladonia stellaris* are rapidly declining
- clearing of *Pinus mugo* should be done by cutting above-ground plant parts and burning in selected parts, especially in depressions
- a follow-up on clearing should be repeated approximately every three years
- grazing by sheep can be an advantage after clearing, in certain areas

Calculated costs after three project years amount to a total of 61.170 Euro (455.103 DKK).

#### **Action F3 – Evaluation of management of herpetofauna breeding localities and elaboration of guidelines for future management**

No activities under this action planned during the first three project years.

#### **Action F4 – Project management and co-ordination**

One project group meeting have been held during the third project year.

Hanherred State Forest District and Thy State Forest District were merged (now Thy State Forest District) by March 1<sup>st</sup> 2004. Until January 1<sup>st</sup> 2005 two separate accounts are kept. The LIFE-staff continues.

Calculated costs after three project years amount to a total of 113.076 Euro (841.285 DKK).