

Recovery of *Mustela lutreola* in Estonia: captive and island populations  
Project N° LIFE2000NAAT/EE/7081

# FINAL REPORT

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WITH PAYMENT REQUEST

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## CONTENT

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<i>Content</i>	2
<b>INTRODUCTION</b>	4
<b>SUMMARY</b>	6
<b>A PREPARATORY ACTIONS/MANAGEMENT PLAN PREPARATION</b>	10
<b>A.1. CONSTRUCTION OF THE INFRASTRUCTURE FOR THE SPECIAL BREEDING FACILITY FOR <i>MUSTELA LUTREOLA</i> AT TALLINN ZOO</b>	10
<b>A.2. DETAILED FIELD SURVEY OF THE DISTRIBUTION OF <i>MUSTELA VISON</i> IN SAAREMAA AND THE AVAILABILITY OF HABITATS/FOOD RESOURCES FOR <i>MUSTELA LUTREOLA</i> IN SAAREMAA</b>	11
<b>A.3. PREPARATION OF MANAGEMENT PLAN FOR <i>MUSTELA LUTREOLA</i> IN HIIUMAA ISLAND</b>	13
<b>C NON-RECURRING MANAGEMENT</b>	18
<b>C.1. REMOVAL OF <i>MUSTELA VISON</i> FROM SAAREMAA ISLAND</b>	18
<b>C.2. PREPARATION OF <i>MUSTELA LUTREOLA</i> FOR RELEASE IN SAAREMAA AND HIIUMAA ISLANDS</b>	18
<b>C.3. RELEASE OF <i>MUSTELA LUTREOLA</i> IN SAAREMAA AND HIIUMAA ISLANDS WITH POST-RELEASE MONITORING</b>	21
<b>D RECURRING MANAGEMENT</b>	31
<b>D.1. HUSBANDRY AND CONSERVATION BREEDING OF <i>MUSTELA LUTREOLA</i> IN SPECIAL BREEDING FACILITY AT TALLINN ZOO (ESTONIA)</b>	31
<b>F OVERALL PROJECT MANAGEMENT</b>	39
<b>F.1. OVERALL PROJECT MANAGEMENT</b>	39
<b>ANNEXES</b>	45
<b>ANNEX 1 – THE ENCLOSURES CONSTRUCTED IN HIIUMAA ISLAND</b>	46
<b>ANNEX 2 – THE ORDER OF THE MINISTRY OF THE ENVIRONMENT ON APPROVAL OF THE MANAGEMENT PLAN FOR <i>MUSTELA LUTREOLA</i> IN HIIUMAA ISLAND</b>	47
<b>ANNEX 3 – THE AREAS PROPOSED FOR NATURA SITES IN HIIUMAA ISLAND</b>	48
<b>ANNEX 4 – THE CAPTIVE POPULATION OF <i>MUSTELA LUTREOLA</i> IN TALLINN AS OF 03.11.2004</b>	57
<b>ANNEX 5 – TRANSFER OF INDIVIDUALS FROM TALLINN FACILITY TO EURONERZ (GERMANY) IN AUGUST 2005</b>	60

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<b>ANNEX 6 – THE BIRTH OF MUSTELA LUTREOLA IN THE COURSE OF CONSERVATION BREEDING DURING THE PROJECT</b>	<b>62</b>
<b>ANNEX 7 – THE DEATH OF MUSTELA LUTREOLA IN THE COURSE OF CONSERVATION BREEDING DURING THE PROJECT</b>	<b>71</b>
<b>ANNEX 8 – RELEASE OF MUSTELA LUTREOLA IN HIIUMAA ISLAND DURING THE PROJECT</b>	<b>73</b>
<b>ANNEX 9 – DEFINITIONS OF DEMOGRAPHIC AND GENETIC PARAMETERS</b>	<b>81</b>
<b>ANNEX 10 – HANDOUTS OF THE POWERPOINT PRESENTATION IN EAZA TAXON ADVISORY GROUP MEETING IN MOSCOW – MAY 2004</b>	<b>82</b>
<b>ANNEX 11 – HANDSOUTS OF THE POWERPOINT PRESENTATION IN II CONSERVATIOIN FORUM IN ANGERS (FRANCE) – JUNE 2004</b>	<b>88</b>
<b>ANNEX 12 – POSTER ON REPRODUCTION OF MUSTELA LUTREOLA – PRESENTED IN EUROPEAN MINK CONSERVATION MEETING IN VITORIA IN</b>	<b>97</b>
<b>Annex 13 – POSTER ON STATUS OF MUSTELA LUTREOLA AND ITS RECOVERY EFFORTS IN ESTONIA</b>	<b>104</b>
<b>Annex 14 – POSTER ON DIET OF RELEASED MUSTELA LUTREOLA IN HIIUMAA ISLAND</b>	<b>108</b>

## INTRODUCTION

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The three-year EU LIFE project LIFE2000NAT/EE/7081 entitled "Recovery of *Mustela lutreola* in Estonia: captive and island populations" was launched in September 2001. The project was run by non-profit nature conservation foundation "LUTREOLA" and by two partners: Tallinn Zoo and Hiiumaa Protected Areas Administration (successor of West-Estonia Archipelago Biosphere Reserve Hiiumaa Centre). Both partners act also as co-financers. In addition to these two more co-financers are engaged in this project: Stichting Dierentuinen Helpen (Zoo Help; the Netherlands) and Centre Environmental Investments (Estonia). According to the initial project documentation project should have ended in 30.09.2004, but the project team asked the permission from the Commission to extend the project until 30.11.2004. The permission was granted by Commission in their letter of 13<sup>th</sup> of October 2004.

The objective of the project is the following:

Ensuring the survival of *Mustela lutreola* in Europe and its recovery in Estonia – establishing viable captive and island populations of the species: (1) to establish, on the basis of the already existing breeding stock in Tallinn Zoo (Estonia), a viable captive population maintaining 90% of genetic diversity of the species for 25 years at least; (2) to establish a second viable island of *Mustela lutreola* in Estonian island Saaremaa in accessible to *Mustela vison*; to prepare a management plan for already established *Mustela lutreola* population in Hiiumaa Island. In the course of the project in 2001/2002 the action C1 has been modified (see page 18) and thus consequently also the objective. It now includes also further establishment of wild population in Hiiumaa Island.

In short, the project has targeted two areas of activities related to the conservation of *Mustela lutreola*. These are the further development of captive population and the breeding facility and the establishment of island population of *Mustela lutreola* in Hiiumaa Island (after modification permitted by Commission). The project management team regards the results of their actions in further development of captive population successful. The establishment of island populations has not fully reached the formulated objectives and there is still work to do for full establishment of sustainable island population. However, in many ways the actions in release of *Mustela lutreola* in Hiiumaa Island has to be regarded as of utmost importance for the conservation of the species. That is because the efforts of the project team have shown all the complicity in forming a new wild population of *Mustela lutreola* and without the experience gained the success in nearest future would be entirely impossible. Surely, the knowledge gained in the course of the project is of utmost importance for all who try to perform similar exercise. So, despite of the fact that the fully viable population is still not in place in Hiiumaa Island, our project team still regards the results as success and good ground for establishing the wild population.

In its letters the Commission has requested additional information on certain aspects of the project or clarification of issues which have remains unclear. Most of these issues have been addressed current report:

- The updated analyses on the status and future prognosis of the free-living population in Hiiumaa Island is provided in the under the description of action C3 in page 21 - 31.
- Current status of designation of Nature 2000 sites for *Mustela lutreola* is addressed in page 16 - 17
- The information on approval of management plan is provided in page 13 and Annex 2
- Socio-economic aspects of the release operation are describes in page 13 - 16.
- The results of the study trip to Belarus are described in page 42.

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## SUMMARY

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The report covers a period of 01.09.2001 – 30.11.2004 of the project LIFE2000NAT/EE/7081 entitled: “Recovery of *Mustela lutreola* in Estonia: captive and island populations”.

The following results have been obtained in 01.09.2001 – 30.11.2004:

- ACTION A1 – Further construction of special breeding facility for *Mustela lutreola*

In the course of this action the already existing breeding facility of *Mustela lutreola* at Tallinn Zoo was greatly enhanced and at present it is the best conservation breeding facility for this species in Europe. This greatly improves its performance as center of the conservation breeding of this species: it acts as a supply of animals for other facilities in Europe as well as for release purposes. The Center also is a unique polygon of experiments for enhancing the keeping and breeding condition for this species as well as for applied research needed to effective conservation action

- ACTION A2: Pilot study of Saaremaa Island and potential future release site for *Mustela lutreola*.

The pilot study reached to the following conclusions:

- **The *Mustela vison* does not inhabit the island**, though single specimen (most likely invaders from mainland) has been reported every now and then. The only realistic explanation is that these single migrants are not able to give start to viable population and just cease slowly by natural reason.
- By the most conservative estimate the **minimum carrying capacity of the island is 150 – 300 animals**. That is more than the size of minimum viable population.
- **The *Mustela lutreola* is not likely to have any detrimental effect to the local *Astacus astacus* population**. In fact, it is most likely that the effect will remain to insignificant level so that it could even not be observed.
- **Exceptionally high number of *Vulpes vulpes* (~8000 animals)** in Saaremaa poses serious threat to release of *Mustela lutreola*. That is because according to the results in Hiiumaa the main cause of mortality of released mink is the predation by *Vulpes vulpes* and feral dogs (look page 29).

- **Low number of amphibians** (especially *Rana temporaria*) in Saaremaa will probably cause a shift in the typical diet of *Mustela lutreola* in Saaremaa. The missing amphibians are likely to be replaced with *Arvicola terrestris* (numerous in Saaremaa) and with fish in its diet.
- ACTION A3. Preparation of Management Plan for *Mustela lutreola* in Hiiumaa Island
  - Management plan for European mink in Hiiumaa Island was compiled. This plan was approved by the order No 849 of the Minister of Environment at 20<sup>th</sup> of September 2004.
  - The management plan envisages actions for the next 5 years (2004 – 2008) in Hiiumaa Island in regards of conservation of *Mustela lutreola*. The management plan has been used as a source for compiling a new project for conservation of the species in Estonia.
  - As the result of the plan the areas in need of protecting has been identified and these sites have been proposed to the Ministry of Environment for inclusion into Natura 2000.
- ACTION C1 Removal of *Mustela vison* in Saaremaa Island. This action was modified and the new content of the action was divided between Action C3 and D1.
- ACTION C2 - Preparation of *Mustela lutreola* for release in Saaremaa and Hiiumaa.
  - Animals were micro-chipped, vaccinated against rabies and weighted
  - The DNA samples were taken from all released animals
  - Various training schemes were applied to animals selected for release including human/predator avoidance, prey recognition, swimming, diving etc.
  - Behavioral enrichment has been applied to animals selected for release as well to ensure the better behavioral capacity of the animals.
  - Deep consideration was paid to the quality parameters of the enclosures the animals were kept before release: the size of the enclosure and the diversity of interior.

- ACTION C3 Release of *Mustela lutreola* in Saaremaa and Hiiumaa Island; post-release monitoring.
  - In the frame of the project 149 animals were released in Hiiumaa Island.
  - The monitoring data indicate that all the animals surviving the 1,5-month adaptation period were in good health conditions.
  - The main cause of mortality was conflict with other predators (including bird of prey).
  - Soft release techniques tend to be more effective than the hard release.
  - The error in monitoring by tracks is far higher than expected and result in biased figures up to 100 – 150% - that is the actual number of surviving animals is 100 – 150% higher than the results of monitoring.
  - The sex ratio of surviving animals is likely close to equal.
  - Establishment of wild populations is much longer progress than assumed when drafting current project. It needs lots of experimenting with numerous. The success can only be expected after very long efforts.
  - For the end of current project the release has not yet resulted in the establishment of sustainable island population, but the core group of animals is in place in Hiiumaa Island.
  - The main concern with the already established group of animals in Hiiumaa Island is a low number of young and/or wild born animals, which evidence the occurrence of problems in breeding of mink in the island.
  
- ACTION D1 Husbandry and conservation breeding of *Mustela lutreola*
  - The number of animals in the conservation breeding facility for the end of the project was 104.
  - 213 animals were born in the course of the project
  - The demographic and genetic parameters have improved in the course of the project
  - The study on breeding of the animals has gained the provisional results which are likely to provide an explanation to the problem of male's poor participation in breeding process.
  
- ACTION F1 – Project management

- The project has been managed in accordance to the project documentation and Estonian law
- The public awareness activities have been producing excellent results as shown by the study on public opinion in Hiiumaa island
- The results of the project have been made public through the webpage [www.lutreola.ee](http://www.lutreola.ee)
- The main shortcoming of the project management was putting the burden of the technical and strategic/scientific management on the shoulders

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## A PREPARATORY ACTIONS/MANAGEMENT PLAN PREPARATION

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### A.1. CONSTRUCTION OF THE INFRASTRUCTURE FOR THE SPECIAL BREEDING FACILITY FOR *MUSTELA LUTREOLA* AT TALLINN ZOO

#### EXCPECTED RESULTS

The action was designed to improve the quality of the breeding facility, especially the requirements of husbandry and animal keepers. Because of that the following actions were foreseen:

1. Installation of stationary water (deadline 04.04.2003).
2. Waste water system (deadline 06.06.2003).
3. Installation of stationary electricity instead of temporary used so far (deadline 06.03.2002).
4. Installation of shelter with rooms for keepers (25.08.2002).
5. Installation of security system (15.12.2002).

According to the project description all these actions were the responsibility of the partner – Tallinn Zoo.

#### ACTIONS PERFORMED

1. **Installation of stationary water (deadline 04.04.2003) and waste water system** (deadline 06.06.2003).

Status: COMPLETED

For details please check the first progress report (page 5).

2. **Installation of stationary electricity instead of temporary used so far** (deadline 06.03.2002).

Status COMPLETED

For details please check the first progress report (page 6).

3. **Installation of shelter with rooms for keepers** (25.08.2002).

Status: COMPLETED

For details please refer to the first progress report (page 6).

The kitchen installation and furniture for shelter was bought in 2003 and for summer 2003 the shelter was fully operational.

4. **Installation of security system** (15.12.2002).

Status: **COMPLETED, but with modification in context as requested in Progress report and granted by Commission: THE FURTHER ENHANCEMENT OF THE BREEDING FACILITY – renovation of enclosures and the old shelter for keepers.**

For details please refer to first progress report (page 7) and first interim report (page 5 – 6)

Apart of these activities the breeding facility was further developed by constructing three additional large enclosures with natural interior. The area of enclosures is 25 – 50 m<sup>2</sup>. They all are equipped with pool and lots of shelter. These natural enclosures serve the purpose of training of animals before the release.

#### **SUMMARY OF ACTION A1:**

In the course of this action the already existing breeding facility of *Mustela lutreola* at Tallinn Zoo was greatly enhanced and at present it is the best conservation breeding facility for this species in Europe. This greatly improves its performance as center of the conservation breeding of this species: it acts as a supply of animals for other facilities in Europe as well as for release purposes. The Center also is a unique polygon of experiments for enhancing the keeping and breeding condition for this species as well as for applied research needed to effective conservation action

#### **A.2. DETAILED FIELD SURVEY OF THE DISTRIBUTION OF *MUSTELA VISON* IN SAAREMAA AND THE AVAILABILITY OF HABITATS/FOOD RESOURCES FOR *MUSTELA LUTREOLA* IN SAAREMAA**

##### EXPECTED RESULTS

1. Report including
  - a. distribution map of *Mustela vison*
  - b. plan for removal of *Mustela vison*
  - c. distribution map of suitable habitats for *Mustela lutreola* in Saaremaa

The results of the survey have to be incorporated to the Final Report.

STATUS: COMPLETED

##### ACTIONS PERFORMED

For details please refer to first progress report (page 8 – 9)

The overall conclusion the study: **THE RELEASE OF EUROPEAN MINK IS A REALISTIC PLAN AND HAS AT LEAST THE SAME LIKELYHOOD TO MEET SUCCESS AS THE OPERATIONS UNDERTAKEN IN HIIUMAA ISLAND**

The more detailed summary of the report is made available in internet: <http://www.lutreola.ee/pdf/Saaremaa%20survey.pdf>

#### **Additional note about the action.**

The local stakeholders expressed their concern on the possible impact of the *Mustela lutreola* to the populations of *Astacus astacus*. Therefore the pilot study was focusing along with other items also to the identification of the possible impact of the released *Mustela lutreola* to the viable population of *Astacus astacus*. The collected data and the analyses incorporated the study report revealed that in comparison to the human consumption the impact of *Mustela lutreola* insignificant and will remain to much lower level than the impact of other species like *Lutra lutra* and *Esox lucius* for instance. The support for our understanding that the release of *Mustela lutreola* will not have any negative effect to the population of *Astacus astacus* was expressed also by the Working Group of Estonian Crayfish Experts. They addressed this issue in the meeting in 28<sup>th</sup> of January 2003 and their conclusions were expressed in the minutes of the meeting: "working group supports the release of *Mustela lutreola* in Saaremaa Island, as it would urge to pay more attention to running water habitats and would also bring along the control of semi-sized carnivores like *Vulpes vulpes*, *Nyctereutes procyonoides*, *Martes martes* and *Lutra lutra*. These actions will be highly beneficial for *Astacus astacus* and will support its population drastically more than the potential harm the release of *Mustela lutreola* may cause." (My summary - TM).

#### **SUMMARY OF ACTION A2:**

- **The *Mustela vison* does not inhabit the island**, though single specimen (most likely invaders from mainland) has been reported every now and then. The only realistic explanation is that these single migrants are not able to give start to viable population and just cease slowly by natural reason.
- By the most conservative estimate the **minimum carrying capacity of the island is 150 – 300 animals**. That is more than the size of minimum viable population.
- **The *Mustela lutreola* is not likely to have any detrimental effect to the local *Astacus astacus* population**. In fact, it is most likely that the effect will remain to insignificant level so that it could even not be observed.
- **Exceptionally high number of *Vulpes vulpes* (~8000 animals)** in Saaremaa poses serious threat to release of *Mustela lutreola*. That is because according to the results in Hiiumaa the main cause of mortality of released mink is the predation by *Vulpes vulpes* and feral dogs (look page 29).

- **Low number of amphibians** (especially *Rana temporaria*) in Saaremaa will probably cause a shift in the typical diet of *Mustela lutreola* in Saaremaa. The missing amphibians are likely to be replaced with *Arvicola terrestris* (numerous in Saaremaa) and with fish in its diet.

### A.3. PREPARATION OF MANAGEMENT PLAN FOR *MUSTELA LUTREOLA* IN HIIUMAA ISLAND

Status – COMPLETED<sup>1</sup>

For details of the actions please refer to the 1<sup>st</sup> Progress Report (page 10 – 11) and 1<sup>st</sup> Interim Report (page 6 – 10).

The management plan was reviewed by Dr. Asko Lõhmus at Tartu University and after slight modifications it was accepted by the Species Conservation Committee at 24<sup>th</sup> of November 2003. The plan was approved by the order of the Minister of Environment nr 849 at 20<sup>th</sup> of September 2004 (look Annex 1) .

The management plan is available in internet:

[http://www.lutreola.ee/pdf/kkkkava\\_engfin.pdf](http://www.lutreola.ee/pdf/kkkkava_engfin.pdf)

#### Additional notes about the action.

1. Study on the public option about the European mink restoration project and its socio-economic context in Hiiumaa Island.<sup>2</sup>

To evaluate the effectiveness of public relations efforts and the socio-economic context of the project a special research was launched. 260 questionnaires was distributed among stakeholders (look table 1) with 164 (64%) returned. The questionnaires contained number of questions about various issues, such as (1) what is their attitude to the project, (2) from where they have receive their information, (3) what is the importance of this project local, country and international scale, (4) is the project considered to be useful or harmful for the inhabitants of the island, etc.

Table 1 . Representation of stakeholders in the study

Stakeholders	Members in organizations (estimation)	% from overall number	Share in sample

<sup>1</sup> The action plan for European mink in Hiiumaa 2004 – 2008 is attached to this report.

<sup>2</sup> This finalization of this study remained out from the timeframe of preparation of the management plan. Thus the rationale of the study could not be addressed in the interim report and will be summarized here.

Hunters	240	49%	28,7%
Fishermen	45	9%	26,2%
Environmental authorities	46	9%	19,5%
Farmers	60	12%	26,2%
Foresters	60	12%	37,2%
Tourism	40	8%	23,8%
Others			21,3%
Greens			6,1%
Total	491	99%	189%

The types of stake holders were non-exclusive and the questionnaire provided the option to list all the fields of activities in order of importance as regarded by respondents. Therefore, to distinguish the types of replies in accordance to their interest and the level of knowledge about the project, a hierarchical cluster analyses was applied to collected data. The following clusters among stakeholders were distinguished among the replies:

**I type:** (14,7% of replies) **the environmental protection** has leading role in their activity profile. In addition tourism and forestry.

**II type:** (33,1% of replies) **hunting, forestry and fishery** have the leading role in their activity profile whereas farming is has a supplementary role.

**III type:** (19,6% of replies) **farming, forestry and tourism** have the leading role in their activity profile, supplemented with fishery.

**IV type:** (15,3% of replies) **tourism and fishery** have the leading role in the activity profile supplemented with hunting.

**V type:** (17,2% of replies) the activity profile consist mostly of **non-traditional activities**, like green movement, tourism, but in all replies also something else as been marked as main field of activity.

Table 2. Stakeholder types and their activity profiles

Activity field	I – 14,7%	II – 33,1%	III – 19,6%	IV – 15,3%	V – 17,2%
Hunting	8%	67%	9%	16%	7%
Fishery	8%	41%	16%	56%	0
Environment protection	100%	9%	6%	4%	0
Farming	8%	13%	91%	0	18%
Forestry	13%	59%	75%	0	7%
Tourism	17%	2%	31%	64%	29%
Something else	8%	4%	9%	0	100%
Green movement	0	0	0	4%	32%

## Public awareness

The overall awareness about the project was very high (more than 97%).

There was a correlation between the interest in the issue and level of awareness. For instance all the questioned persons in type 1 felt that they have sufficient level

of information about the *Mustela lutreola* restoration project. The same applied also for type II (hunters, foresters and farmers). The type IV (tourism and fishery), clustering the stakeholders with least direct impact from restoration (fishermen are almost exclusively fishing in the sea), regarded themselves as less sufficiently informed.

Special questions were incorporated to the questionnaire to estimate the correctness of knowledge about *Mustela lutreola* and the project. The rarity and endangerment of the species was most well acknowledged in type I, though the endangerment was known and acknowledged, in fact, by all the types. Only, the other types regarded the species a bit less endangered – not fully close to extinction, but still endangered.

The questions about the possible impact to the natural resources and the diet of mink, again, revealed that in practically all types (I – V) the clear understanding prevailed that the species is a natural component of the boreal nature and thus cannot bring any harm to the natural resources of the island.

The questions about the potential restrictions the release of protected *Mustela lutreola* could bring along revealed that the prevailing opinion (32 – 50% of replies) across all the stakeholder types was that the restrictions already in place ensure the future survival of *Mustela lutreola*. The possibility of extensive new restriction was not a prevailing belief for any stakeholder type (less 10% of replies), though in all types the designation of some areas were predicted as well.

Interestingly, there were remarkable differences between the age groups (I group 22 – 45 years, second group 46 – 82 years) in the attitude to the project. So, for instance, the second group was significantly more afraid of trouble caused by the *Mustela lutreola*, for instance decline in fish and crayfish resources, killing of hens in farms. The older respondents also tend to have incorrect biological knowledge about the species. They also resist significantly the possible new restrictions for the survival of the species.

Two educational groups distinguished by the study (up to secondary education and higher education), show significant differences in the attitude to the *Mustela lutreola* project. The respondents without higher education significantly more (as opposed to the respondents with higher education) tend to share belief that *Mustela lutreola* poses threat to natural resources like fish and crayfish, and they also are afraid that the species starts to kill hens in the farms. Similarly the respondents with lower education significantly more tend to base in their judgments on incorrect knowledge over the biology of *Mustela lutreola*.

The most important channels of information about the project have been personal contacts followed by the local newspapers, TV and radio. That basically means that for local inhabitants appreciated receiving of information through contacts with the people involved in the project, but also the position of local opinion leaders is of high importance in forming the attitude of local inhabitants. Internet and home page has an interesting status as a channel for sharing information. The study

reveals that the stakeholders start to visit the homepage once they have deeper interest in the issue, or, once they need for some reasons more detailed knowledge about the project. Also, the respondents with higher education tend to use website as source of information significantly more than those with secondary education of lower. This, in fact, reveals the importance of the website as the source thorough information.

The results of this study of socio-economic aspects of the project are till now been available only in the form of manuscript, but the plan is to publish the results. The same methodology is planned to apply in the future to gain comparable results and to identify the possible changes in the public opinion in the course of establishment of the island population. In addition, the same methodology will be used in Saaremaa Island once the efforts of release of *Mustela lutreola* will reach there. Unfortunately this will remain beyond the timeframes of current project.

## 2. Designation of protection regime for habitats of *Mustela lutreola* in Hiiumaa Island.

In accordance with the Government Decree No 195 on 20<sup>th</sup> of May 2004 *Mustela lutreola* is listed in the I protection category. § 48(1) in the new Nature Conservation Law (26.04.2004) obliges to protect all the habitats of the species falling into this category by establishing designating protected areas, special conservation areas or species protection sites. Designation of these types of protection areas will also be the basis for establishing of Natura 2000 network in Estonia.

Estonian Ministry of the Environment contracted the foundation Lutreola in 26<sup>th</sup> of August 2004 for drafting the order for designation of areas for habitat protection for *Mustela lutreola* in Hiiumaa Island. The information on the proposed areas and the types of restrictions to be applied in these areas was passed to the Ministry for the end of November 2004 for further processing. The map with proposed sites and the draft text of the proposed order (in Estonian) is provided in Annex 3.

The designation of all the habitats and sites *Mustela lutreola* does not seem to be appropriate. That is because this species' movements vary remarkably and there are also remarkable seasonal change in use of habitats. Also, the designation of all the areas animal could possibly visit would mean to incorporate vast areas of little importance the species conservation point of view, but would result in very strong negative reaction from local inhabitants and thus would jeopardize the conservation of the species in long-term. Therefore, it was decided that it is more beneficial to identify the core habitats for *Mustela lutreola* and securing the preservation of the habitat parameters important for survival of the species in these. The core habitats were defined as the habitats which are important for breeding and yearly lifecycle of the species. The sites with core habitats were designated as species protection sites (in Estonian: *püsielupaik*). The new nature conservation act defines the species protection site "as the breeding area of protected species or area of periodical gathering of protected species outside of

protected areas which could be in restricted human use." In addition to already existing, or planned, protected areas with other main aim, 10 water bodies or their stretches were proposed as species protection site for *Mustela lutreola*. The selection of sites was made on the ground of the results gained in the course of preparation of the management plan. The sites were also in public hearing in meeting of stakeholders.

The sites are divided into two zones: (1) special management zone: 10-meter zone from water line (except the site in Pihla stream, where the zone will be 20 meters long; (2) limited management zone: 10-50 meter zone from water line<sup>3</sup>.

The list of proposed sites is as follows:

- Suuremõisa River in Pühalepa County at Suuremõisa, Viilupi and Hellamaa villages;
- Vaemla River in Käina County at Jõeküla and Kaasiku villages;
- Luguse River in Käina County at Utu, Luguse, Kleemu, Ühtri, Aadma, Lelu and Pärnselja villages;
- Rebaselja drainage main in Käina County at Luguse, Selja and Nõmme villages;
- Tulimurru drainage main in Käina County at Luguse and Selja villages;
- Jausa Stream in Emmaste County at Jause village
- Vanajõgi River in Kõrgessaare County at Jõesuu and Kiivera villages
- Armioja Stream in Kõrgessaare County at Heiste, Isabella, Lilbe, Kurisu, Metsküla villages
- Pihla oja 1<sup>st</sup> stretch in Kõrgessaare County at Koidma, Heigi and Pihla villages; 2<sup>nd</sup> stretch in Kõrgessaare County at Otsste, Pilha and Kõrgessaare villages
- Kidaste stream in Kõrgessaare County at Kidaste, Mudaste and Ogundi villages.

There seem not to be any reason why the designation of these core areas as the species protection sites could not be performed by the Estonian Ministry of Environment.

### SUMMARY OF ACTION A3:

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<sup>3</sup> The zoning is still under discussion with the experts and might be changed.

- Management plan for European mink in Hiiumaa Island was compiled. This plan was approved by the order No 849 of the Minister of Environment at 20<sup>th</sup> of September 2004.
- The management plan envisages actions for the next 5 years (2004 – 2008) in Hiiumaa Island in regards of conservation of *Mustela lutreola*. The management plan has been used as a source for compiling a new project for conservation of the species in Estonia.
- As the result of the plan the areas in need of protecting has been identified and these sites have been proposed to the Ministry of Environment for inclusion into Natura 2000.

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## C NON-RECURRING MANAGEMENT

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### C.1. REMOVAL OF *MUSTELA VISON* FROM SAAREMAA ISLAND

Status: MODIFIED AND DIVIDED BETWEEN ACTIONS C3 AND D1

Our survey performed under the action A2 revealed that there is no viable population of *Mustela vison* in Saaremaa. That made the rational of action C1 irrelevant and in our letter to European Commission (from February, 27. 2002; text of letter is in Progress Report in Annex 1) we requested a permit to modify the action so that part of the funds will be used for additional release and monitoring acclimatization of *Mustela lutreola* in Hiiumaa (as a new subactivity in Action C3) and for additional funding of action D1. European Commission accepted our request with their letter from August 19, 2002.

Actions undertaken under this modification are reviewed as part of actions C2 and D1 respectively.

### C.2. PREPARATION OF *MUSTELA LUTREOLA* FOR RELEASE IN SAAREMAA AND HIIUMAA ISLANDS<sup>4</sup>

EXPECTED RESULTS (DEADLINE 30.04.2004)

Animals prepared for release. They are trained in human avoidance, predator avoidance, prey catching and swimming/diving. Samples for future DNA analyses are taken, animals are equipped with microchips and vaccinated against rabies, some of the animals are radio-collared and they are treated against parasites. The content of the action might be changed in accordance with gained experience and knowledge.

ACTIONS PERFORMED

Status: COMPLETED

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<sup>4</sup> This action was modified with the letter from Commission from August, 19, 2002. For clarification, look also the preceding chapter about the action C1.

Initially this action was planned to precede immediately to the release of the *Mustela lutreola* in Saaremaa in 2004. Yet, with the modification of actions (see under action C1) and with inclusion of action for additional release of animals in Hiiumaa (as a part of action C3) the performance of part of the action earlier seemed reasonable. That is because the animals to be released in Hiiumaa Island need training in the same way as the animals which will be released in Saaremaa Island in the future. Also, testing with new training methodology for Hiiumaa release will help to fine-tune the preconditioning and release methodology for Saaremaa Island and thus is likely to make the training performance there more effective.

Responsibility of this action lies in most part with Tallinn Zoo; only some minor actions are the responsibility of foundation "LUTREOLA".

The preparation of the animals for release incorporated two types of actions: (1) actions which were conducted in a very same before all releases and (2) actions which were modified or added in accordance with the feedback data from previous release.

The general actions repeated every year were the following:

- all the animals were equipped with microchips allowing to identify the individuals during later re-capturing;
- all the animals were weighted before release to allow the assessment of the physical condition of the animals after recapture;
- all the animals were vaccinated against rabies before release;
- all the animals were treated against the parasites;
- DNA samples (hair, or tissue) were taken from all animals before release.

For details on preparing the animals for release in 2002 please refer to the 1<sup>st</sup> Progress Report (page 12 – 15) and about the preparations in 2003 please refer to the 1<sup>st</sup> Interim Report (page 11 – 14).

## **2004**

The monitoring in early 2004 had remarkable results. These are provided under description of action C3 (page 21). In short, the results of monitoring in early 2004 were very different from previous years and showed first of all that the error of the data collected during monitoring is remarkably higher than assumed earlier and that far more animals have been surviving in previous years. Further, the live trapping efforts showed that mortality is not biased towards females as previous data suggested. The results of previous years were most likely caused by random bias of sex ratio in trapping sample, or, what is more likely, by selective sampling effect of live traps.

The results of previous release and the effect of the release training were analyzed in early 2004 and on this ground the techniques in place were reshaped and the use of new techniques was considered. The most important modification was that the emphasis was put to release less, but better prepared animals. As the preparation for release (preconditioning) and the methods of release were so tightly interwoven in 2004, it is not appropriate to review the preconditioning separately from the release details. Therefore the preparation of animals

in 2004 is discussed in detail under actions C3 (page 21), while here only some short comments are provided.

The main considerations in preparation for release in 2004 were the following:

1. Not to release animals from standard enclosures, but only from large enclosures with natural interior. That is because the survival of animals from these large enclosures natural interior tends to be much higher, even if not trained intensively before release.
2. To pay less attention to the preconditioning as all the release animals come from large enclosures, which seemingly have higher effect to survival than the preconditioning through training. The released animals were either pregnant before release or litters at the age of weaning. In both cases the pre-release training was complicated.
3. To precondition the animals as much of possible: the litters in large enclosures in Hiiumaa Island were provided by live fish and frogs every now and then; the animals in large enclosures in Tallinn Zoo received live prey as well. Preconditioning in predator avoidance did not seem to be reasonable as the animals in large enclosures were very shy and behaved quite as wild animals.
4. To release litters at the time of weaning from large enclosures constructed in Hiiumaa Island in the habitats of *Mustela lutreola*. The enclosures in natural environment in Hiiumaa Island was hoped to get even better results than the animals released from large enclosures in Tallinn Zoo. That is because the animals were kept in the middle of their natural environment and this was hoped to adapt the litters even more to the life in the wild and thus increase their survival rate.
5. To maintain the animals close to water the animals were released in their nest box, which was buried into the bank of the stream with animal in the nest box. The doors of the nest box were opened only after this.

#### **SUMMARY OF ACTION C2:**

The following actions were performed to prepare the animals for release:

- To adapt the animals with live prey available in the wild the animals were provided an opportunity to prey on live fish, mice, rats, frogs, chicken, and partridge.
- To increase the human avoidance the contact with keepers were reduced to minimum by
  - (1) covering the welded meshwire walls between the enclosures and the service corridor with plywood, and

(2) construction of new large enclosures both in Tallinn Zoo and in Hiiumaa Island, which provided an opportunity to reduce the interaction with animals in the course of husbandry close to zero (no need to clean the pens and the enclosure), only interaction which remains is the feeding of animals.

- The animals were tested on the swimming skills and whenever needed the training scheme was applied to teach the animals to swim and dive before the release.
- To increase the predator avoidance the tests with domestic dog supported by alarm calls of *Mustela lutreola* were conducted in two years.
- Several behavioral enrichment schemes were tested and applied to reduce the overall negative impact of captive conditions to the animals' behavioral capacity. The following schemes were applied:
  - Provision of new objects to animals
  - Provision of smell-signs (prey and cons specific) for animals
  - Provision of swimming opportunity
  - Provision of diverse shelter (tubes, pipes etc)
  - Provision of live food
  - Hiding of food

As the judgment of efficiency of this action is very tightly connected with the results of release the conclusions about results of this action will be drawn jointly with the result of release under action C3.

### **C.3. RELEASE OF *MUSTELA LUTREOLA* IN SAAREMAA AND HIIUMAA ISLANDS WITH POST-RELEASE MONITORING<sup>5</sup>**

#### **ACTION FORESEEN**

1. Release of mink in spring and autumn
2. Post release monitoring of spring release
3. Final monitoring with snow and live-trapping in winter and early spring

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<sup>5</sup> With modification permitted with letter from European Commission from August 19, 2002 this action will also include the additional release and post-release monitoring in Hiiumaa.

## EXPECTED RESULTS (DEADLINE 30.11.2004)

- 30 – 50 animals are released
- data on survival, causes of mortality, distribution, habitat use and breeding of released animals are collected during post-release monitoring
- results of re-introduction are analyzed and compiled into report

## ACTIONS PERFORMED

Status: COMPLETED

For details on actions in 2002 please refer to 1<sup>st</sup> Progress Report (pages 15 – 17) and on actions in 2003 refer to 1<sup>st</sup> Interim Report (pages 14 – 20).

**Release in Hiiumaa Island in 2004.**

The release in 2004 was reshaped in accordance of results gained from monitoring the status of released animals in late 2003 and early 2004.

The results of the monitoring differed surprisingly from previous years. If the monitoring of previous years indicated that the females have higher mortality than males, then the 2004-results indicate something different (see table 3). As it can be seen from table 2/3 of the caught animals were females and only 1/3 were males. The animals caught in the course of monitoring originated from all releases performed since 2000, but also the wild born individual was caught. It indicates that the interpretation of monitoring data from previous years has been clearly too conservative. Considering the effect of yearly mortality the real value of surviving animals was perhaps even twice higher than construed from monitoring data so far. The earlier very low ration of females in the monitoring samples can be explained by two factors: (1) stochastic fluctuations of sex in sample, (2) live traps are selectively sampling the animals and provide biased sample of sex. We believe that the latter is more likely explanation.

Aside of the encouraging effect of the monitoring results in 2004, the data also provide reason for serious concern. In case of well established and developing populations the juveniles and young animals should form a majority in the age structure in the population. Our monitoring data indicate the opposite. Only some 30% of the populations can be regarded as young and there was only one confirmed case of breeding in the wild in 2003. This indicates that for some reason the animals released have not been able to reproduce properly. One possible hypothesis for this is provided in description of action D1 (page 35)

Table 3. Result of live trapping in the course of monitoring in late 2003 and in 2004.

ID	SEX	Release	Live trapping date	Notes
1437	F		1.05.2004	Wildborn animal re-trapped and released after conception in spring 2004
847	F	3.09.2000	27.11.2003	brought to Zoo; released in spring 2004
857	F	11.06.2001	10.12.2003	Released

898	M	15.06.2001	4.04.2004	brought to Zoo
927	F	15.05.2002	1.03.2004	identity not fully confirmed
1048	M	7.09.2002	29.03.2004	Released
1018	F	7.09.2002	18.12.2003	brought to Zoo; released in spring 2004
1278	F	4.09.2003	8.12.2003	brought to Zoo; released in spring 2004
1275	M	4.09.2003	7.04.2004	Brought to Zoo

In addition to these 9 live trapped individuals included in table 3, two more animals were detected by track. That makes the overall number of *Mustela lutreola* detected in the wild equal to 11. **Considering the 50 – 150 % error of the monitoring, the realistic number of animals in the wild in 2004 were probably between 16 – 28 animals before breeding season.**

As a summary of the monitoring in 2004 the following aspects of future importance have to be emphasized:

- number of animals surviving in the wild was remarkably higher than previous monitoring data suggested;
- sex ratio of surviving animals is not dangerously biased towards males as the previous data suggested, but is probably close to 1:1;
- the number of young and wild born individuals has remained alarmingly low indicating some trouble with breeding in the wild.

In 2004, the following release operations were conducted:

1. Release of wild caught females. Four females were caught during the monitoring activities in late 2003 and early 2004. These females were brought to Tallinn Zoo and were kept in breeding facility over winter. In spring, these animals were conceived in breeding facility and were thereafter released exactly the same location where they were caught.

As the observations after the release indicated the females were occupying their former home range and their tracks and other signs of action were observed in these sites at least 2 month after release. Two of these females were alive and were re-trapped (and released again) in autumn 2004 in the very same place of spring release. That indicates that these females survived the pregnancy and rearing of litter. Unfortunately no sign of litter was detected in the wild, but that might well be because of the high waters in summer 2004, which made the detection of tracks very complicated.

2. Release of pregnant females from large enclosures in Tallinn Zoo breeding facility. Three females were released some two weeks after conception in Hiiumaa Island. All these females were kept in large enclosures more than half a year and one of them was even born and raised up in large enclosure (Table 4).

Table 4. Females released from large enclosures with natural interior in Tallinn Zoo.

ID	Name	Sex	Born	Conceived	Released
1266	Gisela	F	22.05.2003	12.04. - 15.04	8.05.2004
1284	Fantoom	F	28.05.2003	18.04. - 22.04.	8.05.2004
1288	Loora	F	2.06.2003	13.04. - 16.04.	8.05.2004

### 3. Release of litters from large enclosures in Tallinn Zoo at the time of weaning.

13 animals from three litters born in 2004 in large enclosures were released with their own nest boxes each litter to one site (Table 5). Half of the released animals were equipped with radio-tags, which was hoped to provide us the opportunity to learn about the behaviour and fate of the animals after release. Unfortunately, the radio collars used (BIOTRACK Ltd) differed substantially by parameters from those used before and therefore the radio tracking as not effective and the data collected remained very moderate. The fate of the animals were hoped to be revealed with winter radio tracking.

Table 5. Litters release from large enclosures in Tallinn Zoo.

ID	SEX	BIRTH	WEIG HT	RADIO COLLAR	Release time	Release site
1392	M	1.06.2004	640		21.08.2004	Upper course of Suuremõise River
1393	M	1.06.2004	700		21.08.2004	Upper course of Suuremõise River
1394	F	1.06.2004	500		21.08.2004	Upper course of Suuremõise River
1396	M	3.06.2004	830	Y	21.08.2004	Armioja stream at Lauka village
1397	F	3.06.2004	600	Y	21.08.2004	Armioja stream at Lauka village
1398	F	3.06.2004	640	Y	21.08.2004	Armioja stream at Lauka village
1399	F	3.06.2004	620	Y	21.08.2004	Armioja stream at Lauka village
1405	F	3.06.2004	590		21.08.2004	Lower course of Suuremõisa River
1406	F	3.06.2004	650		21.08.2004	Lower course of Suuremõisa River
1411	M	5.06.2004	905	Y	21.08.2004	Entrance of Tulimurru and Rebaselja mains to Luguse River
1412	F	5.06.2004	570	Y	21.08.2004	Entrance of Tulimurru and Rebaselja mains to Luguse River
1413	M	5.06.2004	780	Y	21.08.2004	Entrance of Tulimurru and Rebaselja mains to Luguse River
1415	F	5.06.2004	640	Y	21.08.2004	Entrance of Tulimurru and Rebaselja mains to Luguse River

#### 4. Release of litters from enclosures in riparian area in Hiiumaa Island.

The animals born in large enclosures seem to be doing much better than those raised up in standard enclosures. Therefore it was decided that the emphasis will be put to release animals from large enclosures with natural interior. This idea was further elaborated by the experience that the interaction between the litter and the keeper will be mediated by the dam in captivity until weaning. Therefore the young will be behaving quite naturally until weaning and adaptation to the captive conditions will occur only after separation. Therefore it was decided to use litters born and raised up in large enclosures in the natural habitats in Hiiumaa Island. For that purpose three large enclosures were constructed in Hiiumaa Island.

Table 6. The litters released to the wild from the enclosures in Hiiumaa Island.

ID	weight	sex	birth date	Release date	Female	Enclosure
1421	626	M	21.05.2004	22.08.2004	1267	Vilivalla
1422	622	M	21.05.2004	22.08.2004	1267	Vilivalla
1423	682	M	21.05.2004	22.08.2004	1267	Vilivalla
1425	454	F	21.05.2004	22.08.2004	1267	Vilivalla
1426	616	M	21.05.2005	22.08.2004	917	Vanajõe
1429	468	F	21.05.2004	22.08.2004	917	Vanajõe
1430	436	F	21.05.2004	22.08.2004	917	Vanajõe
1431	490	F	21.05.2004	22.08.2004	917	Vanajõe
1433	462	F	31.05.2004	22.08.2004	1289	Armioja
1434	442	F	31.05.2004	22.08.2004	1289	Armioja
1435	450	F	31.05.2004	22.08.2004	1289	Armioja
1436	456	F	31.05.2004	22.08.2004	1289	Armioja
1289	670	Dam	2.06.2003	22.08.2004		Armioja
917	810	Dam	2.06.2001	22.08.2004		Vanajõe
1267	800	Dam	22.05.2003	~15.07.2004		Vilivalla

The all pregnant females in the enclosures in Hiiumaa Island delivered litters: dam 1267 five young (4 males and 1 female); dam 917 six young (3 males and 3 females) and dam 1289 five young (1 male and 4 females; table 6). Not all the young were released at the time of weaning. One male from each litter was brought to Tallinn Zoo breeding facility to test the males' capability to breed (for details look action D1 page 31). The dam no 1267 escaped from the enclosure before the planned release. All the remaining animals were equipped with microchips. The litters born in "Armioja" and "Vanajõe" enclosures were equipped with radiocollars.

The initial idea of equipping the animals with radio collars was to compare the behaviour of animals born in large enclosures in Tallinn Zoo with those born in the enclosures in Hiiumaa Island. The transmitters for this purpose were acquired from Biotrack Ltd Company in UK. Unfortunately the company was providing only a very short range (200 – 500 m) transmitter with modest life span (4 – 5 month) in comparison to what was offered and used before (transmitters with 700 – 1000 m range and 6 month lifespan). The company claimed that the transmitters as used before were creating lots of trouble due to inadequate

potting, which made it possible for the water to penetrate the protection layers and reach the electric circuit resulting in malfunctioning of the transmitters or full stop of function. As adding of more potting would have increased the weight and size of the transmitter above the permissible limit, the company decided that they can provide any warrant only to the transmitters with smaller batteries making it possible to add potting with out increasing the weight of the transmitter at the cost of reduced lifespan and transmission range. The previous experience warned us in high likelihood in loosing the animals with so short transmission range, but as the other transmitter producers with acceptable technical specifications were not available, we decided to rely on the transmitters from Biotrack Ltd backed with hope that the animals from large enclosures will stay close to water making the radio tracking with short range transmitters possible. For this purpose we formed a radio tracking team consisting of three persons from Estonia with experience in field work and also in radio tracking. This team was given a task to check for animals at least once a day. The overall number of animals under radio tracking was 18 (8 animals from litters born in large enclosures in Tallinn Zoo and 10 animals from enclosures in Hiiumaa Island). Unfortunately, the behaviour of the released animals did not differ from those released previous years and the individuals moved away from water courses making the radio-tracking with short-range signal impossible. The situation was further complicated by exceptionally rainy summer and autumn resulting in high waters everywhere in the island providing for the animals lots of possibilities for hiding from the radio-tracking team. In this fairly complicated situation the team was doing all possible to spot the animals until early October, but without any noteworthy results.

Then it was decided to stop the monitoring until the formation of snow cover. Unfortunately the weather in winter was very unfavourable for effective tracking of animals due to long period without snow and with very high water-level. Therefore, despite of all our efforts, our project has reached to the end without a clear picture on the status of the released animals in the island.

### SUMMARY OF ACTION C3:

Table 7 provides the data about the animals released in Hiiumaa Island in the course of the project. The first rows (figures in *italic*) of the table provide data of releases which preceded the project, yet, these might be important to grasp the overall development of the action.

Table 7. Data about the release of *Mustela lutreola* in Hiiumaa.

Years	Number of released animals						With radio-collars	Surviving next spring, by monitoring data (estimate)	Estimate for survival (min-max)
	Males	Females		Total	Summer	Autumn			
		Non pregnant	Pregnant						
<i>2000</i>	<i>8</i>	<i>9</i>	<i>0</i>	<b><i>17</i></b>	<i>9</i>	<i>8</i>	<i>17</i>	<i>&gt; 3 (5 – 8)</i>	
<i>2001</i>	<i>19</i>	<i>22</i>	<i>0</i>	<b><i>41</i></b>	<i>41</i>	<i>0</i>	<i>23</i>	<i>&gt; 5 (7 –</i>	<i>0,29 –</i>

Years	Number of released animals						With radio-collars	Surviving next spring, by monitoring data (estimate)	Estimate for survival (min-max)
	Males	Females		Total	Summer	Autumn			
		Non pregnant	Pregnant						
								13)	0,47
2002	23	19	12	54	39	15	12	> 6 (9 – 15)	0, 12 - 0, 22
2003	32	14	14	60	42	18	0	> 11 (17 – 28)	0,15 – 0, 25
2004	9	19	7	35	7	28	18	> ?	? <sup>6</sup>
<b>Total in project</b>	<b>64</b>	<b>52</b>	<b>33</b>	<b>149</b>	<b>88</b>	<b>61</b>	<b>30</b>		
<b>Total</b>	<b>91</b>	<b>83</b>	<b>33</b>	<b>207</b>	<b>138</b>	<b>69</b>	<b>70</b>		

As the table indicates the overall number of animals released in the course of the efforts to establish the population in Hiiumaa Island has been 207. **Within the frame of our current EU LIFE project 149 animals has been released.**

Almost all the animals surviving in the wild over the adaptation period seem to be doing rather well. This is quite well presented by weight of the animals re-trapped in the course of monitoring (table 8). In most of the animals some decrease in the weight has occurred, but considering fluctuation of weight of animals in captivity and the fact that usually the animals in breeding facility tend to have a bit higher weight than normal in the wild, it should be concluded that the physical conditions of the animals surviving the adaptation period is very good. The only exception has been the individual with ID 857, which has lost some 40% of its pre-release weight.

Table 8. Data on the change of weight of animals released in Hiiumaa.

Studbook ID	Sex	Release date	Weight at release	Date of live trapping	Weight at re-trapping	% from the initial weight
Nr.41	♂	28.06.2001	836 g	10.11.01	786 g	94,0 %
				12.01.02	778 g	93,1 %
Nr.11	♂	12.06.2001	554 g	12.11.01	595 g	107,4 %
				25.01.02	650 g	117,3%

<sup>6</sup> At the end of 2004 and at the beginning of 2005 the monitoring has been highly ineffective due to the high level of water and very fluctuating weather conditions. For the time of writing the report no reliable data has been managed to collect. It only can be assumed that the survival in 2004 release was less than expected. The assumed low survival rate can be attributed to the unexpected weather conditions.

Studbook ID	Sex	Release date	Weight at release	Date of live trapping	Weight at re-trapping	% from the initial weight
Nr.21	♂	20.06.2001	852 g	13.11.01	724 g	85,0%
Nr.35	♂	18.06.2001	802 g	17.11.01	746 g	93,0%
Nr.4	♂	29.06.2000	645 g	13.01.02	678 g	105,1 %
				21.03.02	824 g	127,8 %
Nr.9	♀	12.06.2001	462 g	18.01.02	454 g	98,3 %
Nr.32	♂	16.06.2001	842 g	23.03.02	686 g	81,5 %
Nr.39	♀	27.05.2002	565 g.	28.03.2003	410 g.	72,6%
Nr.48	♂	07.09.2002	?	26.03.2003	812 g.	?
Nr.14	♂	04.05.2002	765 g.	31.03.2003	750 g.	98,7%
Nr.7	♂	20.04.2002	?	30.03.2003	880 g.	?
Nr.25	♂	16.06.2001	644 g.	27.03.2003	654 g.	101,6%
Wild born	♀	-	-	01.12.2003	325 g.	-
729	♀	04.09.2000	380 g.	28.11.2003	400 g.	105%
857	♀	11.06.2001	562 g.	10.12.2003	380 g.	68%
1278	♀	04.09.2003	600 g.	08.12.2003	480 g.	80%
1018	♀	07.09.2002	560 g.	18.12.2003	440 g.	79%
1048	♂	07.09.2002	?	07.12.2003	780 g.	?
				29.03.2004		
?	♀	?	?	26.03.2004	350 g.	?
898	♂		802 g.	04.04.2004	1058 g.	132%
1275	♂	04.09.2003	780 g.	07.04.2004	800 g.	103%

The causes of mortality can be judged by radio-tracking data, but also by accidental spotting of death of released animals. As the data in table 9 indicate most of the death has actually occurred during the adaptation period. Only few types of mortality has been detected (Figure 1) and the impact of predators like domestic dogs, other wild carnivores (mostly *Vulpes vulpes*) and bird of prey is substantial with 80% from all death cases detected. However, it has to be noted that although the death cases seem to indicate that mortality has been mostly caused by other carnivores, the reality is somewhat more complicated. As most of the recorded death cases have been recorded during adaptation period it seems logical to connect the death with difficulties in adapting into the wild. That will probably mean that aside of the inability of released animals to avoid the other carnivores, also the other aspects are contributing to the mortality, such as the use of unsuitable habitats, ineffective use of food resources. All these other factors will weaken the organism of released animal and the other predator will have higher chances to prey on released animals.

Figure 1. Causes of mortality of released animals

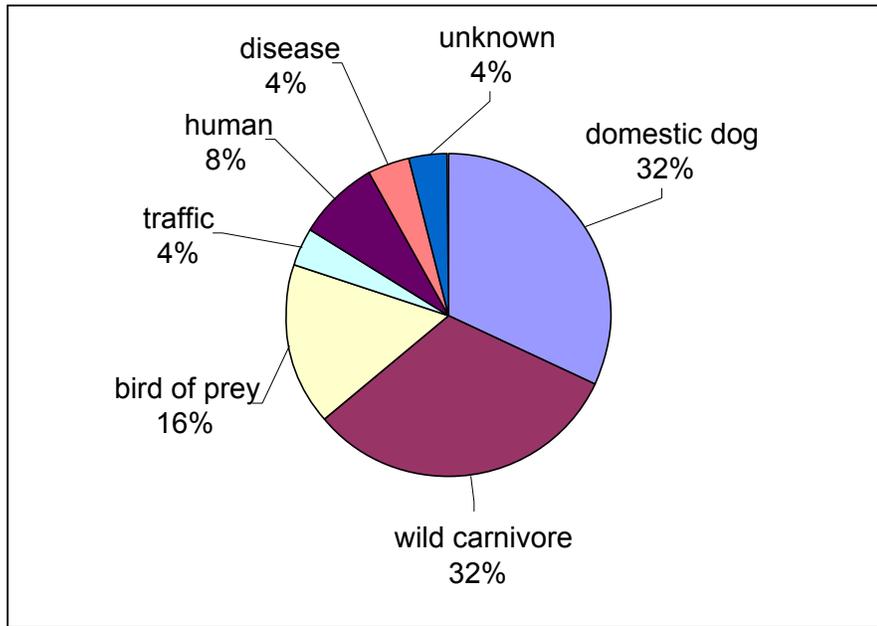


Table 9. The causes of mortality of released animals

ID	Sugu	Birth	Date of release	Date of death	Days from release	Cause of death
680	F	1999	28.06.2000	16.07.2000	18	Other carnivore (dog)
685	F	1999	28.06.2000	16.07.2000	18	Poaching
837	M	2000	3.09.2000	7.09.2000	4	Human
836	M	2000	3.09.2000	10.09.2000	7	Other carnivore
838	F	2000	3.09.2000	11.09.2000	8	Other carnivore
841	M	2000	3.09.2000	17.09.2000	14	Unknown
843	F	2000	3.09.2000	5.11.2000	63	Bird of prey
862	F	2000	27.05.2001	2.07.2001	36	Other carnivore
844	M	2000	11.06.2001	24.07.2001	43	Other carnivore (dog)
866	F	2000	11.06.2001	23.06.2001	12	Bird of prey
897	F	2000	15.06.2001	26.06.2001	11	Other carnivore
867	F	2000	15.06.2001	3.07.2001	18	Other carnivore
868	M	2000	27.06.2001	19.07.2001	22	Other carnivore (dog)
881	F	2000	4.05.2002	9.05.2002	5	Other carnivore
832	F	2000	5.05.2002	5.05.2002	0	Other carnivore (dog)
853	F	2000	15.05.2002	22.05.2002	7	Traffic
560	F	1998	15.05.2002	5.06.2002	21	Other carnivore
952	F	2001	15.05.2002	11.06.2002	27	Other carnivore (dog)
592	F	1998	15.05.2002	15.06.2002	31	Disease (Teeth inflammation)
935	F	2001	15.05.2002	4.07.2002	50	Other carnivore
1014	F	2001	1.06.2002	2.06.2002	1	Bird of prey

ID	Sugu	Birth	Date of release	Date of death	Days from release	Cause of death
811	F	2000	21.04.2003	3.05.2003	12	Other carnivore (dog)
795	F	2000	27.04.2003	7.05.2003	10	Other carnivore (dog)
911	F	2001	27.04.2003	5.05.2003	8	Bird of prey
794	M	2000	12.05.2003	27.05.2003	15	Other carnivore (dog)

As the monitoring was seriously hampered by weather conditions in winter 2004/2005 the project team is unable to report any data on the present status of the wild population of *Mustela lutreola* in Hiiumaa Island. It is clear that the core of forming population is present, but the success of 2004 release remains still has to be revealed with spring weathers. Though it has to be admitted that the overall perception from field activities gave ground to suspect that the results are by far not so good as expected.

The main learning points of the Action C3 are the following:

1. Restoration of wild populations is a long process, with high number of hardly avoidable setbacks. Similarly to restoration process of *Mustela nigripes* (USA) and *Leontopithecus rosalia* (USA & Brasilia), the restoration of *Mustela lutreola* is a long process and the final results can be received after long and dedicated experiments for identifying the best way for release of captive born individuals into wild.
2. The soft release techniques including the pre-lease training and supported release techniques seem to have better chances for success than the so-called hard techniques (release of animals without training and support).
3. There seems not to be difference in the survival of pregnant and non-pregnant females. However, the survival of litter of released pregnant females still has to be studied.
4. The sex ratio of released animals after adaptation period seems not to be biased towards females as afraid and is most likely close to 1:1 despite of the data from first monitoring sessions.
5. The error of monitoring is by far higher than expected and reaches to 50 – 150%, being biased to smaller figure.
6. The main concern with the release is that the number of wild born individuals remain very low. There could be several explanation to this: (1) the released animals need skills they lack for successful breeding in the wild; (2) the animals breed in the wild, but will not be able to raise young, (3) the majority released males are not able to contribute to breeding. The third explanation seems to be most likely and is discussed in detail under action D1 (page 31) .
7. Although lots of various approaches for release have been tested, the most effective one still has to be identified. Despite of all our effort, the main aim of the action for

us (to establish a viable populations in Hiiumaa Island) has not been reached. That is because, contrary to expectations the recovery of wild populations has appeared to be far more complicated task than thought at the beginning of the project. However, it also has to be admitted that the tests already conducted provide good ground to accomplish this work in the nearest future. Also, our experience will be invaluable for similar operations elsewhere in Europe. The only shortcoming with the gained knowledge is that all this remains with the team members and still have to be published in the form of scientific reports for wider access. That is a task in the nearest future.

8. According to the initial project documentation one of the aims was to establish also an island population of *Mustela lutreola* in Saaremaa Island. As the process of establishing an island population in Hiiumaa Island has taken far more time than expected our project was modified and the establishment of Saaremaa Island population remained unfortunately outside of the scope of it. However, for securing survival of *Mustela lutreola* the risks of having only one island population in the situation where all the remaining main-land populations are close to extinction or shrinking quickly, is not a feasible in long-term. Therefore the establishment of second island population in Saaremaa Island in the future remains one of the future task for the beneficiary – the foundation LUTREOLA. Once the Hiiumaa population is in place and the funding is found for Saaremaa release, the beneficiary of current project launches action for establishment of island population in Saaremaa as well.

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## D RECURRING MANAGEMENT

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### D.1. HUSBANDRY AND CONSERVATION BREEDING OF *MUSTELA LUTREOLA* IN SPECIAL BREEDING FACILITY AT TALLINN ZOO (ESTONIA)

#### EXPECTED RESULTS

1. Low level of mortality in captive stock
2. Good breeding results
3. Good physical condition of mink in breeding facility
4. Good demographic and genetic parameters of the captive population

#### ACTIONS PERFORMED

Status: COMPLETED (CONTINUOUS ACTION, SO WILL BE CONTINUED BEYOND THE TIMEFRAME OF CURRENT PROJECT)

For details on actions performed in 2002 please refer to 1<sup>st</sup> Progress Report (pages 19 – 21) and on actions performed in 2003 refer to 1<sup>st</sup> Interim Report (pages 21 – 23).

#### **Conservation Breeding in 2004.**

Similar to the previous years the breeding in 2004 was performed in accordance to plan prepared in January 2004. In compiling the plan present capacity of our breeding facility, the release requirements in Hiiumaa Island, but also the genetics and demography of the captive population in Tallinn Zoo as well as elsewhere in Europe were taken into account. The results of the breeding season in 2004 are provided in the table 10:

Table 10: Breeding results in 2004.

Parameters of breeding effort	Females	Males	Unknown
No of observations of the oestrus cycle	34+7 <sup>7</sup>		
Number of animals attempted to use for breeding	28+7 <sup>8</sup>	50	
Number of animals actually contributing to mating	21+7 <sup>9</sup>	15	
Number of females delivering young in zoo	20		
Mating achieved* - Zoo	80%	30%	
Efficiency of mating** - Zoo	95%		
Death during pregnancy – Zoo	1		
Number of young delivered – Zoo	46	48	
Average litter size	4, 75		
Number of death during first month – Zoo	4	2	
Mortality of young in 1st month - Zoo			6%
Mating achieved * = % of individuals mating from all attempts			
Efficiency of mating** = % of mated females delivering young			
	Beginning	End	
Period of observation of the oestrus cycle	15.03.04	11.05.04	
Mating period	26.03.04	07.05.04	
Birth period	08.05.03	11.06.04	

The breeding season in 2005 differed from previous years in several aspects. The mating efficiency was exceptionally high, so that practically every attempt to mate the female resulted in delivery of litter. Also, the litter size was very high as shown in table 11. The typical mean size of the litter in previous years has been 4 young, but in 2004 it reached 5. Also, the minimum litter size usually as been 1, but in 2004 it was 3.

<sup>7</sup> 7 females were selected for release purpose and not for breeding operation

<sup>8</sup> 7 females were selected for release purpose and not for breeding operation

<sup>9</sup> 7 females were selected for release purpose and not for breeding operation

Table 11. Litter size in 2004

Parameter	Value
Mean	4,75
Standard Error	0,190221478
Median	5
Mode	5
Standard Deviation	0,850696309
Minimum	3
Maximum	6

It is difficult to explain, why the breeding efficiency has increased. One possible explanation for this might well be the better keeping conditions and food, which have resulted from the opportunities provided by current EU LIFE project. Yet, the correlation between the breeding efficiency and the change in management still has to be revealed.

The neonate's death rate (death in 30 days after birth) was close to 6%, which is higher than in previous years, but still remains in the frames of normal neonate mortality. All in all 11 (6.5) animals died in 2004. The details about the death are provided in Annex 7. There were various causes for death, but all typical for captive breeding operation.

The overall number of *Mustela lutreola* in Endangered Species Centre at Tallinn Zoo was 104 (46.58) as of 30.11.2004 (Annex 4).

The genetic parameters for 2004 are provided in table 12 reviewing the change in genetic parameters in the course of the whole project. Also the issues related to the genetics and demography in 2004 are discussed below in chapter devoted the results of the action D1.

Apart from conservation breeding various other management activities were performed in relation to our captive population.

1. As the breeding efficiency in previous years has been very low in Euronorz (Germany) breeding facility and the all-European *Mustela lutreola* conservation breeding greatly relies on the results of breeding in this German facility in August 2004 24 juveniles born in Tallinn Breeding facility was sent to them. The details of the transfer are provided in Annex 5

2. For years the low efficiency of captive born males has been an alarming issue for facilities seriously contributing to the conservation breeding of the species. The rational of the issue is that contrary to wild born males, the captive born males are not able to contribute to conservation breeding. The data about this phenomenon has been provided in Annex 12, which contains a poster presentation on reproduction of *Mustela lutreola* prepared for conference in Spain 2003. As the figures in Annex 12 show only minor part of captive bred males are capable to participate in breeding. That is because the captive born males tend to be very aggressive and attack fiercely everything including even the female in heat. Alternatively, some of males behave in very shy manner in mating situation and do not pay any attention to female, or, are even afraid of her. This issue has increasingly serious implication for conservation breeding. So far the breeding program was mostly focusing on

getting off-springs and increasing the number (though the size of the captive populations is far from being sufficient), but with the fast development the problem that majority of males will not contribute their genes to the next generation becomes alarming. That is because of the danger to loose part of the genetic diversity. Clearly, since the wild males do not have such a problem, the phenomenon is result of flaw in applied captive management scheme. In 2004, we re-trapped two males (ID 898 released in 15 of June 2001, re-trapped in 04.04.2004; ID1048 released in 07.09.2002, re-trapped in 29.03.2004) in Hiiumaa and brought them back into breeding facility in Tallinn Zoo. We wanted to test, if this abnormal breeding behavior of males is reversible in wild conditions after release, or the released males will continue to behave in this abnormal way in the wild as well. Despite of repeated pairing attempts both males were not able to mate. According to our records male ID 898 was behaving aggressively towards females in heat also before the initial release. Although two males is a very small sample size, it still give ground for serious concern and is also providing the most likely explanation why there have been so few cases of birth in the wild among released animals – the released males have not been able to participate in breeding.

The aspects in management causing this abnormal behavior still have to be discovered. Also, the agent within the animal organism triggering such a behavior still has to be identified. Though the first steps in this regards were already made in 2004 already.

To check whether the aggression of males actually is the expression of their physiological inability to mate, or, it is just a behavioral malfunction, we, in collaboration with Dr. Heli Lindeberg (Kuopio University, Finland), performed the electro ejaculation on four males with high level of aggression and evaluated the quality of sperms. The results are provided in table 12.

Table 12. Results of electro-ejaculation of four males in Tallinn Zoo.

Date	ID of male	Sperms alive next day	Motility of sperms next day
01.06.2004	853	5%	No forward movements
01.06.2004	882	20%	5% move forward
01.06.2004	1299	40%	20% move moderately forward
01.06.2004	1292	20-30%	No forward movements
01.06.2004	1263	20%	5% move forward

The table shows that even in the next day after the electro-ejaculation the sperms still had pretty good quality. It suggests that physiologically the aggressive males are likely to be able to breed, but this is prevented by some behavioral barrier. It means that, in principle, the genes of the aggressive males could still be available for the captive population by using

some more invasive method like artificial insemination. Although it must be admitted that so far it has not been used effectively in *Mustela lutreola*.

The next question in need of answer in solving this problem is the following: what is causing this abnormal behavior? For this purpose we retrospectively analyzed all the breeding events ever occurred in breeding facility, but could not find any regular pattern, which could have helped us closer to identification of the causes of this phenomenon. No correlation between the genetic origin, feeding, age, methods of introducing female to male etc. and the aggression of males could be detected.

The only exception was the type of the enclosure. In 2003, the observations were conducted on the impact of the enclosure type at the time of development to the behavior of the young. The development of young (especially the level of activity, observatory behavior and aggression) were observed within the litter in three types of enclosures: (1) 4x2-meter standard enclosure with low level of diversity in interior, (2) ~200 m<sup>2</sup> large enclosures with natural interior, (2) 6x1,5-meter enclosures with higher level of diversity. Although the sample size remained too small, some interesting results came out from these observations:

- 1) The level activity increased with the age of the litter. The difference between the observed periods was statistically significant
- 2) The exploratory behavior was the highest in the 2<sup>nd</sup> enclosure type with large size and lots of diversity in interior. The lowest level of exploratory behavior was detected in 1<sup>st</sup> enclosure type with small size and lowest level of diversity.
- 3) The number of aggressive encounters increased from first period to the last observation period. The difference was statistically significant.
- 4) During the third observation period (just before weaning) when the young already resembled adults the aggression was the highest in the 1<sup>st</sup> enclosure type with small size and little diversity and the lowest in 2<sup>nd</sup> enclosure type with large size and with natural interior. Contrary, the observatory behavior was the highest in the 2<sup>nd</sup> enclosure type and the lowest in the 1<sup>st</sup> enclosure type.

The main conclusion from these observations (though still hypothetical as sample size remained too small for definitive conclusions) is that the size and the interior of the enclosure seems to be related to the level of aggression in litter before weaning.

In 2004, we tested the capability of the males used in this study to participate in breeding. The results are provided in table 13.

Table 13. Relation of breeding efficiency of males and the type of enclosure the males were raised up.

Enclosure type	ID of male	Mating attempt	Result
2x4 meter enclosure with limited diversity	1261	Yes	Aggressive

Enclosure type	ID of male	Mating attempt	Result
2x4 meter enclosure with limited diversity	1262	Yes	Shy
2x4 meter enclosure with limited diversity	1263	Yes	Shy
1,5x6 meter enclosure with medium level of diversity	1264	Yes	Aggressive
1,5x6 meter enclosure with medium level of diversity	1265	Yes	Aggressive
Large enclosure with natural interior	1269	Yes	Mated; female delivered 3 young in 03.06.2004
Large enclosure with natural interior	1270	Yes	Mated; female 1278 released in Hiiumaa
Large enclosure with natural interior	1271	Yes	Mated; females delivered 5 young
Large enclosure with natural interior	1275	No	Released in 04.09.2003 in Hiiumaa
Large enclosure with natural interior	1276	No	Released in 04.09.2003 in Hiiumaa
Large enclosure with natural interior	1279	No	Released in 29.08.2003 in Hiiumaa
1,5x6 meter enclosure with medium level of diversity	1313	Yes	Shy
1,5x6 meter enclosure with medium level of diversity	1314	Yes	Aggressive
1,5x6 meter enclosure with medium level of diversity	1315	Yes	Aggressive

Although, the sample size is very small, the results indicate that keeping the litter before weaning in condition causing in young high level of aggression might be the reason why the male will not be able to reproduce in adulthood. This hypothesis will be further tested in 2004/2005 breeding trials.

### SUMMARY OF ACTION D1

1. The results of conservation breeding during the project period 2001 – 2004 are gathered in table 14 (the detailed data on breeding can be found in Annexes 4 – 8):

Table 14. The results of conservation breeding in 2001 -2004.

Year	Birth	Death	Release	Total at the end of the year
2002	62	7	54	105 <sup>10</sup>

<sup>10</sup> This figure reflects the status of captive population at the end of the year. The 1<sup>st</sup> Progress report contains the figure reflecting the status at the time of reporting – that is 112 animals as of 15.09.2002

2003	57	7	60	110 <sup>11</sup>
2004	94	11	35 (67) <sup>12</sup>	104 <sup>13</sup>
Total	213	25	149 (216)	-

2. The change in demographic and genetic parameters of the captive population during the project is provided on the table 15. The definition of terms used in the table are in Annex 9.

Table 15. Demographic and genetic parameters of *Mustela lutreola* captive population at Tallinn Zoo.

<b>Demographic parameters</b>	<b>2000/2001</b>	<b>2001/2002</b>	<b>2002/2003</b>	<b>2003/2004</b>	<b>EEP<sup>14</sup></b>
<b>Males</b>					
Population Growth Rate	1,6835	2,0886	2,3954	2,8862	1,6307
Mean Generation Time	2,65	0,77	1,41	0,81	1,48
<b>Females</b>					
Population Growth Rate	1,6969	2,0886	1,8980	2,1343	1,5480
Mean Generation Time	1,26	0,77	1,13	1,30	1,67
<b>Genetic parameters</b>	<b>2000/2001</b>	<b>2001/2002</b>	<b>2002/2003</b>	<b>2003/2004</b>	<b>EEP</b>
Founders	19	21	22	12	22
Potential founders	2	1	0	0	0
Living descendants	102,31	101,42	139,86	116,53	188,63
Percent known	97,4	96,6	97,1	97,9	92
Gene Diversity	0,8966	0,9342	0,9399	0,9369	0,94488
Potential Gene diversity	0,9544	0,9582	0,9580	0,9548	0,9635
Gene Value	0,8935	0,9278	0,9343	0,9301	0,9445
Founder Genome Equivalent	4,84	7,60	8,31	7,92	9,77

<sup>11</sup> This figure reflects the status of captive population at the end of the year. The 1<sup>st</sup> Interim report contains the figure reflecting the status at the time of reporting – that is 115 animals as of 01.09.2003

<sup>12</sup> The figure in brackets reflects the number of release animals including the release of surplus animals (too old or genetically unimportant) to the mainland Estonia to free space for further conservation breeding.

<sup>13</sup> This figure reflects the status of captive population at the end of the year. The Final report contains the figure reflecting the status at the time of reporting – that is 104 animals as of 31.11.2004

<sup>14</sup> The column provides the genetic and demographic parameters of the whole (all-European) EEP population at the end of 2004, in which the Tallinn stock forms substantial part.

Potential Founder Genome Equivalents	10,98	11,96	11,92	11,06	13,69
Founder Genome Surviving	8,90	10,88	11,83	11,02	13,65
Potential Founder Genome Surviving	10,98	11,96	11,92	11,06	13,69
Mean Inbreeding Coefficient (F)	0,0318	0,0140	0,0111	0,0102	0,0617

As the figures in table indicate, there has been some substantial change in the population in Tallinn. The demographic data show that the mean generation time has unfortunately declines. Although usually the longer mean demographic time would help to maintain the genetic diversity of the population, the management issues have overdrawn this consideration. Namely, if in earlier years the wild-born males were mostly used for breeding, then in 2004 the focus was in young males and testing in their ability to breed. As for female the increased generation time reflects our efforts to get offspring from some older, but very valuable females.

In the genetic parameters, what needs to be commented is the decrease of founder number from 22 in 2003 to 12 in 2004. This drastic change is the result of release of older animals (not able to breed any more) into mainland to free space for further breeding process (respective permit from the ministry of environment has been issued). These founders are still represented in EEP population elsewhere in Europe. In the years coming the EEP management should stand for better representation if these founders. There are no potential founders left in the captive population. All of them have been contributing to the gene pool of the population. Therefore, although the overall number of founders is quite high, to secure the highest possible survival of genes present in wild populations acquiring of new founders from the wild is of outmost importance. That is especially true as the wild populations are depleting quickly and pretty soon there might not be any wild specimen available of inclusion into conservation breeding program. Despite of all the efforts the attempts to get additional founders in the course of this project failed. Yet, the attempt will be repeated in the future.

The figures show that in Tallinn stock 97,9% of the origin is known versus the whole EEP population where only 92 % is known. Although the genetic management theory recommends removing the animals with partially unknown origin from captive population this is not a good option for captive management of *Mustela lutreola*. That is because the animals with unknowns in their pedigree also contain genes from some founders strongly underrepresented in the whole captive population. This makes the future management rather complicated.

The figures of present gene diversity and potential gene diversity show that there is a possibility for improvement, though not very much. As for the value of inbreeding coefficient there has been substantial improvement during the course of the project. That is partly because all the potential founders have contributed to the captive population, but also because of the adequate mating decisions.

The best options in the future to improve the status of the captive populations are the following:

1. Acquiring additional founders to decrease further the inbreeding depression and to grant the long-term survival of the captive population.
2. Increasing the size of European captive population to 500, which is likely to allow us to maintain 90% of the initial heterozygosity of the population for 100 years.
3. Solving the problem of male inefficiency in breeding behavior. That would allow much easier genetic management of the population and reduce the likelihood of flushing out some valuable genes from population as a result of males inability to mate.

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## F OVERALL PROJECT MANAGEMENT

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### F.1. OVERALL PROJECT MANAGEMENT

#### ACTION FORESEEN

1. Reporting to EU LIFE program
2. Contracting partners, assistants and subcontractors
3. Organization of accounting
4. Supervision of performance of the actions
5. Public awareness
6. Setting up and updating the homepage
7. Organization of field actions

#### ACTIONS PERFORMED

Status: COMPLETED

For details on actions in 2002 please refer to 1<sup>st</sup> Progress Report (pages 21 - 25) and on actions in 2003 refer to 1<sup>st</sup> Interim Report (pages 24 - 26).

#### **Project management in 2004**

1. Reporting to EU LIFE program

Only one mission from the European Commission external team was performed in 2004. Mr. Mats Eriksson visited the breeding facility and the issues related to the performance of the project as well as the future of the project were extensively discussed. Mr. Mats Eriksson also passed to the project management the comments of the European Commission on further reporting of the results of the project.

2. Contracting partners, assistants and subcontractors

The partners have been continuing their task in accordance to the contract made at the beginning of the project. The assistant and the project manager contract were renewed until the end of the project. Numerous contracts were made by subcontractors for short term tasks.

### 3. Organization of accounting.

The contract with the same accountant was extended until the end of the project. The auditing was performed for actions in 2003 by BDO Eesti Ltd. (Reg.No. 10309827, Estonia pst. 7, 10143, Tallinn, Estonia: auditor Ms. Mai Ever). The audit for 2004 and the audit about the whole project were performed by the same company and the report of the auditor is enclosed to this report.

### 4. Supervision of performance of the actions

The project manager personally participated in most of the actions, or, at least, visited the sites of actions regularly.

### 5. Public awareness

The public awareness has always been a higher priority for the project. The presentations have been made both in international and local scale:

1. April 2004: Presentation on the *Mustela lutreola* recovery project for tourist guides in Hiiumaa Island by Madis Põdra.
2. April 2004: Presentation on the *Mustela lutreola* recovery project for school children in Hiiumaa Island by Madis Põdra.
3. May 2004: Presentation on the EAZA Small Carnivore Taxon Advisory Group meeting in Moscow "European mink Conservation – and update" by Tiit Maran (The handouts of the presentation in Annex 10)
4. June 2004: Defending the Masters Decree on Diet ecology of European mink (*Mustela lutreola*) in island Hiiumaa 2000 – 2003. Supervised by Madis Põdra
5. June 2004: Defending the Masters Decree on the behavior of the European mink litter in different enclosure types. Supervised by Tiit Maran.
6. June 2004: Presentation on II World Conservation Forum "Recovery of European mink in Estonia" by Tiit Maran in Angers (France; handouts in Annex 11)
7. October 2004: Presentation at the Estonian Annual Theriological Workshop "Survey and monitoring methods applied in recovery of *Mustela lutreola* in Hiiumaa Island" by Madis Põdra (Matsalu; Estonia)

8. November 2004: Seminar in Tallinn University "Diet of *Mustela lutreola* in Hiiumaa" by Madis Põdra
  9. November 2004: Excursion to the European mink Breeding Facility and presentation on European mink recovery project by Tiit Maran. The audience consisted of the subscribers of the popular science magazine "Horisont". (Tallinn)
  10. December 2004: – Presentation "Species Conservation and European Mink Recovery Project" by Tiit Maran for Tourist Guide Association (Tallinn)
  11. Tiit Maran & Madis Põdra 2004 "Naarits koju tagasi- Europea mink back home" in Eesti Loodus 10: 6 – 15. Long article in Estonian language on *Mustela lutreola* and the recovery program. This article is the best review ever produced in Estonian language.
  12. Madis Põdra & Tiit Maran 2004. Ecological aspects of establishment of island population of European mink (*Mustela lutreola*) in Hiiumaa, 2000 – 2003. In: Eesti Ulukid 9: 23 – 40. Short account of the results of release in Estonian (summary in English).
6. Setting up and updating the homepage

The LUTREOLA web page ([www.lutreola.ee](http://www.lutreola.ee)) has been updated yearly. The technical reports resulting from this project as well as other products have been made public through this webpage. As the table 16 about the use of the webpage shows, this webpage is pretty frequently used, the number of visits per month vary between 520 and 1525 (with average 1235 visits per month). The statistics about the use of the webpage are available in the website [www.lutreola.ee/stat](http://www.lutreola.ee/stat). The needed user name and password can be obtained from the foundation ([lutreola@lutreola.ee](mailto:lutreola@lutreola.ee) or [tiit.maran@tallinnlv.ee](mailto:tiit.maran@tallinnlv.ee)).

Table 16. The intensity of use of the website [www.lutreola.ee](http://www.lutreola.ee)

Summary by Month										
Month	Daily Avg				Monthly Totals					
	Hits	Files	Pages	Visits	Sites	KBytes	Visits	Pages	Files	Hits
<a href="#">Mar 2005</a>	896	700	110	47	530	142720	520	1211	7708	9866
<a href="#">Feb 2005</a>	760	626	102	47	1092	415567	1338	2866	17552	21285
<a href="#">Jan 2005</a>	766	629	104	47	1077	501992	1475	3229	19523	23769
<a href="#">Dec 2004</a>	689	559	110	48	1104	358937	1498	3437	17335	21377
<a href="#">Nov 2004</a>	741	619	90	40	1022	429520	1207	2702	18595	22248
<a href="#">Oct 2004</a>	766	629	103	38	1007	349519	1193	3207	19526	23746
<a href="#">Sep 2004</a>	612	511	92	34	963	334892	1046	2777	15335	18386
<a href="#">Aug 2004</a>	456	376	72	34	759	242113	1075	2262	11658	14162
<a href="#">Jul 2004</a>	575	489	85	41	962	321500	1287	2657	15174	17852

<a href="#">Jun 2004</a>	653	558	89	40	978	398889	1207	2698	16751	19597
<a href="#">May 2004</a>	847	683	135	46	1028	453303	1449	4193	21200	26263
<a href="#">Apr 2004</a>	1116	874	144	50	3565	516056	1525	4336	26234	33499
<b>Totals</b>						<b>4465008</b>	<b>14820</b>	<b>35575</b>	<b>206591</b>	<b>252050</b>

## 7. Organization of field actions.

The project manager has been involved in organization of field actions in Hiiumaa Island. In 2004 the organization of field activities consisted of the following actions:

- Monitoring of the status of released population.
- Live trapping of males/females and returning them back to breeding facility.
- Construction of 3 breeding enclosures in riparian biotopes in Hiiumaa Island.
- Transport of pregnant females to the breeding enclosures in Hiiumaa.
- Arrangement of feeding and husbandry of the animals in Hiiumaa.
- Arrangement of observation of the litter in Hiiumaa Island.
- Release of pregnant females:
  - Return of three wild caught females.
  - The females born in large enclosures in Tallinn Zoo.
- Release of litter:
  - Born in Tallinn Zoo.
  - Born in Hiiumaa enclosures.
- Follow-up monitoring of released animals

### Study trip to Belarus:

Two persons were participating in this study trip: Tiit Maran and Madis Põdra. The purpose of the trip was to learn new methodologies on collecting of field data on mustelids, but also to visit the study sites and to get better understanding on the status of research of this species in Belarus.

For performing this trip a permit was received from the European Commission. The trip was conducted in February 2004. Tiit Maran stayed in Belarus in 16. – 24. February 2004 and Madis Põdra in 16. – 28. February 2004. During the trip Zoological Institute of Belarus was visited to meet persons involved in studying small carnivores. Madis Põdra was studying the

methods on determining the age of the carnivores by teeth and the new methods in study of diet of small carnivores. The study trip continued with visits to two study areas in Belarus: Naliboku Pusha in central Belarus and Gorodok region in North-East of Belarus. In both areas we were learning on the ecology of small carnivores in different ecological situations: in sandy soil ecosystems and in clay soil ecosystems. We also improved our skills in identifying the different form of behavior of the animals by looking the field signs. In addition, we studied and tested also in practice the methodology for measuring the biomass of prey species for small carnivores with the focus on aquatic species.

## SUMMARY OF ACTION F1

### 1. Reporting to EU LIFE program

The reporting has been performed in accordance to the procedures laid down in administrative provision. The questions raised by Commission were replied at once after the first progress report and all needed additional clarifications or documents were provided to Commission as requested. The questions raised by Commission about the 1<sup>st</sup> Interim Reports are covered by current report and added to the report papers.

### 2. Contracting partners, assistants and subcontractors

The partners and other collaborators were contracted or subcontracted according to project documentation.

### 3. Organization of accounting

The performance of the project was accounted according to Estonian Law and the rules provided in the Administrative Provisions. For accounting purposed the bookkeeper was hired part time. The auditor was changed in the course of the project as the first auditor of the project stopped working in this field. The auditor for Foundation LUTREOLA at present is BDO Eesti Ltd (Reg. No 10309827, Estonia pst. 7, 10143 Tallinn, Estonia: Auditor Ms. Mai Ever).

Project manager personally participated in most of the actions, or at least visit all sites regularly.

### 4. Public awareness

The actions for promoting public awareness have been pretty intensive in the course of the project and, judging by the results of the study of the socio-economic contexts of the project, the public awareness on the project and the attitude to it is pretty high (look page 14). The same can be said also about the public awareness in European scale, though there is no special study to prove this with data.

### 5. Setting up and updating the homepage

The development of the project has been reflected in the webpage of foundation LUTREOLA ([www.lutreola.ee](http://www.lutreola.ee)). The technical reports as well as other written products of

the project have been made available there. This homepage continued to be one of the best sources for information on this species. In the future the format of the page is planned to be reshaped to make it more user friendly.

#### 6. Organization of field actions

The field actions has been organized as required by project documentation, but in several cases the scope of field actions has been changed, or even enhanced, depending upon the need of the overall performance of the project.

#### **Learning point from the management of the project:**

During this project the technical management and the strategic/scientific management were the responsibility of the same physical person. That resulted in the too high working load and, what is even worse, concentrating on two substantially differing tasks. No doubt, this undermined the overall performance of the project and should be avoided in the future.

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**ANNEXES**

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**ANNEX 1 – THE ENCLOSURES CONSTRUCTED IN HIIUMAA ISLAND**

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**Vilivalla enclosure**



**Armioja enclosure**



**Vanajõe enclosure  
(at the time of construction)**



**ANNEX 2 – THE ORDER OF THE MINISTRY OF THE ENVIRONMENT ON APPROVAL OF THE MANAGEMENT PLAN FOR MUSTELA LUTREOLA IN HIIUMAA ISLAND**

Rõnn  
/Linn Lemm



**KESKKONNAMINISTER**

**KÄSKKIRI**

Tallinn

20. september 2004 nr 849

**Liigi kaitse tegevuskava kinnitamine**

"Looduskaitseaduse" (RT I 2004, 38, 258) paragrahvi 49 lõike 3 alusel:

1. Kinnitan euroopa naaritsa *Mustela lutreola* kaitse tegevuskava Hiiumaal (2004-2008).
2. Keskkonnaministeeriumi looduskaitse osakonnal, Hiiumaa keskkonnateenistusel ja Hiiumaa Kaitsealade Administratsioonil arvestada punktis 1 nimetatud tegevuskava oma tööplaanide koostamisel ja ülesannete täitmiseks vajalike vahendite taotlemisel.

Villu Reiljan  
Minister

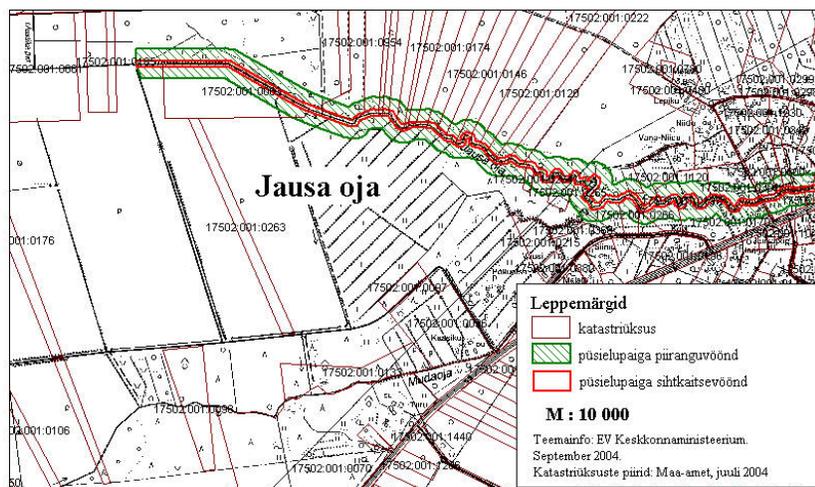
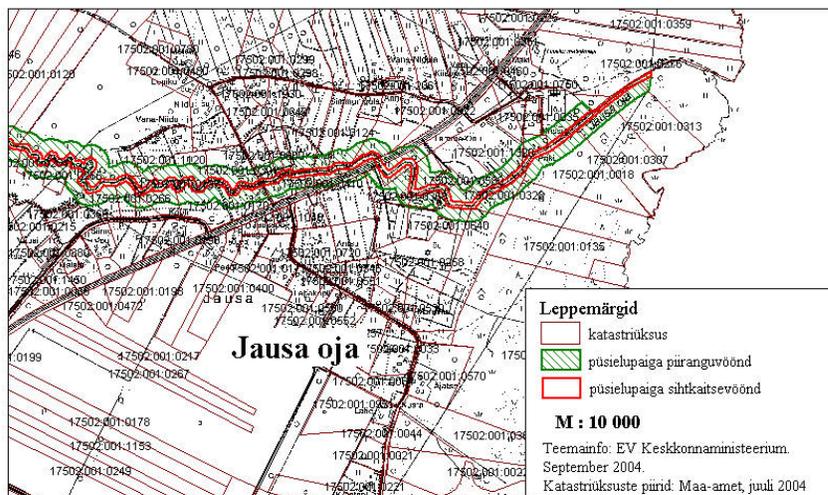
Saata: looduskaitse osakond, Keskkonnainspeksioon, Hiiumaa keskkonnateenistus, Hiiumaa Kaitsealade Administratsioon.

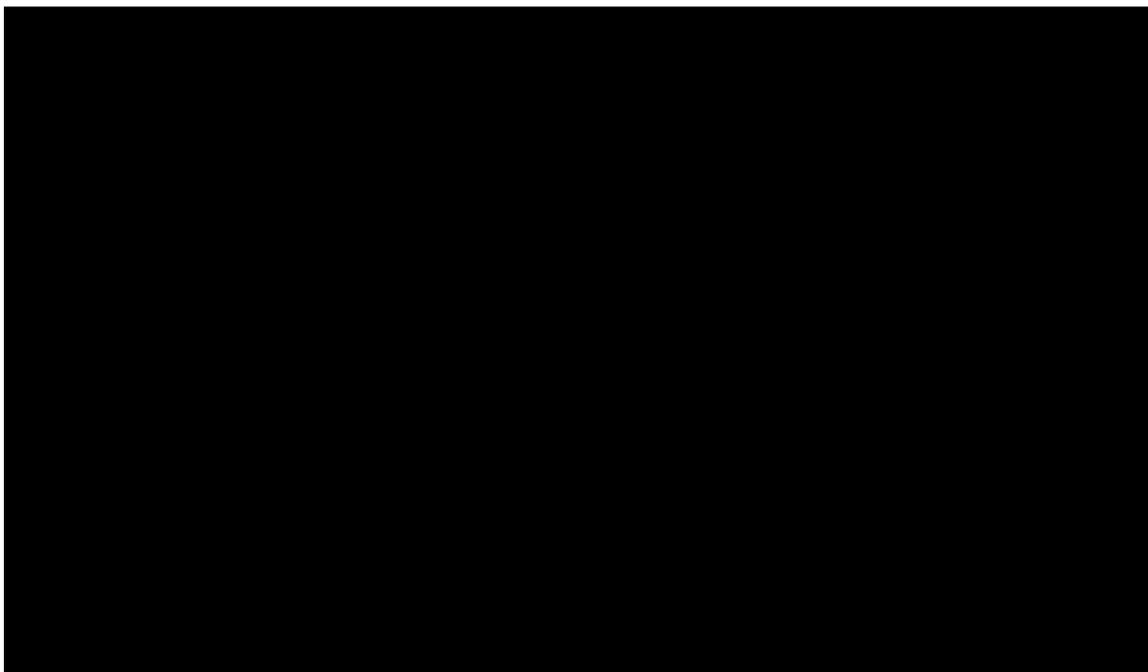
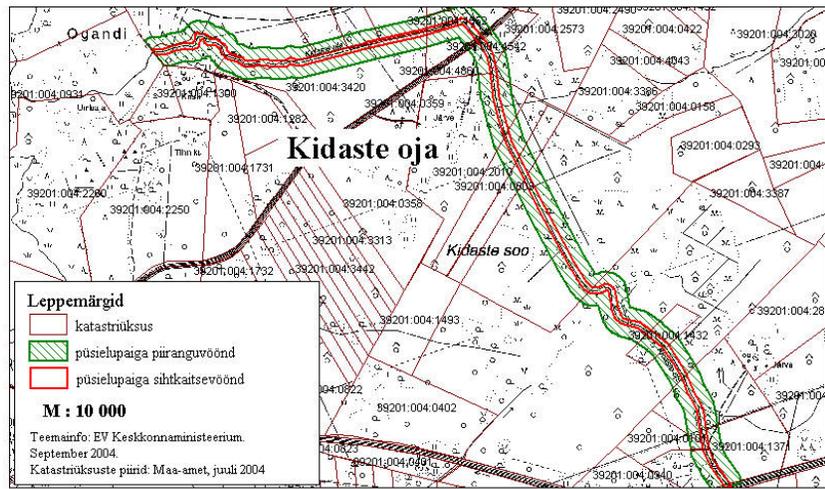
Rõnn 17.09.04  
/Linn Lemm

17.09.04

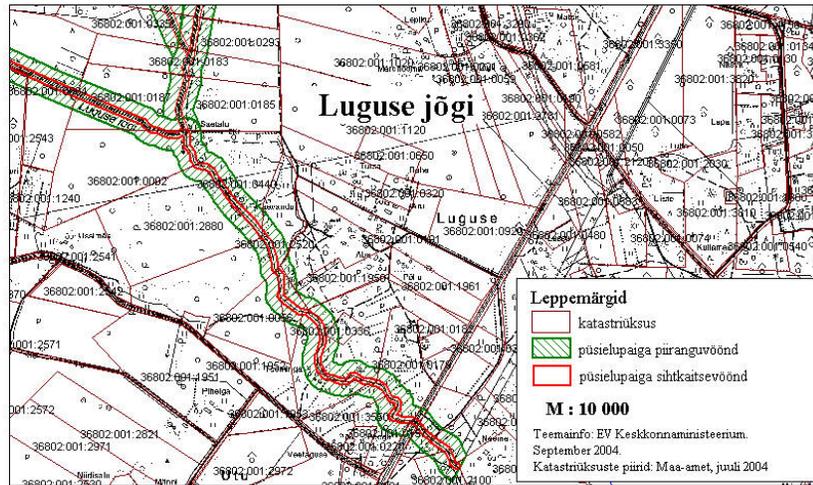
10. ETUERE  
22.09.04

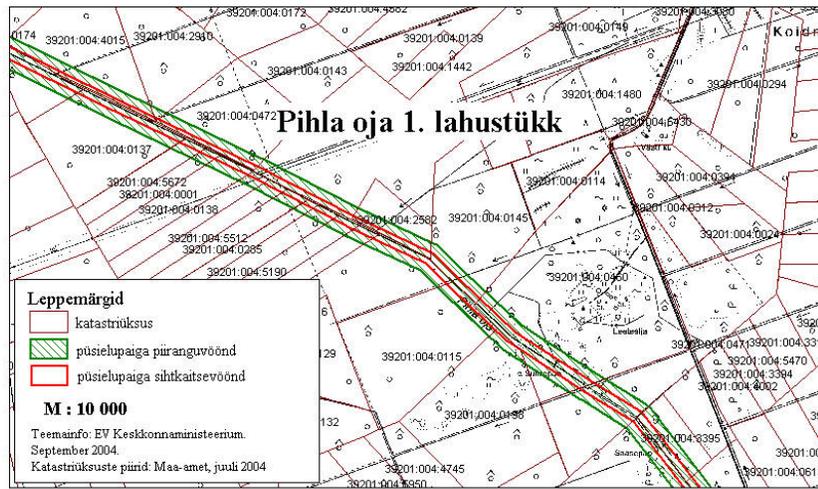
### ANNEX 3 – THE AREAS PROPOSED FOR NATURA SITES IN HIIUMAA ISLAND

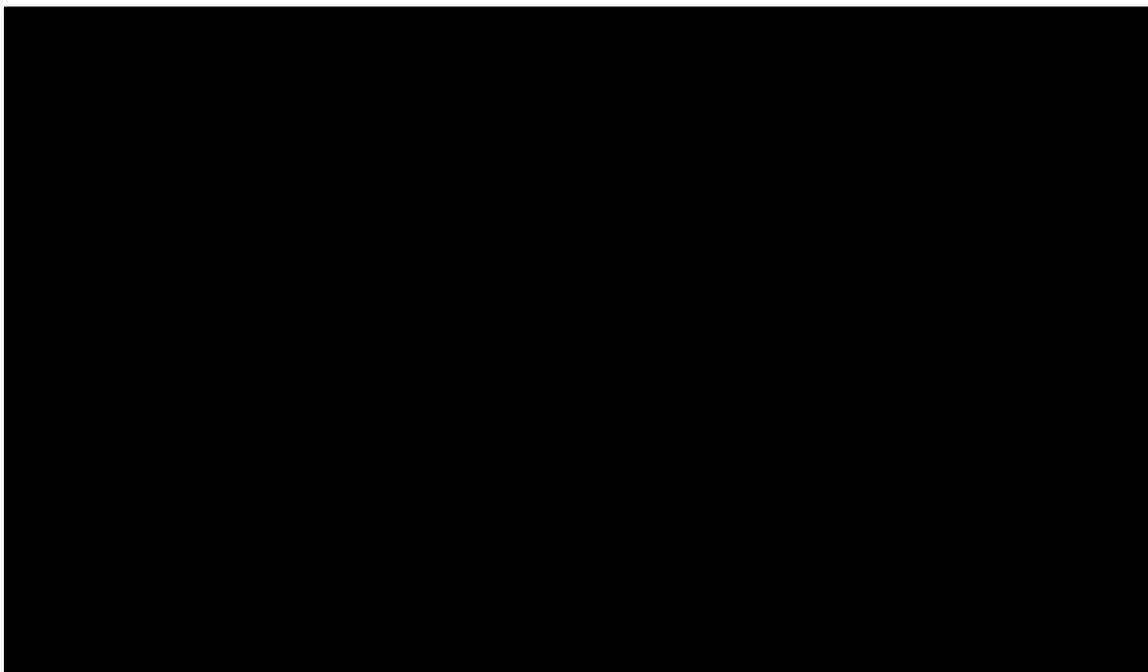
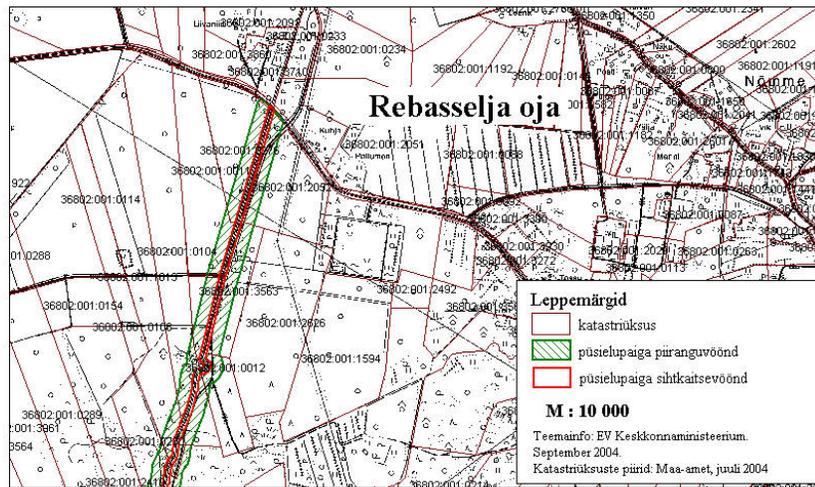


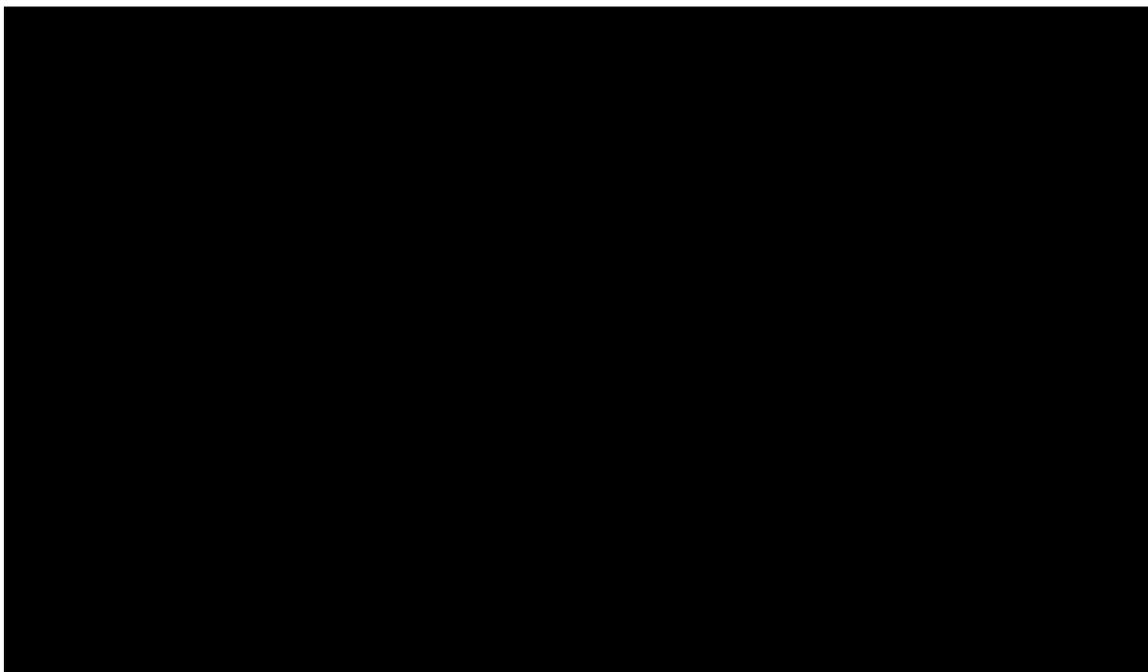
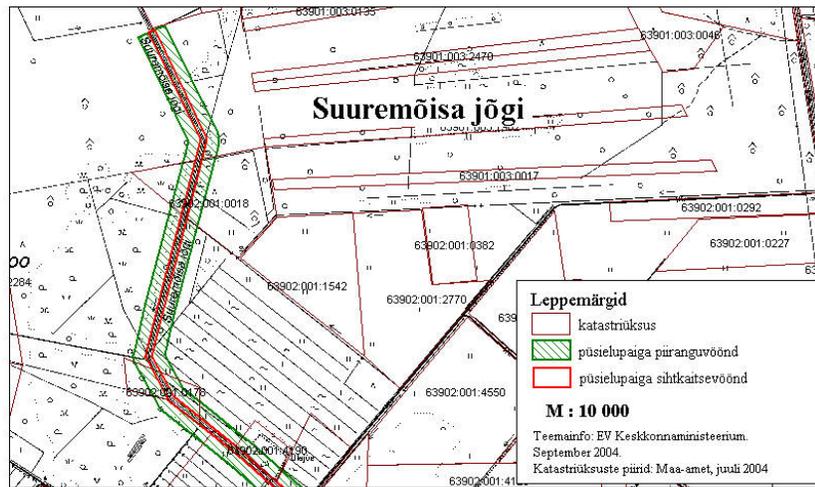


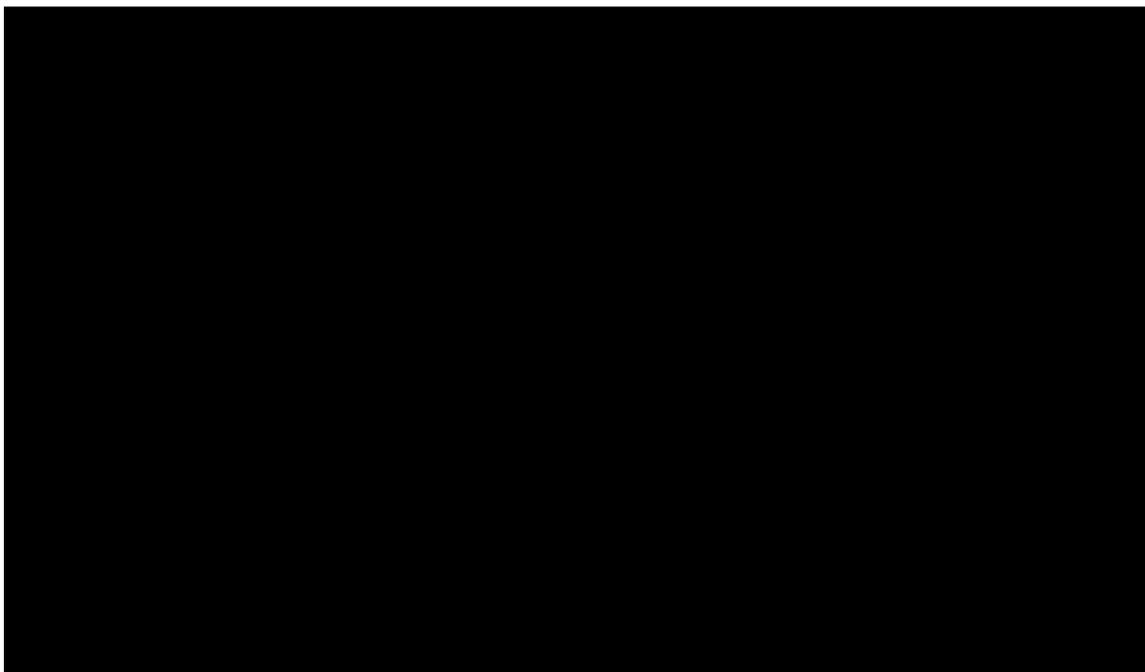
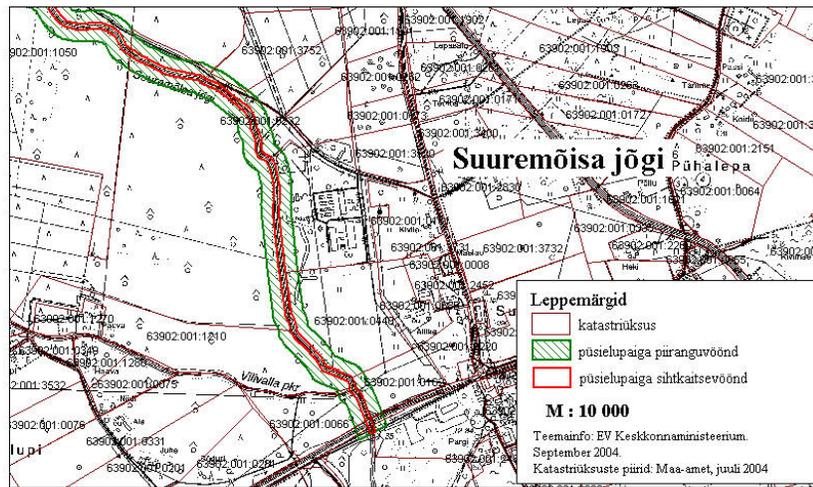


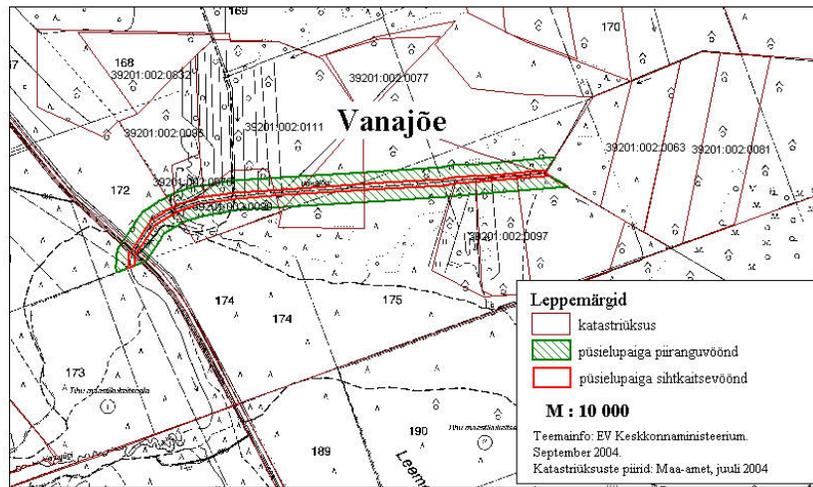












## ANNEX 4 – THE CAPTIVE POPULATION OF MUSTELA LUTREOLA IN TALLINN AS OF 03.11.2004

EUROPEAN MINK Studbook

Restricted to: (Mustela lutreola novikovi)

Locations: TALLIN /

Dates: As of 30/11/2004

Status: Living on 30 Nov 2004

Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name	Transponder #
150	F	27 May 1996	132	133	TALLIN	27 May 1996	12009	Birth	CAMILLE	00.0123.8D69
151	F	27 May 1996	132	133	TALLIN	27 May 1996	12010	Birth	NUBLU	00.0124.FA83
198	M	29 May 1997	168	150	TALLIN	29 May 1997	12415	Birth	MARCUS	00.0123.71E6
615	F	11 Jun 1998	203	167	TALLIN	11 Jun 1998	12684	Birth	FLICKA	
773	M	????	WILD	WILD	OBSHA	????	NONE	Capture	IVAN	
					TALLIN	11 Feb 2000	13234	Transfer		
775	M	????	WILD	WILD	OBSHA	????	NONE	Capture	KOLJA	
					TALLIN	11 Feb 2000	13236	Transfer		
776	M	????	WILD	WILD	OBSHA	????	NONE	Capture	VALERI	
					TALLIN	11 Feb 2000	13237	Transfer		
777	F	????	WILD	WILD	OBSHA	????	NONE	Capture	VALENTINA	
					TALLIN	11 Feb 2000	13238	Transfer		
						6 Feb 2005		Death		
778	F	????	WILD	WILD	OBSHA	????	NONE	Capture	MASHA	
					TALLIN	11 Feb 2000	13239	Transfer		
861	F	5 Jun 2000	774	583	TALLIN	5 Jun 2000	13362	Birth	MILVI	0 006 154 105
882	M	10 Jun 2000	146	167	TALLIN	10 Jun 2000	13384	Birth	NOA	0 006 318 960
883	M	10 Jun 2000	146	167	TALLIN	10 Jun 2000	13385	Birth	ULBIK	0 006 206 506
884	F	10 Jun 2000	146	167	TALLIN	10 Jun 2000	13386	Birth	NAAMA	
885	F	10 Jun 2000	146	167	TALLIN	10 Jun 2000	13387	Birth	KAKSLILL	
909	M	30 May 2001	773	834	TALLIN	30 May 2001	13893	Birth	NORRE	
915	F	3 Jun 2001	774	831	TALLIN	3 Jun 2001	13899	Birth	HIRSI	
917	F	2 Jun 2001	773	871	TALLIN	2 Jun 2001	13901	Birth	ONNE	00 0618 2F7D
					HIIUMAA F	8 May 2004		Transfer		
					TALLIN	22 Aug 2004	13901	Transfer		
920	M	2 Jun 2001	775	832	TALLIN	2 Jun 2001	13904	Birth	GABATSIJOK	
947	F	9 Jun 2001	773	853	TALLIN	9 Jun 2001	13931	Birth	MEETA	
953	M	20 Jul 2001	773	615	TALLIN	20 Jul 2001	13937	Birth	FRANK	0 006 1F7 E22
954	M	20 Jul 2001	773	615	TALLIN	20 Jul 2001	13938	Birth	FARIAN	0 006 322 051
955	F	20 Jul 2001	773	615	TALLIN	20 Jul 2001	13939	Birth	FRIIDA	
957	M	21 May 2001	902	712	POZNAN	21 May 2001	MD0458	Birth	VACLAV	
					TALLIN	27 Mar 2002	14014	Transfer		
958	M	21 May 2001	902	712	POZNAN	21 May 2001	MD0459	Birth	JAN	
					TALLIN	27 Mar 2002	14015	Transfer		
959	F	21 May 2001	902	712	POZNAN	21 May 2001	MD0460	Birth	MARIZA	
					TALLIN	27 Mar 2002	14016	Transfer		
1021	F	19 May 2002	775	910	TALLIN	19 May 2002	14325	Birth	NOSPER	00 0617 B6B4
1024	F	21 May 2002	776	939	TALLIN	21 May 2002	14328	Birth	LIEBLING	
1028	M	22 May 2002	774	959	TALLIN	22 May 2002	14332	Birth	ACHILLEUS	
1033	F	26 May 2002	775	911	TALLIN	26 May 2002	14337	Birth	RAMILDA	
1035	M	27 May 2002	774	918	TALLIN	27 May 2002	14339	Birth	SIIRIUS	
1040	F	27 May 2002	774	918	TALLIN	27 May 2002	14344	Birth	MIKI	
1045	F	30 May 2002	775	915	TALLIN	30 May 2002	14349	Birth	HELLI	
1048	M	31 May 2002	920	947	TALLIN	31 May 2002	14352	Birth	METSMEEES	00-061F-4FDA
					HIIUMAA	7 Sep 2002		Release		

FINAL REPORT - PROJECT LIFE2000/NAT/7081

“Recovery of *Mustela lutreola* in Estonia: captive and island populations”.

Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name	Transponder #
						29 Mar 2004	NONE	Capture		
					TALLIN	29 Mar 2004	14352	Transfer		
1053	F	5 Jun 2002	776	948	TALLIN	5 Jun 2002	14357	Birth	DORIS	
1054	F	5 Jun 2002	776	948	TALLIN	5 Jun 2002	14358	Birth	PEPU	
1056	F	6 Jun 2002	774	922	TALLIN	6 Jun 2002	14360	Birth	ANNIKA	
1060	F	13 Jun 2002	775	884	TALLIN	13 Jun 2002	14364	Birth	KRIISKA	
1063	F	15 Jun 2002	774	912	TALLIN	15 Jun 2002	14367	Birth	NAMI	
1064	F	15 Jun 2002	774	912	TALLIN	15 Jun 2002	14368	Birth	MOPP	
1073	F	18 Jun 2002	773	871	TALLIN	18 Jun 2002	14377	Birth	GEMMA	
1074	M	25 Jun 2002	774	777	TALLIN	25 Jun 2002	14378	Birth	VAL	
1075	M	25 Jun 2002	774	777	TALLIN	25 Jun 2002	14379	Birth	VŽRDI	
1076	M	25 Jun 2002	774	777	TALLIN	25 Jun 2002	14380	Birth	VERN	
1077	F	25 Jun 2002	774	777	TALLIN	25 Jun 2002	14381	Birth	VELLA	
1078	M	20 May 2002	902	712	POZNAN	20 May 2002	MD0491	Birth	ZLOTT	
					TALLIN	29 Mar 2003	14573	Transfer		
1082	M	10 Jun 2002	902	931	POZNAN	10 Jun 2002	MD0495	Birth	POOLA	
					TALLIN	29 Mar 2003	14574	Transfer		
1261	M	9 May 2003	775	959	TALLIN	9 May 2003	14883	Birth	SIIM	
1268	F	22 May 2003	775	1073	TALLIN	22 May 2003	14890	Birth	KELPI	
1269	M	24 May 2003	776	1077	TALLIN	24 May 2003	14891	Birth	VOLDEMAR	
1270	M	24 May 2003	776	1077	TALLIN	24 May 2003	14892	Birth	RAMI	
1271	M	24 May 2003	776	1077	TALLIN	24 May 2003	14893	Birth	AGNUS	
1272	F	24 May 2003	776	1077	TALLIN	24 May 2003	14894	Birth	HILDIS	
1273	F	24 May 2003	776	1077	TALLIN	24 May 2003	14895	Birth	VEDA	
1274	F	24 May 2003	776	1077	TALLIN	24 May 2003	14896	Birth	VIIU	
1290	F	2 Jun 2003	776	885	TALLIN	2 Jun 2003	14912	Birth	TUHAT	
1293	F	4 Jun 2003	1028	955	TALLIN	4 Jun 2003	14915	Birth	AIRI	
1294	F	4 Jun 2003	1028	955	TALLIN	4 Jun 2003	14916	Birth	FLORA	
1295	F	4 Jun 2003	1028	955	TALLIN	4 Jun 2003	14917	Birth	FIORELLA	
1296	F	6 Jun 2003	168	605	TALLIN	6 Jun 2003	14918	Birth	RETI	
1297	F	6 Jun 2003	168	605	TALLIN	6 Jun 2003	14919	Birth	RAASIKE	
1302	F	7 Jun 2003	776	615	TALLIN	7 Jun 2003	14936	Birth	MEELI	
1303	F	7 Jun 2003	776	615	TALLIN	7 Jun 2003	14937	Birth	MAARA	
1304	F	11 Jun 2003	1028	884	TALLIN	11 Jun 2003	14938	Birth	KARLUTT	
1307	F	12 Jun 2003	775	208	TALLIN	12 Jun 2003	14941	Birth	GRETE	
1308	M	11 Jun 2003	773	778	TALLIN	11 Jun 2003	14942	Birth	MAGUN	
1309	M	11 Jun 2003	773	778	TALLIN	11 Jun 2003	14943	Birth	STROH	
1310	F	11 Jun 2003	773	778	TALLIN	11 Jun 2003	14944	Birth	MOON	
1311	F	11 Jun 2003	773	778	TALLIN	11 Jun 2003	14945	Birth	BRANDI	
1312	M	13 Jun 2003	776	777	TALLIN	13 Jun 2003	14946	Birth	KRATT	
1316	F	22 Jun 2003	1075	917	TALLIN	22 Jun 2003	14950	Birth	SÅSTAR	
1317	F	22 Jun 2003	1075	917	TALLIN	22 Jun 2003	14951	Birth	MAASIKAS	
1343	M	8 May 2004	773	959	TALLIN	8 May 2004	15337	Birth	KASPAR	
1346	F	8 May 2004	773	959	TALLIN	8 May 2004	15340	Birth	KLAARA	
1347	F	8 May 2004	773	959	TALLIN	8 May 2004	15341	Birth	KRIKU	
1359	F	21 May 2004	775	885	TALLIN	21 May 2004	15353	Birth	LUMELILL	
1360	F	21 May 2004	775	885	TALLIN	21 May 2004	15354	Birth	PILLE-LILL	
1361	M	22 May 2004	168	1033	TALLIN	22 May 2004	15355	Birth	MAURUS	
1362	F	22 May 2004	168	1033	TALLIN	22 May 2004	15356	Birth	SPUNK	
1363	F	22 May 2004	168	1033	TALLIN	22 May 2004	15357	Birth	TEQUILA	
1364	F	22 May 2004	168	1033	TALLIN	22 May 2004	15358	Birth	RUFFINA	
1370	M	26 May 2004	776	615	TALLIN	26 May 2004	15364	Birth	FALCK	
1373	F	26 May 2004	776	615	TALLIN	26 May 2004	15367	Birth	ITI	
1380	M	27 May 2004	1308	1077	TALLIN	27 May 2004	15374	Birth	TOIVO	00061F8A1F

FINAL REPORT - PROJECT LIFE2000/NAT/7081

"Recovery of *Mustela lutreola* in Estonia: captive and island populations".

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=====
Stud # | Sex | Birth Date | Sire | Dam | Location | Date | Local ID | Event | Name | Transponder # |
=====
1390  F  27 May 2004  775  1310 TALLIN  27 May 2004  15384  Birth  MUMMUKE
1391  M  1 Jun 2004  920  1294 TALLIN  1 Jun 2004  15385  Birth  FOLK      00061FAB4A
1400  F  3 Jun 2004  1075  884  TALLIN  3 Jun 2004  15394  Birth  LŠŠRA
1401  F  3 Jun 2004  1075  884  TALLIN  3 Jun 2004  15395  Birth  GUSLI
1402  F  3 Jun 2004  1075  884  TALLIN  3 Jun 2004  15396  Birth  GRITA
1403  F  3 Jun 2004  1075  884  TALLIN  3 Jun 2004  15397  Birth  NIOBE
1404  M  3 Jun 2004  1269  1073 TALLIN  3 Jun 2004  15398  Birth  GEO      00061FEE4F
1407  M  4 Jun 2004  775  778  TALLIN  4 Jun 2004  15401  Birth  TRIIP
1408  M  4 Jun 2004  775  778  TALLIN  4 Jun 2004  15402  Birth  HAÕIS
1409  M  4 Jun 2004  775  778  TALLIN  4 Jun 2004  15403  Birth  KOKA
1410  F  4 Jun 2004  775  778  TALLIN  4 Jun 2004  15404  Birth  ECSTASY
1414  M  5 Jun 2004  1271  947  TALLIN  5 Jun 2004  15408  Birth  M*RK     0006133FDE
1416  M  11 Jun 2004  1309  1045 TALLIN  11 Jun 2004  15410  Birth  JOHN
1417  M  11 Jun 2004  1309  1045 TALLIN  11 Jun 2004  15411  Birth  GEORG
1418  M  11 Jun 2004  1309  1045 TALLIN  11 Jun 2004  15412  Birth  PAUL
1419  M  11 Jun 2004  1309  1045 TALLIN  11 Jun 2004  15413  Birth  BRIAN
1420  M  11 Jun 2004  1309  1045 TALLIN  11 Jun 2004  15414  Birth  RINGO
1424  M  ~21 May 2004  909  1267 HIIUMAA F ~21 May 2004  15455  Birth  VILLIVOLLI
      TALLIN  22 Aug 2004  15455  Transfer
1427  M  ~21 May 2004  1075  917 HIIUMAA F ~21 May 2004  15458  Birth  VÄITUR
      TALLIN  22 Aug 2004  15458  Transfer
1428  M  ~21 May 2004  1075  917 HIIUMAA F ~21 May 2004  15459  Birth  VAPSIK
      TALLIN  22 Aug 2004  15459  Transfer
1432  M  ~31 May 2004  775  1289 HIIUMAA F ~31 May 2004  15463  Birth  ARMI
      TALLIN  22 Aug 2004  15463  Transfer
=====
TOTALS: 46.58.0 (104)

```

Compiled by: Tiit Maran thru Tallinn Zoo  
 Data current thru: 1 Jan 2005 foundation "Lutreola" - EEP  
 Printed using Sparks v1.52

## ANNEX 5 – TRANSFER OF INDIVIDUALS FROM TALLINN FACILITY TO EURONERZ (GERMANY) IN AUGUST 2005

Restricted to: EUROPEAN MINK Studbook Page 1  
(*Mustela lutreola novikovi*)  
Locations: EURONERZ /  
Dates: Between 01/01/2004 and 01/01/2005  
Event: Transfers

Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name	Transponder #
1348	M	16 May 2004	920	955	TALLIN EURONERZ	16 May 2004 7 Aug 2004	15342 M224	Birth Transfer		00-066C-559D
1349	M	16 May 2004	920	955	TALLIN EURONERZ	16 May 2004 7 Aug 2004	15343 M225	Birth Transfer		00-0670-F124
1350	M	16 May 2004	920	955	TALLIN EURONERZ	16 May 2004 7 Aug 2004	15344 M226	Birth Transfer		00-0670-D2FB
1351	F	16 May 2004	920	955	TALLIN EURONERZ	16 May 2004 7 Aug 2004	15345 F227	Birth Transfer		00-0670-D044
1352	M	19 May 2004	1028	1021	TALLIN EURONERZ	19 May 2004 7 Aug 2004	15346 M252	Birth Transfer		
1353	M	19 May 2004	1028	1021	TALLIN EURONERZ	19 May 2004 7 Aug 2004 ~ Sep 2004	15347 M253	Birth Transfer Death		
1354	F	19 May 2004	1028	1021	TALLIN EURONERZ	19 May 2004 7 Aug 2004 ~ Sep 2004	15348 F254	Birth Transfer Death		
1355	F	19 May 2004	1028	1021	TALLIN EURONERZ	19 May 2004 7 Aug 2004 8 Dec 2004	15349 F255	Birth Transfer Death		
1356	M	21 May 2004	775	885	TALLIN EURONERZ	21 May 2004 7 Aug 2004	15350 M232	Birth Transfer		00-0670-0800
1357	F	21 May 2004	775	885	TALLIN EURONERZ	21 May 2004 7 Aug 2004	15351 F233	Birth Transfer		00-0670-FC7F
1358	F	21 May 2004	775	885	TALLIN EURONERZ	21 May 2004 7 Aug 2004	15352 F234	Birth Transfer		00-0670-03AA
1365	M	25 May 2004	1035	1307	TALLIN EURONERZ GERMANY	25 May 2004 7 Aug 2004 ~ Oct 2004	15359 M256	Birth Transfer Release	ltf	
1366	F	25 May 2004	1035	1307	TALLIN EURONERZ	25 May 2004 7 Aug 2004	15360 F241	Birth Transfer		00-066C-BB21
1367	F	25 May 2004	1035	1307	TALLIN EURONERZ	25 May 2004 7 Aug 2004	15361 F242	Birth Transfer		00-066C-15BD
1368	F	25 May 2004	1035	1307	TALLIN EURONERZ	25 May 2004 7 Aug 2004	15362 F243	Birth Transfer		00-0670-F28A
1369	F	25 May 2004	1035	1307	TALLIN EURONERZ	25 May 2004 7 Aug 2004	15363 F244	Birth Transfer		00-066C-4A8E

FINAL REPORT - PROJECT LIFE2000/NAT/7081

"Recovery of *Mustela lutreola* in Estonia: captive and island populations".

Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name	Transponder #
1376	M	27 May 2004	773	1056	TALLIN EURONERZ	27 May 2004 7 Aug 2004	15370 M249	Birth Transfer		00-066C-95A8
1377	M	27 May 2004	773	1056	TALLIN EURONERZ	27 May 2004 7 Aug 2004	15371 M250	Birth Transfer		00-066F-E0D7
1378	M	27 May 2004	773	1056	TALLIN EURONERZ	27 May 2004 7 Aug 2004	15372 M251	Birth Transfer		00-066C-5307
1379	F	27 May 2004	773	1056	TALLIN EURONERZ	27 May 2004 7 Aug 2004	15373 F248	Birth Transfer		00-066C-2283
1386	M	27 May 2004	775	1310	TALLIN EURONERZ	27 May 2004 7 Aug 2004	15380 M228	Birth Transfer		00-066C-2071
1387	M	27 May 2004	775	1310	TALLIN EURONERZ	27 May 2004 7 Aug 2004	15381 M229	Birth Transfer		00-066C-1902
1388	M	27 May 2004	775	1310	TALLIN EURONERZ	27 May 2004 7 Aug 2004	15382 M231	Birth Transfer		00-066C-IDD8
1389	F	27 May 2004	775	1310	TALLIN EURONERZ	27 May 2004 7 Aug 2004	15383 F230	Birth Transfer		00-066C-4581

TOTALS: 13.11.0 (24)

Compiled by: Tiit Maran thru Tallinn Zoo  
 Data current thru: 1 Jan 2005 foundation "Lutreola" - EEP  
 Printed on 3 Mar 2005 using Sparks v1.52

## ANNEX 6 – THE BIRTH OF *MUSTELA LUTREOLA* IN THE COURSE OF CONSERVATION BREEDING DURING THE PROJECT

EUROPEAN MINK Studbook Page 1  
 Restricted to: (Mustela lutreola novikovi)  
 Locations: TALLIN /ESTONIA /  
 Dates: Between 01/01/2002 and 30/11/2004  
 Event: Births

Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name	Transponder#
1016	M	19 May 2002	775	910	TALLIN	19 May 2002	14320	Birth		00 0618 1960
					HIIUMAA	7 Sep 2002	_____	ltf Release		
1017	F	19 May 2002	775	910	TALLIN	19 May 2002	14321	Birth		00 0618 4953
					HIIUMAA	7 Sep 2002	_____	ltf Release		
1018	F	19 May 2002	775	910	TALLIN	19 May 2002	14322	Birth		00 0617 7D38
					HIIUMAA	7 Sep 2002	_____	Release		
						16 Dec 2003	NONE	Capture		
					TALLIN	18 Dec 2003	14322	Transfer		
					HIIUMAA	26 Apr 2004	_____	ltf Release		
1019	F	19 May 2002	775	910	TALLIN	19 May 2002	14323	Birth		00 061F 65E2
					HIIUMAA	7 Sep 2002	_____	ltf Release		
1020	F	19 May 2002	775	910	TALLIN	19 May 2002	14324	Birth		00 0613 3D6D
					HIIUMAA	7 Sep 2002	_____	ltf Release		
1021	F	19 May 2002	775	910	TALLIN	19 May 2002	14325	Birth	NOSPER	00 0617 B6B4
1022	M	21 May 2002	776	939	TALLIN	21 May 2002	14326	Birth	ZAGREB	
					ESTONIA	16 Jun 2004	_____	Release		
1023	F	21 May 2002	776	939	TALLIN	21 May 2002	14327	Birth	TAISI	00-060F-74FA
					EURONERZ	6 Mar 2003	F179	Transfer		
1024	F	21 May 2002	776	939	TALLIN	21 May 2002	14328	Birth	LIEBLING	
1025	F	21 May 2002	776	939	TALLIN	21 May 2002	14329	Birth	SULLI	00-0615-4476
					HIIUMAA	21 Apr 2003	_____	Release		
1026	M	22 May 2002	774	959	TALLIN	22 May 2002	14330	Birth	AGAMEMNON	
					ESTONIA	11 Jul 2004	_____	Release		
1027	M	22 May 2002	774	959	TALLIN	22 May 2002	14331	Birth	HERAKLES0-006-1FF-0FC	
					HIIUMAA	4 Sep 2003	_____	Release		
1028	M	22 May 2002	774	959	TALLIN	22 May 2002	14332	Birth	ACHILLEUS	
1029	F	22 May 2002	774	959	TALLIN	22 May 2002	14333	Birth		
						24 Jun 2002		Death		
1030	M	26 May 2002	775	911	TALLIN	26 May 2002	14334	Birth	TIIT	0001D1FD1B
					HELSINKI	4 Oct 2002	202274	Transfer		
1031	M	26 May 2002	775	911	TALLIN	26 May 2002	14335	Birth		00 0615 2EA0
					HIIUMAA	7 Sep 2002	_____	ltf Release		
1032	M	26 May 2002	775	911	TALLIN	26 May 2002	14336	Birth	PITSU	
					HELSINKI	23 Oct 2003	203184	Transfer		
1033	F	26 May 2002	775	911	TALLIN	26 May 2002	14337	Birth	RAMILDA	

FINAL REPORT - PROJECT LIFE2000/NAT/7081

“Recovery of *Mustela lutreola* in Estonia: captive and island populations”.

Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name	Transponder#
1034	F	26 May 2002	775	911	TALLIN	26 May 2002	14338	Birth		
						~ Sep 2002		ltf Transfer		
1035	M	27 May 2002	774	918	TALLIN	27 May 2002	14339	Birth	SIIRIUS	
1036	F	27 May 2002	774	918	TALLIN	27 May 2002	14340	Birth	SEMEELE	00-060F-0E18
					EURONERZ	6 Mar 2003	F180	Transfer		
1037	?	27 May 2002	774	918	TALLIN	27 May 2002	14341	Birth		
						27 Jun 2002		Death		
1038	?	27 May 2002	774	918	TALLIN	27 May 2002	14342	Birth		
						27 Jun 2002		Death		
1039	?	27 May 2002	774	918	TALLIN	27 May 2002	14343	Birth		
						1 Jul 2002		Death		
1040	F	27 May 2002	774	918	TALLIN	27 May 2002	14344	Birth	MIKI	
1041	M	30 May 2002	775	915	TALLIN	30 May 2002	14345	Birth	VIP	0 006 206 929
						1 Sep 2004		Death		
1042	M	30 May 2002	775	915	TALLIN	30 May 2002	14346	Birth	HINDRIK	
					ESTONIA	11 Jul 2004		Release		
1043	M	30 May 2002	775	915	TALLIN	30 May 2002	14347	Birth	HADES	00-061F-7F39
					HIIUMAA	29 May 2003		Release		
1044	M	30 May 2002	775	915	TALLIN	30 May 2002	14348	Birth	HORROR	00-0621-4827
					HIIUMAA	29 May 2003		Release		
1045	F	30 May 2002	775	915	TALLIN	30 May 2002	14349	Birth	HELLI	
1046	M	31 May 2002	920	947	TALLIN	31 May 2002	14350	Birth		00 061F 5FAD
					HIIUMAA	7 Sep 2002		ltf Release		
1047	M	31 May 2002	920	947	TALLIN	31 May 2002	14351	Birth		00 0615 3E77
					HIIUMAA	7 Sep 2002		ltf Release		
1048	M	31 May 2002	920	947	TALLIN	31 May 2002	14352	Birth	METSMEEES00-061F-4FDA	
					HIIUMAA	7 Sep 2002		Release		
						29 Mar 2004	NONE	Capture		
					TALLIN	29 Mar 2004	14352	Transfer		
1049	F	31 May 2002	920	947	TALLIN	31 May 2002	14353	Birth		00 061F 60C2
					HIIUMAA	7 Sep 2002		ltf Release		
1050	F	31 May 2002	920	947	TALLIN	31 May 2002	14354	Birth		
						4 Sep 2002		Death		
1051	M	5 Jun 2002	776	948	TALLIN	5 Jun 2002	14355	Birth	DON	00-0618-4B71
					HIIUMAA	29 May 2003		Release		
1052	F	5 Jun 2002	776	948	TALLIN	5 Jun 2002	14356	Birth	MILLA	00-0620-45AE
					HIIUMAA	16 May 2003		Release		
1053	F	5 Jun 2002	776	948	TALLIN	5 Jun 2002	14357	Birth	DORIS	
1054	F	5 Jun 2002	776	948	TALLIN	5 Jun 2002	14358	Birth	PEPU	
1055	M	6 Jun 2002	774	922	TALLIN	6 Jun 2002	14359	Birth	AADU	
					ESTONIA	16 Jun 2004		Release		
1056	F	6 Jun 2002	774	922	TALLIN	6 Jun 2002	14360	Birth	ANNIKA	
1057	M	13 Jun 2002	775	884	TALLIN	13 Jun 2002	14361	Birth	RIPPER	00-0621-4EC1
					HIIUMAA	4 May 2003		Release		
1058	M	13 Jun 2002	775	884	TALLIN	13 Jun 2002	14362	Birth	LEO	00-060F4B05

FINAL REPORT - PROJECT LIFE2000/NAT/7081

“Recovery of *Mustela lutreola* in Estonia: captive and island populations”.

Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name	Transponder#
1059	F	13 Jun 2002	775	884	EURONERZ TALLIN	6 Mar 2003 13 Jun 2002	M183 14363	Transfer Birth	LEONELLA00-0600-820F	
					EURONERZ	6 Mar 2003	F178	Transfer		
						6 Aug 2004		Death		
1060	F	13 Jun 2002	775	884	TALLIN	13 Jun 2002	14364	Birth	KRIISKA	
1061	F	15 Jun 2002	774	912	TALLIN	15 Jun 2002	14365	Birth	NATUKE	00-0620-2F62
					HIIUMAA	16 May 2003	_____	Release		
1062	F	15 Jun 2002	774	912	TALLIN	15 Jun 2002	14366	Birth	SOLEDAD	00-060F-1210
					EURONERZ	6 Mar 2003	F182	Transfer		
1063	F	15 Jun 2002	774	912	TALLIN	15 Jun 2002	14367	Birth	NAMI	
1064	F	15 Jun 2002	774	912	TALLIN	15 Jun 2002	14368	Birth	MOPP	
1065	F	15 Jun 2002	774	912	TALLIN	15 Jun 2002	14369	Birth	VIKAT	00-0620-1490
					HIIUMAA	16 May 2003	_____	Release		
1066	M	15 Jun 2002	775	885	TALLIN	15 Jun 2002	14370	Birth	KAKS	0 006 212 B95
					ESTONIA	11 Jul 2004	_____	Release		
1067	F	15 Jun 2002	775	885	TALLIN	15 Jun 2002	14371	Birth	LILL	
					POZNAN	6 Mar 2003	MD0514	Transfer		
1068	F	15 Jun 2002	775	885	TALLIN	15 Jun 2002	14372	Birth	LUUNA	00-061F-91A0
					HIIUMAA	21 Apr 2003	_____	Release		
1069	F	15 Jun 2002	775	885	TALLIN	15 Jun 2002	14373	Birth	VEEGA	00-060F-40A2
					EURONERZ	6 Mar 2003	F181	Transfer		
						24 Dec 2004		Death		
1070	M	18 Jun 2002	773	871	TALLIN	18 Jun 2002	14374	Birth		00 0617 DA17
					HIIUMAA	16 Sep 2002	_____	lrf Release		
1071	M	18 Jun 2002	773	871	TALLIN	18 Jun 2002	14375	Birth		00 0615 2F4B
					HIIUMAA	16 Sep 2002	_____	lrf Release		
1072	M	18 Jun 2002	773	871	TALLIN	18 Jun 2002	14376	Birth	NILS	00-0097-0606
					EURONERZ	6 Mar 2003	M185	Transfer		
1073	F	18 Jun 2002	773	871	TALLIN	18 Jun 2002	14377	Birth	GEMMA	
1074	M	25 Jun 2002	774	777	TALLIN	25 Jun 2002	14378	Birth	VAL	
1075	M	25 Jun 2002	774	777	TALLIN	25 Jun 2002	14379	Birth	VILDI	
1076	M	25 Jun 2002	774	777	TALLIN	25 Jun 2002	14380	Birth	VERN	
1077	F	25 Jun 2002	774	777	TALLIN	25 Jun 2002	14381	Birth	VELLA	
1261	M	9 May 2003	775	959	TALLIN	9 May 2003	14883	Birth	SIIM	
1262	M	9 May 2003	775	959	TALLIN	9 May 2003	14884	Birth	MURKEL	
					ESTONIA	11 Jul 2004	_____	Release		
1263	M	9 May 2003	775	959	TALLIN	9 May 2003	14885	Birth	SOSSIM	
					ESTONIA	11 Jul 2004	_____	Release		
1264	M	22 May 2003	775	1073	TALLIN	22 May 2003	14886	Birth	DONT	
					ESTONIA	11 Jul 2004	_____	Release		
1265	M	22 May 2003	775	1073	TALLIN	22 May 2003	14887	Birth	SEDRIK	
					ESTONIA	16 Jun 2004	_____	Release		
1266	F	22 May 2003	775	1073	TALLIN	22 May 2003	14888	Birth	GISELA	00 0621 59DC
					HIIUMAA	8 May 2004	_____	Release		
1267	F	22 May 2003	775	1073	TALLIN	22 May 2003	14889	Birth	GREDEL	00 0618 1991
					HIIUMAA F	8 May 2004	_____	Transfer		

FINAL REPORT - PROJECT LIFE2000/NAT/7081

“Recovery of *Mustela lutreola* in Estonia: captive and island populations”.

Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name	Transponder#
					HIIUMAA	~15 Jul 2004	1267	Release		
1268	F	22 May 2003	775	1073	TALLIN	22 May 2003	14890	Birth	KELPI	
1269	M	24 May 2003	776	1077	TALLIN	24 May 2003	14891	Birth	VOLDEMAR	
1270	M	24 May 2003	776	1077	TALLIN	24 May 2003	14892	Birth	RAMI	
1271	M	24 May 2003	776	1077	TALLIN	24 May 2003	14893	Birth	AGNUS	
1272	F	24 May 2003	776	1077	TALLIN	24 May 2003	14894	Birth	HILDIS	
1273	F	24 May 2003	776	1077	TALLIN	24 May 2003	14895	Birth	VEDA	
1274	F	24 May 2003	776	1077	TALLIN	24 May 2003	14896	Birth	VIIU	
1275	M	26 May 2003	775	1040	TALLIN	26 May 2003	14897	Birth		0-006-31B-E20
					HIIUMAA	4 Sep 2003	_____	Release		
						7 Apr 2004	NONE	Capture		
						7 Apr 2004	_____	Release		
1276	M	26 May 2003	775	1040	TALLIN	26 May 2003	14898	Birth		0-006-202-FBB
					HIIUMAA	4 Sep 2003	_____	Release		
1277	F	26 May 2003	775	1040	TALLIN	26 May 2003	14899	Birth		00-0621029C4
					HIIUMAA	26 Aug 2003	_____	Release		
1278	F	26 May 2003	775	1040	TALLIN	26 May 2003	14900	Birth		0-006-31D-D7A
					HIIUMAA	4 Sep 2003	_____	Release		
						8 Dec 2003	NONE	Capture		
					TALLIN	8 Dec 2003	14900	Transfer		
					HIIUMAA	17 May 2004	_____	Release		
1279	M	28 May 2003	775	1054	TALLIN	28 May 2003	14901	Birth		00 0621 4F2F
					HIIUMAA	26 Aug 2003	_____	Release		
1280	F	28 May 2003	775	1054	TALLIN	28 May 2003	14902	Birth		0 006 201 9A3
					HIIUMAA	4 Sep 2003	_____	Release		
1281	F	28 May 2003	775	1054	TALLIN	28 May 2003	14903	Birth		00-006-202-BBF
					HIIUMAA	4 Sep 2003	_____	Release		
1282	F	28 May 2003	775	1054	TALLIN	28 May 2003	14904	Birth		0-006-1FB-21D
					HIIUMAA	4 Sep 2003	_____	Release		
1283	F	28 May 2003	775	1054	TALLIN	28 May 2003	14905	Birth		0-006-203-26A
					HIIUMAA	4 Sep 2003	_____	Release		
1284	F	28 May 2003	775	1054	TALLIN	28 May 2003	14906	Birth	FANTOOM	00-0621-4ED5
					HIIUMAA	8 May 2004	_____	Release		
1285	M	2 Jun 2003	776	885	TALLIN	2 Jun 2003	14907	Birth		0-006-214-3EF
					HIIUMAA	26 Aug 2003	_____	Release		
1286	M	2 Jun 2003	776	885	TALLIN	2 Jun 2003	14908	Birth		0-00-1FB-340
					HIIUMAA	26 Aug 2003	_____	Release		
1287	M	2 Jun 2003	776	885	TALLIN	2 Jun 2003	14909	Birth	SAMM	
					ESTONIA	16 Jun 2004	_____	Release		
1288	F	2 Jun 2003	776	885	TALLIN	2 Jun 2003	14910	Birth	LOORA	00 0621 2C20
					HIIUMAA	8 May 2004	_____	Release		
1289	F	2 Jun 2003	776	885	TALLIN	2 Jun 2003	14911	Birth	SADA	00 061F 72EA
					HIIUMAA F	17 May 2004	_____	Transfer		
					HIIUMAA	22 Aug 2004	1289	Release		
1290	F	2 Jun 2003	776	885	TALLIN	2 Jun 2003	14912	Birth	TUHAT	
1291	M	4 Jun 2003	1028	955	TALLIN	4 Jun 2003	14913	Birth	FRODO	

FINAL REPORT - PROJECT LIFE2000/NAT/7081

“Recovery of *Mustela lutreola* in Estonia: captive and island populations”.

Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name	Transponder#
					ESTONIA	16 Jun 2004		Release		
1292	M	4 Jun 2003	1028	955	TALLIN	4 Jun 2003	14914	Birth	FOX	
					ESTONIA	16 Jun 2004		Release		
1293	F	4 Jun 2003	1028	955	TALLIN	4 Jun 2003	14915	Birth	AIRI	
1294	F	4 Jun 2003	1028	955	TALLIN	4 Jun 2003	14916	Birth	FLORA	
1295	F	4 Jun 2003	1028	955	TALLIN	4 Jun 2003	14917	Birth	FIGURELLA	
1296	F	6 Jun 2003	168	605	TALLIN	6 Jun 2003	14918	Birth	RETI	
1297	F	6 Jun 2003	168	605	TALLIN	6 Jun 2003	14919	Birth	RAASIKE	
1298	M	7 Jun 2003	776	615	TALLIN	7 Jun 2003	14920	Birth		
						10 Jul 2003		Death		
1299	M	7 Jun 2003	776	615	TALLIN	7 Jun 2003	14933	Birth	IPO	
					ESTONIA	16 Jun 2004		Release		
1300	M	7 Jun 2003	776	615	TALLIN	7 Jun 2003	14934	Birth	EIK	
					ESTONIA	16 Jun 2004		Release		
1301	M	7 Jun 2003	776	615	TALLIN	7 Jun 2003	14935	Birth	BIRK	
					ESTONIA	16 Jun 2004		Release		
1302	F	7 Jun 2003	776	615	TALLIN	7 Jun 2003	14936	Birth	MEELI	
1303	F	7 Jun 2003	776	615	TALLIN	7 Jun 2003	14937	Birth	MAARA	
1304	F	11 Jun 2003	1028	884	TALLIN	11 Jun 2003	14938	Birth	KARLUTT	
1305	M	12 Jun 2003	775	208	TALLIN	12 Jun 2003	14939	Birth	HANS	
					ESTONIA	11 Jul 2004		Release		
1306	M	12 Jun 2003	775	208	TALLIN	12 Jun 2003	14940	Birth		
						3 Jul 2003		Death		
1307	F	12 Jun 2003	775	208	TALLIN	12 Jun 2003	14941	Birth	GRETE	
1308	M	11 Jun 2003	773	778	TALLIN	11 Jun 2003	14942	Birth	MAGUN	
1309	M	11 Jun 2003	773	778	TALLIN	11 Jun 2003	14943	Birth	STROH	
1310	F	11 Jun 2003	773	778	TALLIN	11 Jun 2003	14944	Birth	MOON	
1311	F	11 Jun 2003	773	778	TALLIN	11 Jun 2003	14945	Birth	BRANDI	
1312	M	13 Jun 2003	776	777	TALLIN	13 Jun 2003	14946	Birth	KRATT	
1313	M	22 Jun 2003	1075	917	TALLIN	22 Jun 2003	14947	Birth	PORKEN	
					ESTONIA	16 Jun 2004		Release		
1314	M	22 Jun 2003	1075	917	TALLIN	22 Jun 2003	14948	Birth	REDIS	
					ESTONIA	11 Jul 2004		Release		
1315	M	22 Jun 2003	1075	917	TALLIN	22 Jun 2003	14949	Birth	藏N	
					ESTONIA	11 Jul 2004		Release		
1316	F	22 Jun 2003	1075	917	TALLIN	22 Jun 2003	14950	Birth	S籍TAR	
1317	F	22 Jun 2003	1075	917	TALLIN	22 Jun 2003	14951	Birth	MAASIKAS	
1343	M	8 May 2004	773	959	TALLIN	8 May 2004	15337	Birth	KASPAR	
1344	M	8 May 2004	773	959	TALLIN	8 May 2004	15338	Birth		
						8 Jun 2004		Death		
1345	M	8 May 2004	773	959	TALLIN	8 May 2004	15339	Birth		
						13 Jun 2004		Death		
1346	F	8 May 2004	773	959	TALLIN	8 May 2004	15340	Birth	KLAARA	
1347	F	8 May 2004	773	959	TALLIN	8 May 2004	15341	Birth	KRIKU	
1348	M	16 May 2004	920	955	TALLIN	16 May 2004	15342	Birth		00-066C-559D
					EURONERZ	7 Aug 2004	M224	Transfer		

FINAL REPORT - PROJECT LIFE2000/NAT/7081

“Recovery of *Mustela lutreola* in Estonia: captive and island populations”.

Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name	Transponder#
1349	M	16 May 2004	920	955	TALLIN	16 May 2004	15343	Birth		00-0670-F124
					EURONERZ	7 Aug 2004	M225	Transfer		
1350	M	16 May 2004	920	955	TALLIN	16 May 2004	15344	Birth		00-0670-D2FB
					EURONERZ	7 Aug 2004	M226	Transfer		
1351	F	16 May 2004	920	955	TALLIN	16 May 2004	15345	Birth		00-0670-D044
					EURONERZ	7 Aug 2004	F227	Transfer		
1352	M	19 May 2004	1028	1021	TALLIN	19 May 2004	15346	Birth		
					EURONERZ	7 Aug 2004	M252	Transfer		
1353	M	19 May 2004	1028	1021	TALLIN	19 May 2004	15347	Birth		
					EURONERZ	7 Aug 2004	M253	Transfer		
						~ Sep 2004		Death		
1354	F	19 May 2004	1028	1021	TALLIN	19 May 2004	15348	Birth		
					EURONERZ	7 Aug 2004	F254	Transfer		
						~ Sep 2004		Death		
1355	F	19 May 2004	1028	1021	TALLIN	19 May 2004	15349	Birth		
					EURONERZ	7 Aug 2004	F255	Transfer		
						8 Dec 2004		Death		
1356	M	21 May 2004	775	885	TALLIN	21 May 2004	15350	Birth		00-0670-0800
					EURONERZ	7 Aug 2004	M232	Transfer		
1357	F	21 May 2004	775	885	TALLIN	21 May 2004	15351	Birth		00-0670-FC7F
					EURONERZ	7 Aug 2004	F233	Transfer		
1358	F	21 May 2004	775	885	TALLIN	21 May 2004	15352	Birth		00-0670-03AA
					EURONERZ	7 Aug 2004	F234	Transfer		
1359	F	21 May 2004	775	885	TALLIN	21 May 2004	15353	Birth	LUMELILL	
1360	F	21 May 2004	775	885	TALLIN	21 May 2004	15354	Birth	PILLE-LILL	
1361	M	22 May 2004	168	1033	TALLIN	22 May 2004	15355	Birth	MAURUS	
1362	F	22 May 2004	168	1033	TALLIN	22 May 2004	15356	Birth	SPUNK	
1363	F	22 May 2004	168	1033	TALLIN	22 May 2004	15357	Birth	TEQUILA	
1364	F	22 May 2004	168	1033	TALLIN	22 May 2004	15358	Birth	RUFFINA	
1365	M	25 May 2004	1035	1307	TALLIN	25 May 2004	15359	Birth		
					EURONERZ	7 Aug 2004	M256	Transfer		
					GERMANY	~ Oct 2004		lrf Release		
1366	F	25 May 2004	1035	1307	TALLIN	25 May 2004	15360	Birth		00-066C-BB21
					EURONERZ	7 Aug 2004	F241	Transfer		
1367	F	25 May 2004	1035	1307	TALLIN	25 May 2004	15361	Birth		00-066C-15BD
					EURONERZ	7 Aug 2004	F242	Transfer		
1368	F	25 May 2004	1035	1307	TALLIN	25 May 2004	15362	Birth		00-0670-F28A
					EURONERZ	7 Aug 2004	F243	Transfer		
1369	F	25 May 2004	1035	1307	TALLIN	25 May 2004	15363	Birth		00-066C-4A8E
					EURONERZ	7 Aug 2004	F244	Transfer		
1370	M	26 May 2004	776	615	TALLIN	26 May 2004	15364	Birth	FALCK	
1371	M	26 May 2004	776	615	TALLIN	26 May 2004	15365	Birth		
						25 Jun 2004		Death		
1372	M	26 May 2004	776	615	TALLIN	26 May 2004	15366	Birth		
						27 Jun 2004		Death		

FINAL REPORT - PROJECT LIFE2000/NAT/7081

“Recovery of *Mustela lutreola* in Estonia: captive and island populations”.

Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name	Transponder#
1373	F	26 May 2004	776	615	TALLIN	26 May 2004	15367	Birth	ITI	
1374	F	26 May 2004	776	615	TALLIN	26 May 2004	15368	Birth		
						29 Jun 2004		Death		
1375	F	26 May 2004	776	615	TALLIN	26 May 2004	15369	Birth		
						29 Jun 2004		Death		
1376	M	27 May 2004	773	1056	TALLIN	27 May 2004	15370	Birth		00-066C-95A8
					EURONERZ	7 Aug 2004	M249	Transfer		
1377	M	27 May 2004	773	1056	TALLIN	27 May 2004	15371	Birth		00-066F-E0D7
					EURONERZ	7 Aug 2004	M250	Transfer		
1378	M	27 May 2004	773	1056	TALLIN	27 May 2004	15372	Birth		00-066C-5307
					EURONERZ	7 Aug 2004	M251	Transfer		
1379	F	27 May 2004	773	1056	TALLIN	27 May 2004	15373	Birth		00-066C-2283
					EURONERZ	7 Aug 2004	F248	Transfer		
1380	M	27 May 2004	1308	1077	TALLIN	27 May 2004	15374	Birth	TOIVO	00061F8A1F
1381	M	27 May 2004	1308	1077	TALLIN	27 May 2004	15375	Birth	MARKKO	0006203E3F
					HIIUMAA	8 Sep 2004	_____	Release		
1382	F	27 May 2004	1308	1077	TALLIN	27 May 2004	15376	Birth	MARJE	0006205A01
					HIIUMAA	8 Sep 2004	_____	Release		
1383	F	27 May 2004	1308	1077	TALLIN	27 May 2004	15377	Birth	KERTTU	00061FFDAF
					HIIUMAA	8 Sep 2004	_____	Release		
1384	F	27 May 2004	1308	1077	TALLIN	27 May 2004	15378	Birth	MARGIT	00061F1E5F
					HIIUMAA	8 Sep 2004	_____	Release		
1385	F	27 May 2004	1308	1077	TALLIN	27 May 2004	15379	Birth	KARIN	0006212CE6
					HIIUMAA	8 Sep 2004	_____	Release		
1386	M	27 May 2004	775	1310	TALLIN	27 May 2004	15380	Birth		00-066C-2071
					EURONERZ	7 Aug 2004	M228	Transfer		
1387	M	27 May 2004	775	1310	TALLIN	27 May 2004	15381	Birth		00-066C-1902
					EURONERZ	7 Aug 2004	M229	Transfer		
1388	M	27 May 2004	775	1310	TALLIN	27 May 2004	15382	Birth		00-066C-IDD8
					EURONERZ	7 Aug 2004	M231	Transfer		
1389	F	27 May 2004	775	1310	TALLIN	27 May 2004	15383	Birth		00-066C-4581
					EURONERZ	7 Aug 2004	F230	Transfer		
1390	F	27 May 2004	775	1310	TALLIN	27 May 2004	15384	Birth	MUMMUKE	
1391	M	1 Jun 2004	920	1294	TALLIN	1 Jun 2004	15385	Birth	FOLK	00061FAB4A
1392	M	1 Jun 2004	920	1294	TALLIN	1 Jun 2004	15386	Birth		0006262524
					HIIUMAA	21 Aug 2004	1392	Release		
1393	M	1 Jun 2004	920	1294	TALLIN	1 Jun 2004	15387	Birth		0006206F99
					HIIUMAA	21 Aug 2004	1393	Release		
1394	F	1 Jun 2004	920	1294	TALLIN	1 Jun 2004	15388	Birth		00061F9FGE
					HIIUMAA	21 Aug 2004	1394	Release		
1395	F	1 Jun 2004	920	1294	TALLIN	1 Jun 2004	15389	Birth		
					TALLINN	21 Aug 2004	_____	Release		
1396	M	3 Jun 2004	773	915	TALLIN	3 Jun 2004	15390	Birth		00061F987D
					HIIUMAA	21 Aug 2004	1396	Release		
1397	F	3 Jun 2004	773	915	TALLIN	3 Jun 2004	15391	Birth		0006201224
					HIIUMAA	21 Aug 2004	1397	Release		

FINAL REPORT - PROJECT LIFE2000/NAT/7081

"Recovery of *Mustela lutreola* in Estonia: captive and island populations".

Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name	Transponder#
1398	F	3 Jun 2004	773	915	TALLIN	3 Jun 2004	15392	Birth		00061F99AC
					HIIUMAA	21 Aug 2004	1398	Release		
1399	F	3 Jun 2004	773	915	TALLIN	3 Jun 2004	15393	Birth		00062023DA
					HIIUMAA	21 Aug 2004	1399	Release		
1400	F	3 Jun 2004	1075	884	TALLIN	3 Jun 2004	15394	Birth	L圈RA	
1401	F	3 Jun 2004	1075	884	TALLIN	3 Jun 2004	15395	Birth	GUSLI	
1402	F	3 Jun 2004	1075	884	TALLIN	3 Jun 2004	15396	Birth	GRITA	
1403	F	3 Jun 2004	1075	884	TALLIN	3 Jun 2004	15397	Birth	NIOBE	
1404	M	3 Jun 2004	1269	1073	TALLIN	3 Jun 2004	15398	Birth	GEO	00061FEE4F
1405	F	3 Jun 2004	1269	1073	TALLIN	3 Jun 2004	15399	Birth		0006152660
					HIIUMAA	21 Aug 2004	1405	Release		
1406	F	3 Jun 2004	1269	1073	TALLIN	3 Jun 2004	15400	Birth		000617BC40
					HIIUMAA	21 Aug 2004	1406	Release		
1407	M	4 Jun 2004	775	778	TALLIN	4 Jun 2004	15401	Birth	TRIIP	
1408	M	4 Jun 2004	775	778	TALLIN	4 Jun 2004	15402	Birth	HA=IS	
1409	M	4 Jun 2004	775	778	TALLIN	4 Jun 2004	15403	Birth	KOKA	
1410	F	4 Jun 2004	775	778	TALLIN	4 Jun 2004	15404	Birth	ECSTASY	
1411	M	5 Jun 2004	1271	947	TALLIN	5 Jun 2004	15405	Birth		00061F66DF
					HIIUMAA	21 Aug 2004	1411	Release		
1412	F	5 Jun 2004	1271	947	TALLIN	5 Jun 2004	15406	Birth		000615521E
					HIIUMAA	21 Aug 2004	1412	Release		
1413	M	5 Jun 2004	1271	947	TALLIN	5 Jun 2004	15407	Birth		00061F71F3
					HIIUMAA	21 Aug 2004	1413	Release		
1414	M	5 Jun 2004	1271	947	TALLIN	5 Jun 2004	15408	Birth	M儂K	0006133FDE
1415	F	5 Jun 2004	1271	947	TALLIN	5 Jun 2004	15409	Birth		0006184600
					HIIUMAA	21 Aug 2004	1415	Release		
1416	M	11 Jun 2004	1309	1045	TALLIN	11 Jun 2004	15410	Birth	JOHN	
1417	M	11 Jun 2004	1309	1045	TALLIN	11 Jun 2004	15411	Birth	GEORG	
1418	M	11 Jun 2004	1309	1045	TALLIN	11 Jun 2004	15412	Birth	PAUL	
1419	M	11 Jun 2004	1309	1045	TALLIN	11 Jun 2004	15413	Birth	BRIAN	
1420	M	11 Jun 2004	1309	1045	TALLIN	11 Jun 2004	15414	Birth	RINGO	
1421	M	~21 May 2004	909	1267	HIIUMAA F	~21 May 2004	15452	Birth		00062152EB
					HIIUMAA	22 Aug 2004	1421	Release		
1422	M	~21 May 2004	909	1267	HIIUMAA F	~21 May 2004	15453	Birth		000620111A
					HIIUMAA	22 Aug 2004	1422	Release		
1423	M	~21 May 2004	909	1267	HIIUMAA F	~21 May 2004	15454	Birth		00061F9229
					HIIUMAA	22 Aug 2004	1423	Release		
1424	M	~21 May 2004	909	1267	HIIUMAA F	~21 May 2004	15455	Birth	VILLIVOLLI	
					TALLIN	22 Aug 2004	15455	Transfer		
1425	F	~21 May 2004	909	1267	HIIUMAA F	~21 May 2004	15456	Birth		0006200590
					HIIUMAA	22 Aug 2004	1425	Release		
1426	M	~21 May 2004	1075	917	HIIUMAA F	~21 May 2004	15457	Birth		00061F839A
					HIIUMAA	22 Aug 2004	1426	Release		
1427	M	~21 May 2004	1075	917	HIIUMAA F	~21 May 2004	15458	Birth	V儂TUR	
					TALLIN	22 Aug 2004	15458	Transfer		
1428	M	~21 May 2004	1075	917	HIIUMAA F	~21 May 2004	15459	Birth	VAPSIK	

FINAL REPORT - PROJECT LIFE2000/NAT/7081

"Recovery of *Mustela lutreola* in Estonia: captive and island populations".

Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name	Transponder#
					TALLIN	22 Aug 2004	15459	Transfer		
1429	F	~21 May 2004	1075	917	HIIUMAA	F ~21 May 2004	15460	Birth		0006184CD3
					HIIUMAA	22 Aug 2004	1429	Release		
1430	F	~21 May 2004	1075	917	HIIUMAA	F ~21 May 2004	15461	Birth		00061F8627
					HIIUMAA	22 Aug 2004	1430	Release		
1431	F	~21 May 2004	1075	917	HIIUMAA	F ~21 May 2004	15462	Birth		00061F95FD
					HIIUMAA	22 Aug 2004	1431	Release		
1432	M	~31 May 2004	775	1289	HIIUMAA	F ~31 May 2004	15463	Birth	ARMI	
					TALLIN	22 Aug 2004	15463	Transfer		
1433	F	~31 May 2004	775	1289	HIIUMAA	F ~31 May 2004	15464	Birth		0006202A1C
					HIIUMAA	22 Aug 2004	1433	Release		
1434	F	~31 May 2004	775	1289	HIIUMAA	F ~31 May 2004	15465	Birth		00061F89C1
					HIIUMAA	22 Aug 2004	1434	Release		
1435	F	~31 May 2004	775	1289	HIIUMAA	F ~31 May 2004	15466	Birth		0006203671
					HIIUMAA	22 Aug 2004	1435	Release		
1436	F	~31 May 2004	775	1289	HIIUMAA	F ~31 May 2004	15467	Birth		0006214F12
					HIIUMAA	22 Aug 2004	1436	Release		

TOTALS: 101.109.3 (213)

Compiled by: Tiit Maran thru Tallinn Zoo

Data current thru: 1 Jan 2005 Foundation "Lutreola" - EEP

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## ANNEX 7 – THE DEATH OF *MUSTELA LUTREOLA* IN THE COURSE OF CONSERVATION BREEDING DURING THE PROJECT

EUROPEAN MINK Studbook Page 1  
 Restricted to: (Mustela lutreola novikovi)  
 Locations: TALLIN /  
 Dates: Between 01/01/2002 and 30/11/2004  
 Event: Deaths

Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name	Transponder #
133	F	21 Oct 1994	WILD	WILD	TVER	21 Oct 1994	113	Capture	NETTY	000061DCC7
					TALLIN	19 Dec 1995	11890	Transfer		
						14 Aug 2003		Death		
168	M	????	WILD	WILD	RUSSIA	28 Nov 1996	NONE	Capture	VILLU	00.0124.445B
					TALLIN	25 Mar 1997	12135	Transfer		
						23 Nov 2004		Death		
204	F	1 Jun 1997	168	151	TALLIN	1 Jun 1997	12418	Birth	VŽIKE-MY	00.0124.EB86
						3 Jul 2004		Death		
208	F	15 Jun 1997	168	174	TALLIN	15 Jun 1997	12435	Birth	LOTTA	00.0123.9E09
						18 Jul 2003		Death		
212	F	16 May 1997	158	129	ROTTERDAM	16 May 1997	105610	Birth	SANTA	098.100.114.964
					TALLIN	22 May 2002	14158	Transfer		
						25 Aug 2003		Death		
213	F	16 May 1997	158	129	ROTTERDAM	16 May 1997	105611	Birth	BARBARA	098.100.114.929
					TALLIN	22 May 2002	14159	Transfer		
						10 Jul 2004		Death		
605	F	11 Jun 1998	132	133	TALLIN	11 Jun 1998	12636	Birth	RITIMI	
						14 May 2004		Death		
774	M	????	WILD	WILD	ALESHNYA	????	NONE	Capture	KIRILL	
					TALLIN	11 Feb 2000	13235	Transfer		
						24 Mar 2003		Death		
859	M	5 Jun 2000	774	583	TALLIN	5 Jun 2000	13360	Birth	EINSTEIN	
						25 Mar 2003		Death		
918	F	2 Jun 2001	773	871	TALLIN	2 Jun 2001	13902	Birth	SIRME	
						18 Jun 2002		Death		
936	M	4 Jun 2001	773	895	TALLIN	4 Jun 2001	13920	Birth	MIKLUHHO	
						19 Dec 2002		Death		
946	M	9 Jun 2001	773	853	TALLIN	9 Jun 2001	13930	Birth	MONK	
						24 Jun 2002		Death		
1029	F	22 May 2002	774	959	TALLIN	22 May 2002	14333	Birth		
						24 Jun 2002		Death		
1037	?	27 May 2002	774	918	TALLIN	27 May 2002	14341	Birth		
						27 Jun 2002		Death		
1038	?	27 May 2002	774	918	TALLIN	27 May 2002	14342	Birth		
						27 Jun 2002		Death		
1039	?	27 May 2002	774	918	TALLIN	27 May 2002	14343	Birth		
						1 Jul 2002		Death		
1041	M	30 May 2002	775	915	TALLIN	30 May 2002	14345	Birth	VIP	0 006 206 929
						1 Sep 2004		Death		
1050	F	31 May 2002	920	947	TALLIN	31 May 2002	14354	Birth		
						4 Sep 2002		Death		
1298	M	7 Jun 2003	776	615	TALLIN	7 Jun 2003	14920	Birth		

FINAL REPORT - PROJECT LIFE2000/NAT/7081

"Recovery of *Mustela lutreola* in Estonia: captive and island populations".

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=====
Stud # | Sex | Birth Date | Sire | Dam | Location | Date | Local ID | Event | Name | Transponder # |
=====
1306 M 12 Jun 2003 775 208 TALLIN 10 Jul 2003 14940 Death
1306 M 12 Jun 2003 775 208 TALLIN 12 Jun 2003 14940 Birth
1306 M 12 Jun 2003 775 208 TALLIN 3 Jul 2003 Death
1344 M 8 May 2004 773 959 TALLIN 8 May 2004 15338 Birth
1344 M 8 May 2004 773 959 TALLIN 8 Jun 2004 Death
1345 M 8 May 2004 773 959 TALLIN 8 May 2004 15339 Birth
1345 M 8 May 2004 773 959 TALLIN 13 Jun 2004 Death
1371 M 26 May 2004 776 615 TALLIN 26 May 2004 15365 Birth
1371 M 26 May 2004 776 615 TALLIN 25 Jun 2004 Death
1372 M 26 May 2004 776 615 TALLIN 26 May 2004 15366 Birth
1372 M 26 May 2004 776 615 TALLIN 27 Jun 2004 Death
1374 F 26 May 2004 776 615 TALLIN 26 May 2004 15368 Birth
1374 F 26 May 2004 776 615 TALLIN 29 Jun 2004 Death
1375 F 26 May 2004 776 615 TALLIN 26 May 2004 15369 Birth
1375 F 26 May 2004 776 615 TALLIN 29 Jun 2004 Death
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TOTALS: 12.11.3 (26)

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Compiled by: Tiit Maran thru Tallinn Zoo  
 Data current thru: 1 Jan 2005 foundation "Lutreola" - EEP  
 Printed on 31 Mar 2005 using Sparks v1.52

## ANNEX 8 – RELEASE OF *MUSTELA LUTREOLA* IN HIIUMAA ISLAND DURING THE PROJECT

EUROPEAN MINK Studbook Page 1  
 Restricted to: (Mustela lutreola novikovii)  
 Locations: ESTONIA /  
 Dates: Between 01/01/2002 and 30/11/2004  
 Event: Releases

Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name	Transponder #
560	F	25 May 1998	168	149	TALLIN	25 May 1998	12596	Birth	INKS	00-0621-3917
					HIIUMAA	15 May 2002	_____	lrf Release		
565	M	26 May 1998	168	150	TALLIN	26 May 1998	12601	Birth	POMM	00-0618-5069
					HIIUMAA	4 May 2002	_____	Release		
572	F	29 May 1998	168	148	TALLIN	29 May 1998	12608	Birth	MONA	00-0621-55D3
					HIIUMAA	15 May 2002	_____	Release		
580	F	1 Jun 1998	168	211	TALLIN	1 Jun 1998	12616	Birth	KATS	0 006 201 357
					ESTONIA	17 Sep 2004	_____	Release		
582	F	2 Jun 1998	132	192	TALLIN	2 Jun 1998	12669	Birth	MAGDALEENA	
					HIIUMAA	4 May 2003	_____	Release		
583	F	2 Jun 1998	132	192	TALLIN	2 Jun 1998	12670	Birth	IRENA	00-061F-ABDA
					HIIUMAA	15 May 2002	_____	Release		
585	F	2 Jun 1998	132	192	TALLIN	2 Jun 1998	12672	Birth	SAARA	00-061F-70F9
					HIIUMAA	15 May 2002	_____	Release		
591	F	9 Jun 1998	198	208	TALLIN	9 Jun 1998	12622	Birth	TUUSLAR	00-0618-04F7
					HIIUMAA	15 May 2002	_____	Release		
592	F	9 Jun 1998	198	208	TALLIN	9 Jun 1998	12623	Birth	FLAVIA	00-061F-6691
					HIIUMAA	15 May 2002	_____	lrf Release		
598	F	9 Jun 1998	146	204	TALLIN	9 Jun 1998	12629	Birth	LAULURŽSTA00-061F-3C76	
					HIIUMAA	15 May 2002	_____	Release		
602	F	9 Jun 1998	132	189	TALLIN	9 Jun 1998	12633	Birth	TIBI	00-0620-0A75
					HIIUMAA	12 May 2003	_____	Release		
676	F	7 Jun 1999	168	133	TALLIN	7 Jun 1999	13094	Birth	ILKKA	00-0621-429A
					HIIUMAA	15 May 2002	_____	Release		
788	M	2 Jun 2000	495	UNK	EURONERZ	2 Jun 2000	M82	Birth		00-0601-74R5
					TALLIN	28 Feb 2003	14558	Transfer		
					HIIUMAA	12 May 2003	_____	Release		
789	M	2 Jun 2000	495	UNK	EURONERZ	2 Jun 2000	M83	Birth		00-01C3-39DF
					TALLIN	28 Feb 2003	14559	Transfer		
					HIIUMAA	16 May 2003	_____	Release		
793	M	29 May 2000	495	739	EURONERZ	29 May 2000	M89	Birth		00-05FD-FDC7
					TALLIN	28 Feb 2003	14560	Transfer		
					HIIUMAA	12 May 2003	_____	Release		
794	M	29 May 2000	495	739	EURONERZ	29 May 2000	M90	Birth		00-01DD-D783
					TALLIN	28 Feb 2003	14561	Transfer		
					HIIUMAA	12 May 2003	_____	Release		
795	F	26 May 2000	506	744	EURONERZ	26 May 2000	F93	Birth		00-0200-96A4
					TALLIN	28 Feb 2003	14568	Transfer		
					HIIUMAA	27 Apr 2003	_____	Release		
807	M	6 May 2000	495	772	EURONERZ	6 May 2000	M105	Birth		00-01BC-7F53
					TALLIN	28 Feb 2003	14562	Transfer		
					HIIUMAA	12 May 2003	_____	Release		

FINAL REPORT - PROJECT LIFE2000/NAT/7081

“Recovery of *Mustela lutreola* in Estonia: captive and island populations”.

Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name	Transponder #
808	M	4 Jun 2000	153	738	EURONERZ	4 Jun 2000	M106	Birth		00-060F-0458
					TALLIN	28 Feb 2003	14563	Transfer		
					HIIUMAA	12 May 2003		Release		
810	M	4 Jun 2000	153	738	EURONERZ	4 Jun 2000	M108	Birth		00-060F-90C3
					TALLIN	28 Feb 2003	14564	Transfer		
					HIIUMAA	16 May 2003		Release		
811	F	4 Jun 2000	153	738	EURONERZ	4 Jun 2000	F109	Birth		00-060F-61FE
					TALLIN	28 Feb 2003	14569	Transfer		
					HIIUMAA	21 Apr 2003		Release		
814	M	30 May 2000	152	731	EURONERZ	30 May 2000	M112	Birth		00-0601-0E6B
					TALLIN	28 Feb 2003	14565	Transfer		
					HIIUMAA	16 May 2003		Release		
815	M	30 May 2000	152	731	EURONERZ	30 May 2000	M113	Birth		00-0601-3A37
					TALLIN	28 Feb 2003	14566	Transfer		
					HIIUMAA	16 May 2003		Release		
831	F	19 May 2000	776	585	TALLIN	19 May 2000	13332	Birth	HELGA	00 0618 5154
					HIIUMAA	16 Sep 2002		Release	ltf	
832	F	19 May 2000	776	585	TALLIN	19 May 2000	13333	Birth	SANNA	00-061F-BD5A
					HIIUMAA	4 May 2002		Release		
						5 May 2002		Death		
834	F	19 May 2000	776	585	TALLIN	19 May 2000	13335	Birth	NIRU	00 0617 B8C9
					HIIUMAA	16 Sep 2002		Release	ltf	
847	F	2 Jun 2000	168	582	TALLIN	2 Jun 2000	13348	Birth		00-01CE-59B6
					HIIUMAA	3 Sep 2000		Release		
						28 Nov 2003	NONE	Capture		
					TALLIN	28 Nov 2003	13348	Transfer		
					HIIUMAA	14 May 2004		Release		
850	M	2 Jun 2000	146	615	TALLIN	2 Jun 2000	13351	Birth	PORKS	00-0621-4899
					HIIUMAA	15 May 2002		Release		
852	F	2 Jun 2000	146	615	TALLIN	2 Jun 2000	13353	Birth	VIRVE	00-0620-1462
					HIIUMAA	4 May 2002		Release		
853	F	2 Jun 2000	146	615	TALLIN	2 Jun 2000	13354	Birth	MAIMU	00-0620-5DC9
					HIIUMAA	15 May 2002		Release		
857	F	5 Jun 2000	168	150	TALLIN	5 Jun 2000	13358	Birth	ORBIT	00-01CE-9D64
					HIIUMAA	11 Jun 2001	857	Release		
						10 Dec 2003	NONE	Capture		
						16 Dec 2003		Release	ltf	
860	M	5 Jun 2000	774	583	TALLIN	5 Jun 2000	13361	Birth	PROOK	00-061F-8BFD
					HIIUMAA	4 May 2003		Release		
869	M	7 Jun 2000	776	677	TALLIN	7 Jun 2000	13371	Birth	GANDALF	0 006 205 DE5
					ESTONIA	17 Sep 2004		Release		
871	F	7 Jun 2000	776	677	TALLIN	7 Jun 2000	13373	Birth	OIE	
					HIIUMAA	4 May 2003		Release		
877	M	9 Jun 2000	146	170	TALLIN	9 Jun 2000	13379	Birth	BRUTUS	00-0613-66AF
					HIIUMAA	29 May 2003		Release		
878	M	9 Jun 2000	146	170	TALLIN	9 Jun 2000	13380	Birth	CAIUS	00-0631-7821
					HIIUMAA	29 May 2003		Release		
879	M	9 Jun 2000	146	170	TALLIN	9 Jun 2000	13381	Birth	JULIUS	00-0615-546E
					HIIUMAA	4 May 2002		Release		
881	F	10 Jun 2000	683	149	TALLIN	10 Jun 2000	13383	Birth	LIIVI	00-061-B48F
					HIIUMAA	4 May 2002		Release		
895	F	13 Jun 2000	198	605	TALLIN	13 Jun 2000	13397	Birth	ZOJA	00-0617-F89F
					HIIUMAA	15 May 2002		Release		
898	M	15 Jun 2000	146	204	TALLIN	15 Jun 2000	13400	Birth	DZA*SS	0000650526

FINAL REPORT - PROJECT LIFE2000/NAT/7081

“Recovery of *Mustela lutreola* in Estonia: captive and island populations”.

Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name	Transponder #
					HIIUMAA	15 Jun 2001	898	Release		
						4 Apr 2004	NONE	Capture		
					TALLIN	5 Apr 2004	13400	Transfer		
					ESTONIA	11 Jul 2004		Release		
904	F	17 May 2001	168	885	TALLIN	17 May 2001	13888	Birth	MERIBEL	00-0621-4760
					HIIUMAA	4 May 2002		Release		
905	F	17 May 2001	168	885	TALLIN	17 May 2001	13889	Birth	KRISNA	0 006 1F6 C79
					HIIUMAA	20 Apr 2002		Release		
906	F	17 May 2001	168	885	TALLIN	17 May 2001	13890	Birth	MIRJAM	00-0621-4D75
					HIIUMAA	15 May 2002		Release		
908	M	27 May 2001	776	833	TALLIN	27 May 2001	13892	Birth	KONDOR	00-0631-FBDB
					HIIUMAA	4 May 2003		Release		
910	F	30 May 2001	773	834	TALLIN	30 May 2001	13894	Birth	NESSI	
					HIIUMAA	4 May 2003		Release		
911	F	30 May 2001	773	834	TALLIN	30 May 2001	13895	Birth	PAOPE	00-061F-A9B2
					HIIUMAA	27 Apr 2003		Release		
						6 May 2003		Death		
912	F	30 May 2001	773	834	TALLIN	30 May 2001	13896	Birth	NUUSTIK	00-0621-62DF
					HIIUMAA	27 Apr 2003		Release		
914	F	3 Jun 2001	774	831	TALLIN	3 Jun 2001	13898	Birth	HILDA	00-0618-1F5E
					HIIUMAA	27 Apr 2003		Release		
916	M	2 Jun 2001	773	871	TALLIN	2 Jun 2001	13900	Birth	ONNEPAIV	00-061F-4E5D
					HIIUMAA	4 May 2003		Release		
919	M	2 Jun 2001	775	832	TALLIN	2 Jun 2001	13903	Birth	TUGRIK	00-0620-64F5
					HIIUMAA	4 May 2003		Release		
922	F	2 Jun 2001	775	832	TALLIN	2 Jun 2001	13906	Birth	TIRTS	00-0620-03F2
					HIIUMAA	12 May 2003		Release		
925	F	2 Jun 2001	168	605	TALLIN	2 Jun 2001	13909	Birth	SASKIA	00-061F-54C7
					HIIUMAA	4 May 2002		lrf Release		
926	M	2 Jun 2001	168	605	TALLIN	2 Jun 2001	13910	Birth	RINGO	00-061F-B12F
					HIIUMAA	4 May 2002		Release		
927	F	2 Jun 2001	168	605	TALLIN	2 Jun 2001	13911	Birth	RIPLEY	00-0620-1F79
					HIIUMAA	15 May 2002		lrf Release		
928	F	2 Jun 2001	168	605	TALLIN	2 Jun 2001	13912	Birth	METSIK	00-0620-1E3E
					HIIUMAA	15 May 2002		Release		
929	M	2 Jun 2001	776	851	TALLIN	2 Jun 2001	13913	Birth	JESPER	00 0618 504D
					HIIUMAA	16 Sep 2002		lrf Release		
930	M	2 Jun 2001	776	851	TALLIN	2 Jun 2001	13914	Birth	JOONATAN	00-061F-1EB6
					HIIUMAA	4 May 2003		Release		
932	M	4 Jun 2001	168	873	TALLIN	4 Jun 2001	13916	Birth	DANIEL	0 006 217 94D
					HIIUMAA	20 Apr 2002		Release		
933	M	4 Jun 2001	168	873	TALLIN	4 Jun 2001	13917	Birth	SEMPER	0 006 1F6 CCB
					HIIUMAA	20 Apr 2002		Release		
934	F	4 Jun 2001	168	873	TALLIN	4 Jun 2001	13918	Birth	SONJA	00-0618-0C85
					HIIUMAA	15 May 2002		Release		
935	F	4 Jun 2001	168	873	TALLIN	4 Jun 2001	13919	Birth	KUNTIA	00-061F-31B6
					HIIUMAA	15 May 2002		lrf Release		
937	M	4 Jun 2001	773	895	TALLIN	4 Jun 2001	13921	Birth	ZORBAS	
					HIIUMAA	4 May 2003		Release		
938	F	4 Jun 2001	773	895	TALLIN	4 Jun 2001	13922	Birth	ZUZI	00-0620-0D1A
					HIIUMAA	12 May 2003		Release		
942	M	6 Jun 2001	198	881	TALLIN	6 Jun 2001	13926	Birth	LENNY	00-0621-3489
					HIIUMAA	15 May 2002		Release		
943	M	6 Jun 2001	198	881	TALLIN	6 Jun 2001	13927	Birth	PUNIK	00/0621/4C76

FINAL REPORT - PROJECT LIFE2000/NAT/7081

“Recovery of *Mustela lutreola* in Estonia: captive and island populations”.

Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name	Transponder #
					HIIUMAA	4 May 2002		Release		
944	M	6 Jun 2001	198	881	TALLIN	6 Jun 2001	13928	Birth	POTTER	00-0621-2C97
					HIIUMAA	4 May 2002		Release		
945	F	6 Jun 2001	198	881	TALLIN	6 Jun 2001	13929	Birth	LOORE	0 006 213 A0E
					HIIUMAA	20 Apr 2002		Release		
948	F	9 Jun 2001	773	853	TALLIN	9 Jun 2001	13932	Birth	MUGRI	00-061F-FC73
					HIIUMAA	16 May 2003		Release		
949	M	14 Jun 2001	168	884	TALLIN	14 Jun 2001	13933	Birth	NIGUL	0 006 206 761
					HIIUMAA	20 Apr 2002		Release		
950	M	14 Jun 2001	168	884	TALLIN	14 Jun 2001	13934	Birth	NUKITS	00-061F-56FE
					HIIUMAA	4 May 2002		Release		
951	M	14 Jun 2001	168	884	TALLIN	14 Jun 2001	13935	Birth	NIILES	0 006 201 849
					HIIUMAA	20 Apr 2002		Release		
952	F	14 Jun 2001	168	884	TALLIN	14 Jun 2001	13936	Birth	NONN	00-0620-1BCA
					HIIUMAA	15 May 2002		Release		
980	M	7 May 2001	153	731	EURONERZ	7 May 2001	M117	Birth	FRIEDRICH	00-05FE-2873
					TALLIN	28 Feb 2003	14567	Transfer		
					HIIUMAA	27 Apr 2003		Release		
1011	F	9 Jun 2001	809	812	EURONERZ	9 Jun 2001	F148	Birth		00-060F-4550
					TALLIN	28 Feb 2003	14570	Transfer		
					HIIUMAA	27 Apr 2003		Release		
1012	M	31 May 2001	779	721	PAVLOV	31 May 2001	94701	Birth	SVEIK	00-0621-5518
					TALLIN	12 Apr 2002	14028	Transfer		
					HIIUMAA	4 May 2002		Release		
1013	M	31 May 2001	779	721	PAVLOV	31 May 2001	94801	Birth	JAROSLAV	00-0621-2A51
					TALLIN	12 Apr 2002	14029	Transfer		
					HIIUMAA	4 May 2002		Release		
1014	F	31 May 2001	779	721	PAVLOV	31 May 2001	94501	Birth		00-0618-1781
					TALLIN	12 Apr 2002	14030	Transfer		
					HIIUMAA	1 Jun 2002		Release		
1016	M	19 May 2002	775	910	TALLIN	19 May 2002	14320	Birth		00 0618 1960
					HIIUMAA	7 Sep 2002		Release		
1017	F	19 May 2002	775	910	TALLIN	19 May 2002	14321	Birth		00 0618 4953
					HIIUMAA	7 Sep 2002		Release		
1018	F	19 May 2002	775	910	TALLIN	19 May 2002	14322	Birth		00 0617 7D38
					HIIUMAA	7 Sep 2002		Release		
						16 Dec 2003	NONE	Capture		
					TALLIN	18 Dec 2003	14322	Transfer		
					HIIUMAA	26 Apr 2004		Release		
1019	F	19 May 2002	775	910	TALLIN	19 May 2002	14323	Birth		00 061F 65E2
					HIIUMAA	7 Sep 2002		Release		
1020	F	19 May 2002	775	910	TALLIN	19 May 2002	14324	Birth		00 0613 3D6D
					HIIUMAA	7 Sep 2002		Release		
1025	F	21 May 2002	776	939	TALLIN	21 May 2002	14329	Birth	SULLI	00-0615-4476
					HIIUMAA	21 Apr 2003		Release		
1027	M	22 May 2002	774	959	TALLIN	22 May 2002	14331	Birth	HERAKLES	0-006-1FF-0FC
					HIIUMAA	4 Sep 2003		Release		
1031	M	26 May 2002	775	911	TALLIN	26 May 2002	14335	Birth		00 0615 2EA0
					HIIUMAA	7 Sep 2002		Release		
1042	M	30 May 2002	775	915	TALLIN	30 May 2002	14346	Birth	HINDRIK	
					ESTONIA	11 Jul 2004		Release		
1043	M	30 May 2002	775	915	TALLIN	30 May 2002	14347	Birth	HADES	00-061F-7F39
					HIIUMAA	29 May 2003		Release		
1044	M	30 May 2002	775	915	TALLIN	30 May 2002	14348	Birth	HORROR	00-0621-4827

FINAL REPORT - PROJECT LIFE2000/NAT/7081

“Recovery of *Mustela lutreola* in Estonia: captive and island populations”.

Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name	Transponder #
					HIIUMAA	29 May 2003		Release		
1046	M	31 May 2002	920	947	TALLIN	31 May 2002	14350	Birth		00 061F 5FAD
					HIIUMAA	7 Sep 2002		Release		
1047	M	31 May 2002	920	947	TALLIN	31 May 2002	14351	Birth		00 0615 3E77
					HIIUMAA	7 Sep 2002		Release		
1048	M	31 May 2002	920	947	TALLIN	31 May 2002	14352	Birth	METSMEES	00-061F-4FDA
					HIIUMAA	7 Sep 2002		Release		
						29 Mar 2004	NONE	Capture		
					TALLIN	29 Mar 2004	14352	Transfer		
1049	F	31 May 2002	920	947	TALLIN	31 May 2002	14353	Birth		00 061F 60C2
					HIIUMAA	7 Sep 2002		Release		
1051	M	5 Jun 2002	776	948	TALLIN	5 Jun 2002	14355	Birth	DON	00-0618-4B71
					HIIUMAA	29 May 2003		Release		
1052	F	5 Jun 2002	776	948	TALLIN	5 Jun 2002	14356	Birth	MILLA	00-0620-45AE
					HIIUMAA	16 May 2003		Release		
1055	M	6 Jun 2002	774	922	TALLIN	6 Jun 2002	14359	Birth	AADU	
					ESTONIA	16 Jun 2004		Release		
1057	M	13 Jun 2002	775	884	TALLIN	13 Jun 2002	14361	Birth	RIPPER	00-0621-4EC1
					HIIUMAA	4 May 2003		Release		
1061	F	15 Jun 2002	774	912	TALLIN	15 Jun 2002	14365	Birth	NATUKE	00-0620-2F62
					HIIUMAA	16 May 2003		Release		
1065	F	15 Jun 2002	774	912	TALLIN	15 Jun 2002	14369	Birth	VIKAT	00-0620-1490
					HIIUMAA	16 May 2003		Release		
1066	M	15 Jun 2002	775	885	TALLIN	15 Jun 2002	14370	Birth	KAKS	0 006 212 B95
					ESTONIA	11 Jul 2004		Release		
1068	F	15 Jun 2002	775	885	TALLIN	15 Jun 2002	14372	Birth	LUUNA	00-061F-91A0
					HIIUMAA	21 Apr 2003		Release		
1070	M	18 Jun 2002	773	871	TALLIN	18 Jun 2002	14374	Birth		00 0617 DA17
					HIIUMAA	16 Sep 2002		Release		
1071	M	18 Jun 2002	773	871	TALLIN	18 Jun 2002	14375	Birth		00 0615 2F4B
					HIIUMAA	16 Sep 2002		Release		
1110	F	4 Jul 2002	807	792	EURONERZ	4 Jul 2002	174	Birth		00-060F-155D
					TALLIN	28 Feb 2003	14571	Transfer		
					HIIUMAA	21 Apr 2003		Release		
1111	F	4 Jul 2002	807	792	EURONERZ	4 Jul 2002	175	Birth		00-0077-4F8F
					TALLIN	28 Feb 2003	14572	Transfer		
					HIIUMAA	21 Apr 2003		Release		
1234	M	20 May 2002	779	721	PAVLOV	20 May 2002	1159	Birth		203098100131954
					TALLIN	22 Aug 2003	14952	Transfer		
					HIIUMAA	26 Aug 2003		Release		
1235	M	20 May 2002	779	721	PAVLOV	20 May 2002	1160	Birth		203098100131371
					TALLIN	22 Aug 2003	14953	Transfer		
					HIIUMAA	26 Aug 2003		Release		
1236	M	20 May 2002	779	721	PAVLOV	20 May 2002	1161	Birth		0-006-1F9-eD9
					TALLIN	22 Aug 2003	14954	Transfer		
					HIIUMAA	26 Aug 2003		Release		
1237	M	20 May 2002	779	721	PAVLOV	20 May 2002	1162	Birth		203098100131904
					TALLIN	22 Aug 2003	14955	Transfer		
					HIIUMAA	26 Aug 2003		Release		
1238	F	10 Jun 2002	903	1015	PAVLOV	10 Jun 2002	1163	Birth		203098100131154
					TALLIN	22 Aug 2003	14956	Transfer		
					HIIUMAA	26 Aug 2003		Release		
1239	F	10 Jun 2002	903	1015	PAVLOV	10 Jun 2002	1164	Birth		203098400131250
					TALLIN	22 Aug 2003	14957	Transfer		

FINAL REPORT - PROJECT LIFE2000/NAT/7081

“Recovery of *Mustela lutreola* in Estonia: captive and island populations”.

Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name	Transponder #
					HIIUMAA	26 Aug 2003		Release		
1262	M	9 May 2003	775	959	TALLIN	9 May 2003	14884	Birth	MURKEL	
					ESTONIA	11 Jul 2004		Release		
1266	F	22 May 2003	775	1073	TALLIN	22 May 2003	14888	Birth	GISELA	00 0621 59DC
					HIIUMAA	8 May 2004		Release		
1267	F	22 May 2003	775	1073	TALLIN	22 May 2003	14889	Birth	GRENDEL	00 0618 1991
					HIIUMAA F	8 May 2004		Transfer		
					HIIUMAA	~15 Jul 2004	1267	Release		
1275	M	26 May 2003	775	1040	TALLIN	26 May 2003	14897	Birth		0-006-31B-E20
					HIIUMAA	4 Sep 2003		Release		
						7 Apr 2004	NONE	Capture		
						7 Apr 2004		Release		
1276	M	26 May 2003	775	1040	TALLIN	26 May 2003	14898	Birth		0-006-202-FBB
					HIIUMAA	4 Sep 2003		Release		
1277	F	26 May 2003	775	1040	TALLIN	26 May 2003	14899	Birth		00-0621029C4
					HIIUMAA	26 Aug 2003		Release		
1278	F	26 May 2003	775	1040	TALLIN	26 May 2003	14900	Birth		0-006-31D-D7A
					HIIUMAA	4 Sep 2003		Release		
						8 Dec 2003	NONE	Capture		
					TALLIN	8 Dec 2003	14900	Transfer		
					HIIUMAA	17 May 2004		Release		
1279	M	28 May 2003	775	1054	TALLIN	28 May 2003	14901	Birth		00 0621 4F2F
					HIIUMAA	26 Aug 2003		Release		
1280	F	28 May 2003	775	1054	TALLIN	28 May 2003	14902	Birth		0 006 201 9A3
					HIIUMAA	4 Sep 2003		Release		
1281	F	28 May 2003	775	1054	TALLIN	28 May 2003	14903	Birth		00-006-202-BBF
					HIIUMAA	4 Sep 2003		Release		
1282	F	28 May 2003	775	1054	TALLIN	28 May 2003	14904	Birth		0-006-1FB-21D
					HIIUMAA	4 Sep 2003		Release		
1283	F	28 May 2003	775	1054	TALLIN	28 May 2003	14905	Birth		0-006-203-26A
					HIIUMAA	4 Sep 2003		Release		
1285	M	2 Jun 2003	776	885	TALLIN	2 Jun 2003	14907	Birth		0-006-214-3EF
					HIIUMAA	26 Aug 2003		Release		
1286	M	2 Jun 2003	776	885	TALLIN	2 Jun 2003	14908	Birth		0-00-1FB-340
					HIIUMAA	26 Aug 2003		Release		
1288	F	2 Jun 2003	776	885	TALLIN	2 Jun 2003	14910	Birth	LOORA	00 0621 2C20
					HIIUMAA	8 May 2004		Release		
1289	F	2 Jun 2003	776	885	TALLIN	2 Jun 2003	14911	Birth	SADA	00 061F 72EA
					HIIUMAA F	17 May 2004		Transfer		
					HIIUMAA	22 Aug 2004	1289	Release		
1381	M	27 May 2004	1308	1077	TALLIN	27 May 2004	15375	Birth	MARKKO	0006203E3F
					HIIUMAA	8 Sep 2004		Release		
1382	F	27 May 2004	1308	1077	TALLIN	27 May 2004	15376	Birth	MARJE	0006205A01
					HIIUMAA	8 Sep 2004		Release		
1383	F	27 May 2004	1308	1077	TALLIN	27 May 2004	15377	Birth	KERTTU	00061FFDAF
					HIIUMAA	8 Sep 2004		Release		
1384	F	27 May 2004	1308	1077	TALLIN	27 May 2004	15378	Birth	MARGIT	00061F1E5F
					HIIUMAA	8 Sep 2004		Release		
1385	F	27 May 2004	1308	1077	TALLIN	27 May 2004	15379	Birth	KARIN	0006212CE6
					HIIUMAA	8 Sep 2004		Release		
1392	M	1 Jun 2004	920	1294	TALLIN	1 Jun 2004	15386	Birth		0006262524
					HIIUMAA	21 Aug 2004	1392	Release		
1393	M	1 Jun 2004	920	1294	TALLIN	1 Jun 2004	15387	Birth		0006206F99
					HIIUMAA	21 Aug 2004	1393	Release		

FINAL REPORT - PROJECT LIFE2000/NAT/7081

“Recovery of *Mustela lutreola* in Estonia: captive and island populations”.

Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name	Transponder #
1394	F	1 Jun 2004	920	1294	TALLIN	1 Jun 2004	15388	Birth		00061F9FGE
					HIIUMAA	21 Aug 2004	1394	Release		
1395	F	1 Jun 2004	920	1294	TALLIN	1 Jun 2004	15389	Birth		
					TALLINN	21 Aug 2004		Release		
1396	M	3 Jun 2004	773	915	TALLIN	3 Jun 2004	15390	Birth		00061F987D
					HIIUMAA	21 Aug 2004	1396	Release		
1397	F	3 Jun 2004	773	915	TALLIN	3 Jun 2004	15391	Birth		0006201224
					HIIUMAA	21 Aug 2004	1397	Release		
1398	F	3 Jun 2004	773	915	TALLIN	3 Jun 2004	15392	Birth		00061F99AC
					HIIUMAA	21 Aug 2004	1398	Release		
1399	F	3 Jun 2004	773	915	TALLIN	3 Jun 2004	15393	Birth		00062023DA
					HIIUMAA	21 Aug 2004	1399	Release		
1405	F	3 Jun 2004	1269	1073	TALLIN	3 Jun 2004	15399	Birth		0006152660
					HIIUMAA	21 Aug 2004	1405	Release		
1406	F	3 Jun 2004	1269	1073	TALLIN	3 Jun 2004	15400	Birth		000617BC40
					HIIUMAA	21 Aug 2004	1406	Release		
1411	M	5 Jun 2004	1271	947	TALLIN	5 Jun 2004	15405	Birth		00061F66DF
					HIIUMAA	21 Aug 2004	1411	Release		
1412	F	5 Jun 2004	1271	947	TALLIN	5 Jun 2004	15406	Birth		000615521E
					HIIUMAA	21 Aug 2004	1412	Release		
1413	M	5 Jun 2004	1271	947	TALLIN	5 Jun 2004	15407	Birth		00061F71F3
					HIIUMAA	21 Aug 2004	1413	Release		
1415	F	5 Jun 2004	1271	947	TALLIN	5 Jun 2004	15409	Birth		0006184600
					HIIUMAA	21 Aug 2004	1415	Release		
1421	M	~21 May 2004	909	1267	HIIUMAA F	~21 May 2004	15452	Birth		00062152EB
					HIIUMAA	22 Aug 2004	1421	Release		
1422	M	~21 May 2004	909	1267	HIIUMAA F	~21 May 2004	15453	Birth		000620111A
					HIIUMAA	22 Aug 2004	1422	Release		
1423	M	~21 May 2004	909	1267	HIIUMAA F	~21 May 2004	15454	Birth		00061F9229
					HIIUMAA	22 Aug 2004	1423	Release		
1425	F	~21 May 2004	909	1267	HIIUMAA F	~21 May 2004	15456	Birth		0006200590
					HIIUMAA	22 Aug 2004	1425	Release		
1426	M	~21 May 2004	1075	917	HIIUMAA F	~21 May 2004	15457	Birth		00061F839A
					HIIUMAA	22 Aug 2004	1426	Release		
1429	F	~21 May 2004	1075	917	HIIUMAA F	~21 May 2004	15460	Birth		0006184CD3
					HIIUMAA	22 Aug 2004	1429	Release		
1430	F	~21 May 2004	1075	917	HIIUMAA F	~21 May 2004	15461	Birth		00061F8627
					HIIUMAA	22 Aug 2004	1430	Release		
1431	F	~21 May 2004	1075	917	HIIUMAA F	~21 May 2004	15462	Birth		00061F95FD
					HIIUMAA	22 Aug 2004	1431	Release		
1433	F	~31 May 2004	775	1289	HIIUMAA F	~31 May 2004	15464	Birth		0006202A1C
					HIIUMAA	22 Aug 2004	1433	Release		
1434	F	~31 May 2004	775	1289	HIIUMAA F	~31 May 2004	15465	Birth		00061F89C1
					HIIUMAA	22 Aug 2004	1434	Release		
1435	F	~31 May 2004	775	1289	HIIUMAA F	~31 May 2004	15466	Birth		0006203671
					HIIUMAA	22 Aug 2004	1435	Release		
1436	F	~31 May 2004	775	1289	HIIUMAA F	~31 May 2004	15467	Birth		0006214F12
					HIIUMAA	22 Aug 2004	1436	Release		
1437	F	~ 2003	UNK	UNK	HIIUMAA	~ Nov 2003	NONE	Capture		000613414C
					TALLIN	~ Nov 2003		Transfer		
					HIIUMAA	~ May 2004		Release		

FINAL REPORT - PROJECT LIFE2000/NAT/7081

"Recovery of *Mustela lutreola* in Estonia: captive and island populations".

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=====
Stud # | Sex | Birth Date | Sire | Dam | Location | Date | Local ID | Event | Name | Transponder # |
=====
                    5 Dec 2004  NONE  Capture
                    5 Dec 2004  _____  Release
=====
TOTALS: 86.93.0 (179)
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Compiled by: Tiit Maran thru Tallinn Zoo  
Data current thru: 1 Jan 2005 foundation "Lutreola" - EEP  
Printed by using Sparks v1.52

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## ANNEX 9 – DEFINITIONS OF DEMOGRAPHIC AND GENETIC PARAMETERS

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### DEMOGRAPHIC TERMS

**Population Growth Rate** (Lambda,  $\lambda$ ) -- The proportional change in population size from one year to the next. Lambda can be based on life-table calculations (the expected lambda) or from observed changes in population size from year to year. A lambda of 1.11 means a 11% per year increase; lambda of .97 means a 3% decline in size per year.

**P<sub>x</sub>, Age-Specific Survival** -- The probability that an individual of age  $x$  survives one time period; is conditional on an individual being alive at the beginning of the time period. Alternatively, the proportion of individuals which survive from the beginning of one age class to the next.

**Q<sub>x</sub>, Mortality** -- Probability that an individual of age  $x$  dies during time period.  $Q_x = 1 - P_x$

The proportion of individuals that die during an age class. It is calculated from the number of animals that die during an age class divided by the number of animals that were alive at the beginning of the age class (i.e. "at risk").

**l<sub>x</sub>, Age-Specific Survivorship** -- The probability that a new individual (e.g., age 0) is alive at the *beginning* of age  $x$ . Alternatively, the proportion of individuals which survive from birth to the beginning of a specific age class.

### GENETIC TERMS

**Current Gene Diversity** (GD) -- The proportional gene diversity (as a proportion of the source population) is the probability that two alleles from the same locus sampled at random from the population will be identical by descent. Gene diversity is calculated from allele frequencies, and is the heterozygosity expected in progeny produced by random mating, and if the population were in Hardy-Weinberg equilibrium.

**Founder** -- An individual obtained from a source population (often the wild) that has no known relationship to any individuals in the derived population (except for its own descendants).

**Founder Genome Equivalents** (FGE) -- The number wild-caught individuals (founders) that would produce the same amount of gene diversity, as does the population under study. The gene diversity of a population is  $1 - 1 / (2 * FGE)$ .

**Founder Genome Surviving** -- The sum of allelic retentions of the individual founders (i.e., the product of the mean allelic retention and the number of founders).

**Inbreeding Coefficient** (F) -- Probability that the two alleles at a genetic locus are identical by descent from an ancestor common to both parents. The mean inbreeding coefficient of a population will be the proportional decrease in observed heterozygosity relative to the expected heterozygosity of the founder population.

**Mean Generation Time** (I) -- The average time elapsing from reproduction in one generation to the time the next generation reproduces. Also, the average age at which a female (or male) produces offspring. It is not the age of first reproduction. Males and females often have different generation times.

**Mean Kinship** (MK) -- The mean kinship coefficient between an animal and all animals (including itself) in the living, captive-born population. The mean kinship of a population is equal to the proportional loss of gene diversity of the descendant (captive-born) population relative to the founders and is also the mean inbreeding coefficient of progeny produced by random mating. Mean kinship is also the reciprocal of two times the founder genome equivalents:  $MK = 1 / (2 * FGE)$ .  $MK = 1 - GD$ .

**Percent Known** -- Percent of an animal's genome that is traceable to known Founders. Thus, if an animal has an UNK sire, the % Known = 50. If it has an UNK grandparent, % Known = 75.

**KV, Kinship Value** -- The weighted mean kinship of an animal, with the weights being the reproductive values of each of the kin. The mean kinship value of a population predicts the loss of gene diversity expected in the subsequent generation if all animals were to mate randomly and all were to produce the numbers of offspring expected for animals of their age.

**Representation** -- Number of copies of a founder's genome that are present in the living descendants. Each offspring contributes 0.5 to Representation, each grand-offspring contributes 0.25, etc.

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**ANNEX 10 – HANDOUTS OF THE POWERPOINT PRESENTATION  
IN EAZA TAXON ADVISORY GROUP MEETING IN MOSCOW –  
MAY 2004**

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**ANNEX 11 – HANDSOUTS OF THE POWERPOINT  
PRESENTATION IN II CONSERVATIOIN FORUM IN ANGERS  
(FRANCE) – JUNE 2004**

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**ANNEX 12 – POSTER ON REPRODUCTION OF *MUSTELA  
LUTREOLA* – PRESENTED IN EUROPEAN MINK  
CONSERVATION MEETING IN VITORIA IN**

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**ANNEX 13 – POSTER ON STATUS OF *MUSTELA LUTREOLA* AND  
ITS RECOVERY EFFORTS IN ESTONIA**

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**ANNEX 14 – POSTER ON DIET OF RELEASED *MUSTELA*  
*LUTREOLA* IN HIIUMAA ISLAND**

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