

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

FIRST ITERIM REPORT

WITHOUT PAYMENT REQUEST

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INTRODUCTION

The three-year EU LIFE program project LIFE2000NAT/EE/7081 entitled “Recovery of *Mustela lutreola* in Estonia: captive and island populations” was launched in September 2001. The project is run by holder 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 them project has two more co-financers: Stichting Dierentuinen Helpen (Zoo Help; the Netherlands) and Centre Environmental Investments (Estonia).

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 12) and thus consequently also the objective. It now includes also further establishment of wild population in Hiiumaa Island.

The report provides a review of actions under-taken, the current status of every action, the results obtained, problems met and explains why the modification of certain action are considered important. It also shares light to some complications likely to arise and proposes ways to come over these within next year of the project.

SUMMARY

The report covers a period of 01.09.2002 – 01.09.2003 of the project LIFE2000NAT/EE/7081 entitled: “Recovery of *Mustela lutreola* in Estonia: captive and island populations”. According to the initial project documentation it consisted of 8 actions. The results of action A2 in 01.09.1991 – 31.08.2002 revealed the irrelevance of action C1 and the project was modified after permission from European Commission by cancelling action C1, but adding the additional release (and post-release monitoring) of *Mustela lutreola* in Hiiumaa Island to action C3 and by adding financial support to action D1 (additional funding for feeding of mink). The action C3 and D1 were performed during this reporting period in accordance to this modification.

The following results have been obtained in 01.09.2002 – 01.09.2003:

- ACTION A1 on Construction of infrastructure for the special breeding facility was in most part completed in 2002. In 2003 only renovation of enclosures of animals, laboratory was undertaken. **Action A1 is fully completed**
- ACTION A2 was completed in 2002.
- ACTION A3 preparation of management plan for Hiiumaa. In the course of the preparation of the management plan various studies were performed. Management plan describes the conditions in Hiiumaa Island from point of view of requirements for *Mustela lutreola*. It identifies the possible threat for the preservation of the *Mustela lutreola* in this island. It define the aims for the timeperiod of 2004 – 2008. Finally the plan incorporates the description of actions (including the core areas in need of legal protection in the frame of Nature) and the budget.
The draft management plan was introduced to stakeholders in Hiiumaa. Later it was defended in Species Conservation Committee and thereafter approved be then Ministry of the Environment. **Action A3 is fully completed**
- ACTION C1 postponed in 2002 and funds were re-allocated to C3 and D1
- ACTION C2 preparation of *Mustela lutreola* for release is progress. The training was performed by the same scheme as in 2002, though the long and cold winter set limits what could be done. In addition testing of various ways for behavioral enrichment of the animals was started. It is hoped that the overall quality of behavior will improve with the behavioral enrichment. **Action C2 will be continued in 2004.**
- ACTION C3 on release of *Mustela lutreola* in Saaremaa (and Hiiumaa) and post release monitoring is in progress. During the survey on the status of *Mustela lutreola* in Hiiumaa in spring 2003 showed that minimum 6 individuals survived until breeding season. That is regarded to be unexpectedly poor

result, which can partly be explained by exceptionally harsh weather conditions in summer and winter. In 2003 60 animals was released: 32 males, 28 females(14 pregnant). 42 animals were released in summer and 18 in autumn. All the females were released in their nest-boxes. The results of the release in 2003 will be available after survey in 2004. The plans have been made to modify the release methodology in 2004 substantially.

As the result of 2002 release has not meet the expectations, it is proposed to modify the A3 so that the release in 2004 will be continued only in Hiiumaa Island and the release to Saaremaa will be postponed beyond the time-limits of this project. The release in 2004 in Hiiumaa will be performed according to the budget as it was designed for Saaremaa.

Action C3 will be continued in 2004

- ACTION D1 on husbandry and conservation breeding in breeding facility is progress. 57 young were born in 2003. The neonate death rate was close to 0%. In addition, 14 females were mated for release. The total population in breeding facility was 115 animals (as of 01.09.2003). The overall genetic and demographic parameters of the population have improved: Lamda=2,3954(males) 1,8980 (females); No of Founders=22; Gene Diversity=0,9399; Inbreeding Coefficient= 0,0111. The improvement in genetics is partly due to the success of using the last available potential founder in breeding. For improvement of the genetics an exchange of animals was undertaken with Euronorz in Germany. The large-scale release of mink may jeopardize the genetic status, as valuable genes will be flushed out from Tallinn stock. Actions have been foreseen to avoid it.

Action D1 will be continued in 2004

- ACTION F1 on overall project management is in progress. The contracts with partners have been renewed with project manager, accounting assistant, coordinators of field activities and captive breeding. The home page www.lutreola.ee was updated to provide information on the actions in 2002. Number of articles and presentations were to inform public in Hiiumaa Island, in Estonia and elsewhere in Europe about the project and *Mustela lutreola* conservation.

Action D1 will be continued in 2004

A PREPARATORY ACTIONS/MANAGEMENT PLAN PREPARATION

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

EXPECTED 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 during previous reporting period*

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

Status: *COMPLETED during previous reporting period*

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

Status: *COMPLETED during previous reporting period*

4. Installation of security system (15.12.2002).

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

According to the request for modification of the project in project progress report submitted in 2002, renovation was undertaken in breeding facility: the old rusted welded wire bottom in enclosures was substituted; the laboratory for handling animals was renovated, the service corridor of two modules was separated from animal enclosures with plywood wall. The latter was needed to reduce the stereotyped behavior of the animal, which is regarded as an indicator of stress.

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

ACTIONS PERFORMED

Status: *COMPLETED during previous reporting period*

A.3. PREPARATION OF MANAGEMENT PLAN FOR MUSTELA LUTREOLA IN HIIUMAA ISLAND¹

EXPECTED RESULTS

1. Management plan (deadline 06.06.2003)

ACTIONS PERFORMED

Status – COMPLETED²

The responsibility to prepare the management plan lies with the Administration of Protected Areas (APA) in Hiiumaa (the successor of the Hiiumaa Biosphere Reserve). The provisional meeting on the content and the working plan was held in May 2002. It was decided that the management plan should consist of three principal parts: background data, management data and the action proposed to conserve the species. The first part should mainly focus in compiling a set of updated data on availability of food and habitat resources. Second part should identify the main threats for survival of *Mustela lutreola* in the island and the possible conflict areas with various stakeholders. Third part should provide the list of actions for maintenance of *Mustela lutreola* in favorable conservation status in Hiiumaa Island including also identification of core areas for special areas for conservation in NATURA 2000. Also, the budget of planned actions will be incorporated into this part.

The preparation of the management plan has been quite extensive exercise involving detailed field and other research, identification of the status of conditions for mink in the

¹ The action description contains the actions performed both in 2002 and 2003

² The action plan for European mink in Hiiumaa 2004 – 2008 is attached to this report.

island, analyzing the threats, identification of actions, compiling a budget, introducing the draft plan for stakeholders, defending it in the Commission for Species Protection at the Ministry of Environment.

To compile the management plan several experts were contracted for detailed study of important aspects for European mink management in Hiiumaa Island:

1. Survey on the status of fish resource as a prey for European mink.

An expert on fish was contracted for detailed survey on the status of fish as *Mustela lutreola* food resource. The survey also provides the suggestions how to improve the status of fish in watercourses in Hiiumaa Island. The contract foresaw both review of already available information and field-research with electro-fishing to collect fresh information on the status of fish in main rivers and streams.

The chapters dealing with the availability of prey in Hiiumaa Island and with the restoration of watercourses greatly resulted from this study.

2. Study on the status of crayfish, *Astacus astacus* as a prey for European mink.

Although the crayfish form a less important part in the diet of the European mink and has rather fragmented distribution in the island, it was still believed that the study on the status of the will greatly enhance the future management of the European mink in the island. That is for several reasons: (1) the improvement of the habitats might make the crayfish more important prey item for the European mink; (2) presence of crayfish is a good indicator of the wealth of the watercourse; (3) caring for the crayfish is an important signal for local inhabitants that the coming of the European mink will also support the other, important for local inhabitants, species in the wild.

The study based in the field research in summer 2002 and provided the freshest data on the distribution and density of the crayfish, but also recommendations how to increase its number as European mink prey in the wild. It also provides review already available information on the spread and translocation attempts of the *Astacus astacus*.

The results of this study have been incorporated into the management plan, specifically to chapters dealing with habitat restoration.

3. Study on status of amphibians and the ways of improving the amphibian population as European mink prey in Hiiumaa Island

The amphibians are important food resource for *Mustela lutreola*. Therefore it is of utmost importance to have a good understanding on the status of the amphibian populations in Hiiumaa. However, this appears to be not easily achievable because of lack of reliable methodology to survey/monitor amphibians. Still, we have collected data on the spawning sites of amphibians in Hiiumaa and also checked most of the known mink habitats and estimated their quality from point of view of availability of amphibians. During field research in spring the natural spawning sites (as sources of amphibians) were

counted in vicinity of mink areas. In summer 2002, during the driest season, these sites were revisited and the water level in the spawning ponds were checked to identify the ponds actually producing frogs and those in which the water will dry before the tadpoles have develop to the stage they can leave from water. Furthermore, we have frequently consulted with amphibian restoration specialist Lars Briggs (Amphi Consult, Denmark) on the ways how to increase the number of amphibians in Hiiumaa Island. Lars Briggs was contracted to work for the project and with his help 10 new spawning pools were made and 8 pools were restored as models for future activities (Fig.1) . In addition, Hiiumaa Island was surveyed and other sites in need for restoration of spawning sites were identified.

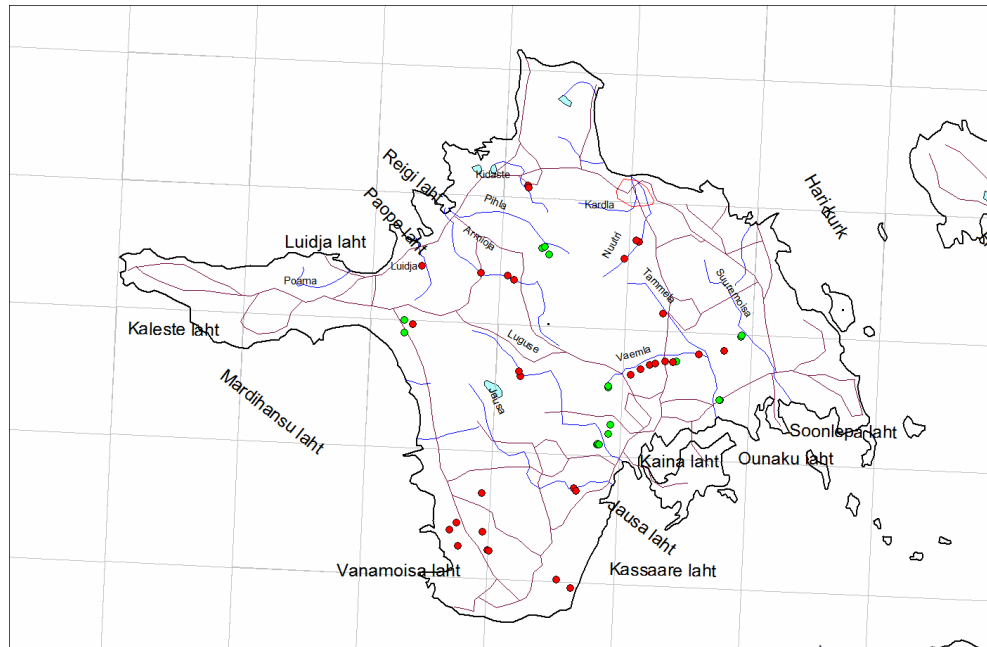


Figure 1 The identified spawning sites in need of restoration (red) and the prepared model areas (green)

The chapters in the management plan addressing the actions for restoration of spawning pools and amphibian monitoring resulted from this contract.

4. Study on legal protection of European mink and the gaps in the legislation.

The experts were contracted to analyze the present protection for the European mink and to identify the gaps in the legal framework for protection of this species. The analyze is divided into several parts: (1) legal framework for protection of the European mink as a species(individuals) (2) legal framework for protection of mink habitats, (3) legal framework to avoid the possible introduction of American mink in Hiiumaa Island, either intentionally or unintentionally. The analyze offers also the text for modifications and additions into the law to cover the presently existing gaps.

The results of this study have been incorporated into the management plan as analyses of the situation as well as actions to improve the legislation.

It is important to emphasize that the proposed changes will not only support the survival of *Mustela lutreola* in Hiiumaa, but also will help to protect the island habitats and especially the riparian habitats.

5. Study on historical changes in the watercourses of Hiiumaa Island.

To understand the impact of human activities (especially the reclamation work) to the watercourses, an expert was contracted from Hiiumaa to study the history of changes in the watercourses in Hiiumaa. The study provided a good understanding about the extent of change taken place in last century. However, at the same time the study also revealed that the role of human activities in the modification of the watercourses has been controversial: from one hand human activities have resulted in the increase of overall length of the watercourses, but on the other hand the straight canals and ditches result in quick run-off of the water and thus in higher likelihood of draught.

The results of this study have been used in drafting the actions designed for restoration of the habitats for mink.

6. Study on the public opinion about the European mink restoration project in Hiiumaa.

To evaluate the effectiveness of public relations efforts in the course of establishment of the wild population in Hiiumaa Island a special research was started to evaluate the public opinion in Hiiumaa Island about the European mink release project. A questionnaire has been sent to the stakeholders with questions about various issues, such as (1) what is their attitude to the project, (2) from where they have got their information, (3) how important they regard this project is in local and international scale, (4) is the project useful or harmful for the inhabitants of the island, etc.

Unfortunately the start of this research has taken longer time as expected and therefore the results of this research can not be fully incorporated into the management plan. Yet, we still consider this study of utmost importance as it helps us to fine-tune our activities in the future in regard of raising the public awareness. It is worth to mention that the project has been made according to standard methodology and this allows us to evaluate the changes in public opinion as time passes, but also compare the public opinion once the project enters to the next phase and will start the release activities in Saaremaa Island.

The results of this research will be reported in the next, final report of the project.

7. Study on the availability of habitats and on ways to restore and/or improve them

In the course of preparation of the management plan the study was conducted to by Madis Podra to evaluate the availability and quality of mink habitats in Hiiumaa Island. Although the pilot study conducted in 1997 was providing us with some insight, it was obvious that present stage of actions need far better understanding on the availability of habitats and on their quality. The habitats were evaluated from following points: (1) availability of prey, (2) availability of shelter, (3) access to water during winter. The number of other predators, like fox *Vulpes vulpes* and raccoon dog *Nyctereutes procyonoides*, was not addressed as both carnivores are numerous along the river and streams banks.

The collected material was used in the management plan to draft the chapters relevant to availability of habitats and restoration of habitats.

The draft management plan was introduced in the meeting in Hiiumaa Island in September to all the stakeholders: private forest owners, state forest company, hunters societies, regional environmental department, regional authorities of land reclamation, government hunting authorities, government nature conservation authorities, nature conservation bureau, scientists. In the meeting the contracted experts made a short review of the results of their work. Thereafter, Tiit Maran and Madis Podra reviewed the content of the management plan. The main concern was expressed by private land owners and the state forestry company. They were worried that the restrictions in forestry activities along the river banks in European mink core areas will substantially decrease their income. However, after explaining the actual extent of the restriction, it was understood that the restrictions will have only minor impact to the rights of landowners to undertake their forestry activities. Most of the needed restrictions have already been in enforces by existing laws, like the act on banks and shores.

The management plan was reviewed by Dr. Asko Lohmus at Tartu University and after slight modifications and additions taking into account the comments and critics from the reviewer and the Species Conservation Committee the plan was approved by the Ministry of Environment.

C NON-RECURRING MANAGEMENT

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

Status: MODIFIED AND DIVIDED BETWEEN ACTIONS C3 AND D1

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 ISLAND

EXPECTED RESULTS (Deadline 30.04.2004)

1. Animals prepared for release. They are trained in human avoidance, predator avoidance, prey catching and swimming/diving. Samples of DNA are taken, animals are equipped with microchips and vaccinated against rabies, some of the animals are radio-collared and they are treated against parasites.

ACTIONS PERFORMED

Status: IN PROGRESS

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 release of *Mustela lutreola* was performed in Hiiumaa in 2002 and 2003. These animals selected for released in Hiiumaa needed training as well. Also, testing with new training methodology before every release will help also to find-tune the preconditioning methodology.

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

The year 2003 was exceptional from point of view of weather and this set limits to some of the plans for pre-conditioning. Namely the winter was very cold and last unusually long with ice still in sea at the beginning of May. As the first release had to be conducted in late April or early May, the natural prey (like frogs) was simply not available from the wild. Also, cold weather and ice complicated the swimming training. Therefore, in 2003 only a “revised” training was possible to carry out. Yet, as most of the animals were treated to some extent also in 2002, it has to be hoped that the memory of the animals is long enough to keep the experience gained in 2002.

As the post-release monitoring in March 2003 (similarly to monitoring in March 2002) indicated relatively poor survival of released animals for the next breeding season and remarkably high mortality of females, it was obvious that main obstacle for success with release is the high mortality of females and consequently the females have to be paid a special attention. Yet, it has to be admitted that from first glance surprisingly the high mortality of released animals is fully logical from biological point of view. According to

our data from previous years the survival is 30 – 70% during adaptation period (1 – 1.5 month). This combined with the level of natural mortality in winter of ~25% (as assessed on the ground of data received in preceding years; estimate available in the European mink management plan for Hiiumaa) will result in a very high overall mortality leaving too few potential breeders to the wild for the next breeding season. Keeping this in mind, we decided that our preconditioning must be reshaped to increase the likelihood for survival with special focus in females.

The following methodology was used for preconditioning and release in 2002 whenever possible to apply:

1. Training of animals to catch the prey (fish, mice, amphibians, partridges) to be continued as before. Each animal was provided a repeated opportunity to catch all main types of prey. The provision of live prey could be performed only in limited extent for reason explained above.
2. For training of human avoidance the walls between the husbandry corridor and enclosures to were covered with plywood to reduce the eye contact with keepers. The keepers minimized their presence in part of facility with release animals.
3. As animals kept in a large and apart-standing enclosures (with natural interior) seemed to be doing better in the wild than animals from standard enclosures and as increasing survival of females is the key for success, we decided keep females in four large enclosures for release. Four female were kept in these enclosures through out winter and after conception they were released in spring into the wild. Thereafter, the next pregnant females were introduced into these enclosures. The females were delivering young in these enclosures and the young were released in autumn at the time of their natural dispersal. The rational of the release of these young in autumn was the following: from *ad hoc* observations it seemed that the contact of young to the keepers are mediated by female until the dispersal and that consequently the behavior young before the dispersal is less affected by captive conditions than animals kept in captivity longer time. Thus, the prediction was that the young released at dispersal time might have better chances to survive in the wild.
4. Release of pregnant females. In case of success, the release of pregnant females will reduce the time until the potential birth of young in the wild, thus increasing rapidly the number of wild-born young. It was hoped that this would provide an opportunity to reduce the effect of overall mortality before the breeding season when the females can actually contribute to production of wildborn kits and to quickly increase wild-born animals. Yet, there is a danger that pregnant females might have higher mortality than non-pregnant. To find the difference in survival of pregnant *versus* non pregnant females, it was decided to release equal number of pregnant and non-pregnant females.
5. According to our belief the high level mortality during adaptation period is largely caused by animal's withdrawal from riparian zone and moving through other, often highly unsuitable for them habitats. That will make them an easy prey for other carnivores (e.g. fox and feral dogs). In 2002, we released females in special next-boxes. As the result from this release was quite

promising, with almost half of females staying for appr. a month (1 – 1,5 month is the adaptation period to the wild) close to the release site, we decided to use the same methodology also in 2003. The release was conducted according to following scheme: (1) female’s enclosures will be equipped with these nest-boxes some one month before release to allow mink to get used to them; (2) females were transported to Hiiumaa Island closed in the same nest-boxes (3) the nest-boxes were dug into the bank of watercourse with animal inside; (4) the door of the enclosure was opened providing to the animal possibility to merge from the nest-box to the ground through special pipe leading close to the water. The rational behind this scheme was that providing to the animal its own nest box in the new and strange environment might reduce the likelihood of unwanted movements away from riparian zone.

The DNA samples were taken from all animals and also the animals were equipped with microchips.

The animals were vaccinated against rabies and treated against parasites according to standard routine in Tallinn Zoo.

Released animals were not radio-collared in 2003. That for several regions: (1) there were no any urgent questions in need of reply as most of basic information needed was already gained during previous years, (2) the final results of the release will provide the survey by track- and live-tracking in spring 2004, (3) the radio-tracking is very expensive exercise both in terms of cost for the equipment and human resources, (3) it seemed more reasonable to concentrate resources and the efforts for actions needed to compile the management plan.

It was decided to continue the autumn releases in September as it was done in 2002. The rational behind the autumn release is that this will reduce the costs of maintaining the surplus animals in captivity and, at the same time, it is hoped that it will increase animals in the wild, thus also increasing survival of higher number of animals until next breeding season. Also, according to our observations, the young tend to adapt to captivity and to humans only after separation from mother. Before that, a dam seems to be a mediator of the impulses (e.g. food) from outside of the cage/pen to the pups. Therefore, it is likely that the young animals taken for release from mother just before the usual separation time are likely to have higher survival than those being separated and maintained in captivity for a while.

A separate issue addressed in 2003 was the behavioral enrichment of mink in captivity. When the pre conditioning of animals is a relatively short-term effort to train the animals before release, the better keeping conditions taking better into account the behavioral requirements of the European mink would increase the overall behavioral capacity of the animal, maintain its behavioral repertoire and to increase the animals capability to effectively respond to treatment during training activities. To update our knowledge on the ways how to mitigate the effects of captivity to the behavior of the animals, we started with tests of various approaches to behavioral enrichment:

- adding regularly new elements into the enclosure like stumps, tubes, leaves;

- hiding food into various places;
- regularly changing the interior of the enclosure;
- moving the elements (e.g. tubes and stunts) of the enclosure from one animal to another;
- making temporary muddy ponds into the enclosure;
- providing the pile of woodchips stained with the urine of the rodents;
- reducing visual contact with keepers;
- providing live food etc.

The very provisional results provide reason to think that the most effective are the means, which have something to do with olfactory signals. Also, furnishing the interior with anything providing shelter like tubes, stunts etc., will increase the overall activity of the animals. Live prey seems also to be important to increase the overall activity of animal in captivity. Interestingly, covering of fence between animal enclosure and the service corridor reduced the stereotyped behaviour (indicator of stress) of the animal significantly.

C.3. RELEASE OF *MUSTELA LUTREOLA* IN SAAREMAA ISLAND AND POST-RELEASE MONITORING³

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 early spring 2002

ACTIONS PERFORMED

Status: IN PROGRESS

Before starting the release in 2003 the regular survey conducted in Hiiumaa provided us the insight on the status of mink released in previous years. The survey was performed by track counting on December, 2002 and January, 2003. In March and April 2003 the animals were live-trapped to identify the individuals. 43 live-traps were used in survey in 9 water-bodies. All in all, traps were set up for 311 trapping night in 21 sites. For live-trapping these sites were selected according to the results of track-counting.

The caught animals were identified with the help of microchips, they were sexed and weight and released again. The sites of live-trapping are provided in Figure1

³ 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.

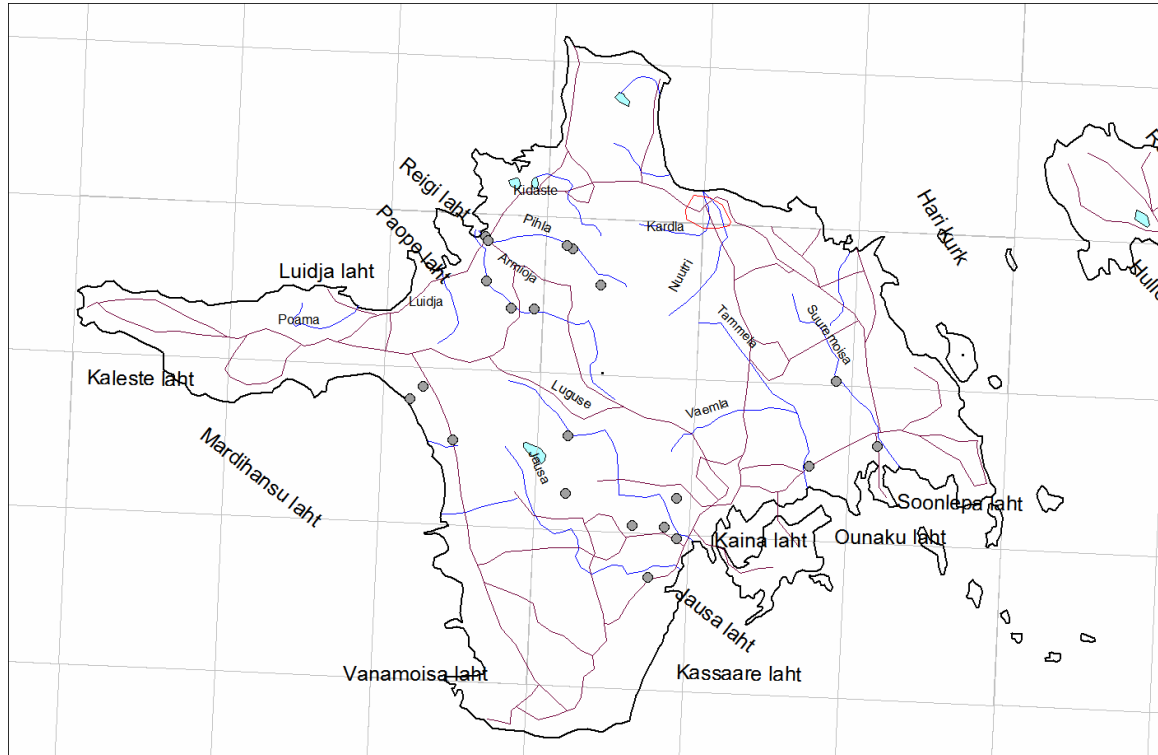


Figure 1. Live-trapping sites in Hiiumaa Island during survey in spring 2003

During the survey before the breeding season minimum 6 mink (5 males and 1 female) were detected (table 1). As the counting in December 8 animals were surviving the winter mortality in 2003 was around 25%.

Table 1.

Surviving *Mustela lutreola* in winter 2002/2003 ⁴

Individual	Sex	Date of release	Weight at release	Date of trapping	Weight	% of weight as in release
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%

The results of release in 2002 were not meeting the expectation. Partly it can be explained by exceptional draught in summer 2002 resulting in dry rivers and streams

⁴) One animal was removed to Pihla stream in February and its tracks were continuously monitored on the bank. However, despite of long live-trapping efforts we failed to catch it.

almost everywhere. It was the hardest drought in 20 years (Figure 2) The situation was worsened by early long and exceptionally cold winter when most of the water courses due to lack of water froze to bottom.

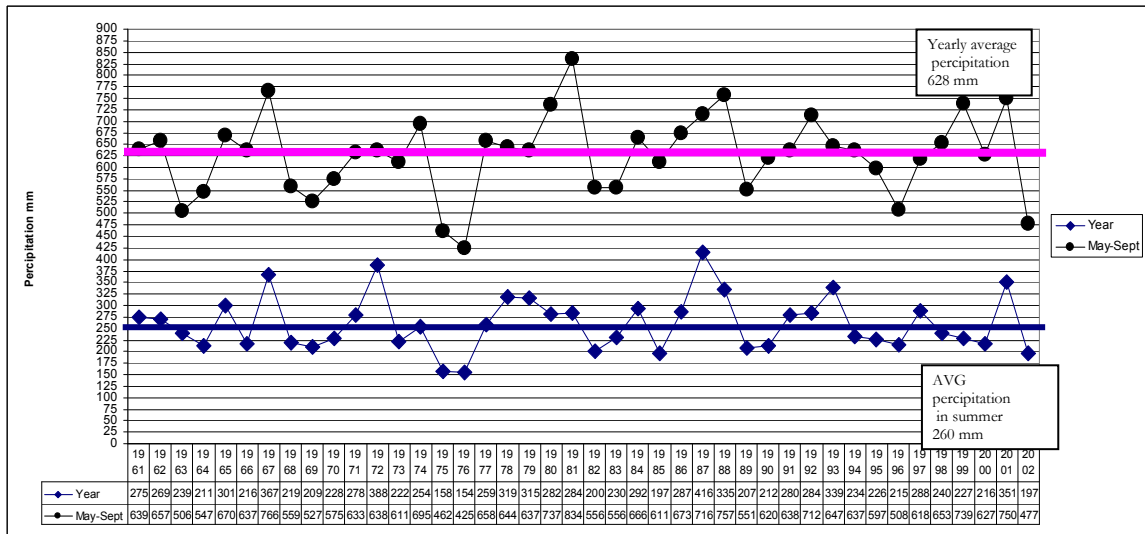


Figure2 . Yearly and summer precipitation in Hiiumaa in 1961 – 2002.

However, it is clear that not only the exceptional conditions have to be blamed for moderate results. It seems that the process of setting up a new wild population in more complicated and time-demanding exercise that assumed at the beginning.

The release in 2003 was performed during two periods (Annex 1):

- Late April and May
- Late August and September

Altogether 60 animals were released (Table 2 & Figure 3).

Table 2

Release of European mink in Hiiumaa Island 2002– 2003.

Years	Number of released animals						With radiocollars	Surviving next spring
	Males	Females		Total	Summer	Autumn		
		Non pregnant	Pregnant					
2002	23	31	12	54	39	15	12	> 6
2003	32	28	14	60	42	18	0	> ?
Total	55	59	26	172	130	41	52	

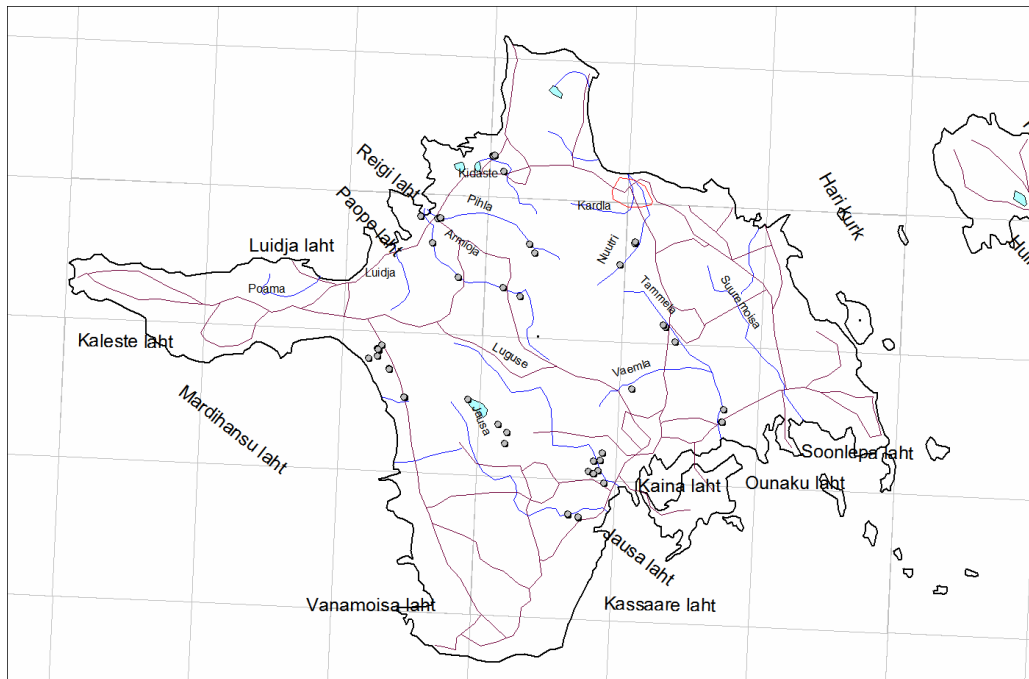


Figure 3. Release sites of *Mustela lutreola* in Hiiumaa in 2003

The selection of animals was made in accordance to the analyzes on the genetic and demographic status of captive stock. Various programs included on software packages SPARKS (Gene and Demog) and Population Management 2000 were used for that. The main principle of selection was that withdrawal of animals for release must not have significant negative impact to genetic and demographic quality of captive population. Still, it has to be admitted that large-scale release of animals will to certain extent change the parameters of the all-European captive population. That is because the most valuable genes are kept in Tallinn Zoo. With removing animals from Tallinn population will flush out valuable genes raising the proportion of low-value genes kept in other zoos in Europe (e.g. EURONERZ, Germany).

The decrease of the genetic diversity of captive population was of greatest concern to be addressed in 2003. To mitigate the effect of flushing out the genes of high-value in Tallinn, the exchange of animals was performed with EURONERZ (Germany) in early spring (as described under action D1) and the animals received from Germany were released in Hiiumaa Island as well (Annex 5).

The sex ratio of released animals was 32:28. Half of the females were pregnant. The pregnant females were released approx. 1 – 1,5 weeks after mating. This year none of the animals were equipped with radio-collars and that because of the following reasoning: (1) we do have already received the basic information on behavior of the animals in the wild after release, (2) the collars may still have effect on the animals survival, (3) it is relatively expensive to use the collars both in terms of the costs of the transmitters and the working load needed to radio-track the animals effectively.

The criteria of site selection for release were the abundance of amphibians (occurring in high number and easily available for mink in spring) or other prey, but also availability

of shelter in riparian area. All the females were released with nest boxes as described under action C2.

The release was performed by coordinator in the field Madis Podra. The animals were prepared for release by coordinator in captivity Merje Polma, project manager Tiit Maran and animal keepers.

The results of the release in 2003 can be estimated after the survey in 2004

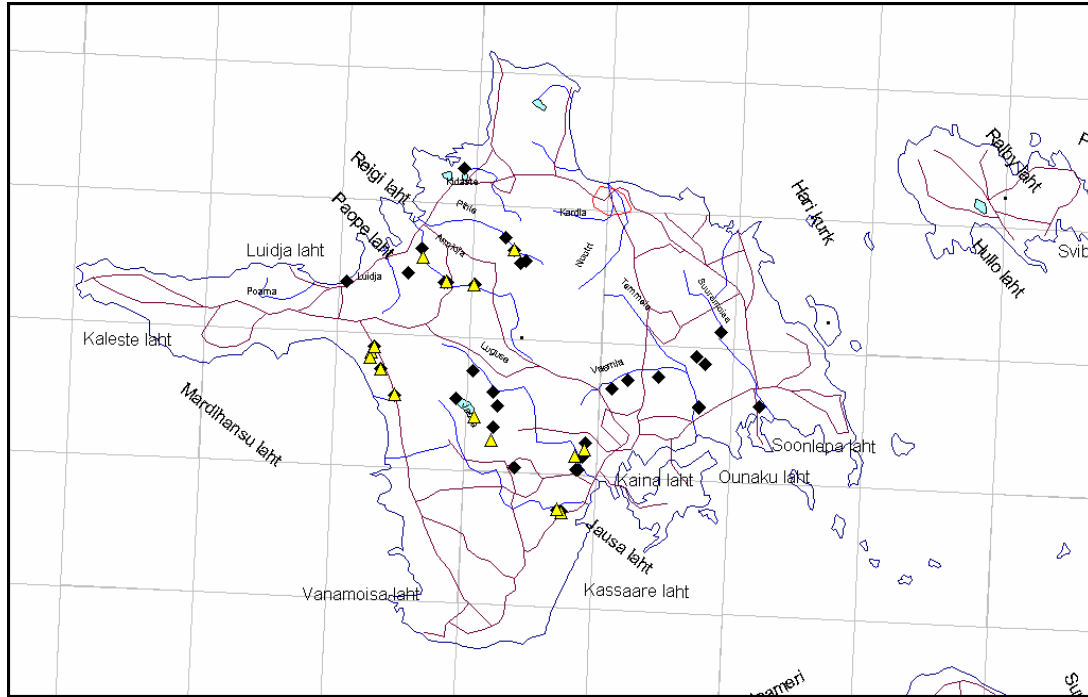


Figure 2. Sites of release of *Mustela lutreola* in Hiiumaa in 2002: black rout- release sites in spring; grey triangle - release sites in autumn

However, considering the relatively dry summer again in 2003, it is likely that the results of release in 2003 will not meet the expectations. It is clear that, achieving success will need long-term commitment and experimenting with new release methodologies.

In 2004, it is planned to test new methods of release to increase the survival of *Mustela lutreola*:

- In November and December the females will be live-trapped and brought back to breeding facility. They will be maintained in captivity until next spring and will be then released again exactly the same place the animals were caught. The hope its that in this way it is possible to avoid the impact of winter mortality. It is not decided yet whether the female have to be mated in breeding facility or not.
- In winter and spring 2004 three large enclosures will be constructed in Hiiumaa into riparian zone of suitable of mink watercourses. The pregnant females will be introduced there some week after mating. The female are hoped to deliver young in these outdoor pens. The litter and the female will be kept in the pen until the natural time of dispersal. Then the doors will be

opened and the young will be provided the opportunity to disperse into the nature. All the animals will be radio-collared and will be intensively monitored with in 1, 5 – 2 month.

- In parallel to this action the new born from the natural enclosure in Tallinn Zoo will be released at the time of natural dispersal. They will be radio-tagged and followed in the same way those born in Hiiumaa.

REQUEST FOR MODIFICATION OF THE ACTION

The non-expectedly moderate results for the release in 2001 – 2002 have resulted in dilemma on the future of the action C3. According to the project documentation we have to start with the release in Saaremaa Island in 2004. The pilot research (Action A3) has shown the suitability of the island for release, despite of some factors demanding preparatory actions and very careful planning. However, the insufficient success in Hiiumaa Island asks for careful consideration before next year release action(s). The following aspects have to be kept in mind:

- The Hiiumaa release needs continuation or otherwise the works already done there will be lost.
- The Hiiumaa Island is geographically well-known for the project and the overall attitude of local inhabitants is positive to the release project. Starting actions in Saaremaa Island and stopping them in Hiiumaa might look awkward public: “they have not finished work in one island, but already are starting the same action in the other”. That could jeopardize the overall credibility of the release project, but also the conservation projects in general. It does not seem to be wise not benefit from good knowledge gained in 1998 – 2003 about the habitats and natural conditions in Hiiumaa Island and to start the actions in Saaremaa, where everything has to be started from beginning.
- The performance of release in both islands simultaneously would be highly complicated and would split our moderate human resources for simultaneous actions in two islands. It is likely that it as quite high impact the results in both islands.

On the ground of above-mentioned considerations we propose to modify the project once more:

- To continue with the release only in Hiiumaa Island and postpone the release of *Mustela lutreola* in Saaremaa Island beyond the time-limits of this project.⁵

⁵ According to the European mink recovery plan in Estonia approved by the Estonian Ministry of the Environment the release in Saaremaa Island is foreseen in Saaremaa Island anyway. So, even if it will not be performed in the frame of this LIFE project, it will be conducted anyway in the frame of the future project.

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

- To use other methods of pre-conditioning and release in 2004 with the aim to gain better survival rates.
- To perform the release in 2004 following the same budget as foreseen for action in Saaremaa.

It is our conviction that in this way the conservation of *Mustela lutreola* will benefit more from allocated funds.

D RECURRING MANAGEMENT

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: IN PROGRESS (CONTINUOUS ACTION)

The breeding in 2002 was performed according to plan prepared in January similarly to the previous years (table 3). Considering the capacity of breeding facility and the intentions to release animals in Hiiumaa, but also the genetics and demography of captive population in Tallinn Zoo as well as in elsewhere in Europe we decided to mate 17 females for conservation breeding like in 2002. The overall list females possible to use in breeding consisted of 53 females (including females selected for release). With the breeding success of about 60 – 70 % (like in previous years) the outcome was estimated to be around 40 young.

The actual breeding was slightly higher reaching 57 young (Annex 2).

The neonate's death rate (death in 30 days after birth) was close to 0% (one animal died within a month after death). All in all 7 animals died in 2003 (Annex 3) because of various, but typical reasons in captivity.

In addition 14 females were conceived for release purpose.

The overall number of *Mustela lutreola* in Endangered Species Centre at Tallinn Zoo was 115 (52.63) as of 01.09.2003 (Annex 5).

The overall genetic and demographic parameters of the populations and change from 2000/2001 to 2002/2003 are provided in table 4. The definitions for parameters used in table 4 are provided in Annex 6.

Table 3.

Conservation breeding in breeding facility at Tallinn Zoo 2001- 2003

Year	Number of young produced	Number of animals at the end of the year
2001	53	105
2002	62	105
2003	57	115 (as of 01.09.2003)

Table 4.

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

Demographic parameters	2000/2001	2001/2002	2002/2003
Males			
Population Growth Rate	1,6835	2,0886	2,3954
Mean Generation Time	2,65	0,77	1,41
Females			
Population Growth Rate	1,6969	2,0886	1,8980
Mean Generation Time	1,26	0,77	1,13
Genetic parameters	2000/2001	2001/2002	2002/2003
Founders	19	21	22
Potential founders	2	1	0
Living descendants	102,31	101,42	139,86
Percent known	97,4	96,6	97,1
Gene Diversity	0,8966	0,9342	0,9399
Potential Gene diversity	0,9544	0,9582	0,9580
Gene Value	0,8935	0,9278	0,9343
Founder Genome Equivalents	4,84	7,60	8,31
Potential Founder Genome Equivalents	10,98	11,96	11,92
Founder Genome Surviving	8,90	10,88	11,83
Potential Founder Genome Surviving	10,98	11,96	11,92
Mean Inbreeding Coefficient (F)	0,0318	0,0140	0,0111

As is evident from table 4, the demography of the captive population has developed and the capacity of reproduction is better than in previous years. The mean generation time has grown, which indicates a slowdown in generation rotations and, thus, also

decrease in rate of loss in gene diversity. However, arbitrary lengthening the generation time might be a dangerous given the very short reproductive life-span of *Mustela lutreola* females 3 - 4 years.

The genetic parameters of captive population have improved remarkably. That is mostly caused by the success in entering the genes of last potential founder into the overall genetic pool of the population. However, it is also clear that appropriate management decisions have contributed to improvement genetic status of the population.

To further improve the genetic quality of the captive stock not only in Tallinn, but in the whole EEP region, we made a large-scale exchange of animals with the second largest facility in Europe – the Euronorz in Germany. In the course of the action 15 animals with low genetic value were transported to Tallinn and 8 animals of high genetic value were moved from Tallinn to Euronorz (Annex 5). The animals brought to Tallinn were released to Hiiumaa Island.

The second important action in 2003 for improvement of the captive stock listed in the “First Progress Report: 01. September 2001 – 31. August 2002” was the import of additional founders from Russia. This was not achieved because of two reasons: (1) difficulties in finding the wild animals, (2) difficulties on finding a feasible way of export the animals from Russia.

Although the quality of the genetic stock has improved during the last two years, the danger remains that continuous release of animals may have negative impact to the captive stock.

Two actions, a bit apart-standing from genetic and demographic management of the project were performed in collaboration with other institutions:

- Pilot study on nutrition of the European mink conducted in collaboration with Van Hall Insitute (the Netherlands) and European Zoo Nutrition Centre (Holland). The aim of the study was to review the nutrition of the *Mustela lutreola* in European zoos and to collect the existing information relevant for nutrition of this species. The review compiled will serve as the baseline for further study which is hoped to result in nutrition recommendations for European mink conservation breeding operation.
- Study on the *Canine distemper* vaccines suitable for *Mustela lutreola* in collaboration with Rotterdam University (The Netherlands) and Rotterdam Zoo (The Netherlands). The contagious disease *Canine distemper* has detrimental effect to *Mustela lutreola* – the lethal effect could reach to 95% percent of the population. However, the standard vaccines (both live and modified) for commercial mink farming can not be used for *Mustela lutreola* as this species appears to be highly sensitive to this virus and even the vaccine can induce the disease. Therefore the animals in captivity have not been vaccinated against this virus posing the whole operation to high risk. In the study we tested the effect of commercial recombinant vaccine (Purevax; USA) and an experimental ISCOM vaccine (the Netherlands) to determine their safety and humoral immunogenicity. Both vaccines appeared to be safe to use in *Mustela lutreola*, while the ISCOM vaccine seems, according to our provisional results, to be 22 times more effective. The study continues in 2004.

F OVERALL PROJECT MANAGEMENT

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: IN PROGRESS (CONTINUOUS ACTION)

1. Reporting to EU LIFE program

There was no specific mission during the period covered by this report. However, several issues have been consulted by Mats Erickson and Marita Karling during the reporting period by means of communication.

2. Contracting partners, assistants and subcontractors

The partners have been continuing their actions according to the contracts made at the beginning of the project. The assistants and the project manager contracts were renewed at the beginning of this reporting period. Several contracts were made with other institutions and experts for short-term tasks.

3. Organization of accounting

The contract with the same accountant was renewed for a year. The audit was performed for the year 2002. However, as the auditor who was performing the auditing for 2001 stopped her work as an auditor we had to choose a new. The new auditor for Foundation LUTREOLA 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 project and actions related to the conservation of *Mustela lutreola* has been presented in several local and international meetings, but also in media:

- September 2002, EAZA Annual Conference in Leipzig. Presentations in Small Carnivore Expert Group and European mink EEP meeting, both devoted to the conservation of *Mustela lutreola* in Estonia, with emphasis also on EU LIFE Project. In addition, a presentation was made in plenary session proposing the European mink as a flagship species for the conservation actions in European Zoo Community.
 - March 2003 - Presentation on the progress of the project in Rotterdam Zoo for the Netherlands Zoo Association and supporters on the project.
 - March 2003 - Presentation on the progress of the project in La Thoiry Zoo (France) on the project
 - April 2003, Article in the flight magazine in the national air-company “Estonian Air” (summer-edition 2003)
 - Mai 2003, Environment protection NGO of Tallinn Pedagogical University “Sorex” – a presentation on the European mink release project.
 - Mai 2003, Article in the Estonian Hunting Journal on the progress of the project
 - June 2003, Article in the local newspaper in Hiiumaa Island on the release plans in 2003.
 - July 2003 Article on the European mink Conservation in Hiiumaa Island in the Tourist Guide of Hiiumaa: “Hiiumaa 2003/2004”.
 - September 2003 - Meeting with stakeholders in Hiiumaa Island on the conservation of *Mustela lutreola* in Hiiumaa. Two presentations: on the conservation of the European mink, on the management plan in Hiiumaa.
 - Three meetings with the keepers of the animals in Tallinn Zoo over the progress of the project and on the ways to proceed with captive breeding of the European mink.
5. Setting up and updating the homepage
- The LUTREOLA web page (www.lutreola.ee) was updated. It contains the review on breeding results in 2002 and the last reports about results in 2002.
6. Organization of field actions

Project manager has been involved in organization of field actions in Hiiumaa Island. He has been organizing the transport, accommodation, but also field equipment needed of effective field research. Project manger has also required all the necessary permits needed to perform field actions (e.g. permit fro release of *Mustela lutreola*, permit to use leg-hold traps etc.).

7. Drafting the new EL LIFE CO-OP Project with Spanish, German, Check and Russian colleagues. Under the initiative of Spanish colleagues an application of LIFE CO-OP project was drafter for 2004 – 2005. The main aim of the project is to collaborate between several centers of conservation activities around the Europe and to unify our efforts for common interest.

ANNEXES

ANNEX 1 – *MUSTELA LUTREOLA* RELEASED IN HIIUMAA IN 2003
AND PROVISIONAL RESULTS

ID	SEX	MICROCHIPS	Mated with MALE	MATE DATE	CALC. BIRTH DATE	RELEASE DATE	PEN TYPE	WEIGHT	COORDINATES	
									E	N
811	F	00.060F-61FE	909	4.3.03	05.15.03	4.21.03	SMALL	480	22,68630	58,78434
1025	F	00-0615-4476	773	4.2.03	05.14.03	4.21.03	LARGE	600	22,71701	58,80675
1068	F	00-061F-91A0	773	4.3.03	05.15.03	4.21.03	LARGE(OLD)	770	22,70916	58,81483
1110	F	00-060F-4550	920	4.1.03	06.03.03	4.21.03	SMALL	520	22,54566	58,85903
1111	F	00-0077-4F8F	909	3.31.03	05.12.03	4.21.03	SMALL	630	22,67293	58,78626
795	F	00-0200-96A4	920	4.22.03	06.03.03	4.27.03	SMALL	730	22,59269	58,83117
911	F	00-061F-A9B2	980	4.15.03	05.27.03	4.27.03	LARGE	720	22,86451	58,85583
912	F	00-0621-62DF	1028	4.16.03	05.28.03	4.27.03	SMALL	570	22,50373	58,97522
914	F	00-0618-1F5E	807	4.22.03	06.03.03	4.27.03	SMALL	705	22,49749	58,95929
1011	F	00-060f-4550	920	4.1.03	05.13.03	4.27.03	SMALL	520	22,69812	58,81409
980	M	00-05FE-2873	N/A	N/A	N/A	4.27.03	SMALL/LARGE	840	22,86451	58,85583
582	F	NO	1035	4.26.03	06.06.03	5.4.03	LARGE	700	22,67309	58,78635
871	F	NO	773	4.25.03	06.06.03	5.4.03	SMALL NEW	550	22,50634	58,97571
910	F	NO	775	4.27.03	06.08.03	5.4.03	SMALL NEW	630	22,48198	58,97636
1057	M	00-0621-4EC1	N/A	N/A	N/A	5.4.03	SMALL/NEW	980	22,62566	58,95416
860	M	00-061F-8BFD	N/A	N/A	N/A	5.4.03	SMALL/NEW	765	22,43243	58,88576
908	M	00-0631-FBDB	N/A	N/A	N/A	5.4.03	SMALL/NEW	825	22,57065	59,01631
916	M	00-061F-4E5D	N/A	N/A	N/A	5.4.03	SMALL/NEW	875	22,44695	58,87802
919	M	00-0620-64F5	N/A	N/A	N/A	5.4.03	SMALL/NEW	750	22,58521	59,00666
930	M	00-061F-1EB6	N/A	N/A	N/A	5.4.03	SMALL/NEW	820	22,46698	58,85961
937	M	00-0620-17D0	N/A	N/A	N/A	5.4.03	SMALL/NEW	810	22,43714	58,89304
922	F	00-0620-03F2	N?	N/A	N/A	5.12.03	SMALL	590	22,68633	58,78457
602	F	00-0620-0A75	1035	5.5.03	06.16.03	5.12.03	SMALL	640	22,70428	58,82079
938	F	00.0620-0D1A	1028	4.26.03	06.07.03	5.12.03	SMALL	740	22,70347	58,81306
788	M	00-0601-74R5	N/A	N/A	N/A	5.12.03	SMALL/G	1000	22,79006	58,90795

ID	SEX	MICROCHIPS	Mated with MALE	MATE DATE	CALC. BIRTH DATE	RELEASE DATE	PEN TYPE	WEIGHT	COORDINATES	
									E	N
793	M	00-01C4-C139 (00-05FD-FDC7)	N/A	N/A	N/A	5.12.03	SMALL/G	980	22,71478	58,8262
794	M	00-01DD D783	N/A	N/A	N/A	5.12.03	SMALL/G	1000	22,7498	58,96164
807	M	00-01BC-7F53	N/A	N/A	N/A	5.12.03	SMALL/G	920	22,73237	58,94762
808	M	00-060F-0458	N/A	N/A	N/A	5.12.03	SMALL/G	690	22,86233	58,84748
1044	M	00-0621-4827	N/A	N/A	N/A	5.29.03	SMALL	860	22,7507	58,96256
1043	M	00-061F-7F39	N/A	N/A	N/A	5.29.03	SMALL	865	22,7501	58,86786
1051	M	00-0618-4B71	N/A	N/A	N/A	5.29.03	SMALL	760	22,8625	58,84764
877	M	00-0613-66AF	N/A	N/A	N/A	5.29.03	SMALL	715	22,78713	58,90966
878	M	00-0631-7821	N/A	N/A	N/A	5.29.03	SMALL	805	22,80251	58,89888
948	F	00-061F-FC73	N	N/A	N/A	5.16.03	SMALL	560	22,43371	58,88953
1052	F	00-0620-45AE	N	N/A	N/A	5.16.03	SMALL	550	22,53069	58,93755
1061	F	00-0620-2F62	N	N/A	N/A	5.16.03	SMALL	680	22,42095	58,88415
1065	F	00-0620-1490	N	N/A	NA	5.16.03	SMALL	650	22,62566	58,95409
789	M	00-01C3-39DF	N/A	N/A	N/A	5.16.03	SMALL/G	1000	22,58399	58,84323
810	M	00-060F-90C3	N/A	N/A	N/A	5.16.03	SMALL/G	790	22,59262	58,83115
814	M	00-0601-0E6B	N/A	N/A	N/A	5.16.03	SMALL/G	830	22,57176	59,01646
815	M	00-0601-3A37	N/A	N/A	N/A	5.16.03	SMALL/G	890	22,61843	58,96013
1277	f	00-0621-29c4	N	N/A	N/A	8.26.03	LARGE3	530	22,67298	58,78631
1279	M	00-0621-4f2f	N	N/A	N/A	8.26.03	LARGE2	810	22,43185	58,88558
1276	M	0-006-202-fbb	N	N/A	N/A	8.26.03	LARGE3	820	22,58674	58,93169
1285	M	0-006-214-3ef	N	N/A	N/A	8.4.03	LARGE/OLD	920	22,44752	58,87734
1286	M	0-006-1fb-340	N	N/A	N/A	8.26.03	LARGE/OLD	850	22,46625	58,85983
1236	F	0-006-1F9-ED9	N	N/A	N/A	8.26.03	fromPAV/LOV	1100	22,57293	59,0165
1239	F	203098400131250	N	N/A	N/A	8.26.03	fromPAV/LOV	730	22,49732	58,95926
1234	M	203098100131954	N/A	N/A	N/A	8.26.03	fromPAV/LOV	960	22,60865	58,92626
1238	f	203098100131154	N	N/A	N/A	8.26.03	fromPAV/LOV	720	22,50723	58,97553
1237	M	203098100131904	N/A	N/A	N/A	8.26.03	fromPAV/LOV	1100	22,62545	58,95426
1235	M	203098100131371	N/A	N/A	N/A	8.26.03	fromPAV/LOV	920	22,43318	58,88997
1278	F	0-006-31D-D7A	N	N/A	N/A	9.4.03	LARGE3	600	22,70407	58,81296
127	M	0-006-31B-	N/A	N/A	N/A	9.4.03	LARGE3	780	22,5456	58,8590

ID	SEX	MICROCHIPS	Mated with MALE	MATE DATE	CALC. BIRTH DATE	RELEASE DATE	PEN TYPE	WEIGHT	COORDINATES	
									E	N
5		E20							3	4
1281	F	0-006-202-BBF	N	N/A	N/A	9.4.03	LARGE2	630	22,5071	58,97554
1027	M	0-006-1FF-0FC	N/A	N/A	N/A	9.4.03	SMALL/ NEW	830	22,59507	58,83827
1280	F	0-006-201-9A3	N	N/A	N/A	9.4.03	LARGE2	660	22,71236	58,82137
1282	F	0-006-1fb-21d	N	N/A	N/A	9.4.03	LARGE2	620	22,53077	58,93756
1283	F	0-006-203-26a	N	N/A	N/A	9.4.03	LARGE2	600	22,43232	58,89039

ANNEX 2 – BIRTH IN CAPTIVE BREEDING FACILITY IN 2003

EUROPEAN MINK Studbook Page 1
 Restricted to: (Mustela lutreola novikovii)
 Locations: TALLIN /
 Dates: 01/01/2003 <= date
 Event: Births

Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event
1261	M	9 May 2003	775	959	TALLIN	9 May 2003	14883	Birth
1262	M	9 May 2003	775	959	TALLIN	9 May 2003	14884	Birth
1263	M	9 May 2003	775	959	TALLIN	9 May 2003	14885	Birth
1264	M	22 May 2003	775	1073	TALLIN	22 May 2003	14886	Birth
1265	M	22 May 2003	775	1073	TALLIN	22 May 2003	14887	Birth
1266	F	22 May 2003	775	1073	TALLIN	22 May 2003	14888	Birth
1267	F	22 May 2003	775	1073	TALLIN	22 May 2003	14889	Birth
1268	F	22 May 2003	775	1073	TALLIN	22 May 2003	14890	Birth
1269	M	24 May 2003	776	1077	TALLIN	24 May 2003	14891	Birth
1270	M	24 May 2003	776	1077	TALLIN	24 May 2003	14892	Birth
1271	M	24 May 2003	776	1077	TALLIN	24 May 2003	14893	Birth
1272	F	24 May 2003	776	1077	TALLIN	24 May 2003	14894	Birth
1273	F	24 May 2003	776	1077	TALLIN	24 May 2003	14895	Birth
1274	F	24 May 2003	776	1077	TALLIN	24 May 2003	14896	Birth
1275	M	26 May 2003	775	1040	TALLIN HIIUMAA	26 May 2003 4 Sep 2003	14897	Birth Release
1276	M	26 May 2003	775	1040	TALLIN HIIUMAA	26 May 2003 4 Sep 2003	14898	Birth Release
1277	F	26 May 2003	775	1040	TALLIN HIIUMAA	26 May 2003 26 Aug 2003	14899	Birth Release
1278	F	26 May 2003	775	1040	TALLIN HIIUMAA	26 May 2003 4 Sep 2003	14900	Birth Release
1279	M	28 May 2003	775	1054	TALLIN HIIUMAA	28 May 2003 26 Aug 2003	14901	Birth Release
1280	F	28 May 2003	775	1054	TALLIN HIIUMAA	28 May 2003 4 Sep 2003	14902	Birth Release
1281	F	28 May 2003	775	1054	TALLIN HIIUMAA	28 May 2003 4 Sep 2003	14903	Birth Release

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 Restricted to:
 Locations: TALLIN /
 Dates: 01/01/2003 <= date
 Event: Births

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Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event
1282	F	28 May 2003	775	1054	TALLIN HIUMAA	28 May 2003 4 Sep 2003	14904	Birth Release
1283	F	28 May 2003	775	1054	TALLIN HIUMAA	28 May 2003 4 Sep 2003	14905	Birth Release
1284	F	28 May 2003	775	1054	TALLIN	28 May 2003	14906	Birth
1285	M	2 Jun 2003	776	885	TALLIN HIUMAA	2 Jun 2003 26 Aug 2003	14907	Birth Release
1286	M	2 Jun 2003	776	885	TALLIN HIUMAA	2 Jun 2003 26 Aug 2003	14908	Birth Release
1287	M	2 Jun 2003	776	885	TALLIN	2 Jun 2003	14909	Birth
1288	F	2 Jun 2003	776	885	TALLIN	2 Jun 2003	14910	Birth
1289	F	2 Jun 2003	776	885	TALLIN	2 Jun 2003	14911	Birth
1290	F	2 Jun 2003	776	885	TALLIN	2 Jun 2003	14912	Birth
1291	M	4 Jun 2003	1028	955	TALLIN	4 Jun 2003	14913	Birth
1292	M	4 Jun 2003	1028	955	TALLIN	4 Jun 2003	14914	Birth
1293	F	4 Jun 2003	1028	955	TALLIN	4 Jun 2003	14915	Birth
1294	F	4 Jun 2003	1028	955	TALLIN	4 Jun 2003	14916	Birth
1295	F	4 Jun 2003	1028	955	TALLIN	4 Jun 2003	14917	Birth
1296	F	6 Jun 2003	168	605	TALLIN	6 Jun 2003	14918	Birth
1297	F	6 Jun 2003	168	605	TALLIN	6 Jun 2003	14919	Birth
1298	M	7 Jun 2003	776	615	TALLIN	7 Jun 2003 10 Jul 2003	14920	Birth Death
1299	M	7 Jun 2003	776	615	TALLIN	7 Jun 2003	14933	Birth
1300	M	7 Jun 2003	776	615	TALLIN	7 Jun 2003	14934	Birth
1301	M	7 Jun 2003	776	615	TALLIN	7 Jun 2003	14935	Birth

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 Locations: TALLIN /
 Dates: 01/01/2003 <= date
 Event: Births

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Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event
1302	F	7 Jun 2003	776	615	TALLIN	7 Jun 2003	14936	Birth
1303	F	7 Jun 2003	776	615	TALLIN	7 Jun 2003	14937	Birth
1304	F	11 Jun 2003	1028	884	TALLIN	11 Jun 2003	14938	Birth
1305	M	12 Jun 2003	775	208	TALLIN	12 Jun 2003	14939	Birth
1306	M	12 Jun 2003	775	208	TALLIN	12 Jun 2003 3 Jul 2003	14940	Birth Death
1307	F	12 Jun 2003	775	208	TALLIN	12 Jun 2003	14941	Birth
1308	M	11 Jun 2003	773	778	TALLIN	11 Jun 2003	14942	Birth
1309	M	11 Jun 2003	773	778	TALLIN	11 Jun 2003	14943	Birth
1310	F	11 Jun 2003	773	778	TALLIN	11 Jun 2003	14944	Birth
1311	F	11 Jun 2003	773	778	TALLIN	11 Jun 2003	14945	Birth
1312	M	13 Jun 2003	776	777	TALLIN	13 Jun 2003	14946	Birth
1313	M	22 Jun 2003	1075	917	TALLIN	22 Jun 2003	14947	Birth
1314	M	22 Jun 2003	1075	917	TALLIN	22 Jun 2003	14948	Birth
1315	M	22 Jun 2003	1075	917	TALLIN	22 Jun 2003	14949	Birth
1316	F	22 Jun 2003	1075	917	TALLIN	22 Jun 2003	14950	Birth
1317	F	22 Jun 2003	1075	917	TALLIN	22 Jun 2003	14951	Birth

TOTALS: 28.29.0 (57)

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ANNEX 3 DEATH IN 2003 IN BREEDING FACILITY

EUROPEAN MINK Studbook Page 1
 Restricted to: (Mustela lutreola novikovii)
 Locations: TALLIN /
 Dates: Between 01/01/2003 and 01/09/2003
 Event: Deaths

Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name
133	F	21 Oct 1994	WILD	WILD	TVER TALLIN	21 Oct 1994 19 Dec 1995 14 Aug 2003	113 11890	Capture Transfer Death	NETTY
208	F	15 Jun 1997	168	174	TALLIN	15 Jun 1997 18 Jul 2003	12435	Birth Death	LOTTA
212	F	16 May 1997	158	129	ROTTERDAM TALLIN	16 May 1997 22 May 2002 25 Aug 2003	105610 14158	Birth Transfer Death	SANTA
774	M	????	WILD	WILD	ALESHNYA TALLIN	???? 11 Feb 2000 24 Mar 2003	NONE 13235	Capture Transfer Death	KIRILL
859	M	5 Jun 2000	774	583	TALLIN	5 Jun 2000 25 Mar 2003	13360	Birth Death	EINSTEIN
1298	M	7 Jun 2003	776	615	TALLIN	7 Jun 2003 10 Jul 2003	14920	Birth Death	
1306	M	12 Jun 2003	775	208	TALLIN	12 Jun 2003 3 Jul 2003	14940	Birth Death	

TOTALS: 4.3.0 (7)

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 Data current thru: 15 Sep 2002 foundation "Lutreola" - EEP
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ANNEX 4 – *MUSTELA LUTREOLA* IN BREEDING FACILITY AS OF 01.09.2003.

EUROPEAN MINK Studbook											Page	1
Restricted to: (Mustela lutreola novikovi)												
Locations: TALLIN /												
Dates: As of 01/09/2003												
Status: Living on 1 Sep 2003												
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		
168	M	????	WILD	WILD	RUSSIA TALLIN	28 Nov 1996 25 Mar 1997	NONE 12135	Capture Transfer	VILLU	00.0124.445B		
189	F	8 Jun 1997	168	133	TALLIN	8 Jun 1997	12425	Birth	SOPHIE	0 006 31C 983		
198	M	29 May 1997	168	150	TALLIN	29 May 1997	12415	Birth	MARCUS	00.0123.71E6		
201	F	29 May 1997	168	150	TALLIN	29 May 1997	12416	Birth	NMMEROOSI00.0123.A8AF			
204	F	1 Jun 1997	168	151	TALLIN	1 Jun 1997	12418	Birth	VZIKE-MY	00.0124.EB86		
205	F	1 Jun 1997	168	151	TALLIN	1 Jun 1997	12419	Birth	RUU	00.0123.974E		
207	F	15 Jun 1997	168	174	TALLIN	15 Jun 1997	12434	Birth	SIISIKE	00.0124.4ABC		
211	F	16 May 1997	158	129	ROTTERDAM TALLIN	16 May 1997 16 Apr 1998	105609 12517	Birth Transfer	DIXI	098.100.114.848		
213	F	16 May 1997	158	129	ROTTERDAM TALLIN	16 May 1997 22 May 2002	105611 14159	Birth Transfer	BARBARA	098.100.114.929		
580	F	1 Jun 1998	168	211	TALLIN	1 Jun 1998	12616	Birth	KATS	0 006 201 357		
605	F	11 Jun 1998	132	133	TALLIN	11 Jun 1998	12636	Birth	RITIMI			
615	F	11 Jun 1998	203	167	TALLIN	11 Jun 1998	12684	Birth	FLICKA			
773	M	????	WILD	WILD	OBSHA TALLIN	???? 11 Feb 2000	NONE 13234	Capture Transfer	IVAN			
775	M	????	WILD	WILD	OBSHA TALLIN	???? 11 Feb 2000	NONE 13236	Capture Transfer	KOLJA			
776	M	????	WILD	WILD	OBSHA TALLIN	???? 11 Feb 2000	NONE 13237	Capture Transfer	VALERI			
777	F	????	WILD	WILD	OBSHA TALLIN	???? 11 Feb 2000	NONE 13238	Capture Transfer	VALENTINA			
778	F	????	WILD	WILD	OBSHA TALLIN	???? 11 Feb 2000	NONE 13239	Capture Transfer	MASHA			
861	F	5 Jun 2000	774	583	TALLIN	5 Jun 2000	13362	Birth	MILVI	0 006 154 105		
869	M	7 Jun 2000	776	677	TALLIN	7 Jun 2000	13371	Birth	GANDALF	0 006 205 DE5		
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			

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Restricted to: (Mustela lutreola novikovi)												
Locations: TALLIN /												
Dates: As of 01/09/2003												
Status: Living on 1 Sep 2003												

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Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name	Transponder #
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	
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 TALLIN	21 May 2001 27 Mar 2002	MD0458 14014	Birth Transfer	VACLAV	
958	M	21 May 2001	902	712	POZNAN TALLIN	21 May 2001 27 Mar 2002	MD0459 14015	Birth Transfer	JAN	
959	F	21 May 2001	902	712	POZNAN TALLIN	21 May 2001 27 Mar 2002	MD0460 14016	Birth Transfer	MARIZA	
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	
1024	F	21 May 2002	776	939	TALLIN	21 May 2002	14328	Birth	LIEBLING	
1026	M	22 May 2002	774	959	TALLIN	22 May 2002	14330	Birth	AGAMEMNON	
1027	M	22 May 2002	774	959	TALLIN HIJUMAA	22 May 2002 4 Sep 2003	14331	Birth Release	HERAKLES	0-006-1FF-0FC
1028	M	22 May 2002	774	959	TALLIN	22 May 2002	14332	Birth	ACHILLEUS	
1032	M	26 May 2002	775	911	TALLIN	26 May 2002	14336	Birth	PITSU	
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	
1041	M	30 May 2002	775	915	TALLIN	30 May 2002	14345	Birth	VIP	0 006 206 929
1042	M	30 May 2002	775	915	TALLIN	30 May 2002	14346	Birth	HINDRIK	
1045	F	30 May 2002	775	915	TALLIN	30 May 2002	14349	Birth	HELLI	
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	PEFU	

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Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name	Transponder #
1055	M	6 Jun 2002	774	922	TALLIN	6 Jun 2002	14359	Birth	AAU	
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	
1066	M	15 Jun 2002	775	885	TALLIN	15 Jun 2002	14370	Birth	KAKS	0 006 212 B95
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	VZRDI	
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	
1081	M	10 Jun 2002	902	931	POZNAN TALLIN	10 Jun 2002 29 Mar 2003	MD0494 14573	Birth Transfer		
1082	M	10 Jun 2002	902	931	POZNAN TALLIN	10 Jun 2002 29 Mar 2003	MD0495 14574	Birth Transfer		
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	
1263	M	9 May 2003	775	959	TALLIN	9 May 2003	14885	Birth	SOSSIM	
1264	M	22 May 2003	775	1073	TALLIN	22 May 2003	14886	Birth	DONT	
1265	M	22 May 2003	775	1073	TALLIN	22 May 2003	14887	Birth	SEPPIK	
1266	F	22 May 2003	775	1073	TALLIN	22 May 2003	14888	Birth	GISELA	
1267	F	22 May 2003	775	1073	TALLIN	22 May 2003	14889	Birth	GRENDEL	
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 HIUMAA	26 May 2003 4 Sep 2003	14897	Birth Release		0-006-31B-E20

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Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name	Transponder #
1276	M	26 May 2003	775	1040	TALLIN HIIUMAA	26 May 2003 4 Sep 2003	14898	Birth Release		0-006-202-FBB
1278	F	26 May 2003	775	1040	TALLIN HIIUMAA	26 May 2003 4 Sep 2003	14900	Birth Release		0-006-31D-D7A
1280	F	28 May 2003	775	1054	TALLIN HIIUMAA	28 May 2003 4 Sep 2003	14902	Birth Release		0 006 201 9A3
1281	F	28 May 2003	775	1054	TALLIN HIIUMAA	28 May 2003 4 Sep 2003	14903	Birth Release		00-006-202-BBF
1282	F	28 May 2003	775	1054	TALLIN HIIUMAA	28 May 2003 4 Sep 2003	14904	Birth Release		0-006-1FB-21D
1283	F	28 May 2003	775	1054	TALLIN HIIUMAA	28 May 2003 4 Sep 2003	14905	Birth Release		0-006-203-26A
1284	F	28 May 2003	775	1054	TALLIN	28 May 2003	14906	Birth	FANTOOM	
1287	M	2 Jun 2003	776	885	TALLIN	2 Jun 2003	14909	Birth	SAMM	
1288	F	2 Jun 2003	776	885	TALLIN	2 Jun 2003	14910	Birth	LOORA	
1289	F	2 Jun 2003	776	885	TALLIN	2 Jun 2003	14911	Birth	SADA	
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	
1292	M	4 Jun 2003	1028	955	TALLIN	4 Jun 2003	14914	Birth	FOX	
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	FIGORELLA	
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	
1299	M	7 Jun 2003	776	615	TALLIN	7 Jun 2003	14933	Birth	IPO	
1300	M	7 Jun 2003	776	615	TALLIN	7 Jun 2003	14934	Birth	EIK	
1301	M	7 Jun 2003	776	615	TALLIN	7 Jun 2003	14935	Birth	BIRK	
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	
1307	F	12 Jun 2003	775	208	TALLIN	12 Jun 2003	14941	Birth	GRETE	

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Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name	Transponder #
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	
1314	M	22 Jun 2003	1075	917	TALLIN	22 Jun 2003	14948	Birth	REDIS	
1315	M	22 Jun 2003	1075	917	TALLIN	22 Jun 2003	14949	Birth	aUN	
1316	F	22 Jun 2003	1075	917	TALLIN	22 Jun 2003	14950	Birth	SaSTAR	
1317	F	22 Jun 2003	1075	917	TALLIN	22 Jun 2003	14951	Birth	MAASIKAS	

TOTALS: 52.63.0 (115)

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ANNEX 5 – TRANSFERS OF ANIMALS TO TALLINN AND TO EURONERZ 01.01.2003 – 01.09.2003

Restricted to: EUROPEAN MINK Studbook (Mustela lutreola novikovi)
 Locations: to TALLIN /
 Dates: Between 01/01/2003 and 01/09/2003
 Event: Transfers

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Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name
788	M	2 Jun 2000	495	UNK	EURONERZ	2 Jun 2000	M82	Birth	
					TALLIN	28 Feb 2003	14558	Transfer	
					HIIUMAA	12 May 2003		Release	
789	M	2 Jun 2000	495	UNK	EURONERZ	2 Jun 2000	M83	Birth	
					TALLIN	28 Feb 2003	14559	Transfer	
					HIIUMAA	16 May 2003		Release	
793	M	29 May 2000	495	739	EURONERZ	29 May 2000	M89	Birth	
					TALLIN	28 Feb 2003	14560	Transfer	
					HIIUMAA	12 May 2003		Release	
794	M	29 May 2000	495	739	EURONERZ	29 May 2000	M90	Birth	
					TALLIN	28 Feb 2003	14561	Transfer	
					HIIUMAA	12 May 2003		Release	
795	F	26 May 2000	506	744	EURONERZ	26 May 2000	F93	Birth	
					TALLIN	28 Feb 2003	14568	Transfer	
					HIIUMAA	27 Apr 2003		Release	
807	M	6 May 2000	495	772	EURONERZ	6 May 2000	M105	Birth	
					TALLIN	28 Feb 2003	14562	Transfer	
					HIIUMAA	12 May 2003		Release	
808	M	4 Jun 2000	153	738	EURONERZ	4 Jun 2000	M106	Birth	
					TALLIN	28 Feb 2003	14563	Transfer	
					HIIUMAA	12 May 2003		Release	
810	M	4 Jun 2000	153	738	EURONERZ	4 Jun 2000	M108	Birth	
					TALLIN	28 Feb 2003	14564	Transfer	
					HIIUMAA	16 May 2003		Release	
811	F	4 Jun 2000	153	738	EURONERZ	4 Jun 2000	F109	Birth	
					TALLIN	28 Feb 2003	14569	Transfer	
					HIIUMAA	21 Apr 2003		Release	
814	M	30 May 2000	152	731	EURONERZ	30 May 2000	M112	Birth	
					TALLIN	28 Feb 2003	14565	Transfer	
					HIIUMAA	16 May 2003		Release	
815	M	30 May 2000	152	731	EURONERZ	30 May 2000	M113	Birth	
					TALLIN	28 Feb 2003	14566	Transfer	
					HIIUMAA	16 May 2003		Release	
980	M	7 May 2001	153	731	EURONERZ	7 May 2001	M117	Birth	FRIEDRICH
					TALLIN	28 Feb 2003	14567	Transfer	
					HIIUMAA	27 Apr 2003		Release	

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

Restricted to: EUROPEAN MINK Studbook
(*Mustela lutreola novikovii*)
Locations: TALLIN /
Dates: Between 01/01/2003 and 01/09/2003
Event: Transfers

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Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name
1011	F	9 Jun 2001	809	812	EURONERZ TALLIN HIUMAA	9 Jun 2001 28 Feb 2003 27 Apr 2003	F148 14570	Birth Transfer Release	
1081	M	10 Jun 2002	902	931	POZNAN TALLIN	10 Jun 2002 29 Mar 2003	MD0494 14573	Birth Transfer	
1082	M	10 Jun 2002	902	931	POZNAN TALLIN	10 Jun 2002 29 Mar 2003	MD0495 14574	Birth Transfer	
1110	F	4 Jul 2002	807	792	EURONERZ TALLIN HIUMAA	4 Jul 2002 28 Feb 2003 21 Apr 2003	174 14571	Birth Transfer Release	
1111	F	4 Jul 2002	807	792	EURONERZ TALLIN HIUMAA	4 Jul 2002 28 Feb 2003 21 Apr 2003	175 14572	Birth Transfer Release	
1234	M	20 May 2002	779	721	PAVLOV TALLIN HIUMAA	20 May 2002 22 Aug 2003 26 Aug 2003	1159 14952	Birth Transfer Release	
1235	M	20 May 2002	779	721	PAVLOV TALLIN HIUMAA	20 May 2002 22 Aug 2003 26 Aug 2003	1160 14953	Birth Transfer Release	
1236	M	20 May 2002	779	721	PAVLOV TALLIN HIUMAA	20 May 2002 22 Aug 2003 26 Aug 2003	1161 14954	Birth Transfer Release	
1237	M	20 May 2002	779	721	PAVLOV TALLIN HIUMAA	20 May 2002 22 Aug 2003 26 Aug 2003	1162 14955	Birth Transfer Release	
1238	F	10 Jun 2002	903	1015	PAVLOV TALLIN HIUMAA	10 Jun 2002 22 Aug 2003 26 Aug 2003	1163 14956	Birth Transfer Release	
1239	F	10 Jun 2002	903	1015	PAVLOV TALLIN HIUMAA	10 Jun 2002 22 Aug 2003 26 Aug 2003	1164 14957	Birth Transfer Release	

TOTALS: 16.7.0 (23)

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Restricted to:
 Locations: to EURONERZ /
 Dates: 01/01/2003 <= date
 Event: Transfers

Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name	Transponder #
921	M	2 Jun 2001	775	832	TALLIN EURONERZ	2 Jun 2001 6 Mar 2003	13905	Birth Transfer	SERGO	
1023	F	21 May 2002	776	939	TALLIN EURONERZ	21 May 2002 6 Mar 2003	14327	Birth Transfer	TAISI	
1036	F	27 May 2002	774	918	TALLIN EURONERZ	27 May 2002 6 Mar 2003	14340	Birth Transfer	SEMEELE	
1058	M	13 Jun 2002	775	884	TALLIN EURONERZ	13 Jun 2002 6 Mar 2003	14362	Birth Transfer	LEO	
1059	F	13 Jun 2002	775	884	TALLIN EURONERZ	13 Jun 2002 6 Mar 2003	14363	Birth Transfer	LEONELIA	
1062	F	15 Jun 2002	774	912	TALLIN EURONERZ	15 Jun 2002 6 Mar 2003	14366	Birth Transfer	SOLEDAD	
1069	F	15 Jun 2002	775	885	TALLIN EURONERZ	15 Jun 2002 6 Mar 2003	14373	Birth Transfer	VEEGA	
1072	M	18 Jun 2002	773	871	TALLIN EURONERZ	18 Jun 2002 6 Mar 2003	14376	Birth Transfer	NILS	
1078	M	20 May 2002	902	712	POZNAN EURONERZ	20 May 2002 6 Mar 2003	MD0491	Birth Transfer		
1080	M	10 Jun 2002	902	931	POZNAN EURONERZ	10 Jun 2002 6 Mar 2003	MD0493	Birth Transfer		

TOTALS: 5.5.0 (10)

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ANNEX 6 – DEFINITIONS OF DEMOGRAPHIC AND GENETIC PARAMETERS

DEMOGRAPHIC TERMS

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

P_x, 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_x, 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_x, 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.

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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.