NOTE FROM THE EDITOR

NOTE FROM THE EDITOR

Dear Friends, Colleagues and Otter Enthusiasts!

The publication of this issue of the IUCN OSG Bulletin has, unfortunately, been delayed by at least 2 months. There are several reasons for this delay. As some of you may know, I presently work in the Netherlands, where my position has recently changed such that I have no time at all to edit the Bulletin in my working hours. In addition, my private computer has crashed. As a result, I can only work for the Bulletin at the weekends or in the evening.
However, it must be said, the main problem has been caused by the authors of manuscripts. I have to state that the accuracy of the manuscripts received over past months has dropped considerably. It is not the scientific quality of the manuscripts that bothers me but the general slovenly habits of some of the authors. It costs a lot of time to check whether all references are in the text or reference list. Further, I need all tables on a floppy disk, I am not ready to retype tables. In the future, manuscripts that do not fulfil a basic level of accuracy will not be sent to reviewers nor will they be considered for publication.

In Trebon, it was decided that in the near future, those of you who could afford it should contribute to the Bulletin (see Recommendations IUCN OSG Bull. 15). In the past, cheques from overseas were very expensive to cash, were not excepted or the bank wanted to charge 15 US$ for any cheque. However, the IUCN OSG Bulletin now has a contract with VISA and you should find a leaflet in this issue with which you can pay for the Bulletin. The costs for printing and postage of the two issues that are published annually are approx. 12 EURO or 15 US$. I hope that those who can afford it decide to contribute to the costs for issues 16/1 and 16/2, published in 1999. The leaflet should be sent back anyway, as I want to reduce the mailing list to active and interested members. NO RESPONSE - NO BULLETIN!!

Claudio Gnoli, Hillary Marshall, Roland Melisch, Vincent Wildlife Trust, Werner Tschirch, and Addy de Jongh provided several new additions for the list of references. LAST MINUTE CHANGE! I had to remove the list of references at the end of the Bulletin in order to keep the total weight lower than 100 gram. Otherwise the costs for the postage would have been doubled!! I will send the list upon request!

Beginning with this issue, all articles and reports will have a Spanish abstract. Alvaro Soutullo/Uruguay will translate the abstracts. Kevin Roche/Czech Republic once again functions as a reader for those contributions, which are not reviewed by at least one native speaker. I have to thank the “Otter Bulletin Team” - Barbara Gutleb-Rainer (Oosterbeek), Hans van den Berg (Wageningen) and Els Hoogsteede-Veens (Grafisch Service Centrum Van Gils, Wageningen) - for their continuing help. My son Tobias did all the work with the envelopes.

I U C N / S S C O S G G R O U P

FROM THE CHAIRMAN'S DESK

Time is running and as we look back over the past year have to realise how much time is gone since our last meeting at Trebon/CZ in March 1998. Many activities have been initiated since then. And I am happy that more and more people are not only interested in the work of OSG but also are beginning to contribute.

The listserver initiated and organised by Janice Reed-Smith has been very successful at encouraging better communication between people interested in otters. The bulletin board on the "otternet" homepage, run by Bob Fetterman, is an additional tool drawing in students and the general public. Because Philip Bacon's offer to install an OSG homepage on the server of ITE in Great Britain was not realisable, an offer from Bob Fetterman to establish this homepage via "otternet" is currently under consideration.

For the revision of the Otter Action Plan a nearly 60 pages authors instruction was written. I would like to thank Michaela Bodner, Arno Gutleb, Roland Melisch, Janice Reed-Smith and Christof Schenck for their fruitful co-operation. Unfortunately – and as expected by everyone experienced with this kind of work – the first deadlines are gone without getting the contributions the co-ordinators and authors were asked for. So far little more than a dozen country reports for Europe and some contributions to chapter 4 have arrived. I would like to thank all those who met the first deadlines. And I encourage all other authors to contribute to an efficient revision process or to inform the board of editors immediately if it becomes clear that they can not co-operate in the promised way.

Some interesting news can be reported for the European otter scene. The realisation of the project "Otter Habitat Network Europe" (OHNE) was started in October. After testing the method in a German Otter Habitat Network it is planned to do the first borders crossing steps in spring 1999. Otter specialists from the neighbouring countries will be contacted soon. A meeting of the European section of OSG is in preparation as part of the 3rd European Congress of Mammalogy to be held in Jyväskylä, Finland from May 30 to June 4, 1999. By the way, while writing this report I received the information that the Finnish authorities have decided to include the otter in the national game law. This means that beginning next year otters can be hunted in Finland again! As our Finnish colleagues report, the responsible Finnish Ministry for Forestry and Agriculture was not interested in any information on the status of the otter in Finland as offered by Finnish Environment Institute and Finnish otter specialists. Because Finland has signed the Berne Convention we will inform the Council of Europe immediately and discuss the consequences with our Finnish colleagues. Finally I want to refer to a workshop "Keeping otters = Conserving otters?" to be held at the German otter centre in February 17 - 19, 1999. I will try to transfer some of the experience collected in the 20 years I am working with otters in captivity (assisted by Alfred Melissen, the studbook keeper for *Lutra lutra*, and Janice Reed-Smith, the editor of the husbandry notebook for *Lontra canadensis*,) to people involved with or interested in keeping otters.

In conclusion, I want to express my best wishes to all of you for the year 1999. Health for you and your families and success and satisfaction for your work with, and for the otter is what I wish most to all of you for the future.

Claus Reuther
Aktion Fischotterschutz e.V.
OTTER-ZENTRUM
D-29386 Hankensbüttel
Germany
Phone: +49-5832-98080
Fax: +49-5832-980851
e-mail: Aktion.Fischotterschutz@t-online.de

V I E W P O I N T

RE-INTRODUCTION OF OTTERS - SUPPORT OR RISK FOR OTTER CONSERVATION?

REUTHER Claus

Aktion Fischotterschutz e.V., OTTER-ZENTRUM, D-29386 Hankensbüttel, Germany

One of the most intensively disputed questions at the VII. International Otter Colloquium (IOC) in Trebon 1998 was the sense (or the nonsense) of otter re-introductions in Europe. It resulted in recommendation II.1 saying that the IUCN/SSC Otter Specialist Group (OSG) and the participants of VII. IOC "are deeply concerned about the increasing number of otter re-introduction projects in Europe that do not follow IUCN re-introduction guidelines" (IUCN/SSC OSG 1998). Having dealt with otter conservation matters for 25 years I know this, sometimes tiresome, discussion in detail. So far, it has been a mainly theoretical discussion. However, it now gets a new quality because, in some European countries, re-introduction projects have either been started, or are planned to start soon. Many members of the Otter Specialist Group are deeply concerned about this development and this ongoing discussion. They consider it necessary that the group will define a clear position to this topic. To support this process there was an agreement in Trebon to publish the statements of two antipodes in this discussion as a "viewpoint" in the OSG Bulletin. All members of OSG are asked to contribute to this discussion. It might also help the "Re-introduction Advisory Committee", founded in Trebon, to develop specific criteria for the evaluation of otter re-introduction projects.

I would like to underline that the following statement is limited to the Eurasian otter (*Lutra lutra*) and the European situation, nevertheless, the central point of my arguments should also reflect the situation of other otter species or other regions. However, a serious discussion requires a detailed knowledge of the ecology of a species and of the specific regional preconditions.

When discussing the complex issue of releasing we first have to define what we are talking about. Clear definitions are given in the "IUCN Guidelines for Re-introductions" (IUCN 1998) as follows:
"Re-introduction": an attempt to establish a species in an area which was once part of its historical range, but from which it has been extirpated or become extinct. ("Re-establishment" is a synonym, but implies that the re-introduction has been successful).
"Translocation": deliberate and mediated movement of wild individuals to an existing population of conspecifics.
"Re-enforcement/Supplementation": addition of individuals to an existing population of conspecifics.
"Conservation/Benign Introductions": an attempt to establish a species, for the purpose of conservation, outside its recorded distribution but within an appropriate habitat and eco-geographical area. This is a feasible conservation tool only when there is no remaining area left within a species' historic range.

It might be undisputed that the last-named aspect is insignificant for otter conservation. "Translocation", however, is an aspect that is advancing more and more

to the foreground, particularly in connection with discussions about the conflict between otters and fish production. Its value or importance, therefore, has to be discussed in connection with other issues. This is also partly true for the aspect "re-enforcement/supplementation", although I am sure that many of my arguments regarding re-introductions will also meet this point. However, if it is requested, I am prepared to expand on and continue discussion on these aspects.

The other points that have to be clarified when discussing the need for re-introductions are the aims and objectives for such a measure. For these questions, the IUCN Guidelines offer the following definitions:

The principal aim of any re-introduction should be to establish a viable, free-ranging population in the wild, of a species, subspecies or race, which has become globally or locally extinct, or extirpated, in the wild. It should be re-introduced within the species' former natural habitat and range and should require minimal long-term management.

The objectives of a re-introduction may include: to enhance the long-term survival of a species; to re-establish a keystone species (in the ecological or cultural sense) in an ecosystem; to maintain and/or restore natural biodiversity; to provide long-term economic benefits to the local and/or national economy; to promote conservation awareness, or a combination of these.

I am sure there will be little dispute of the aims. It might be discussed how the term "minimal long-term management" could be interpreted, however, in general, it should be possible to agree on this principal aim.

Looking at the objectives, there might also be an immediate consensus that "providing of long-term economic benefits to the local and/or national economy" is of less importance for a re-introduction of otters (Just the opposite might be expected by interest groups like anglers or fishermen!). However, what about the other objectives?

Is there really a risk of extinction for the species *L. lutra* as a whole which needs actions like re-introductions "to enhance the long-term survival" of the species? I would accept this argument for a species that is reduced to a population of some dozen or of some hundred specimens. Though we do not have detailed numbers, a look at the distribution map of *L. lutra* should be sufficient to realise that its population cannot be counted in hundreds or even thousands of individuals. In fact, I am sure that tens of thousands of Eurasian otters still live in the distribution range of this species.

If we talk about the risk of extinction for the Eurasian otter, and if we argue seriously, we have to admit that this risk has to be evaluated on a regional level. It is, for instance, obvious that in parts of Central Europe, such as the Benelux countries, parts of Germany and France, Switzerland and the northern parts of Italy, the otter population is already reduced to a level which involves a high risk of complete extinction (in this region!). However, if we look at areas like the eastern parts of Germany and Poland, or to Ireland and Scotland, with survey results indicating more than 80 % of the country with otters present, any argument claiming the otter is near to extinction (in this region!) would be hard to understand.

Therefore, the enhancement of the long-term survival of the species is unsuitable as a serious reason for re-introductions – irrespective of the region were it is planned. But what about the other objectives, such as re-establishment of a key-stone species, maintenance or restoration of natural biodiversity, or promotion of conservation awareness?

Everybody who deals with terms like keystone-, flagship-, umbrella-, indicator- or target-species knows how hard it is to define which species, or why a species, should represent specific habitats or structures. Such definitions should also withstand scientific evaluation. This is not only because many other species may fulfil such functions in the same manner, but also because it is difficult to determine limits which are acceptable for a species or to weight the importance of single impacts, especially in such a plastic species as *L. lutra*. To give some examples: Who can seriously declare the Eurasian otter can only survive in clear waters, inhabited by (special species of) fish, with banks covered with (special species of) trees and undisturbed by human activities? Moreover, if someone really should argue this way: what are the limits? What visibility is necessary to define water "clear"? How much fish biomass of which species (in which seasons) has to be available for the otter? How many trees of which species and size are needed per kilometre of riverbank? What kind and which level of human disturbance are acceptable for the otter?

If we are honest, we must state that, for most of these (simple!) questions, we do not have an answer. Further, we no very little of the net of interrelations between all these (and the many other) factors representing an otter habitat and the problem to weight which factor can compensate another.

Does this mean that our argumentation is wrong making the otter a representative of ("healthy") wetlands? I am sure it is not. "Naturally" the otter belongs to all kinds of habitats which are influenced by water. And because of his large-spatial way of life he is an excellent symbol for large-spatial, diverse wetlands. But he is a symbol only – not more and not less.

What is the function of such a "symbol"? It has to transfer a message or – from a technical point of view – it is a tool. The message standing behind otter conservation is: We need large-spatial, diverse wetlands – as a living room for otters as well as a drinking water resource for man or as a contribution to biodiversity. And otter conservation as a tool means to establish a lobby for a sustainable management of habitats or natural resources.

Because of his high sympathy valence the otter is a much better tool than many other species (although this argumentation includes the risk that we divide fauna in valuable and valueless species – on the base of their level of popularity). It is surprisingly enough that a species with such a hidden way of life enjoys such a public awareness. And because we are living in a world where decisions are made mainly on an emotional level (that's why some people call this a manipulation society) it seems to be legal to use the otter as a tool - the "other side" (those people who do not act sustainable) are using the same "soft" arguments (like the argument that nature conservation hinders the development of new jobs – of which in many cases nothing is left when the aim is reached).

One of the often used arguments of this "other side" says: it does not matter if we dry our wetlands, if we canalise our rivers, if we pollute our water or if we urbanise our sea shores – we can handle all the negative effects technically and turn them to a positive result. We can clean our water in sewage purification plants - and it will be much more healthy than "natural" water. We can built artificial pools and lakes which are much better to use for recreation activities than all the swamps and wetland areas. We can construct new (meandering!) rivers which are much nicer and of a lower risk of flooding than "natural" rivers are. And to show people how an undisturbed sea shore looks like we can establish a national park – guiding tourists to the most beautiful places by boat or by helicopter.
This argumentation is not only a proof for the unclouded belief that all problems of this world can be solved by technical measures. It also shows that people arguing this way are not prepared to go to the roots of the problems – they are dealing with the symptoms only.

And this is exactly the problem I see with re-introductions (of the otter in Europe): They support those arguments, strengthen the position of the "other side" and weaken the position of otter (habitat) protection. What is our counter-argument to the argumentation: You don't want us to canalise this river or to drain this wetland because it is an otter habitat? Don't worry, we will release new otters – as has been done elsewhere (and was described by "otter conservationists" as very successful). What is our counter-argument to an argumentation like: You don't want us to build a road through this wetland area because you fear it will isolate otter populations? Don't worry, we will construct an "otter friendly" bridge and compensate the losses of specimen by releasing others. These are no examples from my fantasia, I have heard them several times (as I also heard the argument: if our resident otters or the Eurasian otter as species are not able to survive in our canalised and polluted rivers we have to breed as long as we have animals which can survive or we have to replace them by North American river otters).

This might sound absolutely crazy to the ears of ecologists or conservationists. But we have to accept that on the "other side" many people are placed who never understood (and most of them will not do so in the future) the principles of ecology or sustainability. And this is not a minority. Looking on the results of evaluations of the so called public "environmental consciousness" we have to realise that there is a great difference between verbal statements and real behaviour (KUCKARTZ, 1998, REUTHER and JANSSEN, 1993). It is a fact that the majority of the European societies has a deeply rooted anthropocentric position and that it will need generations to re-implement a feeling which I would call "awe for non-human nature".

Now I hear the counter-argument that all this might be true for areas where otters still exist, but that my argumentation is no help for areas where the otter is already extinct and where people are prepared to support habitat management and restoration. These people, so is argued in many cases, need a target and a proof that their efforts are suggestive and successful. I do understand this psychological problem. But is this argumentation not exactly what I described above? It says: Well we did wrong in the past, but meanwhile we found technical solutions to overcome the symptoms (in some "show areas") and now we want our reward.

Who argues that a re-introduction of otters is needed as a reward or a proof for (successful?) habitat management did the wrong job in his education or public

awareness work. If we use the otter as a symbol for ecosystems, saying that all conservation measures in the name of the otter will benefit many other species of animals and plants, it is not really necessary to have the otter back soon. There are many other elements of flora and fauna which could be used as a reward or a proof for first successful steps towards a sustainable management of wetlands. The otter is on the top (of the food chain, of the ecosystem or of the symbols for intact wetlands). And if he comes back by natural recovery we will have a real proof for a successful management of wetlands. But if he is brought back by artificial measures like re-introductions this is – from a scientific point of view – only a proof that the otter can survive in this kind of habitat (saying nothing if this is an optimal or a sub-optimal habitat and if the artificially founded population is a long-term viable one) and it is – from the educational view – teaching people that they have done enough for wetland conservation and everything is fine.
I am sure this is not the intention of the objectives of the IUCN Guidelines "to promote conservation awareness". Public relation for re-introductions (as a necessary part of serious program) includes the risk to produce the impression to the public that animal releases are the "pinnacle of conservation", instead of making clear that this is the absolute last "prosthesis of nature conservation".

If I summarise my arguments so far I come to the conclusion that re-introductions of otters in Europe do not meet the basic objectives of the IUCN Guidelines: they are not necessary to contribute to the enhancement of a long-term survival of the species *L. lutra*, they do not support the otter's function as a "symbol" (what might be the sense of the term "keystone species in a cultural sense" as used in the IUCN Guidelines), their contribution to a restoration of natural biodiversity is low, they do not provide long-term economic benefits to the local and/or national economy, and they reverse the efforts to promote conservation awareness in the sense of an ecological consciousness and sustainable acting.

Remains the question: Does the countries or regions where the otter is already extinct have to accept this fact and should they forget about the otter? My clear answer is: No.
Looking on the results of the surveys done in the last decade it is clear that there is an obvious trend towards recovery by the otter of much of its former distribution ranges (REUTHER, in press). In Great Britain for instance, STRACHAN and JEFFERIES (1996) calculated an approximate otter population recovery curve for England from which it appears possible that the otter will recover to 75 % of its former range (site occupation) by the year 2025 – starting with a 5.8 % as shown in a 1977 to 1979 survey.

I am sure, some people will answer: 45 years what a long time. But what do 45 years really mean in the cycle of nature? This is less than the half of the age of a tree. And in many areas in Europe the otter is already extinct since such a period – without causing a complete ecological disaster in the areas. And we have to be aware that many (sustainable!) habitat management measures and most of the alterations in consciousness, attitudes and behaviour of the human society will need such a period before they can benefit the otter.
Many people who want to re-introduce otters fail to notice that the measures and alterations which are necessary for a serious re-introduction are the same which are needed for a natural recovery of the otter to its former ranges. Why therefore not consequently act in habitat management and socially alterations and simply wait for

the otter? There is enough what have to be done and there are enough vital otter populations/occurrences, which could form the source for a natural recovery.

But they can fulfil this function only if they are kept in a vital position. That's why the protection and strengthening of the core areas of the otter's distribution in Europe needs top priority. For this purpose an important part of the available personal and financial resources in otter conservation is needed. The other part is necessary for the re-vitalisation of former otter habitats. In view of the limited personal and financial resources in nature conservation each person and each penny invested for re-introductions means a weakening of the two priority aims. Using personal and financial resources for re-introductions of otters might result in an artificial re-colonisation of some areas in Europe. But what kind of logic is this, when at the same time the natural populations of otters decrease because of a lack of personal and financial resources for their protection?

Because of limited space I have concentrated my argumentation to the fundamental aspects of conservation policy for otters related to re-introductions. There are many technical aspects, which have to be surmounted before a re-introduction can take place. Some of them have been described earlier (MASON, 1991, 1992; REUTHER, 1992). I am sure most of them are soluble. I am also sure that some of the re-introductions planned so far will be more or less successful – as long as enough specimen were "pumped" into an area. The question remains if this will be the right signal for otter conservation and if it will support otter research and conservation. I completely agree to Hans KRUUK (1995) who said at the end of the last chapter of his book where he described technical measures to improve otter habitats: "All these points do not detract from the fact that what is required, most of all, is a conservation policy for whole wetlands. The above comments are merely suggestions to pursue the restricted aim of maximising numbers of otters – probably, we now have a substantial proportion of the knowledge required to follow such a course." And he ended up: "Because of the size of areas used by top predators such as the one I am discussing here (up to 80 km of stream for one individual otter), a strong human influence, including agriculture or fishing, will almost necessarily have to be included in any management plan. It is possible, however, to accommodate this next to an impressive diversity of wild fauna, and I believe that it is one of our more important duties as research scientists to advice on how this can be done. Questions need to be addressed such as how many fish one can harvest before affecting numbers of top predators, how nutrient input from agriculture and forestry affects fish populations (through plankton and invertebrates), how organochlorines, mercury, and other pollutants affect the food web. One needs to know much more about these problems and several others before we can feel some confidence that we are managing rationally. I hope that at least some of the conservation agencies in Europe will direct funding towards these ends, because rational management of the European wetlands is vitally important."

ACKNOWLEDGEMENTS - I would like to thank Oskar Kölsch, Hans-Heinrich Krüger and Roland Melisch for their constructive comments.

REFERENCES

IUCN 1998. IUCN Guidelines for Re-introductions. Prepared by the IUCN/SSC Re-introduction Specialist Group. IUCN, Gland, 20 pp.

IUCN/SSC OSG 1998. Recommendations and results VII. International Otter Colloquium (IOC) Trebon/Czech Republic, March 14-20,1998. IUCN Otter Specialist Group Bulletin **15**, 8-14.

Kruuk, H. 1995. Wild Otters - Predation and Populations. Oxford University Press, Oxford, 290 pp.

Kuckartz, U. 1998. Umweltbewußtsein und Umweltverhalten. Springer Verlag, Berlin, 112 pp.

Mason, C.F. 1991. Otter re-introductions: Does practice match theory? In: **Reuther, C., Röchert, R.** (eds.) Proceedings V. International Otter Colloquium Hankensbüttel 1989. Habitat **6**, 213-217.

Mason, C.F. 1992.Do otter releases make sense? The experience in Great Britain. In: **Reuther, C.** (ed.) Otterschutz in Deutschland. Habitat **7**,157-161.

Reuther, C. 1992.Some fundamental remarks on the sense and nonsense of otter release. In: **Reuther, C.** (ed.) Otterschutz in Deutschland. Habitat **7**, 135-141.

Reuther, C. in press. The Otter in Europe – Recent Developments and Future Needs. In: **Dulfer, R., Gutleb, A.C., Nel. J.A.J.** (eds.) Proc. VIIth Int. Otter Coll. Trebon, Czech Republic, 13-19 March 1998.

Reuther, C., Jansen, W. 1993. Das OTTER-ZENTRUM Hankensbüttel – Konzeption und Evaluation einer Naturschutz-Bildungseinrichtung. Habitat **3**, 173 pp.

Strachan, R. Jefferies, D. J. 1996. Otter survey of England 1991 - 1994. The Vincent Wildlife Trust, London, 221 pp.

RESUMEN

Reintroducción de nutrias: ¿contribución o riesgo para la conservación de las nutrias?. Una de las cuestiones más discutidas en el VIIº IOC fue el sentido o no de las reintroducciones en Europa. Como resultado se concluyó que el IUCN SSC OSG y los participantes del IOC ”están profundamente preocupados sobre el creciente número de proyectos de reintroducción de nutrias en Europa que no siguen los lineamientos de la IUCN”. También se llegó al acuerdo de publicar las opiniones de 2 antípodas de esta discusión como “puntos de vista” en el boletín del OSG. Se invita a todos los miembros del OSG a participar de esta discusión. Mis afirmaciones se limitan a la nutria eurasiática (*Lutra lutra*) y la situación europea, aunque el centro de mis argumentos pueden alcanzar la situación de otras especies o regiones. En los lineamientos de la IUCN para reintroducciones se considera que los objetivos de éstas deben ser reforzar la supervivencia de una especie a largo plazo, restablecer especies claves, mantener o recuperar biodiversidad, promover preocupación por la conservación y proveer un beneficio económico a largo plazo. Debería haber un consenso en que este último objetivo es de menor importancia para la reintroducción de nutrias. ¿Existe realmente un riesgo de extinción para la especie *Lutra lutra* como un todo que requiera reintroducciones para reforzar la supervivencia a largo plazo?. Aceptaría este argumento para una especie que está reducida a una población de algunas docenas o uno cientos de individuos, pero estoy seguro de que decenas de miles de nutrias eurasiáticas aún viven dentro del rango de distribución de la especie. Si hablamos de riesgo de extinción seriamente, debemos admitir que éste debe ser evaluado a nivel local. Es obvio que en partes de Europa central, la población de nutrias está reducida a niveles que implican alto riesgo de extinción. Pero en áreas

con relevamientos que muestran más del 80% de sitios con presencia de nutrias, un argumento diciendo que las nutrias se encuentran cerca de la extinción (en la región), es difícil de entender. Por lo tanto, el reforzar la supervivencia a largo plazo de la especie es inadecuada como razón seria para justificar reintroducciones. Si hablamos de especies claves, paraguas, etc., es difícil encontrar una definición o razón para la representatividad de una especie para hábitats o estructuras específicos que puedan soportar una evaluación científica. No sólo porque otras especies pueden cumplir la misma función de la misma manera, sino porque también es difícil establecer los límites aceptables para cada especie o pesar la importancia de impactos singulares; especialmente en una especie tan plástica como *Lutra lutra*. Naturalmente la nutria pertenece a todo tipo de hábitat influenciado por el agua, y debido a su forma de vida, es un excelente símbolo de humedales diversos (sanos). Pero es sólo un símbolo, cuya función es trasmitir un mensaje, o desde un punto de vista técnico, servir como herramienta. El mensaje es: necesitamos humedales diversos y grandes como un lugar para las nutrias, y como un recurso de agua potable para el hombre o como contribución a la biodiversidad. Como herramienta, la conservación de las nutrias significa ejercer presión para un manejo sustentable de hábitats y recursos naturales. El problema que yo veo con la reintroducción de nutrias en Europa es que refuerza la posición de que se pueden manejar técnicamente los efectos negativos y volverlos resultados positivos (según esta visión todos los problemas de este mundo pueden resolverse a través de medidas técnicas). Por otra parte, la reintroducción debilita la posición de protección de las nutrias (y sus hábitats). ¿Cuál es la respuesta al argumento: ¿no quiere canalizar este río o desecar este humedal porque es un hábitat de nutrias?, no se preocupe, liberaremos otras nutrias como ha sido hecho en todos lados y fue descripto por "conservacionistas de nutrias" como muy exitoso?. Tenemos que aceptar que en "el otro lado" mucha gente nunca entendió (y mucha tampoco lo hará) los principios de la ecología y la sustentabilidad. Y no son minoría. Puede argumentarse que mi posición no ayuda en zonas en donde las nutrias se han extinguido y donde la gente está preparada para apoyar restauración y manejo de hábitats, y que la gente necesita en muchos casos un objetivo y una prueba de que sus esfuerzos son sugestivos y exitosos. Pero este argumento es el mismo que ya mencionamos, dice: lo hicimos mal en el pasado, pero entretanto encontramos soluciones técnicas para sobreponernos a los síntomas, y ahora queremos nuestra recompensa. Las nutrias están en la cima de las cadenas tróficas, del ecosistema, o entre los símbolos de humedales intactos, y si regresan debido a la recuperación natural, tendremos una prueba real de un manejo exitoso de los humedales, pero si las devolvemos artificialmente, sólo obtenemos prueba de que pueden sobrevivir en este tipo de hábitat (sin saber nada respecto a si esta población es viable en el largo plazo, o de la calidad del hábitat). Resumiendo mis argumentos hasta ahora, concluyo que la reintroducción de nutrias en Europa no alcanza los objetivos básicos de los lineamientos de la IUCN. En los países y regiones en los que las nutrias ya han desaparecido lo correcto sería trabajar en el manejo de hábitat y sobre alteraciones sociales, y esperar por las nutrias (en Gran Bretaña, por ejemplo, parece probable que en 45 años, la población recupere aproximadamente el 75% de su distribución histórica). Existen s suficientes poblaciones vitales que pueden actuar como fuentes para una recuperación natural. Es de máxima prioridad proteger y fortalecer áreas núcleo de la distribución de las nutrias en Europa. Para este importante propósito se necesita parte del personal y los recursos económicos disponibles; la otra parte, para la revitalización de antiguos hábitats. Desviar recursos y personal hacia reintroducciones significa debilitar estos 2 objetivos.

Page 79 now blank due to format changes

V I E W P O I N T

RE-INTRODUCTION OF OTTERS - SUPPORT OR RISK FOR OTTER CONSERVATION?

JONGH de Addy W.J.J.

Dutch Otterstation Foundation, De Groene Ster 2, 8926 XE Leeuwarden, The Netherlands

The Dutch have been famous for re-conquering land from the sea, not only in their own country but also in many other parts of the world. People say that God created the world and the Dutch created Holland 50 years later. In other words, when discussing nature and re-introductions, it should be remembered that much of what we consider 'natural' is not as natural as we would like to think. The same is true for many wetlands. Nevertheless, in these areas one can find high natural values, reflected in an impressive level of biodiversity. In many of these wetlands, otters are present as the top predator. It has been generally accepted that the status (or presence) of an otter population in such wetlands could show the 'health' of such an ecosystem.

Over recent decades, otter populations have decreased in numbers in many parts of Europe. Populations became fragmented or became extinct due to the destruction of their habitat and human exploitation of natural resources. In some cases, the latter factor has been more detrimental (e.g. drowning in fyke nets).

We can be very happy now that the tide has started to turn. In several European countries, where populations were once threatened, otters are now increasing in numbers and gradually expanding their range. This appears to have come about through a general improvement in wetland quality, the easing of barriers between populations, re-introduction or re-stocking efforts and/or measures that have been taken to prevent otters from drowning in fyke nets.

Although this is a positive sign, we must realise that the economic development of central and east European countries still poses a threat to the surviving otter populations in these countries. Therefore, the International Union for the Conservation of Nature (IUCN) Otter Specialist Group has made it a top priority to promote and support the conservation of these otter strongholds.

It is, however, equally important to restore former otter habitats. Our goal must be to create a network of wetlands throughout Europe as a whole, in which otters can survive in almost any part of Europe (REUTHER, 1994). The European Community has accepted this concept, not only for wetlands but also for other ecosystems. In the Netherlands this idea has already been put into practice, where it has been called the Ecological Head Structure (EHS). Within this econet, agricultural land is bought and turned into new wetlands, fitting within the existing landscape. In some cases, old meanders of rivers and brooks are restored. In fact, existing nature is being preserved or restored and new nature is being built. In certain area's, Mother Nature takes over control after the reconstruction, in other area's this is the job of people. There are areas where the natural succession from open water to swampy forests is stopped and maintained at the desired stage to obtain the biodiversity aimed for. This is a matter of human choice, a matter of management.

Unfortunately, nowadays, nature management has to go hand in hand with technical support and devices, especially in countries with dense human populations (de

JONGH, 1995). Tunnels or 'ecoducts' will have to be built under roads to ensure safe passage for all kinds of wildlife, including the otter. It is too idealistic to believe that the building of more and more roads in Europe can be stopped, I am afraid there will be many more though, of course, the struggle must go on to prevent highways or other human structures being built inside wetlands. We must make sure that it becomes standard policy to build tunnels and other devices under all railways and roads. Along rivers and canals with a lot of traffic, measures have to be taken in many cases to prevent bank erosion. In all cases, these problems can be solved with the aid of nature itself, in the latter case, for example, through the use of reed beds. Villages, towns and cities are all destined to grow, and in such a way that they may block some important migration bottlenecks. However, there are ways of spatial planning that allow an integration of natural structures into urban areas.

SENSE OR NONSENSE OF RE-INTRODUCTION

Before even thinking about re-stocking or re-introducing otters, one has to be sure that the conditions for survival are adequate and that all the original causes for the decline or extinction of the population have been removed. All of the IUCN Guidelines for Re-introductions have to be followed. If these are not obeyed, there are high risks that the re-introduction will fail. A re-introduction that fails could mean an enormous negative blow for the conservation of the species. In many cases, releasing otters is not necessary at all as a natural influx of animals from neighbouring populations will soon follow after the former threats have been removed. This is definitely true when there are no barriers in the landscape and when existing populations are not that far away.
In the Netherlands, there were many problems about the plan to release white tailed eagles along the big rivers. Because of weak and badly prepared publicity, many people were given the impression, wrongly, that along these rivers, everything was once again fine. However, during discussions, it appeared that the breeding cases of this magnificent bird were shifting towards the Netherlands by itself. The release of this raptor species was therefore cancelled and it is expected that the bird will breed in the Netherlands within the next decade.

- Birds can fly, but otters don't. Therefore, what about those areas that are very remote from the present flourishing populations or the area's that are isolated from those populations? Why should we wait maybe more than 50 years or even more than a century (and sometimes never) to let the otter return by itself? When it is really possible, why not start a re-introduction?

- Under suitable restrictions, such as those already mentioned (IUCN, 1998), I am in favour of re-introductions and, in some area's, restocking. I admit right away that in many cases it is all to do with ecological impatience. Why wait so long? I believe re-introduction is a tool that can be very beneficial in terms of 1) re-establishing a keystone species and therefore enhancing biodiversity, of 2) the promotion of conservation awareness and 3) economics.

I am sure that the concept of an approaching re-introduction of otters in, for example, the Netherlands, has given an enormous drive to preserve, restore, and build otter habitats. Should that concept not have been there the results would not have been so spectacular. That has nothing to do with our promotion and education being bad; this

has been done in a sound way. The return of the otter by re-introduction has not been presented as the reward, but is seen as an extra stimulus. However, what if it should be a reward! As long as it is a reward with the right content of ecology and sustainability behind it, it isn't so bad. The work towards a re-introduction itself is a good concrete tool that helps people understand that which is necessary to get a species back that was once extinct. No steps should be forgotten in the accompanying educational process of course! When we Europeans are maybe one or two generations ahead, such a tool or other tools should no longer be necessary. It is too idealistic to say that we already understand the process now or that we can explain it to its fullest extent to everybody. Unfortunately, ordinary people are not yet that far in their understanding. Not everybody comes to educational centres, like the otter stations in Hankensbüttel or Leeuwarden, to get a good stroke of this. Therefore, vehicles are needed for this, suitable for these times. In the meantime, we have no time left to wait for other generations to grow up, we have to act now and make use of the available tools in an appropriate way.

If promotion and education measures have been undertaken correctly, no politician, civil servant or contractor should come to you for compensation offers or a bribe as they understand that they will fail in the public view by asking for these. Well-prepared re-introductions will not weaken the position of otter (habitat) protection. On the contrary, due to their great media impact they will strengthen it, when put in the right perspective, i.e. they are made possible only by good habitat protection and management.

- Good re-introductions are costly. Why not use this money for protection of otters and otter habitat in the vulnerable area's of Europe? There is no discussion about the fact that much of money is indeed needed for research and habitat protection in those areas. However, when we really look at the sources of the money spent on re-introductions it appears that in many cases these (mostly local) funds would not have been granted for the other necessary work in the central and east European countries. In setting up proposals for re-introductions, there are however, chances to involve the research work abroad.

Although it seems that there are plenty of otters in east Europe, there are several signs that these vast populations are not safe. To preserve the otter on a European scale we should not only protect these populations and their habitats, but we should also enable the establishment of populations elsewhere. Re-introduction (according to the guidelines!) helps establish populations in a faster way than would occur through natural migration. These re-introduced populations may prove to be important if, for whatever reason, the populations in the east should decline.
When aiming towards connection of all otter populations in the whole of Europe it is much better to have more otter populations throughout Europe than just hoping for natural migration from the east going west, north and south. This is not only common sense but can be supported with models based on population dynamics.
There is also an economic value to the re-introduction of the otter. During the last two decades the animal gained a lot of popularity due to its nice looks, playful behaviour and last, but not least, its role as an ambassador of wetlands. The hoped for presence of this animal alone has shown to have an important economic value already in several countries. Restoring and making new otter habitat yields employment and cash flow. It has also led to acceptable forms of local eco-tourism. Fishermen in the

north of the Netherlands no longer look at the otter as an enemy (for central European countries with many fishponds this is probably a utopian dream). When there are otters their fish must be of good quality. There could come a time when they will sell their fish with an otter trademark! There is also an important gut feeling that, after the re-introduction the area will have more value, because its ambassador is back.
I therefore believe that, under certain circumstances, re-introductions of otters in Europe do meet the objectives of the IUCN guidelines:

1. Re-introductions help to establish more (sub-) populations throughout Europe. This will help to secure the long-term survival of the entire population.
2. Well-prepared and performed re-introductions give more impact to the otter's function as a symbol. We can find proof of this in several European countries.
3. Re-introductions contribute to a higher bio-diversity. They result in one extra species in the target area. The return of any species that was lost, intrinsically means an enormous gain for nature.
4. Re-introductions, and even preparations in that direction, provide economic benefits with respect to employment, cash flow and also environmental awareness.

In the end, it is a matter of human belief and choice whether to wait for the otter to come back by itself or to start a re-introduction according to the guidelines. Countries that are close to good otter populations can decide more easily to wait, because they probably do not have to wait that long anymore for the return of the otter. It is easy for those countries to tell the others to wait too.

- It should be considered that the extinction of otters in the area's where they are no longer present, was not a natural process. It was a process caused by man. When man has the possibility to facilitate the return of the otter, it is his duty to go on with that. Re-introduction is not a natural process, but can help. The return of the otter by itself is not a natural process either; it is also initiated by human influence through environmental recovery, building of new nature and technical measures. So, why not re-introduce?

We should be much more concerned about the way some re-introductions are planned (or not planned at all!) and performed. There are some initiatives already present and, besides that, some new re-introduction projects still come up, that do not or only partly consider the guidelines of the IUCN. These projects should be criticised and tackled when the initiators refuse to adapt the way they want to perform their re-introductions. The well-organised re-introductions, however, should not suffer from the bad ones.
At the last meeting of the IUCN Otter Specialist Group in the Czech Republic (1998), a very good solution was suggested to deal with this problem. A new committee was formed, the Re-introduction Advisory Committee (RAC). The present (elected) members of the RAC are Arno Gutleb, Jordi Ruiz Olmo, Hans Kruuk, Alfred Melissen (studbook keeper), Claus Reuther, and myself. The RAC is supposed to judge every initiative towards re-introduction of otters in Europe. The resulting advice of the committee will be given to the government agency responsible for the release of permits for the intended re-introduction. Since the RAC has an official status within the IUCN the release of permits can be cancelled or postponed in the case of a badly prepared or performed re-introduction.

REFERENCES

IUCN (1998). IUCN Guidelines for Re-introductions. IUCN/SSC Re-introduction Specialist Group. IUCN, Gland, 20 pp.

Jongh de, A.W.J.J. (1995). In het Spoor van de Otter. Otterpark AQUALUTRA, Leeuwarden, 120 pp.

Reuther, C. (1994). European Otter Habitat Network (discussion paper). In: Report of the Otter Seminar (Council of Europe, Ministerie van Landbouw, Natuurbeheer en Visserij, IUCN Otter Specialist Group, Otterpark AQUALUTRA), Leeuwarden, pp. 188-193.

RESUMEN

Reintroducción de nutrias: ¿contribución o riesgo para la conservación de las nutrias?. Cuando se discute sobre naturaleza y reintroducciones debería tomarse en cuenta que mucho de lo que consideramos natural no lo es tanto como nos gustaría. A pesar de eso en esas áreas uno pude encontrar grandes valores naturales, lo que se refleja en un impresionante nivel de biodiversidad. En varios de esos humedales las nutrias están presentes como el predador top. Se ha aceptado generalmente que el estado (o la presencia) de una población en tales humedales podría reflejar la "salud" del ecosistema. En las últimas décadas las poblaciones de nutrias han disminuido en números en varias partes de Europa. Las poblaciones se vuelven fragmentadas o se extinguen localmente debido a actividades humanas. Podemos estar contentos de que las cosas están cambiando y de que en varios países Europeos donde las poblaciones estaban amenazadas, las nutrias se están recuperando. Esto parece deberse a una mejoría en la calidad de los humedales, la remoción de barreras entre poblaciones y esfuerzos de reintroducción, reposición y para evitar que se ahogaran en redes. A pesar de estos signos positivos, debemos reconocer que el desarrollo de los países de Europa central y oriental continúa implicando amenazas para la supervivencia de las nutrias en esos países. Por eso para el IUCN OSG es una prioridad promover y apoyar la conservación de esas "fortalezas". Es, sin embargo, igualmente importante restaurar antiguos hábitats de nutrias. Nuestro objetivo debe ser crear una red de humedales a través de Europa. La Comunidad Europea ha aceptado este concepto tanto para humedales como para otros ecosistemas. En Holanda esta idea ya ha sido puesta en práctica, y tierra agrícola está siendo transformada en humedales, y antiguos meandros de ríos y arroyos son restaurados. De hecho, la naturaleza existente está siendo preservada o restaurada, y nueva naturaleza está siendo construida. En ciertas áreas la Madre Naturaleza toma el control tras la reconstrucción, en otras, este es trabajo de la gente. Desafortunadamente, el manejo de la naturaleza tiene que ir (actualmente) de la mano con apoyo técnico y dispositivos. Especialmente en países con poblaciones humanas densas. Túneles o "ecoductos" deberán construirse bajo las carreteras para permitir el pasaje seguro de todo tipo de vida silvestre. Es demasiado idealista creer que la construcción de rutas en Europa puede detenerse. La lucha debe dirigirse a prevenir la construcción de autopistas y otras construcciones humanas dentro de los humedales. Debemos asegurarnos que sea una política standard construir túneles y otros dispositivos bajo las vías férreas y las rutas. A lo largo de canales con mucho tráfico se deben tomar, en muchos casos, medidas para evitar la erosión de las orillas. Villas, pueblos y ciudades están destinados a crecer y de esa forma pueden bloquear importantes cuellos de botellas para migraciones. Sin embargo, existen formas de planificación del espacio que pueden permitir la integración de estructuras naturales en áreas urbanas. Antes de pensar sobre reintroducciones o reposiciones de nutrias, hay que asegurarse de que las condiciones para su supervivencia son adecuadas y las causas originales de la declinación o extinción de la población han sido eliminadas. Todos los lineamientos de la IUCN para reintroducciones deben seguirse, de lo contrario se corre el riesgo de fracasar. En muchos casos no es necesario liberar nutrias ya que el influjo natural desde poblaciones vecinas seguirá una vez eliminadas las antiguas amenazas. Esto es definitivamente cierto cuando no existen barreras en el paisaje y las poblaciones existentes no están alejadas. ¿Qué pasa con las áreas que están demasiado alejadas de las poblaciones florecientes (prósperas), o las que están aisladas de esas poblaciones? . ¿Por qué esperar más de 50 o 100 años (o por siempre) para dejar que las nutrias vuelvan por sí mismas?. Cuando es posible, ¿por qué no comenzar un reintroducción?. Bajo restricciones apropiadas (como las que señalan los lineamientos de la IUCN), estoy a favor de las reintroducciones y, en algunas áreas, la reposición de nutrias. Creo que la reintroducción puede ser muy beneficiosa en términos 1) de restablecimiento de una especie clave (y entonces de aumento de la biodiversidad), 2) de promoción de conciencia por la conservación y 3) económicos. Estoy seguro de que la idea de una próxima reintroducción de nutrias en Holanda ha dado un enorme impulso a la

preservación, restauración y construcción de hábitats para nutrias. Sin esa idea los resultados no hubieran sido tan espectaculares. Esto no tiene nada que ver con una mala promoción o educación. La reintroducción de nutrias no ha sido presentado como una recompensa, es un estimulo extra. Pero ¿qué si debe usarse como recompensa?. En la medida en que sea una recompensa con el contenido apropiado de ecología y sustentabilidad, no es malo. El trabajo hacia la reintroducción es una buena herramienta concreta que ayuda a la gente a entender lo que es necesario para traer nuevamente una especie una vez extinguida. Es demasiado idealista decir que los europeos ya entendemos el proceso o que podemos explicarlo en su máxima expresión a todos. El común de la gente no llega tan lejos en su entendimiento. No todo el mundo va a centros educacionales para tener una buen idea de esto. Mientras tanto, no tenemos tiempo que perder esperando a que otras generaciones crezcan. Debemos actuar ahora haciendo correcto uso de las herramientas disponibles. Si se han llevado a cabo correctamente medidas de promoción y educación, ningún político o contratista vendrá pidiendo compensación o soborno ya que entenderán que van a perder ante la opinión pública. Reintroducciones bien preparadas no debilitarán la posición de protección de las nutrias (y sus hábitats). Por el contrario, debido a su gran impacto en los medios, la fortalecerán. Las buenas reintroducciones son costosas. ¿Por qué no usar ese dinero para la protección de las nutrias y sus hábitats en las áreas vulnerables de Europa?. Cuando se miran las fuentes de dinero para realizar reintroducciones aparece que, en muchos casos, estos fondos (mayormente locales) no hubieran sido asignados para otros trabajos necesarios. Al establecer propuestas de reintroducción hay, sin embargo, chances de involucrar el trabajo de investigación fuera del país. Aunque parece que viven muchas nutrias en Europa oriental, existen varios signos de que estas vastas poblaciones no están a salvo. Para preservar a las nutrias en una escala europea, no sólo debemos proteger esas nutrias y sus hábitats, también debemos permitir el establecimiento de poblaciones en otros lados. Las reintroducciones (según los lineamientos) ayudan a establecer poblaciones más rápidamente de lo que ocurriría por migración natural. Estas poblaciones reintroducidas pueden ser importantes si, por alguna razón, declinan las poblaciones del Este. Al apuntar hacia la conexión de todas las poblaciones de nutrias en toda Europa, es mejor tener más poblaciones a través de Europa que sólo esperar por migraciones desde el Este hacia el Oeste, el Sur y el Norte. Esto no sólo es sentido común, sino que puede ser respaldado por modelos basados en dinámicas de poblaciones. También existe un valor económico en la reintroducción de nutrias. En las últimas 2 décadas estos animales han ganado mucha popularidad. Restaurar y crear nuevos hábitats para nutrias produce flujos de empleo y divisas, y ha llevado a formas aceptables de ecoturismo. Los pescadores en el Norte de Holanda ya no ven a las nutrias como enemigo (lo que probablemente es un sueño utópico en algunos países de Europa central y oriental). Donde existen nutrias, los peces deben ser de buena calidad. Existe una sensación de que tras la reintroducción el área tendrá más valor porque su embajador ha vuelto. Creo que bajo ciertas circunstancias, las reintroducciones de nutrias en Europa alcanzan los objetivos de los lineamientos de la IUCN: 1) ayudan a establecer más (sub) poblaciones a lo largo de Europa, ayudando a asegurar la supervivencia a largo plazo de toda la población, 2) bien preparadas y ejecutadas dan más impacto a la función de las nutrias como símbolo, 3) contribuyen a una mayor biodiversidad (el regreso de una especie perdida intrínsecamente significa una enorme ganancia para la naturaleza) y 4) incluso preparativos en esa dirección proveen beneficios económicos y conciencia ambiental. Es un asunto de decisión humana esperar el regreso de las nutrias por sus medios o comenzar reintroducciones de acuerdo a los lineamientos de la IUCN. Los países que están más cerca de buenas poblaciones pueden decidir más fácilmente esperar el regreso de las nutrias porque probablemente no tendrán que hacerlo por mucho tiempo. Es fácil para esos países decirle a los otros que también esperen. Debe tenerse en cuenta que la extinción local de las nutrias no fue un proceso natural. Cuando el hombre tiene la posibilidad de facilitar el regreso de las nutrias, es su tarea hacerlo. El regreso de las nutrias por ellas mismas tampoco es un proceso natural, también es iniciado por el hombre a través de recuperación ambiental, construcción de nueva naturaleza y medidas técnicas. Entonces, ¿por qué no reintroducir?. Deberíamos estar mucho más preocupados por la manera en que algunas reintroducciones son planificadas y ejecutadas. Los malos proyectos deben ser criticados y evitados cuando quienes los proponen se niegan a modificarlos. Las reintroducciones bien planificadas no deberían sufrir por aquellas. En el último encuentro del IUCN OSG en República Checa (1998), una muy buena solución fue sugerida para tratar con este problema. Se creo el "Comité Asesor en Reintroducciones" (RAC), cuya función es evaluar todos los proyectos de reintroducción en Europa. Sus sugerencias serán entregadas a las agencias gubernamentales responsables de extender los permisos para realizar reintroducciones. Como el RAC tiene status oficial dentro de la IUCN, la extensión de estos permisos pude ser cancelada o pospuesta en reintroducciones mal planificadas o ejecutadas.

A R T I C L E

EXAMINATION OF BLOOD SAMPLES OF THE EURASIAN OTTER (*LUTRA LUTRA*)

KÖNIG Christian, KÖNIG Uschi

Klinik für Kleintiere, Wienerstrasse 63, A-3830 Waidhofen/Thaya, Austria

(received 15th July 1998, accepted 14th November 1998)

ABSTRACT
Heparin and EDTA blood samples were analysed from 14 Eurasian otters. Reflotron and Vettest 8008 were used to identify ALB, ALPK, ALT, AMYL, AST, BUN, Ca, CK, CREA, GLU, Mg, BIL, GGT and CHOL. The electrolytes (Na, K and Cl) were measured by using VetLyte. The QBC haematology system gave a profile for HKT, Thrombo, Leuko, Gran and Lymph/Mono. These values were compared with those from dogs, cats and the North American river otter (*Lutra canadensis*). Several heparin parameters and a leucocytosis recorded in four individuals indicated that the otters were considerably stressed.

keywords: otter, Lutra lutra, haematology

INTRODUCTION

There are only a few haematological records for otters in the literature (KANE, 1979; HOOVER et al., 1984; HOOVER et al., 1985), most of them are for the North American river otter (*Lutra canadensis*). Hence, the goal of this study was to identify such values for the Eurasian otter (*Lutra lutra*). In addition, evidence for stress as indicated by haematological parameters was investigated.

ANIMALS, MATERIALS AND METHODS

During 1992 - 1997 EDTA- and heparin blood samples were taken from 14 Eurasian otters, 9 females and 5 males, from which 13 were right after a surgery to implant transmitters into the abdomen (KÖNIG and KÖNIG, in press). The blood was taken from the vena jugularis.
Customary EDTA blood sampling tubes (1mg/1ml) and heparin blood sampling tubes (0.75mg/1ml) were used as anticoagulators. The blood sampling tubes were centrifuged as soon as possible (2-3 hours) in order to separate blood cells and plasma and then analysed immediately afterwards.
The heparin blood samples of the first 5 otters were analysed with the dry-chemical photometer Reflotron from Böhringer. The corresponding values of otter no. 6 -14 were analysed with a Vettest 8008 (Idexx). The following substrates and enzymes were investigated: Albumin ALB, alkaline phosphates ALKP, alanin transaminase ALT, amylase AMYL, aspartate transaminase AST, urea BUN, Calcium Ca, creatininekinase CK, creatinine CREA, glucose GLU, magnesium Mg, totalbilirubin TBIL, gamma- glutamyltransferase GGT and cholesterol CHOL. The electrolyte analysator VetLyte gave values for sodium Na, potassium K and chloride Cl in mmol/l.

The EDTA blood samples of 12 otters were analysed for the erythrocyte PCV values, the total leukocyte and the thrombocyte values. The leukocytes could be split in total granulocytes (including eosinophiles) and lymphocytes and monocytes. This was done by using the Quantitative Buffy-Coat analysator (QBC, Becton Dickinson) which is a very quick and precise tool for the haematological investigations of animals (LEVINE et al., 1988).

RESULTS

Table 1 gives blood values of 14 otters. In some cases, not all parameters could be identified, because the blood quantity was insufficient or the test equipment was unable to provide those parameters. The average of these values was compared with standard values of dogs and cats (BARONETZKY-MERCIER, 1992) and values recorded for *Lutra canadensis* (HOOVER et al., 1985). The Eurasian otter values of AST, CK, GLU, GGT and potassium were much higher than those recorded for dogs and cats, the other values were similar. The CK and the GLU values of the Eurasian otter were also much higher than was reported in the North American river otter.

Table 1. Haematological parameters of *Lutra lutra*

otter	machine	g/dl ALB	IU/L ALKP	GPT IU/L ALT	IU/L AMYL	GOT IU/L AST	mg/dl BUN	mg/dl Ca	IU/L Ck	mg/dl/L CREA	mg/dl GLU	mg/dl Mg	mg/dl TBIL	Na K mmol/L C	GGT U/L	Chol U/L
1	R			20.6	0	37.5	37.9		23.3	0.51	56		1		10.5	154
2	R			18	0	41.7	34.1		193	0.54	13		0.69		11.3	
3	R			46.3	0	110	65.3		58.3	0.68	190		0.59		2.8	102
4	R			166		>675	44.7		104	0.79	310		>0.5		10.6	
5	R			76.2		100	74		>1000	>0.5					22.9	
6	V	3.16		72	0		37.7	8.85	312	0.67	184.5		0.31	156.7 5.52 115.5	7.76	74.7
7	V					78				0.54	254.8				35	
8	V	3.34	103	42	0	84	31.1	9	498	0.62	316.8	2.42	0.29	158.9 5.8 116.4		
9	V	3.32	89	108	0	79	29.9	2.45	307	0.64	280.2	2.29	0	157.6 8.69 111.7		
10	V	3.07	73	78	0	87	23.4	8.39	411	0.62	214.5	3.02	0	160 5.28 117.2		
11	V	2.91	75	119	0	136	37.9	8.65	1906	0.33	243.9	2.56	0.01	157.9 4.99 118.2		
12	V	2.03	155	43	0	75	9.3	8.13	431	0.95	300.2	3.11	0.32	156 6.01 112.4		
13	V	3.17	39	73	0	110	20.8	8.72	836	0.9	310.7	2.62	0.22	160.6 6.1 114.4		
14	V	2.77	55	40	0	109	16	8.43	562	0.57	185.5	2.5	0.11	161.4 6.05 116.8		
mean		2.97	84	69.4	0	132.5	35.2	7.8	511	0.63	220	2.64	0.4	158.6	15.5	110.2

													6.06 115.3		
lit.	3.2- 3.8		3-80	0	70- 130	<80	7.9- 12.2	<200	<1.6	70- 130		<0.5	150-160 4.5-5 111-120	10- 35	70- 150
norm cat	2.6- 3.9	10- 200	10- 120	500- 1500	0-48	16- 36	8- 12	<80	0.8- 2.4	76- 145	1.45- 3.12	0- 0.5	150-165 3.5-5.8 112-129	0-1	70- 150
norm dog	2.7- 3.8		8-80	500- 1500	0-50	7- 27	7.9- 12	10- 200	0.5- 1.8	77- 125	1.4- 2.38	0- 0.9	144-160 3.5-5.8 109-122	0-7	110- 320

The QBC profiles of 12 otters are listed in Table 2. In four of them (otter no. 4, 7, 9 and 11) a leukocytosis was identified.

Table 2. Haematological parameters of *Lutra lutra*

otter	HKT%	Thrombo-cytes	Leukocytes	Granulo-cytes	%Gran	Lympho-cytes/ Monocytes	% Lymph/ Mono
1	na	na	na	na	na	na	na
2	na	na	na	na	na	na	na
3	43.7	19	7.8	7.8	91	0.7	9
4	46.5	524	13.6	11.9	87	1.7	13
5	37.4	393	9.6	7.6	78	2.0	22
6	56.4	638	8.6	6.0	69	2.6	31
7	52.0	496	13.4	9.1	68	4.3	32
8	42.8	825	8.8	6.5	74	2.3	26
9	54.4	687	14.9	11.3	75	3.6	25
10	48.6	836	10.8	8.3	77	2.5	23
11	40.5	489	13.9	11.1	80	2.8	20
12	61.3	735	7.8	4.7	60	3.1	40
13	59.0	511	9.8	5.4	55	4.4	45
14	53.7	644	8.0	5.4	67	2.6	33
mean	49.7	566	10.6	7.9	73.4	2.7	26.6
otter lit.	48-70						
norm cat	27-47	180-430	5-11	3.6-11.6	60-84	0.9-3.7	15-35
norm dog	44-52	200-400	6-12	3.3-10.0	55-84	0.8-4.1	15-35

Thrombocytes (G/L); Leukocytes (G/L); Granulocytes (G/L);

DISCUSSION

The blood was taken right after considerable stress for the animals caused by their capture, confinement and the just completed surgery. The increased glucose values (GLU of on average 220mg/dl) reflect this (SCHWENDENWEIN, 1995). A simultaneous increase of AST and CK is typically seen 2-6 hours after muscle damage, which can occur during an operation and also can be due to cramps caused by a ketamin immobilisation. These blood samples were, however, taken within one hour of the immobilisation. Therefore, it is theorised that these increased values of AST and CK must have another reason, which is probably also stress related (ARNEMO, 1991). The slightly elevated values of potassium indicate an acidosis in the blood and a reduced excretion through the kidneys. The extremely high value of 8.69 mmol/l for otter no. 9 was excluded from the calculation of the average value because it is believed to be a mistake of measuring. The recorded leukocytosis QBC

profile is another indicator for stress when no inflammation is recorded as was the case in these otters. Stress hormones mobilise marginal reservoirs of leukocytes, usually in the form of a neutrophilie (SCHWENDENWEIN, 1995). One of the otters (no. 5) died two days after the operation (KÖNIG and KÖNIG, in press). The blood values obtained from this otter were not higher than those of the others, however, overstress following an inappropriate capture (DULFER, pers. comm.) and a secondary inflammation, appeared to be the reason for the death of this animal (KÖNIG and KÖNIG, in press). Handling and implanting transmitters in wild caught otters may place more stress on these animals than most of them can tolerate. The use of stress reducing drugs like long-acting anxiolytica might be one way to overcome this problem and should be tested in the future. Everything must be done to avoid stress, which implicates that special attention should be paid to all aspects concerning the catching, the handling, the transport and the holding facilities.

REFERENCES

Arnemo, J.M. (1991). Surgical implantation of intraperitoneal radio-telemetry devices in European river otters (*Lutra lutra*). In: **Reuther, C., Röchert, R.** (eds.) Proc. Vth Int. Otter Coll. Habitat **6**, 119-121.

Baronetzky-Mercier, A. (1992). Blutbefunde bei Zootieren nach eigenen Untersuchungen und Literaturangaben. Thesis, Univ. Giessen, Germany.

Hoover, J.P., Root, C.R., Zimmer, M.A. (1984). Clinical evaluation of American river otters in a reintroduction study. JAVMA **185**, 1321-1326.

Hoover, J.P., Bahr, R.J., Nieves, M.A., Doyle, R.T., Zimmer, M.A., Lauzon, S.E. (1985). Clinical evaluation and pre-release management of American river otters in the second year of a reintroduction study. JAVMA 187, 1154-1161.

Kane, K.K. (1979), Medical management of the otter. Proc. Annual Meeting American Association Zoo Veterinarians, 100-103c.

König, C., König, U. in press, Surgical intraperitoneal implantation - a practicable method to fit Eurasian otters with radio transmitters. In: **Dulfer, R., Gutleb, A.C., Nel. J.A.J.** (eds.) Proc. VIIth Int. Otter Coll. Trebon, Czech Republic, 13-19 March 1998.

Levine, A.L., Hart, A.H., Wardlaw, S.C. (1988). Quantitative Buffy-Coat Analysis of blood samples from dogs, cats and horses. JAVMA 189, 670-673.

Schwendenwein, I. (1995). Selektive Labordiagnostik nichtinfektiöser Erkrankungen. Gustav Fischer, Jena-Stuttgart.

RESUMEN

Examen de muestras de sangre de la nutria europea (*Lutra lutra*). Se analizaron muestras de sangre con EDTA y Heparina de 14 nutrias eurasiáticas. Se usaron Reftlotron y Vettest 8008 para identificar ALB, ALPK, ALT, AMYL, AST, BUN, Ca, CK, CREA, GLU, Mg, BIL, GGT y CHOL. Los electrolitos (Na, K y Cl) se midieron usando VetLyte. El sistema hematológico QBC dio un perfil para HKT, trombocitos, leucocitos, granulocitos y linfocitos/monocitos. Estos valores se compararon con los de perros, gatos y nutrias norteamericanas (*Lutra canadensis*). Varios parámetros de heparina y una leucocitosis registrada en cuatro individuos indicaron que las nutrias estaban considerablemente estresadas.

Page 91 – 92 now blank due to format changes

ARTICLE

MORPHOLOGICAL CHARACTERISTICS OF SEA OTTER *ENHYDRA LUTRIS* L. (CARNIVORA, MUSTELIDAE) PELAGE AND FIRST AGE MOULT

ZAGREBELNY Sergey Vladimirovitsh

State National Preserve "Komandorsky", Nikolskoe, Aleutian distr., Kamchatka, 684500, Russia

(received 4th September 1998, accepted 5th December1998)

INTRODUCTION

Previous researchers, including Barabash-Nikiforov (1938), Barabash-Nikiforov et al. (1968), Marakov and Sudakov (1978), have described the structure of the pelage in adult sea otter's hair. They described length topography, shape and some morphological features of both the guard and underfur hairs. Williams (1992) has also published some data on morphology, skin histology, hair density, length, diameter and structure and has examined variations in these features in different animals. In our previous investigation we attempted to describe juvenile and adult sea otter hair structure, inner and external features, and height topography of guard and underfur hairs. We also found variations with sex, age and season (Zagrebelny, 1993). In this article we further investigate the morphological characteristics of the pelage and first moult of both adult and young sea otters.

METHODS

Skin samples were taken from the midback and stomach of sea otters from embryos, new-born, one-month pups and adult sea otter (7-8 years old) from around the Commander islands (Kamchatka, Russia). Preparation and biometric calculations were made using standard techniques for microscopic and histological examination (Sokolov et al., 1988; Lakin, 1990).

Hair height was measured on dry skin using a graduated ruler. Hairs from embryos were examined after fixing fresh individual hairs to a glass surface and measured using a microscope micrometer. Order and timing of juvenile (first postnatal) and definitive (second postnatal) moult were obtained using two young sea otters. The first animal was captured at Medny Island in summer 1990, the second was kept at the authors' home between February and April 1992. Observations were made on the first, sixth, fourteenth and thirtieth days after moult.

The cuticular structure was determined and measured using negative imprints in colourless varnish (Kuznetchov, 1952; Khmelevskaja, 1965).

RESULTS

Hair morphology of juvenile pelage

The light yellow pelage of the embryo was shorter and less dense on the stomach than on any other part of the animals' body. For the most part, hairs were at the stage of growing the distal flat end. Two types of hair, guard hairs and underfur,were determined on the otters' back.

Generally, the fur of newborn and one-month old pups was still developing. Three different kinds of fur were noted - guard hairs, intermediate hairs and underfur. The size of these hairs is shown in Table 1.

Table 1: Individual hairs characteristics of different sea otters at different ages

Age of Animal	Hair Type	No	Hair length (mm)	Blade Width (mm)	Core maintenance % in blade in shank
Back Fur					
Embryo	guard	1°	4.1 ± 0.20	62.35 ± 3.52	24.90 ± 1.14
	underfur	6	5.5 ± 0.34	21.16 ± 1.91	12.43 ± 0.46
Newborn	guard 1st	9	35.7 ± 0.44	69.60 ± 2.25	31.78 ± 1.18
				51.26 ± 3.74	22.03 ± 1.30
	2nd	6		55.04 ± 2.06	34.87 ± 1.40
				40.68 ± 1.28	19.18 ± 0.67
	3rd	7		41.36 ± 2.28	27.76 ± 0.52
				30.18 ± 1.90	15.55 ± 0.38
	intermediate	18	20.5 ± 0.10	27.26 ± 0.63	25.58 ± 0.38
				19.28 ± 0.89	17.57 ± 0.29
	underfur	8	15.4 ± 0.65	17.67 ± 0.76	21.47 ± 0.59
				14.25 ± 0.49	16.76 ± 0.29
1 month	guard 1st	6	42.3 ± 0.01	70.17 ± 3.11	34.86 ± 1.01
				46.30 ± 2.36	18.78 ± 0.86
	2nd	10	32.5 ± 0.72	49.01 ± 2.06	23.85 ± 0.68
				33.76 ± 1.02	17.18 ± 0.47
	3rd	14	31.3 ± 0.68	38.16 ± 2.06	26.66 ± 0.84
				28.57 ± 0.92	15.04 ± 0.40
	intermediate	10	26.9 ± 0.59	24.16 ± 1.10	23.13 ± 0.53
				20.13 ± 1.08	19.92 ± 0.31
	underfur	6	25.3 ± 0.41	19.08 ± 0.83	18.63 ± 0.08
				14.57 ± 0.64	8.82 ± 0.43
7-8 years	guard 1st	7	31.0 ± 0.26	129.6 ± 4.42	19.72 ± 2.30
				59.92 ± 4.86	17.87 ± 4.03
	2nd	9	30.1 ± 0.29	82.33 ± 5.05	14.37 ± 1.47
				31.34 ± 1.72	10.18 ± 0.92
	3rd	6	29.0 ± 0.41	41.17 ± 2.80	7.93 ± 0.77
				18.83 ± 0.92	10.88 ± 0.98

	underfur 1st	7	28.7 ± 0.21	13.66 ± 0.48	16.42 ± 1.19
				8.09 ± 0.16	12.46 ± 4.65
	underfur 2nd	8	14.5 ± 1.20	10.75 ± 0.20	18.90 ± 1.42
				8.88 ± 0.03	27.50 ± 1.80

Age of Animal	**Hair Type**	**No**	**Hair length (mm)**	**Blade Width (mm)**	**Core maintenance % in blade in shank**
Stomach Fur					
Embryo	underfur	15	7.2 ± 0.44	24.75 ± 0.17	23.57 ± 0.06
Newborn	guard 1st	5	29.9 ± 0.56	23.12 ± 4.68	29.77 ± 1.76
				61.58 ± 6.75	21.93 ± 1.73
	2nd	13	26.3 ± 0.70	39.37 ± 0.20	30.94 ± 0.75
				30.87 ± 0.23	21.01 ± 0.59
	intermediate	12	22.0 ± 0.07	25.04 ± 0.60	24.36 ± 0.42
				24.02 ± 1.25	18.97 ± 0.29
	underfur	8	13.6 ± 0.41	18.58 ± 0.33	22.44 ± 0.44
				15.87 ± 0.76	15.73 ± 0.09
1 month	guard 1st	7	38.6 ± 1.68	82.77 ± 2.97	23.82 ± 4.18
				60.93 ± 2.19	11.78 ± 0.80
	2nd	14	29.9 ± 0.47	37.42 ± 1.46	26.53 ± 0.78
				30.37 ± 0.91	17.84 ± 0.41
	intermediate	8	26.5 ± 0.39	25.33 ± 1.18	20.22 ± 0.56
				25.58 ± 1.43	15.63 ± 0.67
	underfur	6	21.1 ± 0.81	15.64 ± 0.95	19.18 ± 0.46
				15.11 ± 0.99	16.58 ± 0.36
7-8 years	guard 1st	7	28.4 ± 0.67	133.70 ± 3.84	9.93 ± 0.81
				62.03 ± 3.13	13.67 ± 1.51
	2nd	7	25.4 ± 0.39	89.14 ± 6.10	8.68 ± 0.75
				32.63 ± 3.07	8.99 ± 0.82
	3rd	7	24.6 ± 0.29	51.31 ± 3.69	5.95 ± 0.54
				21.76 ± 1.67	3.75 ± 1.45
	4th	7	23.3 ± 0.18	26.19 ± 3.06	9.38 ± 1.13
				13.06 ± 1.08	4.34 ± 1.90
	underfur 1st	7	23.2 ± 0.45	13.00 ± 0.00	13.72 ± 0.55
				8.26 ± 0.29	3.53 ± 1.75
	underfur 2nd	8	42.7 ± 0.88	10.94 ± 0.27	12.14 ± 2.02
				7.80 ± 0.00	4.76 ± 3.18

The cuticular scale pattern of juvenile guard hairs was of a mosaic type in the distal portion and lanceolate in the middle (Fig.1). The cuticle of the underfur and intermediate hairs was lanceolate shaped. Their sizes are given in Table 2.

Table 2: Cuticular cell size of juvenile and definitive hairs

Hair Type	**Characteristics**	**shank**					**blade**				
		x	**Sx**	**cv**	**lim**	**n**	**x**	**Sx**	**cv**	**lim**	**n**
juvenile											

guard 1st	length width	61.75 10.16	1.37 0.17	9.9 7.7	49.4 - 72.8 8.0 - 11.0	20	8.94 33.85	0.32 2.41	30.1	6.0 - 12.0	20
guard 2nd	length width	65.39 11.72	1.15 0.25	7.9 9.6	54.6 - 72.8 10.4 - 13.0	20	8.15 24.97	0.21 1.23	11.8 33.0	6.0 - 10.4 15.6 - 31.2	20
underfur	length width	62.77 7.90	1.52 0.02	10.8 1.3	49.4 - 75.4 7.8 - 8.0	20	44.33 7.93	0.83 0.08	8.4 4.3	39.0 - 52.0 7.8 - 8.0	20
definitive											
guard 1st	length width	66.10 9.79	1.34 0.19	9.1 8.7	57.2 - 78.0 7.8 - 10.4	20	11.66 63.18	0.72 4.64	27.4 32.8	7.8 - 20.8 31.2 - 106.6	20
guard 2nd	length width	57.11 9.81	0.99 0.19	7.8 8.7	52.0 - 78.0 8.0 - 10.4	20	15.04 54.80	0.94 4.13	28.1 34.2	10.4 - 21.0 26.2 - 91.0	20
guard 3rd	length width	84.76 9.14	1.45 0.16	7.7 7.8	72.8 - 93.6 8.0 - 10.4	20	11.60 34.36	0.44 1.90	17.4 24.7	8.0 - 15.0 24.4 - 52.0	20
underfur 1st	length width	72.34 8.46	1.50 0.18	9.5 9.3	54.6 - 85.8 7.8 - 10.4	20	36.61 7.86	1.48 0.08	16.7 4.3	28.6 - 54.6 7.0 - 9.0	20
underfur 2nd	length width	89.16 8.41	1.35 0.16	6.8 8.6	80.6 - 104.0 7.8 - 10.0	20	43.16 7.82	1.62 0.07	16.8 4.2	33.8 - 52.0 7.0 - 7.8	20

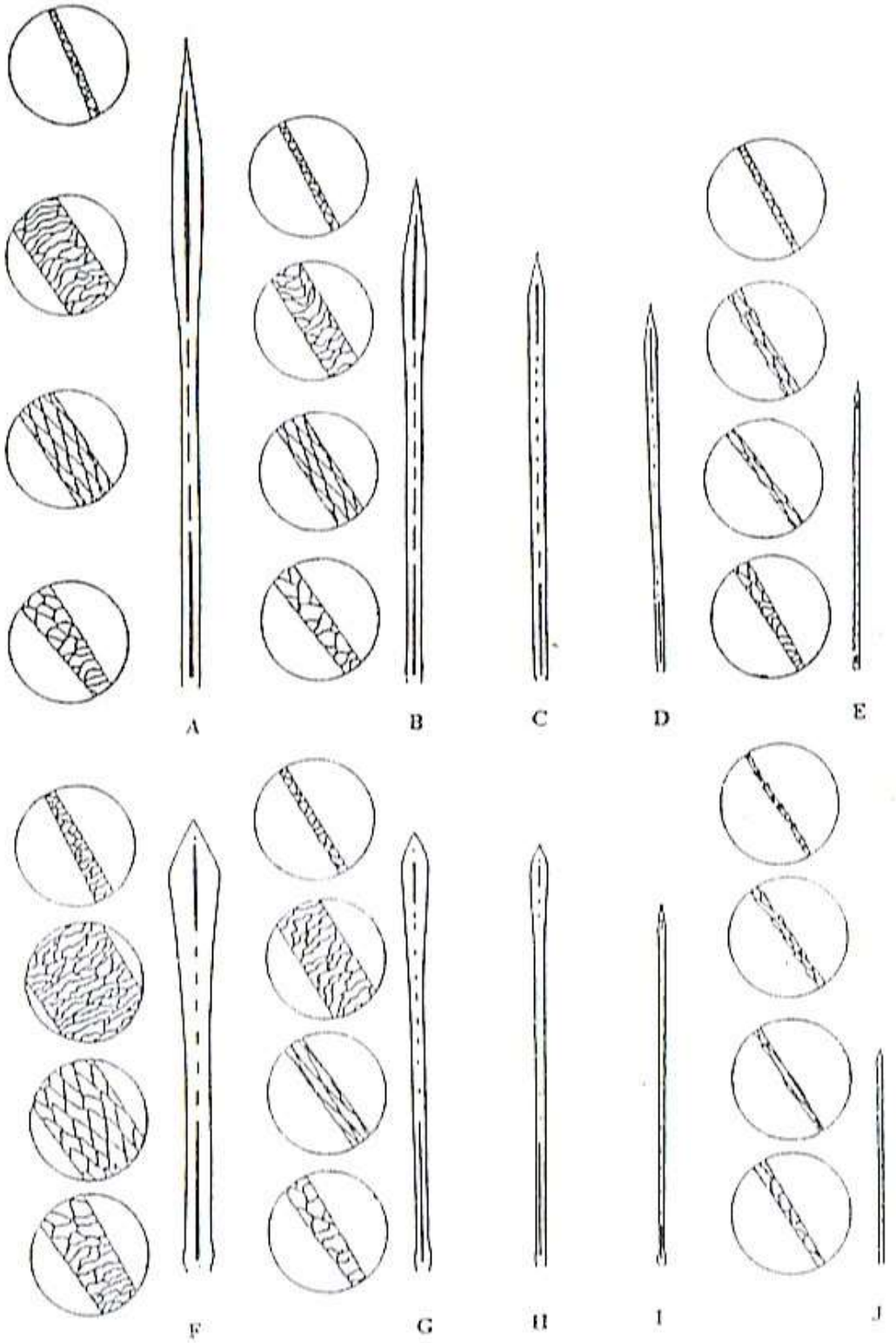

Figure 1. Juvenile (A-E) and definitive (F-J) hair structure and cuticle structure in tip, blade, shank and root of hairs

No significant differences (P>0.05) of embryo and new born pup hair parameters (blade width, maintenance of core in the blade or length of cuticular cells) were found. Therefore it is assumed that embryo fur pelage consists of two hair-types with the taller and denser fur of older pups belonging to the juvenile generation.

Changes in the height of the pelage over different parts of the otters' skin surface was used to indicate the process of juvenile hair growth (Table 3). The condition of the embryo pelage was better on the back, with stomach pelage being less dense and consisting of underfur only. The fur of new-born cubs was denser and higher and continued to grow, as indicated by the increase in length of the guard and underfur hairs of one month old pups. The fur of new-born and one month old pups seems to be responsible for thermoregulation although, in new born pups, there was only underfur hairs on the chest.

Table 3: Height of guard (1) and underfur (2) hairs at different locations

Age of animals	Number of animals	head		withers		back		rump		throat		chest		stomach	
		1	2	1	2	1	2	1	2	1	2	1	2	1	2
embryo	1	10.2	11.7	8.0	11.0	7.7	9.5	9.0	9.8	-	4.6	-	3.3	-	7.2
newborn	2	28.0	17.0	32.0	17.5	30.5	16.0	28.5	19.0	13.5	8.5	-	12.0	23.5	14.4
one-month	2	30.0	18.0	41.0	21.0	39.5	20.5	41.5	23.0	22.0	16.0	24.0	15.5	40.0	23.0
2-8 vear	6	25.0	13.8	34.5	21.7	28.7	21.8	28.3	20.0	24.7	14.0	25.5	11.3	27.3	18.5

Hair morphology of definitive pelage

Two types of adult hairs were identified, 3-4 guard hairs and two underfur hairs (Zagrebelny, 1993) although Marakov and Sudakov (1978) noted six kinds of guard hairs, intermediate and two kinds of underfur. The underfur hairs were distinctly different in both length and core maintenance, whereas the second kind of underfur hairs had no core except at the blade (Table 1).

The cuticle of the guard hairs was mosaic in style at the blade and lanceolate in the shank. The cuticular scale of underfur hairs was lanceolate throuhout their length (Figure 1). The length of the cuticular petal increased from guard to underfur hairs whilst the width decreased (Table 2).

First postnatal moulting

The juvenile pelage changed at 2 to 5 months of age (Barabash-Nikiforov, 1968; Marakov and Sokolov, 1978; Kenyon, 1969). The pelages of both animals studied was similar: moulting was noted at the head, withers (back of the neck), on the forearm in particularly, the back, stomach, tail, side and foot. Moulting was complete on the chest, inner surface of the forearm and the groin (Figure 2).

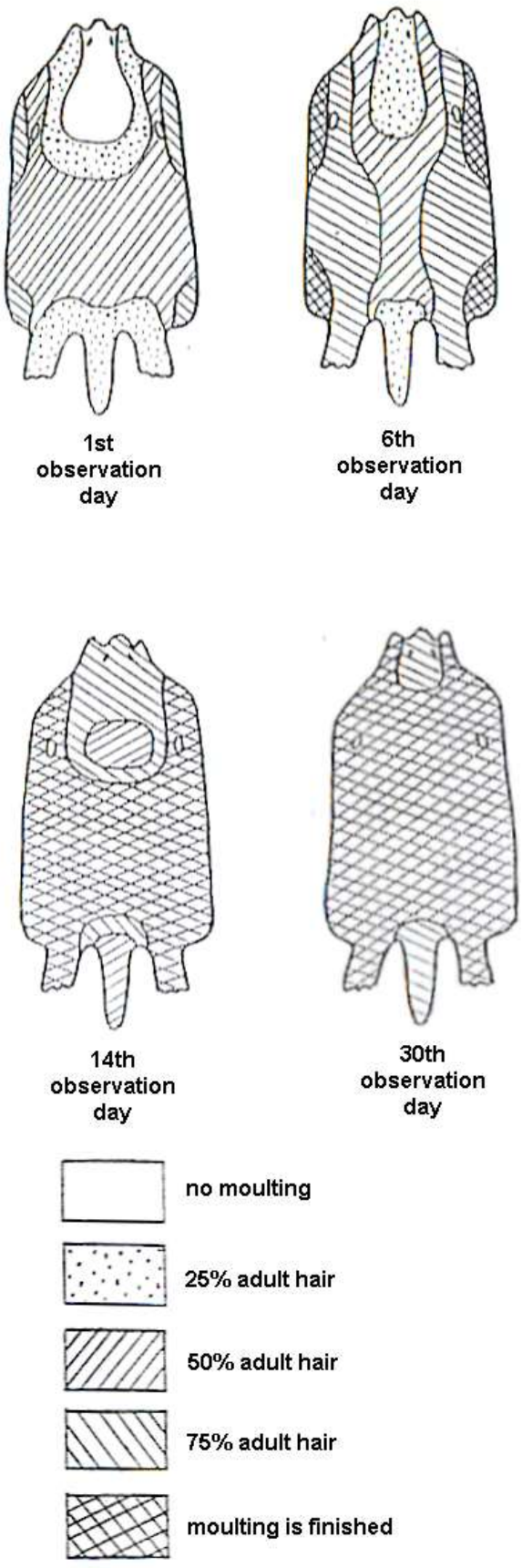

Figure 2 . Moult order of juvenile hairs.

Visual observations indicated the beginning of the moult on the chest and groin. At six days the moult progressed from the surface of the stomach to the back (Figure 2), ending on the head and the rump. The overall moult covered 80-90 % of the animals' skin and concluded by the fourteenth day. Juvenile hairs remained on the head and rump until six months of age.

Secondary moulting was noted in the animal living in the house after 55-60 days of observation. The new generation of definitive pelage was thinner and taller, whilst the colour of the fur became lighter. The order of moult was the same as in the first postnatal (juvenile) moult: back and stomach first and, within 17-20 days, the moult spreading from the back to the withers, forearm, side and from the stomach to the groin and hips. The head, shoulder blades and rump moulted last.The animal was released to the wild before moulting process was finished. The animal died shortly after it was released.

DISCUSSION

The sea otter is the smallest marine mammal. It lives in cold water and, though it has no insulating fat layer, it does have very dense fur. This fur has an underlayer which traps air and thus enables the otter to maintain its' body heat (Sokolov, 1973; MacArthur, 1989; Williams, 1992). Room temperature (20-25 °C) is critical (a temperature beyond which death occurs due to overheating) for animals (Morrison et al., 1974). Sea otters can lose body heat to the outside environment in two ways. Firstly, wetting of the fur can result in an increase in heat production of 3 - 5.5 times (Costa and Kooyman, 1982). Secondly, through the changes in pelage structure (i.e. moulting) as observed during this study. We argue that the first adult moult following the juvenile moult is an adaptation to extreme temperatures. This may also be the process for the seasonal moult.

This study identified some peculiarities of pre- and post-natal fur development. Embrionic fur was sparse and short and we separated it into two types of hairs; guard and underfur. The stomach of the embryo was covered with underfur hairs only. New-born and one-month old pup pelage was dense and high and protected the pup's bodies from the cool ocean water by a layer of air beneath the fur. All types of hair identified in the adult pelage were also found in the pelage of young otters, i.e. two kinds of guard hair, intermediate hairs and underfur.

This study indicated the order of juvenile (first postnatal) and adult (second postnatal) moulting. In all instances the moult began on the stomach, followed by the back, withers and rump. The moult started on that part of the body with the shortest hairs (or with latest hair development), followed by parts with the longest pelage. This process was similar to that found by Zagrebelny (1993) using hair height topography pictures. Further, the same rule was noted by Ivanter et al. (1984) for other semi-aquatic mammals, e.g. *Neomys fodiens*.

REFERENCES

Barabash-Nikiforov, I.I. 1938. The sea otter and stages in its investigation. Nature **2**, 51-61. (In Russian).

Barabash-Nikiforov, I.I., Marakov, S.V., Nikolayev, A.M. 1968. Kalan (sea otter). Moscow. Vycshaya Shkola. 154 pp.(In Russian).
Costa, D.P., Kooyman, G.L. 1982. Oxygen consumption, thermo-regulation and the effect of fur oiling and washing on the sea otter *Enhydra lutris*. Can. J. Zool. **60**, 2761-2767.
Ivanter, E.V., Ivanter, T.V., Levina, R.V. 1984. The adaptive peculiarities of the structure of hair cover and of the moult in semi-aquatic mammals, *Neomys fodiens* taken as an example. J. Zool. **63**, 245-255. (In Russian).
Kenyon, K.W. 1969. The sea otter in the Eastern Pacific Ocean. North. Amer. Fauna 68, 352.
Khmelevskaya, N.V. 1965. Structure of the rodent hair cuticle, its variability and its significance for taxonomy. J. Zool. **44**, 1064-1073. (In Russian).
Kuznetchov, B.A. 1952. Trade testing principles of fur row materials. Moscow. Zagotizdat. 321 pp. (In Russian).
Lakin, G.F. 1990. Biometry. Moscow. Vycshaya shkola., 335 pp. (In Russian).
MacArthur, R.A. 1989. Aquatic mammals in the cold. Advances in Comparative and Environmental Physiology. Berlin ets. 4, pp. 289-325.
Marakov, S.V., Sudakov, V.V. 1978. On some morphological adaptations of the sea otter. pp.117-119. In: Marine Mammals. Thesis of the 7th All-Union meeting. Moscow. (In Russian).
Morrison, P., Rosenman, M., Estes, J. 1974. Metabolism and thermo-regulation in the sea otter. Physiol. Zool. **47**, 218-229.
Sokolov, V.E. 1973. Skin pelage of mammals. Moscow, Nauka, 487 pp. (In Russian).
Sokolov, V.E., Skurat, L.M., Sumina, E.B., Schabadash, S.A. 1988. Guide to the study of mammal skin pelage. Moscow, Nauka, 280 pp. (In Russian).
Williams, T.D. 1992. An analysis of Californian sea otter (*Enhydra lutris*) pelage and integument. Marine Mammal Science **8**, 1-18.
Zagrebelny S.V. 1993. Pelage of the sea otter *Enhydra lutris* (Carnivora, Mustelidae): hair structure, topography and some adaptive features. J. Zool. **72**, 129-140 (In Russian).

RESÚMEN

Características morfológicas del pelaje y primera muda de la nutria marina *Enhydra lutris* L. (Carnivora, Mustelidae)

Se tomaron muestras de la zona dorsal media y el estómago de embriones de nutrias marinas, neonatos, crías de un mes y adultos de 7 a 8 años de las islas Commander. El pelaje amarillo pálido de los embriones fue más corto y menos denso en el estómago que el cualquier otra parte del cuerpo. En la mayor parte de este el pelo se encontraba en crecimiento. En la espalda se determinaron dos tipos de pelo: guardianes y felpa. Generalmente el pelaje de neonatos y crías de un mes continuaba en crecimiento, y era posible distinguir tres tipos de pelo: guardianes, intermedios y felpa. Las escamas cuticulares de los pelos guardianes de juveniles presentaban un patrón de tipo mosaico en la zona distal, y lanceolado en la región media. La de los pelos intermedios y felpa, tenía un patrón lanceolado. No se detectaron diferencias en las características de los pelos de embriones y neonatos, por lo que se asume que el pelaje de los embriones consiste en dos tipos de pelo, y que el pelaje mas largo y denso de crías mayores pertenece a la generación juvenil. En adultos se distinguieron dos tipos de pelos: tres a cuatro guardianes y dos de felpa. La cutícula de los pelos guardianes de adultos

presentaba un patrón tipo mosaico en la parte de la hoja y lanceolado en la base. El de la felpa era lanceolado en todo el pelo. El pelaje juvenil cambió a los 2 a 5 meses de edad, comenzando por el pecho y la ingle. A los 6 días el proceso cubría desde la superficie del estómago hasta la espalda, terminando en la cabeza y las ancas. La muda general cubría el 80 al 90% de la piel y estaba concluida hacia el 14º día. El pelaje juvenil se mantuvo en la cabeza y las ancas hasta los 6 meses de edad. La muda secundaria fue observada en animales domesticados tras 55 a 60 días de observación. El pelaje definitivo es mas fino, largo y claro, y el proceso de muda sigue el mismo orden que el de la primera. Consideramos que la primera muda adulta que sigue a la juvenil es una adaptación a las temperaturas extremas.

A R T I C L E

THREE MEN IN A BOAT (TO SAY NOTHING OF THE OTTER IN LATVIA)*

OZOLINS Janis[1], KRANZ Andreas[2], TOMAN Ales[3]

[1] *State Forest Inventory Institute, Kristapa 30, LV - 1046 Riga, Latvia*
[2] *Department of Wildlife Biology and Game Management, Universität für Bodenkultur Wien, Peter Jordanstr. 76, A - 1190 Vienna, Austria*
[3] *Czech Agency of Nature and Landscape Conservation, Pavlov 54, CR - 58401 Ledec n. S., Czech Republic*

(received 12th June 1998, accepted 14th November, 1998)

*It is not our aim to imitate or to compete with the excellent writer JEROME K. JEROME (1889). We just make an attempt to follow the kind recommendations of TERTIL (1992) and, with this title, try to raise more attention to the otter in a region of Europe which was comparatively rarely mentioned in international papers, the East Baltic.

INTRODUCTION

In the first half of this century, the otter *Lutra lutra* was regarded as 'nowhere numerous in Latvia but more common in the eastern part of the country than in the western' (LANGE, 1970). Latvian game statistics show a fairly evident decrease of otters from the 1920s until the 1940s, followed by a rapid increase after the Second World War (ORNICANS, 1996). Following the annexation of the country by the USSR, very little was known on an international scale about the status of the country«s otter populations. REUTHER (1980) mentioned that otters were rare in the whole East Baltic in the late 1970s. The first more detailed survey of otters in a Baltic country came from Estonia (LAANETU, 1989), who estimated the population to be 600 individuals, a comparatively low number for an area of 45.100 km^2. The first investigations on otters in Latvia after the Second World War started in the 1980s. Initial evidences of an abundant population came from the legal bycatch of otters killed in beaver (*Castor fiber*) traps. 1.490 otters were killed in beaver traps over four consecutive hunting seasons in Latvia, in an area of 63.700 km^2 (OZOLINS and RANTINS, 1994, 1995). Beaver hunting lasts from 1. October until 31. March, however, most beavers and also otters are caught in two months, October and November, before the rivers are covered by ice. Field surveys were also carried out between 1986 and 1991 (OZOLINS and RANTINS, 1992) and the minimal population was estimated to be 4,000 otters. In the 1990s, beaver hunting was no longer popular, because the fur price became too low and consequently only few otters are caught as a bycatch. This might cause an increase of otter numbers, but in Latvia fish densities are very low (BIRZAKS et al., 1998). This raises interest in the feeding peculiarities of otters in these habitats with few fish. Hence our 10 day field excursion had two main goals. Firstly, are there indications that otters increased in Latvia since the last survey, which was conducted 10 years ago. Secondly, what do otters eat in late summer, the season elsewhere in Europe dominated by fish as otter food. An additional question was to determine whether or not otters occur along the coast of the Baltic Sea and feed also in the marine environment.

STUDY SITES, MATERIAL AND METHODS

The Gauja is one of the main rivers of Latvia with a total length of 452 km. The investigated stretch - 23 km long and 91-68 km upstream of the estuary - is located within the Gauja National Park, though this did not mean a hunting ban on beavers. Here the river is about 70-100 m wide and on average 1.5 m deep. The flow is generally slow, but often interrupted by the presence of rapids. Bank side vegetation is trees, with areas of high sandstone cliffs.

This stretch was investigated from a rowing boat on 6. and 7. September 1997, at the end of a long dry season which had resulted in a low water levels. Data from exactly the same stretch were available from an earlier survey in July 1988, but then the water level was higher (OZOLINS and RANTINS, 1992). Otter signs (spraints, tracks and sand heaps) were counted along 1 km river sections.
In addition to the survey along the River Gauja, 237 spraints were collected from 12 small-medium sized inland streams, a further 26 were collected from the mouth of six small streams draining into the Baltic Sea (Fig. 1). The age of the spraints was from very fresh up to two weeks old (dry but still strong smelling) These were analysed and the results expressed as a relative frequency of occurrence. The length of eaten fish were estimated according to measurements of vertebrae (CONROY et al., 1993) or using measurements of other bones or scales in the reference collections (BIRZAKS et al., 1998).

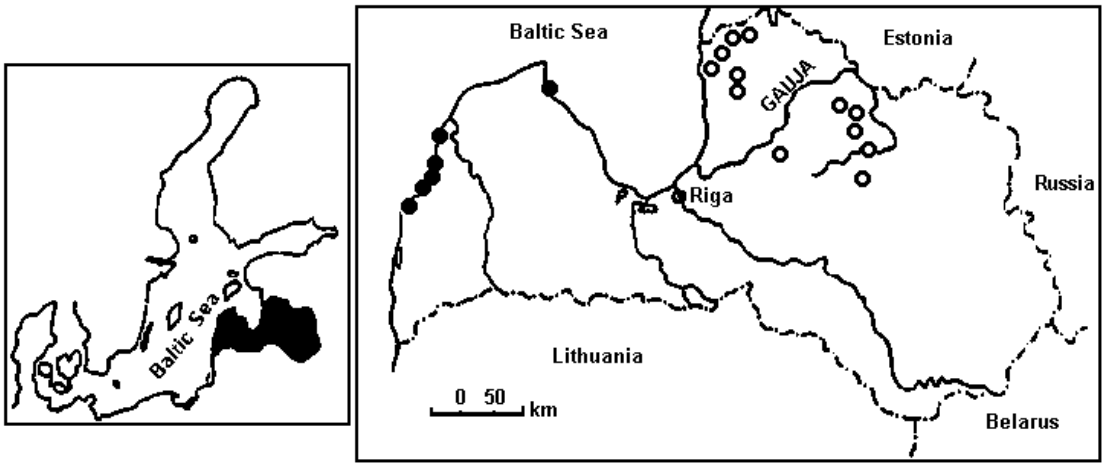

Figure 1. Location of the study sites (black dots indicate coastal sites, empty dots indicate inland sites)

RESULTS AND DISCUSSION

In September 1997 many more signs (206 signs) were found along the 22 sections of river than in July 1988 (96 signs). These findings might be biased by more favourable weather conditions in September 1997 as well as a general seasonal increase of sprainting activity (KRANZ, 1996). It should be noted that the number of spraints alone is a problematic parameter for indicating the status of a population (CONROY and FRENCH, 1987; MASON and MACDONALD, 1987; KRUUK et al., 1986), however, the fact that during the 1997 survey otters occurred along almost all waterbodies, including ditches and small streams throughout the country, and even on

isolated less than 3 m wide creeks draining into the Baltic Sea, indicates a thriving population. This omnipresence of otters is obviously the result of a sufficient population to push otters also into small isolated streams and ditches and indicates rather a stable or increasing otter population than a decreasing one. However, more systematic investigations would be necessary to really prove an increase of the otter population after hunting ceased.

The Baltic Sea obviously does not hold an otter population on its own, because no tracks and spraints could be found except from estuaries of small creeks and even there spraints did not contain many saline fish species. Along the coast of Kurland, between the Lithuanian border and Riga, otters were found at six of seven estuaries visited, but only 6.5% of the prey items found in 26 spraints belonged to saline species, mainly *Zoares viviparus*. The Baltic Sea is very shallow and sandy there, which might be unfavourable for fish in the littoral zone and in particular for otters predating these fish. Coastal otters are more commonly associated with rocky or gravel coast, frequently with kelp forests, which provide cover for fish (KRUUK, 1995). Similar observations come from the Lake Baikal, where otters avoid sandy beaches (KRANZ et al., 1995) and the same is true along the Costa Brava in eastern Spain, where otters were reintroduced (RUIZ-OLMO, pers. com.)

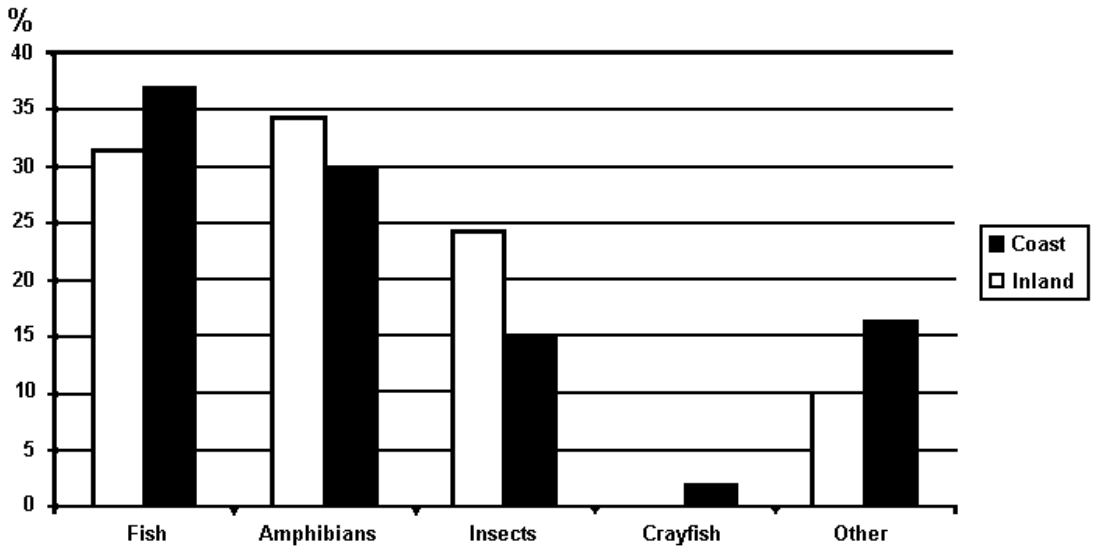

Figure 2. The diet of otters in Latvia in September (n = 263 spraints)

Along the inland streams, the late summer diet of otters (Fig. 2) was only to 37% fish. Amphibians accounted for 30%; insects (mainly *Dytiscus sp*., terrestrial Coleoptera and Odonata) 15%; mammals 4%; birds 4%; molluscs 2.2% (spraints contained whole shells or fragments and covers of cover-holding snails (Viviparidae); plants 5.8% and crayfish 2%. The situation along the coast was similar, but more insects and amphibians were recorded; no crayfish or crabs were found. Almost 90% of the fish (n = 501) were less than 10 cm (Tab. 1). The strong prevalence of non-fish prey, especially in late summer contrasts with findings elsewhere in Europe. In most habitats throughout Europe fish dominate the diet of otters, e.g. in Sweden (ERLINGE, 1967), in Hungary (KEMENES and NECHAY, 1990), in the Pyreneas (RUIZ-OLMO et al., 1989) or in Ireland (KYNE et al., 1989). Only in spring can amphibians form an important part of the diet (WEBER, 1990). Actively consumed

insects, as it was definitely the case here in Latvia, were nowhere recorded in such quantities. It is only in the geographically near eastern Poland (BRZEZINSKI et al., 1993) resembles our findings. They contradict the statement that insects and amphibians increase in otter spraints as latitude decreases (ADRIAN and DELIBES, 1987). Indeed not only in late August and early September but throughout the year (BIRZAKS et al., 1998) non-fish prey is dominant in the diet of Latvian otters. The low abundance of fish in the small and medium-sized streams fits well to these findings. Big rivers, lakes and large beaver ponds are more rich in fish (OZOLINS and RANTINS, 1992), but they make only a small fraction of otter habitat in the Eastern Baltic. Hence, Latvia might provide an example that otters can thrive even when fish are scare, given that other prey species are abundant.

ACKNOWLEDGEMENTS *- We are very grateful to two anonymous reviewers for their comments, which improved both, the style and the content.*

REFERENCES

Adrian, M. I., Delibes, M. 1987. Food habits of the otter (*Lutra lutra*) in two habitats of the Donana National Park, SW Spain. J. Zool. **212**, 399-406.

Birzaks, J., Ozolins, J., Ornicans, A. 1998. Otter (*Lutra lutra*) diet related to abundance of fish in some Latvian rivers. Proc. Latvian Acad. Sci. Section B **52**, No. 1/2, 70-76.

Brzezinski, M., Jedrzejewski, W., Jedrzejewska, B. 1993. Diet of otters (*Lutra lutra*) inhabiting small rivers in the Bialowieza National Park, eastern Poland. J. Zool. **230**, 495-501.

Conroy, J.W.H., French, D.D. 1987. The use of spraints to monitor populations of otters (*Lutra lutra*). Symp. Zool. Soc. Lond. **58**, 247-262.

Conroy, J.W.H., Watt, J., Webb, J.B., Jones, A. 1993. A guide to the identification of prey remains in otter spraint. An occasional publication of the Mammal Society **16**, pp 52.

Erlinge, S. 1967. Food habits of the fish-otter, *Lutra lutra* L., in south Swedish habitats. Viltrevy **4**, 371-431.

Jerome K. Jerome 1889. Three Men in Boat (To Say Nothing of the Dog). London, Latvian interpretation by V. Belevica, 1963, Riga.

Kemenes, I., Nechay, G. 1990. The food of otters *Lutra lutra* in different habitats in Hungary. Acta Theriol. **35**, 17-24.

Kranz, A. 1996. Variability and seasonality in sprainting behaviour of otters *Lutra lutra* on a highland river in Central Europe. Lutra **39**, 33-44.

Kranz, A., Knollseisen, M., Gutleb, A.C., Elmeros, M., Leonards, P.E.G., Toman, A. 1995. Aspects of the ecology of otters (*Lutra lutra*) in the Zabajkalsk National Park. Lutreola **6**, 9-12.

Kruuk, H. 1995. Wild otters - Predation and populations. Oxford University Press, Oxford.

Kruuk, H., Conroy, J.W.H., Glimmerveen, U., Ouwerkerk, E.J. 1986. The use of spraints to survey populations of otters *Lutra lutra*. Biol. Conserv. **35**, 187-194.

Kyne, M.J., Smal, C.M., Fairley, J.S. 1989. The food of otters *Lutra lutra* in the Irish Midlands and a comparison with that of mink *Mustela vison* in the same region. Proc. R. Ir. Acad. **89B**, 33-46.

Laanetu, N. 1989. Zur Ökologie des Fischotters *Lutra lutra* (L., 1758) in Estland. - **Stubbe, M.** (ed.) Populationsökologie marderartiger Säugetiere, 1, Wiss. Beitr. 1989/37 (39) Halle (Saale), 59-70.
Lange, W.L. 1970. Wild und Jagd in Lettland. Harro von Hirscheydt Verlag, Hannover-Dühren, 266 S.
Mason, C.F., Macdonald, S.M. 1987. The use of spraints for surveying otter *Lutra lutra* populations: an evaluation. Biol. Cons. **41**, 167-177.
Ornicans, A. 1996. Legal status of the otter in Latvia. Seminar on the conservation of the European otter (*Lutra lutra*), Environmental encounters, 24, Council of Europe Publishing, Strasbourg, 87-90.
Ozolins, J., Rantins, M. 1992. Einige Vorraussetzungen zur heutigen Bestandsentwicklung und zur Verbreitung des Fischotters *Lutra lutra* (L.) in Lettland. In: **Schröpfer, R., Stubbe, M., Heidecke, D.** (eds.) Semiaquatische Säugetiere, Wiss. Beitr. Univ. Halle, 365-384.
Ozolins, J., Rantins, M. 1994. Otter survival in relation to beaver trapping in Latvia. Seminar on the management of small populations of threatened mammals. Environmental encounters, 17, Council of Europe Press, Strasbourg, 121-122.
Ozolins, J., Rantins, M. 1995. The data on otter *Lutra lutra* population provided by beaver trapping in Latvia. Ekologija, **2**, 64-69.
Reuther, C. 1980. Zur Situation des Fischotters in Europa. In: **Reuther, C., Festetics, A.** (eds.) Der Fischotter in Europa: Verbreitung, Bedrohung, Erhaltung. Selbstverlag, Oderhaus, Göttingen, 71-92.
Ruiz-Olmo, J., Jordan, G., y Gosalbez, J. 1989. Alimentacion de la nutria (*Lutra lutra* L., 1758) en el Nordeste de la Peninsula Iberica Donana, Acta Vertebrata **16**, 227-237.
Tertil, R. 1992. Wildlife English or the Wild Life of English: on modern communication problems in wildlife and game biology. In: **Bobek, B., Perzakowski, K., Regelin, W.** (eds.) Global trends in wildlife management. Trans. 18th IUGB Congress, Krakow, 1987, Swiat Press, Krakow-Warszawa, 71-74.
Weber, J.-M. 1990. Seasonal exploitation of amphibians by otters (*Lutra lutra*) in north east Scotland. J. Zool. **220**, 641-651.

RESUMEN

Tres hombres en un bote (decir nada sobre las nutrias en Latvia). En la primera mitad de este siglo la nutria Lutra lutra se consideraba "de ninguna forma numerosa en Latvia, pero mas común en la parte oriental del país que en la occidental". Las nutrias era raras en todo el Este Báltico a finales de los '70. Las primeras investigaciones en Latvia posteriores a la segunda guerra mundial son de 1980, y entre 1986 y 1991 se estimó una población mínima de 4000 nutrias. Los objetivos de este estudio fueron ver si existían evidencias de un aumento en el número de nutrias en los últimos 10 años, averiguar que comían a fines del verano en una zona con poca disponibilidad de peces, y determinar su presencia o no en las costas del mar Báltico y si forrajeaban en ambientes marinos. Se contaron signos a lo largo de secciones de 1 km del río Gauja, y se recogieron fecas (que variaban de frescas a 2 semanas de viejas) en otros cursos de agua. Se registró la presencia de nutrias en la mayoría de los cursos estudiados (se registraron más signos que en 1988). Esto parece indicar la existencia de una población estable o en crecimiento. El Mar Báltico no alberga por sí mismo poblaciones de nutrias, quizás debido a que la poca profundidad en esas zona y el hecho de ser arenoso podría dificultar la pesca en la zona litoral. En los cursos de agua tierra adentro la dieta estaba compuesta sólo en un 37% por peces, en un 30%

por anfibios, 15% por insectos, 4 % por mamíferos, 4 % por aves, 2,2% por moluscos, 5,8% por plantas y 2% por cangrejos de río. La situación en la costa fue similar. Más del 90% de los peces medían menos de 10 cm. Este predominio de presas no peces contrasta con lo registrado en el resto de Europa. El consumo activo de insectos en tales cantidades no había sido registrado previamente en ningún lugar. Sólo en Polonia del Este los resultados son similares. Esto contradice la aseveración de que anfibios e insectos aumentan en las fecas de las nutrias con el descenso latitudinal. De hecho, durante todo el año las presas no peces predominan en la dieta de las nutrias en Latvia. La escasez de peces en los cursos pequeños y medianos concuerda con estas observaciones.

R E P O R T

SPRAINT SURVEYS AND SPARSELY POPULATED OTTER POPULATIONS

Paul Yoxon

IOSF, Broadford, Isle of Skye, Scotland, IV49 9AQ

(Received 2nd July 1998, accepted 4th July 1998)

Abstract: Otters deposit spraint anointed with anal sac secretions in prominent sites in their territory. Otters have been shown to be able to distinguish individuals from their spraint, including distinguishing their own spraint from that of others. They may use these to signal resource use to other otters. Because they plainly have significance to the animals, when attempting to encourage otters back into an area, spraints should not be wholly removed for analysis as they may be of critical importance in encouraging an otter to stay.

The spraints or scats of an otter are normally deposited on easily recognised sites, on grassy mounds near the sea shore, at the mouths of rivers, under bridges and at the entrances to holts (Conroy & French, 1985, 1987). For many years they have been used not only for survey work, (Green & Green, 1980, 1997) but also as a means of analysing otter diet (Watson & Hewson, 1973; Veen, 1975; Watson, 1978; Watt, 1991, 1995; Webb, 1975).

Like many carnivores, the otter has scent-producing organs and an anal scent is deposited on this spraint. However, relatively little is known of the chemistry of social odours in carnivores (Albone, 1984) and the actual communication function is the subject of much debate. There have been many proposed functions, including individual or group recognition, and these are not attributed to a single chemical compound but to differences in the relative concentrations of the constituents of this complex chemical mixture. These differences have not only been reported in the Eurasian otter (*Lutra lutra*) (Trowbridge, 1983), but also in the stoat (*Mustela erminea*) (Brinke *et al*., 1983), brown hyena (*Hyaena brunnea*) (Mills *et al*., 1980), red fox (*Vulpes vulpes*) (Albone & Perry, 1976) and the European badger (*Meles meles*) (Gorman *et al*., 1984).

The exact chemical composition of spraints was analysed by Trowbridge (1983), who extracted the scent from the spraint using ether and subjected the extract to gas chromatography analysis. The scent was found to consist of over 100 separate compounds and one compound was found to form a high proportion in all samples; this was also less volatile and lasted a long time, and so she concluded that this might be the compound that spelled "otter" to other animals.

Using trials with captive otters, Trowbridge (1983) also found that they were able to distinguish individuals by smelling the spraint, and that over 80% of the spraints could be accurately identified by the captive otter. Mason & Macdonald (1980) at Loch Broom in north west Scotland used the spraint of a captive otter and put it on

spraint piles in the natural environment to compare how many of these sites were visited compared to some controlled areas. They found that the wild otters responded to these foreign spraints by sprainting more often on these piles than on the controlled sections.

In Russia, Rozhnov (1994) found that the Eurasian otter was able to distinguish between its own spraint and that of other otters and from their results showed that this could be up to 30 days after the spraint was deposited.

However, Kruuk (1992) suggested that otters use scent markings to signal their use of resources like feeding patches and freshwater pools, and concluded that spraints may only have a communication function for a short time of not more than 4 days after deposition.

While the debate about the exact significance of spraints may go on for many years, it cannot be questioned that they do play an important role in the social organisation of otters. The otter is a complex creature living a complex life in which the social order is maintained by the transmission of information between individuals by vision, sound or in the odour on spraint. In many surveys of otters in sparsely populated areas the spraint is the only evidence found of the otter being present (Strachan *et al*., 1990; Andrews *et al*., 1993). In certain areas of England spraints are taken on a regular basis for analysis, as in East Anglia and County Durham (Lovett, personal communication); the same is true for certain areas in America where the re-introduction of the American river otter is taking place (Berg, personal communication).

If, as all scientific evidence suggests, spraint does have a major significance in otter communication and is important to the social organisation of the otter, then we are in danger of stopping the otter from recolonising sparsely populated areas by continually removing the spraint. For example, if a male otter is in a particular county of England and spraints are continuously taken, then any other otter transient. It would be a logical conclusion that in areas where habitat improvements are being done, including the construction of artificial holts to encourage the otter to move back, then the removal of spraints for analysis should be discouraged. By leaving them they may be of critical importance to encourage an otter to stay in that area.

REFERENCES

Albone, E.S. (1984). Mammalian Semiochemistry. Wiley and Sons.

Albone, E.S. & Perry, G.C. (1976). Anal sac secretion in the red fox, *Vulpes vulpes*. Volatile fatty acids and diamines. *J. Chem. Ecol.* **2**, 101-111.

Andrews, E., Howell, P. & Johnson, K. (1993). Otter survey of Wales 1991. Vincent Wildlife Trust.

Brinck, C., Erlinge, S. & Sandell, M. (1984). Anal sac secretion in mustelids. *J. Chem. Ecol.* **9**, 727-745.

Conroy, J.W.H. & French, D.D. (1985). Monitoring otters in Shetland. Final Report to Shetland Oil Terminal Environmental Advisory Group.

Conroy, J.W.H., French, D.D. (1987). The use of spraints to monitor populations of otters (*Lutra lutra*). *Symp. Zool. Soc. London* **58**, 247-262.

Gorman, M.L., Kruuk, H. & Leitch, A. (1984). Social functions of the sub-caudal scent gland secretion of the European badger (*Meles meles*). *J. Zool*. **204**, 549-559.

Green, R. & Green, J. (1980). Otter survey of Scotland. Vincent Wildlife Trust.

Green, R. & Green, J. (1997). Otter survey of Scotland. Vincent Wildlife Trust.
Kruuk, H. (1992). Scent markings by otters (*Lutra lutra*) signalling the use of resources. *Int. Soc. Behav. Ecol.* **3**, 133-140.
Mason, C.F. & Macdonald, S.M. (1980). The winter diet of otters (*Lutra lutra*) on a scottish sea Loch. *J. Zool. Soc. Lond*. **192**, 558-561.
Mills, M.G.L., Gorman, M.LK. & Mill, M.E.J. (1980). The scent marking behaviour of the brown hyaena, *Hyaena brunnea*, in the southern Kalahari. *S. African J. Zool*. **15**, 240-248.
Rozhnov, V. (1994). The ability of the otter to distinguish scent marks. *Lutreola* **3**, 5-9.
Strachan, R., Birks, J.D.S. & Chanin, P.R.F. (1990). Otter survey of England 1984-1986. Nature Conservation Council.
Trowbridge, B.J. (1983). Olfactory communication of the European otter (*Lutra lutra*). PhD Thesis, Aberdeen University.
Veen, J. (1975). Het vorkomen en enige gedragsverschijnselen van de visotter in Noord-Holland. *Lutra* **17**, 21-37.
Watson, A. & Hewson, R. (1973). Food and feeding habits of otters (*Lutra lutra*) at Loch Park, NE Scotland. *J. Zool. Soc. London* **170**, 159-161.
Watson, H. (1978). Coastal otters (*Lutra lutra*) in Shetland. Vincent Wildlife Trust.
Watt, J.P. (1991). Prey selection by coastal otters (*Lutra lutra*). PhD Thesis Aberdeen University.
Watt, J.P. (1995). Seasaonal and area-related variations in the diet of the otter (*Lutra lutra*) on Mull. J. Zool. Lond. **237**, 179-184.
Webb, J.B. Food of the otter (*Lutra lutra*) on the somerset levels. *J. Zool.* **177**, 486-491.

RESÚMEN:
Relevamientos de fecas y poblaciones esparcidas de nutrias. Las fecas de las nutrias son depositadas normalmente en sitios fácilmente reconocibles, y se utilizan para realizar relevamientos y estudios de dieta. Como otros carnívoros, las nutrias poseen órganos odoríferos, pero poco se conoce sobre la química de los olores sociales en carnívoros y la verdadera función de comunicación es objeto de debate. En el rastro (esencia) de las nutrias se han aislado más de 100 compuestos químicos diferentes, con uno, menos volátil, representado en alta proporción en todas las muestras. Nutrias en cautividad pueden distinguir entre individuos olfateando sus fecas, y se ha demostrado que nutrias en libertad responden a la presencia de fecas de extraños con una mayor frecuencia de marcaje con fecas. La nutria Eurasiática tiene la capacidad de discernir entre fecas de hasta 30 días del propio individuo o de extraños. Sin embargo, también se ha señalado que las nutrias usan las fecas como indicadores del uso de un recurso y que estas pueden tener función de comunicación por períodos de no más de 4 días. A pesar de la discusión sobre la función de sus fecas, es incuestionable que estas juegan un rol importante en la organización social de las nutrias. En muchos relevamientos de nutrias las fecas son la única evidencia de su presencia, y en ciertos lugares de Inglaterra y Norteamérica éstas se recogen regularmente para análisis. Si las fecas juegan un papel importante en la comunicación y la organización social de las nutrias, corremos el riesgo de detener la recolonización de áreas poco pobladas por nutrias al extraerlas constantemente. Es lógico señalar que en áreas en las que se están haciendo mejoras en el hábitat, como la construcción de refugios, para el regreso de las nutrias, la remoción de fecas debe ser desestimulada. Dejar las fecas puede ser de importancia crítica para estimular a una nutria a mantenerse en dicha área.

R E P O R T

EURASIAN OTTER (*Lutra lutra*) STILL PRESENT IN SYRIA

Hélène Jacques

13, Place De Verdun 38320 Eybens, France

(received 9th August 1998, accepted 20th September 1998)

Abstract: The author presents strong anecdotal evidence of presence of the Eurasian otter along the River Euphrates in Syria. Numbers, however, seem to have dropped considerably following irrigation schemes over the last 40 years.

BACKGROUND AND INTRODUCTION

Foster-Turley & Santiapilliai (1990) mentioned that "the Eurasian otter occurs in adjacent rivers in Israel and Jordan, so it is probably present in Syria but no recent information is available". Together with the River Oronte, which is highly industrialised, the River Euphrates is the main river in Syria. As the river flows through a desert area, if otters are present they may come from up- or downstream, i.e. the bordering countries. However, there appears to be no literature or precise data available on the status of the Eurasion otter *Lutra lutra* in Syria at the present time.

Otters are indeed present in the countries bordering Syria, particularly those along the River Euphrates. In Turkey (source of the Euphrates) otters were once widespread, however, the species is now considered endangered in the south, where the Euphrates enters Syria (Eroglu, 1994), principally due to habitat destruction, poor river management and illegal killing.

In Iraq, where the River Euphrates flows after having crossed Syria, Hatt (1959, cited in: Conroy et al., 1998) gave evidence of otters on the upper sections of the River Euphrates. He also reported many otters near the Hindiya Barrage (some 95km south of Bagdhad on the River Tigris), concluding that it was probable that the species ranged through all the major streams of Iraq from the Persian Gulf to the Northern frontiers. Whilst on a professional trip to Syria, the author took the oppurtunity to interview local people along the River Euphrates regarding the possible presence of the Eurasian otter.

FINDINGS

In July 1998, following a question about "an animal living in the river" (the Arabic translater not knowing the precise arabic word for otter [*kalp elma* or *al kandes*]) the curator of the famous site of DOURA EUROPOS (50 km north-west of the Iraq border) immediately answered "yes, water dog". He went on to describe the animal precisely (upper part reddish brown with white spots, under part white) and added that the otters could be spotted mainly at night but sometimes also during the day. They

are sometimes caught in fishing nets and are occasionally shot as the pelt fetches a high price. However, he said they were not destroyed on a large scale and otters do not seem to be considered as vermin. The author later accompanied the curator to a small cliff where he had seen otters. Though no otter signs were seen and it was not possible to check the river banks, the surroundings did seem suitable for otters. Whilst one bank was cultivated the other was covered in wild vegetation, in the middle of the river were small islands and fish biomass seemed high.

Later that day, the author interviewed the owner of a restaurant at Deir el Zor (100 km upstream of Doura Europos), an industrialised region of oil wells. Both the owner and his brother stated that otters were common before the construction of the Tabaqua dam (Lake Assad) 200 km upstream. 40 years ago an otter "family" was frequently seen within metres of the restaurant. He stated that, as otters are now becoming rare, a pelt could now be sold for around 100 US$.

CONCLUSIONS

As no physical evidence of otter presence was obtained, the information presented above should be considered anecdotal. However, when asked, local people were very clear in their description of the animal and quickly recognised a picture of the otter. It would seem that otters are still present along the River Euphrates, though population numbers have dropped considerably over the last 40 years. The principle cause of this drop would appear to be an irrigation scheme at Deir el Zor (45 000 ha) and river management during and following the construction of the Tabaqa dam, which resulted in 400 000 ha of irrigated land.

REFERENCES

Conroy, J., Melisch, R. & Chanin, P. (1998). The distribution and status of the Eurasian otter (*Lutra lutra*) in Asia - a preliminary review. *IUCN Otter Spec. Group Bull.* **14**, 15-30

Eroglu, M. (1994). The status and habitat destruction of the otter (*Lutra lutra* L.) in the eastern Black Sea region of Turkey. In: Seminar on the Conservation of the European otter *(Lutra lutra*), Leeuwarden, the Netherlands, 7-11 June 1994. pp. 81-83. Council of Europe, Strasbourg.

Foster-Turley, P. & Santiapillai, C. (1990). Action Plan for Asian Otter. In**: Foster-Turley, P., Macdonald, S.M., Mason, C.F.** (eds). Otters - an Action Plan for their Conservation. IUCN, Gland, Switzerland. 62 pp.

RESÚMEN:

La nutria eurasiática (*Lutra lutra*) aún presente en Siria. El autor presenta evidencia anecdótica fuerte de la presencia de la nutria eurasiática a lo largo del Río Eufrates en Siria. Los números, sin embargo, parecen haber bajado considerablemente siguiendo los esquemas de irrigación de los últimos 40 años.

REPORT

BEHAVIOUR OF OTTERS IN A MARINE COASTAL HABITAT: SUMMARY OF A WORK IN PROGRESS

J. Scott Shannon

P.O. Box 24, Arcata, CA 95518, USA

(Received 15th December 1998, accepted 20th December 1998)

Abstract: Since 1983, I have studied 67 wild otters (*Lontra canadensis*) in Trinidad Bay, California, USA. The observations were made at short range (<100 m), and individuals were identified using a combination of facial and physical characteristincs. In Trinidad Bay, the otters normally form two social groups: one maternal family and one "Clan" of males. The most noticeable pattern in this population's social organisation was that adult males and adult females led largely sexually-segregated lives. Since 1986, I have studied the behavioural ontogeny of otters, chronicling the development of 6 litters (22 pups) by one mother, 4 litters (9 pups) by that mother's daughters, and 5 litters (7 pups) by a granddaughter. The author summarises observations to date.

Since 1983, I have studied a marine coastal population of otters (*Lontra canadensis*), by naturalistic observation, at Trinidad Bay, California, USA. During this time, I have documented the behaviour of 67 free-ranging otters of known identity or birth, whose lives have spanned 5 otter generations. Thus far, I have conducted 3.457 sessions, recorded >8,500 otter-hours of direct observations, and seen otters at Trinidad Bay during 2.966 (86%) of my sessions. From 1983-1998, 5-18 otters shared a home range comprising 4 km. of marine coastline. At Trinidad Bay, otters were observable at very close distances (<100 m.). Individuals were identified reliably by noting each otter's unique combination of facial, physical, and behavioural characteristics.

The otters at Trinidad Bay typically formed 2 distinct social groups: a maternal "Family", and a male "Clan". The Family consisted of a dominant "matriarch" and her pups of the year, and usually, at least 1 elder daughter as a full-time cohabitant. Elder daughters provided socialisation, supervision, and some shared-food to the matriarch's pups, and helped defend their "home territory". Elder daughters were not alloparents in the strict sense, because they did not directly provision their mother's pups with food, nor did they assume true parental care in the matriarch's absence. When an elder daughter of the matriarch became a mother herself, the matriarch formed a "maternal alliance" with her daughter, combining their respective families into a stable, cohabiting, 3-generation "Super-family". Males at Trinidad Bay were highly gregarious, forming a seasonally-stable, cohabiting, socially-egalitarian "Clan". The Clan comprised all of the population's 2-8 adult males: the local fathers, sons, matrilineal brothers, unrelated immigrant males, and yearlings of both sexes. No adult females were observed to share the society of the males until summer 1997, when 2 elder uncles accepted their 2 nulliparous adult nieces into their company. Adult females aggressively expelled unrelated females from their home territory. Although the 2 mothers of the Super-family were usually tolerant of each other's dependent female pups, a maternal female usually aggressively expelled any independent yearling female that was not her own daughter. Expulsion attacks by territorial adult

females were astonishingly fierce; even a grandmother attacked her yearling granddaughter with uninhibited ferocity. In the severest territorial attack, the eldest daughter of the matriarch killed the yearling daughter of the matriarch. Although territory literally meant life or death to females, males here displayed no intrasexual territoriality, except for brief fights during the females' oestrus.

The most noticeable pattern in this population's social organisation was that adult males and adult females led largely sexually-segregated lives. The strength of this behavioural segregation of the sexes was, at times, truly remarkable. For example, a period of 70 mon. elapsed between instances when I saw an adult male and an adult female simply forage together, and 58 mon. elapsed between episodes of reciprocal play between opposite-sex adults. Typically, the primary enforcers of sexual segregation were the adult males. In general, the only prolonged social interaction that adult females and adult males engaged in was copulation, during the females' annual oestrus from late-March to mid-April. After all the adult females died in 1992, however, a new matriarchy was established by a female who had grown to adulthood as a Clan-mate and social co-equal with the males. When this female attained motherhood, the frequency of amicable interactions between the Family and Clan increased noticeably, to the extent that, in mid-1995, I concluded that the rigid regime of sexual segregation I documented here from 1988-1992 was no longer in effect. The Family and Clan still maintained essentially separate and independent existences, but free interaction between the sexes was observed frequently. In 1997, all of the otters here were direct matrilineal relatives, and amicable intersexual interactions reached an all-time high, and for a brief unprecedented period, all of the resident adults formed a single unified social group. In 1998, however, 2 unrelated yearling males joined the population, resulting in a re-emergence of segregation and agonism between the sexes. In this current manifestation of sexual segregation, though, the females are the principal enforcers of the social distance, and the females' aggressive attacks are directed exclusively against the new unrelated males.

Since 1986, I have studied the behavioural ontogeny of otters, chronicling the development of 6 litters (22 pups) by one mother, 4 litters (9 pups) by that mother's daughters, and 5 litters (7 pups) by a granddaughter. At Trinidad Bay, otters achieved proficient aquatic locomotion only 9 wks. after leaving the natal nest, but proficiency in aquatic hunting required >9 mon. of trial-and-error learning. Basic self-sufficiency in food procurement was attained at 37-42 wks., but the young did not achieve optimal utilisation of food sources and habitat until after they were abandoned by their mother at 48 wks. Yearlings did not disperse from their home area voluntarily. After 3 mon. of independence, yearlings of both sexes joined the Clan. Yearling females were accepted as fully co-equal members of the male Clan. In her 16th months, a yearling female either returned to her mother, remained with the Clan, or was expelled incidentally from the Clan by a territorial adult female. A female could remain a member of the Clan until she reached sexual maturity. After her first oestrus, however, most males would shun her socially, and some males attacked their former Clan-mate without apparent provocation. The 2 sisters born in 1986 were sexually mature at 24 months, but they remained nulliparous until 48 month and 60 month, respectively. The first daughter to give birth was accepted into a maternal alliance with her mother. When the lower-ranking daughter became a primipara, however, her mother expelled her aggressively from the home territory. In 1998, the 2 sisters born in 1995 should have had their first litters, but they remained nulliparous as their

grandmother did, so my previous finding of reproductive suppression in socially-subordinate adult females was replicated. Males born at Trinidad Bay continued to base their activities at their home area well into adulthood. At times, though, males not born at Trinidad Bay joined the local Clan, indicating that some males do disperse permanently from their home area. Older males were noticeably less gregarious than young males, and 1 old male was expelled aggressively from the Clan at approximately 11 years of age; this exiled male died soon thereafter. The eldest female at Trinidad Bay was the former matriarch "Old Mama"; I estimated she was 11 years old when she terminated her own life in July 1992. The eldest male was "Beady Eyes", who joined the population as a young adult in 1987 and died in November 1996 at approximately 12 years of age.

RESÚMEN: COMPORTAMIENTO DE LAS NUTRIAS EN UN HÁBITAT MARINO COSTERO: RESUMEN DE UN TRABAJO EN PROGRESO.

Desde 1983 he registrado el comportamiento de 67 nutrias (*Lontra canadensis*) silvestres en Bahía Trinidad, California, USA. Las observaciones se han realizado a corta distancia (<100 m), y la identificación de individuos se ha basado en la combinación única de características faciales, físicas y comportamentales. En Bahía Trinidad la nutrias típicamente forman 2 grupos sociales distintos, una „Familia" maternal, que consiste en una „matriarca" y sus crías del año y generalmente al menos una hija mayor cohabitando permanentemente, y un „Clan" de machos. Las hermanas mayores colaboran con la madre en la socialización y supervisión de las crías, pero no las alimentan directamente ni les proveen de cuidados parentales en ausencia de la „matriarca". Cuando una de estas hermanas tiene sus propias crías forman una „alianza maternal" con aquella. Los machos son muy gregarios. Los „Clanes" son estacionalmente estables y socialmente igualitarios. El „Clan" incluye a todos los machos adultos de la población: padres locales, hijos, hermanos matrilineales, machos inmigrantes y juveniles de ambos sexos. A partir de 1997 2 hembras adultas nulíparas se sumaron al grupo. Las hembras adultas rechazan con mucha agresividad otras hembras de su territorio, incluso juveniles indirectamente emparentadas. Los machos no presentan territorialidad intrasexual fuera del período de estro de las hembras. El patrón social más evidente es que machos y hembras llevan vidas sexualmente segregadas. Este patrón es principalmente impulsado por los machos adultos. La única interacción prolongada entre adultos de distintos sexos suele darse durante la cópula, entre fines de marzo y mediados de abril. Tras la muerte de todas las hembras adultas en 1992, un nuevo matriarcado fue establecido por una hembra que había crecido y llegado a su madurez como integrante del „Clan". A partir de entonces las interacciones amigables entre ambos grupos aumentaron evidentemente en frecuencia, hasta que a mediados de 1995 llegué la conclusión de que el rígido régimen de segregación sexual observado entre 1988 y 1992 había quedado sin efecto. En 1997 todas las nutrias eran parientes matrilineales y todos los adultos residentes conformaban un único grupo social. Con la llegada de 2 machos juveniles inmigrantes, se restableció la segregación de sexos, siendo en este caso las hembras las principales impulsoras de la misma, dirigiendo exclusivamente sus ataques hacia los 2 inmigrantes. En Bahía Trinidad las crías adquieren destreza en la locomoción acuática a las 9 semanas de abandonar el nido, y en la pesca después de los 9 meses. Adquieren autosuficiencia para procurarse la comida entre las 37 y 42 semanas, y llegan a utilizar óptimamente los recursos alimenticios recién después de ser abandonadas por sus madres a las 48 semanas. Los juveniles no se dispersan voluntariamente. Cuando la primera de 2 hermanas nacidas en 1986 tuvo crías, formó

una alianza con la „matriarca", sin embargo, cuando la segunda tuvo su primer camada, fue expulsada agresivamente por la madre de su territorio. Probablemente exista supresión reproductiva sobre las hembras subordinadas. Los machos más viejos son menos gregarios que los más jóvenes, y uno de unos 11 años murió al poco tiempo de haber sido expulsado agresivamente del „Clan". Una hembra de aproximadamente 11 años y un macho de 12 fueron los animales más viejos registrados.

SHORT NOTE

OTTER SKINS CONFISCATED

cited from: TRAFFIC Bulletin 1998, 17, 89.

On 6 November 1997, in Meghala, Assam, India, the following materials being transported from Jowai to Champai in the Garo Hills were seized: 113 kg of ivory; a 9 ft piece of tiger *Panthera tigris* (App. I) skin and 13.5. kg of tiger bones; 4 pieces of leopard *P. pardus* (App. I) skins, 13 pieces of river otter skins; and 20 kg of Pangolin Manis (App. II) scales. The items were to be sent to Myanmar and onto China.

Three persons who were arrested in connection with the incident were released on bail but a notice was issued for their re-arrest.

Wildlife Protection Society of India, Aranyak Nature Club, Guwahati, India.

R E P O R T

THE OTTER HABITAT NETWORK EUROPE (OHNE) PROJECT HAS BEEN STARTED

REUTHER Claus

Aktion Fischotterschutz e.V., OTTER-ZENTRUM, D-29386 Hankensbüttel, Germany

One of the main problems for the protection of *Lutra lutra* in its Central European range is the fragmentation and isolation of split populations. Whilst stable or thriving otter populations remain in the east and west, only isolated populations remain in Central Europe.

This situation contains great risks for the survival of the species:

– The former closed distribution area, which covered the whole of Europe only 80 years ago, threatens to be split into an eastern and a western population. This leads to the risk of genetic isolation of these two populations and could finish in the development of two sub-species.

– As the history of the decrease in the otter population shows, fragmented and isolated populations are not viable. This leads to the risk that the decrease in the otter population will continue and will result in an increasing area where the otter is extinct.

The aim of the 'Otter Habitat Network for Europe (OHNE)' project is to reverse this development, i.e. to re-connect the isolated populations.

The main reason for the decrease of the otter population has not been overhunting but the destruction of habitats. The canalisation of rivers, the loss of structure diversity, the destruction of riparian vegetation, the drainage of wetlands, water pollution, etc. are all results of this habitat destruction. Many of these measures are caused by the increase of industrial agriculture and forestry as well as urbanisation of the landscape.

Therefore, a re-connection of isolated otter populations has to be based upon a restoration of otter habitats. Restoration of otter habitats offers a great chance for otter conservation and the OHNE project can become a symbol for the management of wetlands according to AGENDA 21.

The otter is a species, which can demand a large living area. Each individual can claim dozens of kilometres of river or hundreds of hectares of wetland as a territory. Therefore, traditional conservation policy, which focuses on reserves (generally too small) for different species, reaches its limits. Survival of the otter exclusively on the basis of protected areas will not be successful!

The only chance for the survival of the otter is a management of riverine habitats and wetlands on a large spatial base. This means that we have to develop management or

utilisation strategies for the landscape which allow man to satisfy his economic and social demands as well as allow the otter to survive - an idea clearly central to the aims of AGENDA 21.

A first test for the compatibility of these aims was realised for the catchment of the River Ise (Germany, Lower Saxony). This river system of 450 km, with a catchment of 420 square kilometres, represents the (habitat) bridge between the most eastern otter population of the federal state of Saxony Anhalt and the most eastern otter population of the federal state of Lower Saxony.

Within the last 100 years, this river system was canalised with no consideration for ecological principles and the adjacent landscape was transformed to extreme intensive agricultural utilisation. This resulted in a loss of structure and species diversity, the reduction of water and substance retention, high pollution with fertilisers and pesticides, a reduction of dynamic processes - and the extinction of the otter between 1960 and 1970.

Since 1987, Aktion Fischotterschutz has been working on the revitalisation of this river system. After a survey of 18 month a wide range of ecological and economic parameters, different scenarios were developed to forecast the future evolution of the river system. The scenarios were based upon ecological principles, with the aim of supporting the river's natural attributes: retention, diversity, and dynamics. There were four fundamental premises accepted before realisation took place: no reconstruction of an 'historical state' of the river system, no technical recreation of the river bed, no establishment of a protected area and the involvement, on a voluntary basis, of all persons and interest groups concerned. The project has shown that it is possible to initiate a (semi-) natural development of a canalised river system by utilising its own natural dynamics and by altering the agricultural practice in the river's lowland from intensive to extensive use.

So far, approximately 500 hectares of arable land have been transformed into extensive pastureland and more than 20 kilometres of riparian woodland and hedges have been planted. In addition, more than 50 kilometres of marginal zones along rivers and roads now form a "green net" in this area. The costs for this project have reached, so far, approximately 18 million DM. The costs have been covered by the Federal Ministry of Environment, the Lower Saxony Ministry of Environment, the county of Gifhorn and the donors and sponsors of Aktion Fischotterschutz.

The results are impressive and show more and more sustainable effects year by year. The most exciting example, regarding its economic and social effects, is the establishment of a marketing system for organic products, which resulted from co-operation between local farmers and the conservationists of Aktion Fischotterschutz. The most important ecological effect, besides results such as an increase in plant diversity or an increase in different endangered bird species of up to five times, is the return of the otter. Seven years after the start of the project, and more than 20 years after the last sign of an otter, immigrating (not released!) otters started to re-colonise the River Ise.

The results of the river Ise project show that it is possible to re-connect isolated otter populations by habitat management. The experience gained from this project will now

be used to establish an Otter Habitat Network for Europe (OHNE). In various European regions, there is a recognisable tendency for otter populations to expand into suitable habitats naturally, therefore, the likelihood of this network succeeding is estimated to be very high.

The network project is based upon three categories of activities:

– To protect otter habitats and populations in the core areas of its European distribution, these forming the basis for natural re-colonisation. These protection measures should result in a population surplus and, hence, territorial or population pressures causing an emigration of animals.

– To develop habitats between these core areas to a state where they can become suitable habitat for dispersing otters. These habitats can function as corridors between isolated populations.

– To protect those otter habitats where only low otter populations now survive and to include them into this network of core areas and corridors. These under populated areas can function as stepping-stones in this network.

The final result of this program could be a complete re-colonisation of all riverine and wetland areas in Europe by the otter, however, this is a long range vision.

The first phase in a realisation of an Otter Habitat Network for Europe is to identify those areas, which can function as corridors or stepping-stones. This will be done in co-operation with those national experts and authorities who have a knowledge of regional otter distribution and habitat status. The survey will also consider whether otter protection status is adequate or whether restoration programs are necessary in those habitats.

The final result of this first phase will be a cartographic presentation which will show, in detail, the potential corridors and stepping-stones for a re-connection of the European otter populations, as well as the different levels of protection or development measures which are needed to establish an Otter Habitat Network for Europe. This information will be used for the second phase, i.e. inducing national governmental and private institutions (such as nature conservation authorities or societies, water authorities, farming and forestry associations, etc.) as well as international institutions (such as the European Union or the Council of Europe) to include these data in their own planning processes and to take initiatives for regional otter habitat network programmes.

RESUMEN

El proyecto red de hábitats para nutrias Europa (OHNE) ha sido iniciado. Uno de los principales problemas para la protección de las nutrias (*Lutra lutra*) en Europa central es la fragmentación y el aislamiento de sus poblaciones. El principal objetivo del proyecto OHNE es reconectar poblaciones aisladas. La principal causa del descenso en las poblaciones de nutrias es la destrucción de su hábitat, por lo que la reconección de poblaciones aisladas debe ir de la mano con iniciativas de restauración de hábitat. La única chance de supervivencia para las nutrias es el manejo a gran escala de hábitats riparios y humedales, lo que debe articularse con la satisfacción de demandas económicas y sociales. Una primera prueba de la compatibilidad entre estos objetivos

fue realizada en el Río Ise en Alemania. En los últimos 100 años en este río han habido modificaciones en su cause y en las tierras adyacentes con fines productivos, provocando el deterioro de las condiciones ambientales y la extinción local de las nutrias entre las décadas de 1960 y 1970. Desde 1987 Aktion Fischotterschutz viene trabajando en la recuperación del área a través de la utilización de la propia dinámica del río y la alteración de la práctica agrícola a un uso más extensivo, sin recurrir a la recreación técnica del lecho del río, reconstrucción de sus condiciones históricas, ni al establecimiento de áreas protegidas. El ejemplo más claro de los efectos positivos desde el punto de vista social y económico de esta iniciativa, es el establecimiento de un mercado de productos orgánicos, resultado de la cooperación entre granjeros locales y conservacionistas. Desde un punto de vista ecológico el efecto es evidente por el aumento de la diversidad de especies vegetales y de aves amenazadas, y la recolonización natural del área por nutrias. Los resultados de esta experiencia demuestran que es posible reconectar poblaciones aisladas de nutrias a través del manejo de su hábitat.

C O N G R E S S A N N O U N C E M E N T S

3rd EUROPEAN CONGRESS OF MAMMALOGY

May 30th- June 4th, 1999 in Jyväskyla, FINLAND

OTTER WORKSHOP I (HALF-DAY)
How to better standardise the "standard" (IUCN/SSC Otter Specialist Group) method for otter surveys?

Chair:
Jerzy Romanowski, Institute of Ecology, Polish Academy of Science
Claus Reuther, Chairman IUCN/SSC Otter Specialist Group
Program:
Claus Reuther: Review of the state of utilisation of the "standard" method in otter surveys in Europe (15 minutes)
Jerzy Romanowsky: Review of the "standard" method, the modifications and the suggestions for a better standardisation (45 minutes)
Discussion and formulation of obligatory regulations
Topics:

- General differentiation of methods in relation to the region to be surveyed (local or regional surveys, surveys based on national political borders (federal states, provinces, etc.)
- Map basis (scale)
- Number of survey sites per grid
- Selection of survey sites
- Selection of river bank (side, direction) in surveys on rivers
- Length of stretch surveyed
- Definition of "signs" (proofs)
- Seasonal distribution of visits to survey sites
- Personal aspects (number of surveyors, qualification, etc.)
- Repetition of surveys (span of intervals, alteration of survey sites)
- Documentation of results (computer programs, etc.)
- Interpretation of results

Presentation of results

OTTER WORKSHOP II (HALF-DAY)
Otters and fishery

Chair:
Michaela Bodner, WWF Austria
Marcela Kucerová, Trebon Otter Foundation
Program:
Introduction
Michaela Bodner, Marcela Kucerová

Claus Reuther: Why could the finding of solutions for the conflict "otters and fishery" represent a proof for the efficiency of otter research and conservation? (15 minutes)

Country by country reports to the state of the conflict between otters and fishery (10 minutes each)
Based on a written report which has to be send to the chairpersons until April 30th at the latest containing the following essential information:

- Distribution of *Lutra lutra* (map)
- Areas of fish-production (on the same or on another map)
- Description of fish-production (farmed species, annual net and per ha production, economic importance for the region and/or nation, etc.)
- Organisations/interest groups of fishfarmers/fishermen (address, chairman, etc.)
- Legal status of the otter, including international conventions
- Present approach to the situation: recognised as a problem, by whom (stakeholders)
- Measures already undertaken: description, financial dimension, pro and contra assessment
- Measures in preparation
- Public awareness and opinion

Research running and in preparation (contact person)
Michaela Bodner: Need and suggestions for co-operation (30 minutes)
Discussion
Establishment of work groups, definition of contact persons
Working out of working plans, definition of aims and targets, complete with time-tables

INFORMAL MEETING I (ONE EVENING, PREFERRED JUNE, 1ST)

MEETING EUROPEAN SECTION IUCN/SSC OTTER SPECIALIST GROUP

Chair:
Claus Reuther, Co-ordinator European section and Chairman IUCN/SSC Otter Specialist Group
Program:
Report of the co-ordinator
Report of the studbook keeper for *Lutra lutra*
Report of the editor of the Bulletin
Realisation of point VII.1 of the Trebon recommendations: (development of procedures and guidelines for decisions and elections of an internal nature)
Realisation of point VII.5 of the Trebon recommendations: (definition of aims and priorities of the group regarding of otter protection; formulation of fundamental positions to topics like re-introduction activities, solutions for conflicts with fish production, guidelines for habitat management etc.; standardisation for methods of research)

INFORMAL MEETING II

(approximately 3 hours; preferred first (May 29th) or second day of the conference to enable discussion of special aspects in small working groups later in the conference)

MEETING AUTHORS OTTER ACTION PLAN

Chair:
Claus Reuther, Chair board of editors
Program:
Discussion and collection of suggestions for revision of the chapters
1.10 Introduction to the biology of *Lutra lutra*
2.10 Conservation of *Lutra lutra*
3.5 Country reports Europe
4. Current research techniques
App. A10 Identification sheet *Lutra lutra*
(A printout of these chapters will be distributed to all participating authors before or on the first day of the conference.)

INFORMAL MEETING III

(approximately 3 hours; preferred second or third day of the conference to enable discussion of special aspects in small working groups later in the conference)

OTTER HABITAT NETWORK EUROPE (OHNE)

Chair:
Claus Reuther, Chair board of editors
Program:
Introduction of the project OHNE
Introduction of the Otter Habitat Network Germany
Arrangement of multinational working groups for borders crossing expansion of the network.

Contact addresses:

CLAUS REUTHER
Chairman IUCN/SSC Otter Specialist Group
Aktion Fischotterschutz e.V.
OTTER-ZENTRUM
D-29386 Hankensbüttel
Germany
Phone +49/5832/98080
Fax +49/5832/980851
e-mail: Aktion.Fischotterschutz@t-online.de

JERZY ROMANOWSKI
Institute of Ecology
Polish Academy of Science
Dziekanow L.
PL-05-092 Lomianki
Poland
Phone +48/22/7513046
Fax +48/22/7513100
e-mail: ecolog@warman.com.pl

MICHAELA BODNER
WWF Waldviertel
Ullrichs 47
A-3932 Kirchberg am Walde
Austria
Phone +43/28546545
Fax +43/28546545
e-mail: stuetzpunkt@waldviertel.wwf.at

MARCELA KUCEROVÁ
Trebon Otter Foundation
P.O. Box 53
CZ-379 01 Trebon
Czech Republic
Phone +420/333/722088
Phone +420/333/722088
e-mail: otter@envi.cz

For general information on the congress please contact:
ECM3, Jyväskylä Congress, POB 35, FIN-40351 Jyväskylä, FINLAND
e-mail: congresses@cone.jyu.fi
Web-page: http://www.jyu.fi/ecm3-1999/

18th MUSTELID COLLOQUIUM

September 16th- September 19th, 1999 in Schloss Zeilern, AUSTRIA

The programm 1999 will present contributions including the whole field of investigations in Mustelids (morphology, genetics, pysiology, ethology, ecology, hunting, trapping,....). Oral presentations shoul deal with planned projects or "work in progress", posters should present already finished studies.
For further information please contact:
Dr. Johanna Sieber, KLIVV Savoyenstr. 1a, A-1160 Wien, AUSTRIA
Fax.: +43 1 486 21 21 28, e-mail J.SIEBER@KLIVV.OEAW.AC.AT

C A L L F O R I N F O R M A T I O N

REQUEST FOR OTTER SKULLS OF KNOWN AGE

Dear friends and colleagues,

the ability to determine the age of animals is one of the most important conditions for interpreting various field and laboratory work. Not only the interpretation of population structure, but also of physiological data or animal behaviour is closely connected with as precise knowledge as possible of the absolute age of the animals. Besides many methods of age determination, the use of growth lines is most promising and serviceable. This method is based upon the assumption that, in the course of growth, skeleton material and especially teeth periodically deposit well defined layers of bone substances, cementum and dentine.
Nevertheless, application of this method encounters objective and subjective difficulties as well. Contrary to roe deer, red fox and other game species, for instance, there is no concrete evidence for the periodical or annual deposition of cementum lines in the otter. Also seasons and time period of forming growth lines vary interspecifically and are hardly known for this species. To adapt this method for otter ageing we need skulls of European otters (*Lutra lutra*) of known absolute age. Such material can be or become available, for instance, in zoological gardens, veterinarian and zoological institutes. Skulls in every stage and condition (fresh, macerated, skull fragments) can be used; if only teeth are available in lieu of a skull preparation, they can be used towards the same purpose. For age determination, only one tooth will be extracted from the alveole and two longitudinal sections (50-100 ‘m thick) of the tooth root will be taken. After re-insertion of teeth into the alveoles, no damage to the face of the skull will be evident. Therefore, also skulls for exhibition use or teeth from dermoplastics are of interest.

If you have any information about known-age otters or otter skulls we would be very grateful for your help.

Dr. Hermann Ansorge
Staatliches Museum für Naturkunde Görlitz
Am Museum1
PF 300154
D - 02806 GÖRLITZ
Fax: ++3581/ 401742
e-mail: SMNG.Ansorge@t-online.de

Silke Hauer
Institut für Zoologie
Martin-Luther-Universität Halle
Domplatz 4
D - 06108 HALLE/ Saale
Fax: ++345/ 5527152
hauer@zoologie.uni-halle.de

SOUTH AMERICAN OTTERS

A group of South American biologists and veterinarians are working to produce a chapter entitled "South American Mustellidae" to be published in a book by Prof. Murray E. Fowler, UC Davis. The Co-editor would like to receive information concerning Biology, Ecology, Conservation, Veterinary aspects, and diseases of South American otters.
Please send any relevant information to:
Zalmir Silvino Cubas
Parque das Aves Foz Tropicana
Caixa Postal 988
Foz do Iguassu - PR
CEP 85863-000
Brazil

FORSCHUNGSBERICHTE FISCHOTTER

WWF AUSTRIA published 3 reports on the scientific and management aspects of its otter conservation programm in Austria. These articles inlcude a variety of aspects such as otters and fish ponds, causes of death, otters and contaminants. The articles are in German with an English abstract. The issues are now sold for 120,- ATS (appr. 10 US$). This is the last chance to buy them as only a few copies are left and the small stock will be removed by the end of July.
For further information please contact: Hannes Seehofer, WWF Austria, Ottakringer Str. 114-116, A-1160 Wien, Austria, e-mail: hannes.seehofer@wwf.at

V I R T U A L O T T E R S

E-MAIL COMMUNICATION NETWORK

The IUCN Otter Specialist Group has decided to start an e-mail communication network for all individuals working with otters. This includes field researchers, zoos, aquariums, rehabilitation centers, university settings, veterinary clinics, etc.
The goal of the network is to foster communication between professionals working with otters in different disciplines, and encourage the timely exchange of information between field and captive biologists.
Individuals are invited to send in questions and/or comments which will then be passed on to all participants interested in that species or topic. Answers will be sent to the inquirer and to the central library address.
Interested individuals are requested to send their name, e-mail address, institution affiliation, species and/or area of interest and expertise to: jrsotter@iserv.net

VET OTTER NETWORK

Dear colleagues,

At the last Otter Colloquium in the Czech Republic last March, it was decided to organise a 'Veterinarian Network for Otters', to exchange views and answer questions as quickly as possible.
If you are interested in becoming a member of this Otter Vet Network, please send your full address, telephone and fax number and your E-mail number to the following address as soon as possible.
Thanks in advance.

Dr Hélène Jacques
13, Place de Verdun 38320 EYBENS FRANCE
Tel. & Fax: ++ 33 4 7662 0717
E-mail: h.jacques.otter@wanadoo.fr

SPANISH MAILING LIST

Alvaro Soutollo opened a mailing list in Spanish to discuss all aspects of otter biology and conservation. Please feel free to subscribe at:
http://otters.listbot.com

Otter, otter, churning in the bight
Who turned on in otter eye, the look of fright
Playful, frolicsome
Full of fun, handsome
Buoy him up, hold up a beckoning light
Across waterways, he always free ranged
Till man crossed his path and fishing nets arranged
For a crime not his, otter is now arraigned
Trapped, in sheer survival instinct cuts the net loose
Fishing net, easy to mend and reuse, once thread rearranged
But a thread broken, in Nature's net, the web of life is a noose
A rule true, for trutta, teal or tiger, the otter or moose.

(Inspired by William Blake's poem)

By :
Prof. J. V. Ramana Rao (Retd.)
Wildlife Biology Section
Department of Zoology
Osmania University
HYDERABAD - 500 007
Andhra Pradesh, INDIA