National actions plan
for the common hamster
Cricetus cricetus
2012-2016

Ministère de l'Ecologie, du Développement durable et de l'Energie

Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE

Ministère de l'Écologie, du Développement durable et de l'Énergie

www.developpement-durable.gouv.fr

Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE

MINISTÈRE DE L'ÉCOLOGIE, DU DÉVELOPPEMENT DURABLE
ET DE L'ÉNERGIE

Direction générale de l'aménagement, du logement et de la nature

Direction de l'eau et de la biodiversité

Sous-direction de la protection et de la valorisation des espèces et de leurs milieux

Bureau de la faune et de la flore sauvages

Paris, le 31 octobre 2012

Mesdames, Messieurs les membres du comité de pilotage du plan national d'actions en faveur du hamster commun (*Cricetus cricetus*

Objet : Validation du plan national en faveur du hamster commun (*Cricetus cricetus*) 2012-2016
PJ : Plan national d'actions en faveur du hamster commun (*Cricetus cricetus*) 2012-2016

Mesdames, Messieurs,

Je vous prie de trouver ci-joint le plan national d'actions en faveur du hamster commun (*Cricetus cricetus*) 2012-2016.

Couverts par des engagements internationaux, au titre de la convention de Berne et de la Directive Habitats, Faune, Flore, la protection du hamster commun (*Cricetus cricetus*) est plus que jamais une obligation impérieuse de la France. Force est de constater qu'après deux premiers Plans Nationaux d'Actions (PNA), une forte mobilisation des acteurs locaux, les populations hamster ont connu une décroissance sensible. La France est tenue de prendre des mesures en faveur du développement des populations de hamsters et de la préservation de l'habitat naturel de l'espèce, de sorte à recouvrer son seuil de viabilité.

Cette évolution à la baisse a d'ailleurs été relevée par la Cour de Justice de l'Union Européenne dans son arrêt du 9 juin 2011.

Le Plan National d'Action 2012-2016 est une pièce essentielle de la stratégie d'action de reconquête des populations de hamster. Il est le fruit de neuf mois d'intenses travaux avec les acteurs locaux de toutes sensibilités. A l'arrivée, il illustre des objectifs partagés, des synergies sur des actions concrètes, nouvelles ou porteuses d'ambitions renforcées mais surtout la garantie de bénéficier d'une motivation renouvelée des acteurs locaux et des meilleures compétences. A cet égard, ce plan a été examiné par un conseil scientifique international.

Vous avez, durant l'année 2012 travaillé à la rédaction de ce projet que le préfet de la région Alsace m'a transmis fin juillet 2012. Après amendements par mes services, il a fait l'objet d'une présentation lors du comité de pilotage du plan national d'actions en faveur du hamster le 31 août 2012. Puis, ont été organisées au cours du mois de septembre la consultation des ministères concernés, ainsi que la consultation du public sur le site internet du ministère en charge de l'écologie. La consultation du Conseil National de la Protection de la Nature a eu lieu le 6 septembre 2012. L'avis de ces différentes instances m'a conduit à prendre en compte de nombreuses remarques.

La version définitive du plan national d'actions en faveur du hamster commun (Cricetus cricetus) 2012-2016 est jointe en annexe.

Le pilotage de ce plan est confié au préfet de la région Alsace qui s'appuiera sur les instances de gouvernance proposés dans le document, notamment son comité de pilotage. Ce document constitue la feuille de route 2012-2016 pour l'ensemble des acteurs alsaciens engagés dans la protection du hamster commun, et je sais qu'il sont nombreux et actifs.

www.developpement-durable.gouv.fr Grande Arche Paroi Sud – 92055 La Défense cedex – Tél : 33 (0)1 40 81 21 22 – Fax : 33 (0)1 40 80 74 71

La mise en œuvre du plan nécessitera un travail d'intégration de l'espèce dans des politiques publiques sectorielles, notamment l'agriculture et l'aménagement du territoire. Ce projet est difficile car il appelle des choix d'aménagement du territoire forts dans un contexte d'urgence, alors que la connaissance des déterminants de développement de l'espèce sont multiples. A ce titre, un partenariat étroit avec les collectivités locales et les organisations socioprofessionnelles ou associatives est proposé. Il est essentiel à la réussite de ce plan.

Les actions clés sont particulièrement :

- assurer la mise en œuvre d'un suivi performant des populations ;
- mettre en place un projet agro-environnemental permettant une amélioration effective de la qualité des habitats ;
- assurer la protection stricte de l'espèce contre la destruction des spécimens, la destruction, la dégradation et l'altération de leurs aires de repos et sites de reproduction et de leur habitat ;
- assurer la mise en œuvre d'un programme de renforcement des populations accepté sur le territoire et performant.

Au delà, si l'urgence conduit à devoir concentrer les moyens au plus près des terriers, le plan porte aussi une large dynamique prospective tant par l'ampleur de son volet connaissance que par ses multiples actions expérimentales. La mise en œuvre coordonnée de différents volets du PNA, accompagnée d'actions de communication et d'une gouvernance maîtrisée, constitue la réponse adaptée à l'état actuel des populations de hamster.

L'ensemble de ces éléments me conduisent, à réaffirmer l'engagement de l'Etat à s'appuyer pleinement sur un travail collectif avec les acteurs locaux pour flécher les moyens d'action renforcés qui seront consacrés à la protection du hamster commun et à les valoriser dans des actions partenariales.

Au vu de l'état de conservation de l'espèce, le PNA 2012-2016 couvrira des années charnières ; j'en appelle à la mobilisation collective pour la déclinaison opérationnelle de ce Plan National d'Action.

Les services de la direction régionale de l'environnement, de l'aménagement, et du logement d'Alsace sont à votre disposition pour tout renseignement complémentaire relatif à la mise en œuvre de ce plan qui est disponible sur le site Internet du ministère de l'Écologie, du Développement Durable et de l'Energie à l'adresse suivante : http://www.developpement-durable.gouv.fr/Les-plans-France.html (cliquer sur «mammifères» dans la liste des plans «faune»)..

La Directrice de l'eau et de la biodiversité

Odile GAUTHIER

Copie : - Monsieur le préfet de la région Alsace, préfet du Bas-Rhin ;
- Monsieur le préfet du Haut-Rhin ;
- Monsieur le chef du Service de la stratégie agroalimentaire et du développement durable (MAAF) ;
- Monsieur le Directeur Général de l'Office national de la chasse et de la faune sauvage.

RÉSUMÉ

Le hamster commun est un petit rongeur présent de l'Asie mineure jusqu'à l'Est de la France dans la seule région de l'Alsace. Considérée historiquement comme nuisible, l'espèce est désormais protégée aux niveaux international, européen et national. Autrefois abondantes, ses populations sont depuis plusieurs années menacées. Malgré les programmes précédemment engagés en Alsace les effectifs ont diminué d'environ 75% entre 2001 et 2012, avec une certaine stabilisation ces dernières années, son aire de répartition est passée de 53 communes en 2001 à 19 communes en 2012 et aurait été estimée à 329 communes en 1972. Les principales menaces identifiées depuis l'interdiction des piégeages portent sur la modification de la qualité de l'habitat avec la perte de cultures favorables et la conduite moderne de l'agriculture, la fragmentation de l'habitat par l'expansion urbaine et le développement d'infrastructures routières ainsi que d'autres facteurs tels que la prédation facilitée, les pollutions ou encore les maladies. De nombreuses incertitudes persistent y compris sur les besoins de l'espèce. L'objectif général du plan national d'actions est d'assurer le bon état de conservation du hamster commun en Alsace en cohérence avec la Directive « Habitat ». Il s'agira sur les 5 années du plan de conserver l'aire de présence actuelle, tripler l'effectif de hamsters de l'année 2010-2011 pour tendre vers l'objectif de populations viables de 1500 individus et contribuer à l'amélioration de la qualité de l'habitat du hamster. Ces objectifs se traduisent par 38 actions opérationnelles réparties dans 6 axes thématiques: renforcer les connaissances ; restaurer et protéger les habitats ; conserver l'espèce ex-situ et la réintroduire efficacement ; éviter, réduire, compenser ; sensibiliser et informer ; appui à la gouvernance du plan. Le programme sera accompagné d'une gouvernance adaptée et coordonné pour une mise en œuvre efficace avec l'ensemble des acteurs impliqués.

Abstract

The common hamster is a small rodent found from Asia Minor to the East of France, where it is only present in the Alsace region. Historically considered as pests, the species is now protected by international, European and national legislation. The population, once abundant, has been threatened for many years. Despite previous conservation programmes, specimens in Alsace declined by about 75% between 2001 and 2012, with some stabilisation in recent years. The hamsters' range covered some 53 municipalities in 2001 but only 19 municipalities in 2012 - 329 municipalities were estimated in 1972. The main threats identified since the ban on trapping are changes to habitat with the loss of favourable crops and the introduction of modern farming methods, fragmentation of the habitat by urban expansion and road infrastructure as well as other factors such as increasingly effective predation, pollution and disease. Yet many uncertainties remain, even about the species' needs. The overall objective of the national action plan is to ensure the favourable conservation status of the common hamster in Alsace in accordance with the Habitats Directive. For the five years of the plan, the goals are to maintain current geographical coverage, triple the 2010-2011 numbers, aiming for a viable population of 1500 individuals, and continue to improve habitat quality. These objectives translate into 38 operational actions across six themes: reinforce knowledge; restore and protect habitats; conserve the species ex-situ and reintroduce it effectively; avoid, reduce and compensate, educate and inform; and support the plan. The programme will be managed by an appropriate governance structure for effective coordination of implementation with all stakeholders and partners.

CONTENTS

TABLE OF ILLUSTRATIONS

Introduction

The common hamster (*Cricetus cricetus*) is an emblematic species of Alsace, its sole French distribution area. Hamster populations, previously abundant in the Alsatian fields, have been gradually disappearing from the region. Population size has shrunk steadily since the 1980s, but a drastic drop of hamster's range and specimen was recorded at the end of the 1990's.

Several factors explain the decline of the species. Historically considered as pests, common hamsters were trapped, for a long time.. Trends in crop rotation, farming practices and land-use planning led to a progressive disappearance and fragmentation of the most favourable habitats.

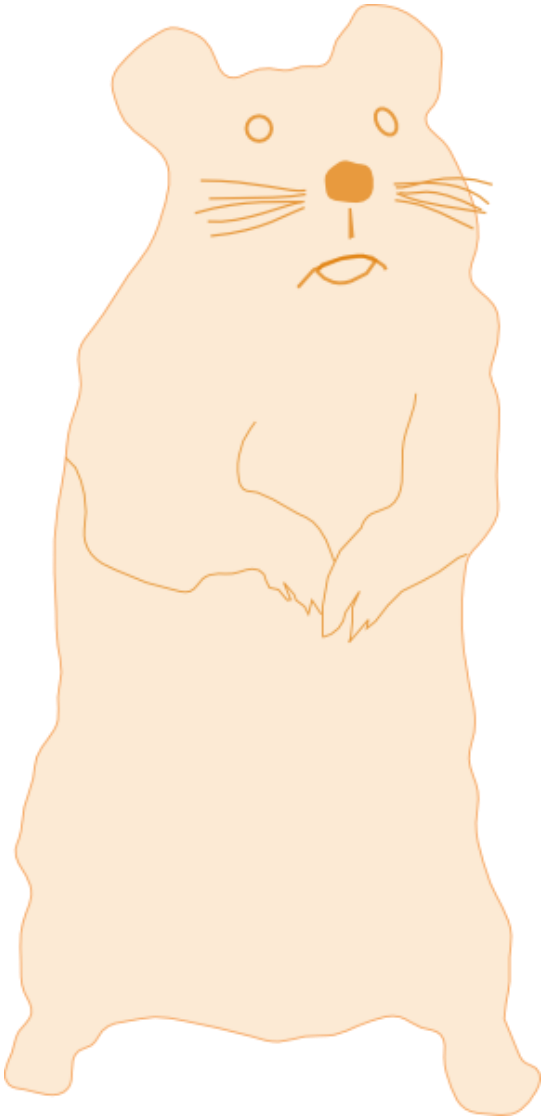
The combination of reduced populations and fragmented habitats has threatened the species' survival in Alsace. In 1990, the common hamster was listed as an "endangered species" within the framework of the Bern Convention, ratified by France and thirty-one other European countries. The "Habitats" Directive, applied in France as from 1993, provided an operational interpretation of protection obligations with respect to common hamster populations, with, in particular, a ban on the destruction of both individuals and their habitats.

To halt the species' decline, two consecutive action plans for the protection of hamsters were launched. Despite efforts made so far and the relative stabilisation of hamster populations, the conservation status of the common hamster remains poor or unfavourable. A new ambitious national action plan is now needed to contribute to hamsters reaching a favourable conservation status in Alsace.

This document illustrates the national action plan for the period 2012-2016. In particular, this report includes:

- A review of the existing knowledge base on the species;
- A summary of the common hamster's needs and threats to its conservation status;
- A summary of the main issues linked to the protection of the common hamster and actions already initiated in the two previous plans;
- The new overall conservation strategy proposed for the plan;
- The operational strategy of the plan and concrete actions listed according to five themes;
- An action plan for implementing the strategy over the five years of the plan and an outlook of relevant stakeholders;
- Proposed monitoring and evaluation plan to ensure NAP's continued relevance.

1. Review of the existing knowledge base and management tools in place for the protection of hamsters



1 REVIEW OF THE EXISTING KNOWLEDGE BASE AND MANAGEMENT TOOLS IN PLACE FOR THE PROTECTION OF HAMSTERS

1.1 WHAT IS THE COMMON HAMSTER?

The common hamster, also referred to as the European Hamster, "marmotte de Strasbourg" [Strasburg groundhog] or "Kornfarel", is a rodent with a bulky, stocky body, a short tail, short hair and powerful legs. If on the one hand this morphology makes the hamster fit to burrow, on the other it hampers its ability to run.

The back of its coat is light red and it has white spots on its snout, cheeks, throat and flanks behind its hind feet. Its belly fur is black.

It weighs 100 to 550 g (males are larger than females), its height ranges from 20 to 27 cm and its tail measures 3 to 6 cm. Its distinctive feature is cheek pouches, which it uses to transport food to its burrow.

Figure 1. A common hamster (© ONCFS)

1.2 SYSTEMATIC ELEMENTS

The common hamster belongs to the Rodent order, Cricetides family, Cricetinae sub-family and Cricetus genus. Although 11 sub-species of this genus were described worldwide, only two sub-species are present in Western Europe:

- *Cricetus cricetus cricetus* (LINNAEUS, 1758) found from Germany to Russia;
- *Cricetus cricetus canescens* (NEHRING, 1899) found in Belgium, France, the Netherlands and on the left bank of the Rhine in Germany.

Recent genetic studies, however, showed that *Cricetus cricetus canescens* might as well be a sub-population of *cricetus cricetus cricetus*.

1.3 LEGAL PROTECTION STATUS OF THE SPECIES

In the Red List of continental mammals in metropolitan France (2009), the common hamster is classified as an "endangered species". It is thus granted a reinforced protection status.

The common hamster is protected by several national, European and international regulations, and namely (see box below for further information):

- Annex II of the Bern Convention on the conservation of European wildlife and natural habitats (19 September 1979) which grants the Common hamster the status of "strictly protected fauna species";
- Annex IV of the EEC Habitats-Fauna-Flora Directive 92/43, which provides the list of "animal and plant species of Community interest in need of strict protection" from the Directive on the conservation of natural habitats and of wild fauna and flora (EEC Directive 92/43);
- Articles L411-1 et seq. of the French Environmental Code;
- Ministerial Order of 23 April 2007 which establishes the list of protected land mammals throughout France and provisions for their protection;
- Ministerial Order of 6 August 2012 which stipulates the conditions under which exemptions from common hamster measures are granted and defines its breeding sites and resting places.
- Ministerial Order of 31 October 2012, which concerns the protection of the habitat of the common hamster (Cricetus cricetus) and was drawn up according to the hamsters' areas of presence in the years 2010-2012 (location of burrows in the last three years of monitoring).

PROTECTION OF THE COMMON HAMSTER IN THE MAIN LEGISLATION

Bern Convention

The European Union is a party to the convention on the conservation of European wildlife and natural habitats, submitted for signature on 19 September 1979 in Bern (hereinafter referred to as the "Bern Convention").

Article 4(1) of the Convention makes it mandatory for the Contracting Parties to protect habitats:

- "Each Contracting Party shall take appropriate and necessary legislative and administrative measures to ensure the

1

conservation of the habitats of the wild flora and fauna species, especially those specified in Appendices I and II, and the conservation of endangered natural habitats.

- The Contracting Parties in their planning and development policies shall have regard to the conservation requirements of the areas protected under the preceding paragraph, so as to avoid or minimise as far as possible any deterioration of such areas.
- The Contracting Parties undertake to give special attention to the protection of areas that are of importance for the migratory species specified in Appendices II and III and which are appropriately situated in relation to migration routes, as wintering, staging, feeding, breeding or moulting areas.
- The Contracting Parties undertake to co-ordinate as appropriate their efforts for the protection of the natural habitats referred to in this article when these are situated in frontier areas."

In addition, Article 6 of the convention includes provisions for the protection of the species: "Each Contracting Party shall take appropriate and necessary legislative and administrative measures to ensure the special protection of the wild fauna species specified in Appendix II. The following in particular will be prohibited for these species:

- all forms of deliberate capture and keeping and deliberate killing;
- the deliberate damage to or destruction of breeding or resting sites;
- the deliberate disturbance of wild fauna, particularly during the period of breeding, rearing and hibernation, insofar as disturbance would be significant in relation to the objectives of this Convention;
- the deliberate destruction or taking of eggs from the wild or keeping these eggs even if empty;
- the possession of and internal trade in these animals, alive or dead, including stuffed animals and any readily recognisable part or derivative thereof, where this would contribute to the effectiveness of the provisions of this article."

Appendix II of the Convention mentions the common hamster in particular.

On 27 November 2008, the Standing Committee to the Convention adopted Recommendation No. 136, whereby the Contracting Parties to the Convention with small or declining populations of common hamster are invited to draft and implement national action plans on the basis of the European Action Plan.

European Habitats Directive

In conjunction with the directive on the protection of birds, the Habitats Directive is aimed at transposing the Bern Convention. Among the definitions included in Article 1 of the Habitats Directive, the definition of a species' conservation status is particularly relevant:

"For the purpose of this Directive:

[...] conservation status of a species means the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within the territory referred to in Article 2.

The conservation status will be taken as 'favourable' when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis. [...]"

Article 2 of the Habitats Directive contains the main aims of the Habitats Directive:

- "The aim of this Directive shall be to contribute towards ensuring bio-diversity through the conservation of natural

habitats and of wild fauna and flora in the European territory of the Member States to which the Treaty applies.

- Measures taken pursuant to this Directive shall be designed to maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest.
- Measures taken pursuant to this Directive shall take account of economic, social and cultural requirements and regional and local characteristics."

The relevant provision of the Habitats Directive as regards the protection of the common hamster is Article 12(1). The Article reads as follows: "Member States shall take the requisite measures to establish a system of strict protection for the animal species listed in Annex IV (a) in their natural range, prohibiting:

- all forms of deliberate capture or killing of specimens of these species in the wild;
- deliberate disturbance of these species, particularly during the period of breeding, rearing, hibernation and migration;
- deliberate destruction or taking of eggs from the wild;
- deterioration or destruction of breeding sites or resting places."

Annex IV, subparagraph a), of the Habitats Directive specifically mentions the common hamster.

Protection status under French law

The French Republic transposed Article 12 of the Habitats Directive into Articles L411-1 et seq. of the Environmental Code and, in the Ministerial Order of 23 April 2007, established the list of protected land mammals throughout the country and provisions for their protection (referred to below as the "Ministerial Order of 23 April 2007").

The Environmental Code Article L411-1 prohibits the following (unless there is a particular scientific interest or need for preservation of the species):

- Subparagraph 1: "The destruction or taking of eggs or nests, mutilation, destruction, capture or taking, deliberate disturbance, naturalisation of animals of these species or, whether living or dead, their transport, hawking, use, detention, offering for sale, sale or purchase"
- Subparagraph 3: "The destruction, 'alteration or degradation of these natural habitats or species' habitats"

Article 2(2) of the Ministerial Order covers the protection of breeding sites and resting places:

"The destruction, alteration and degradation of animals' breeding sites and resting areas are prohibited in parts of the metropolitan territory where the species is present and also within the natural ranges of existing core populations. These provisions apply to the physical and biological elements deemed necessary for the breeding or resting of the species, for as long as they are actually used or usable during the consecutive cycles of breeding and resting of the species, provided that the destruction, alteration or degradation jeopardizes the successful completion of these biological cycles."

1

1.4 International trade regulations

Article 6 of the Bern Convention stipulates:

> *"Each Contracting Party shall take appropriate and necessary legislative and administrative measures to ensure the special protection of the wild fauna species specified in Appendix II. The following in particular will be prohibited for these species: [...] the possession of and internal trade in these animals, alive or dead, including stuffed animals and any readily recognisable part or derivative thereof, where this would contribute to the effectiveness of the provisions of this article."*

1.5 Which biological and ecological aspects of the species are relevant for conservation?

The existing literature provides an understanding of the main stages in the annual cycle of the common hamster, as well as the conditions needed for its development and conservation. The stages of the cycle (see figure opposite), as well as the challenges met by the common hamster at each stage are summarised below.

Breeding

The common hamster's breeding period lasts from April to August. Immediately after their spring awakening, the (polygamous) males set out in search of females, which they must find during estrus, so they visit the burrows of several females. Gestation lasts for about twenty days. The number of litters of Alsatian populations in the wild is not known but females may give birth to one or two and, more rarely, three litters per year, generally in June, July and August, each litter including, on average, seven naked and blind pups which are nursed for three weeks. Although they are independent at the end of the weaning period and sexually

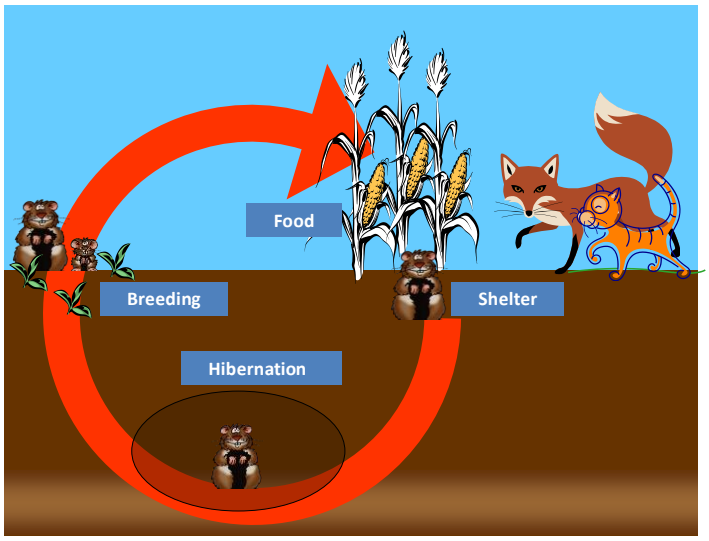


Figure 2. Life cycle of the common hamster (source: C. Habold, CNRS)

mature at the age of two to three months, the young that survive do not generally breed before the following year, with some exceptions noted (see La Haye *et al.* 2011). The first litter is generally the most prolific one and produces the most robust juveniles which breed earlier and produce more juveniles the following year (Millesi *et al.* 2011). The life expectancy of the common hamster in the wild is low: from one to two years (Nechay 2000). From a demographic viewpoint, the strategy of the common hamster consists of increasing breeding efforts to compensate for the high probability of mortality.

Population structure (age and sex-ratio)

Although the proportions of males and females in litters would appear to be identical, males have higher mortality rates due to their wider ranges, which make them more exposed to predation (Eidenschenk and Villemay 2012). However, very little is yet known about the variation of the sex-ratio of common hamster populations in the wild.

Nutrition

Milk-fed only up to the age of six days, young hamsters become first herbivorous and then omnivorous from the age of four weeks, although their diet is composed of more than 80% highly varied plant items supplemented by small animals (insects, frogs, worms, small rodents, etc.). The common hamster has a preference for stalks, leaves or grains of cereals (wheat, barley, rye, corn, etc.) and legumes (clover, alfalfa). However, its daily menu does not exclude sugar beets or fodder beets, potatoes, cabbage, etc. Nevertheless, its winter reserves predominantly include cereal grains and legume seeds. On average, food reserves amount to 12 kg per individual, but may reach 50 kg, particularly for females which also use them to feed their youngsters the following spring (Wencel *et al.* 2001).

Natural habitat

The common hamster requires deep and dry or well-drained soil (of the loess type, with groundwater situated at a minimum depth of 120 cm) in order to build its burrows, whose depths and areas vary according to the time of the year, and which display oblique holes and vertical escape holes. The common hamster also needs good ground cover for its dietary needs and for protection against predators. It prefers open landscapes and a continental climate (Wencel *et al.* 2001). The majority of burrows are concentrated in winter straw cereal crops, even if a variable, high proportion can be found in other crops (see ONCFS 2010 report).

The common hamster is a solitary animal. During the breeding period, the female tolerates the male in her burrow for the time it takes for mating but then chases him away. The burrows generally include a living chamber and one or more food stores with excrement pits (Nechay 2000; Wencel *et al.*, 2001).

The living space for males may range from 1.8 to 2.6 hectares, generally larger than that of females (0.2 to 0.3 hectares) which travel shorter distances (Ulbrich and Kayser 2004, Petrova 2012 https://theses.cz/id/zr20kp/Petrova_DP.pdf). The home ranges of males and females may overlap.

1

The common hamster marks out its territory by secretions from the scent glands situated on its flanks. The size of its home range varies according to the availability of food (wider range when availability is reduced, Le Louarn & Quéré, 2003; Wencel *et al.* 2001). Telemetric monitoring and the capture/recapture method show that common hamsters travel, on average, 300 m around their burrows (Wencel *et al.* 2001). Released hamsters may use a wider area than hamsters in the wild (Schaffrath and Weinhold 2011).

Activity periods

The common hamster is an early-morning and nocturnal animal, but it may also be seen outside its burrow in daylight hours. A recent study carried out in Poland points out that hamsters are mainly active during the day, with notable differences according to sex and age (Ziomek *et al.* 2011). On the whole, females and juveniles are active for longer than adult males[1].

The hibernation period is from September to April, with males entering into and emerging from hibernation about one month before females. Nearly 50% of hamsters may leave their burrows during the hibernation period, for variable periods of time (cumulative total of 1 to 16 hours, Wassmer 2004). Preparation for hibernation is, in part, controlled by photoperiods, but seasonal body temperature variation cycles are also controlled endogenously by a circannual internal clock (Darrow *et al.* 1988, Canguilhem *et al.* 1988, Monecke *et al.* 2011). The hibernation period comprises alternating phases of deep hypothermia (drop in body temperature of nearly 27°C for a few consecutive days) and activity during which the body temperature rises again to about +37°C (Wassmer and Wollnik 1997) the latter are more frequent when temperatures are below zero (Monecke *et al.* 2011). The duration of the hibernation period depends especially on the individual's body mass (for males only) and the duration of heterothermia[2] phases during the hibernation period. An individual hibernation strategy would therefore appear to exist.

Predation is the main cause of mortality, and it is more intense during breeding season and when hamsters emerge from hibernation: during these periods, in fact, predatory species have greater nutritional needs. For example, predation is responsible for 50 to 90% of cases of mortality for individuals in the wild or released (see Eidenschenk and Villemey 2012). Foxes and mustelids are the common hamster's main predators, followed by birds of prey and carnivorous domestic animals (cats and dogs in particular); however, some studies mention birds of prey as being the main predators (Schaffrath and Weinhold, 2011).

Diseases, particularly those related to bacterial infections (*E. Coli, Pseudomonas and Stapphylococcus*), as well as farming operations explain a small portion of the causes of mortality (Kuiters *et al.* 2011, Schaffrath and Weinhold 2011). However, there are major differences between

[1] Juveniles and female adults demonstrated four peaks of activity between 4:00 and 22:00. The sub-adult individuals were active at dawn and dusk whereas the adult males showed two peaks of activity, the first between 4:00 and 8:00, and the second between 18:00 and 22:00.

[2] Periods during which a species' central temperature varies directly with that of the environment, with activity dependent upon the external temperature. These cold-blooded species do not have the energy resources to ensure thermoregulation. They are unable to produce the heat required to compensate for losses under variable external conditions.

regions: diseases and farming operations account for less than 10% of the causes of mortality in the Southwest of Germany and up to 43% in other regions (Kayser *et al.* 2003). The presence of ground cover, late harvests and ploughing reduce the risk of predation and help the collection of sufficient food supplies before hibernation. Keeping wheat crops standing until hibernation could also significantly reduce the predation rate.

Besides the direct effect of predation, a favourable ground cover can have an indirect effect linked to the perception of the risk of predation and the search for a compromise between the risk of fasting and the risk of predation (Mac Leod *et al.* 2007; Lima and Bednekoff 1998). It may be assumed that, if habitat fragmentation makes it necessary for the hamster to travel further for food, it can choose between incurring in a higher risk of predation or limiting its search for food. The choice of the latter may cause deterioration of its body condition and/or a reduction of the food supply set aside for hibernation. The presence of predators may also increase the secretion of stress hormones and disturb the social relations of common hamsters, a plausible hypothesis that has been validated for two species of rodents similar to the hamster (Zhang *et al.* 2003); however, this still needs to be assessed for common hamsters in Alsace.

Conversely, predation action could lower intraspecific competition for access to food and thus increase the chances of survival during hibernation (see Kayser *et al.* 2003). This causal relationship appears to be dependent on the structure of the habitat and/or times when hamster densities are very high, which is obviously not the case in Alsace today.

Population dynamics

The common hamster is a species with an r-type[3] demographic strategy. The dynamic of the common hamster population is thus characterised by a high mortality rate, low life expectancy, early sexual maturity and a high investment in breeding. The growth of the population mainly depends on the survival of females and the average number of litters per female per year. According to Kuiters *et al.*, 2011, an average of two litters per year, with 7 juveniles each, is necessary to guarantee population growth. Predation is effectively limited by protective ground cover. The continuous presence of ground cover from April to October, to protect both adult individuals and their youngsters, would then appear to be the priority. Under these conditions, according to observations in the Netherlands on a population of 500 hamsters (over nearly 300 hectares of favourable crops), an average litter would be sufficient to stabilise population size (Muskens comm pers, Scientific Committee meeting on 5/6/12), although it would not appear to ensure population growth or respond to the various risks. In addition, winter mortality must not be neglected. According to Kayser *et al.* (2003), 50 to 60% of hamsters die during hibernation due to insufficient food supply and diseases. Moreover, since hibernation of some individuals may be characterised by regular emergence during the winter period, it is not known whether, or how, interrupted hibernation

[3] Demographic strategy is a concept developed by Mac Arthur and Wilson in 1967. According to the theory, a species' breeding strategy is related to fluctuations in the environment. Two main strategies are identified: the r strategy (high reproduction, fast growth, low rate of survival) and the K strategy (low reproduction, slow growth, high rate of survival).

strategies adopted by such individual may impact survival. On the whole, no in-depth study has so far provided precise modelling of the population dynamics of the common hamster for small fragmented populations. The data currently available are therefore incomplete.

In the previous 2007 - 2011 NAP (Annex II, Volume 1 of 2007 – 2011 NAP), the work of Kayser (2005) was examined. It defines a viable population according to minimum thresholds for species survival, adopting the following criteria:

- minimum population size of 1500 hamsters (approximate estimate derived from a German population modelling test);
- minimum density of 4 burrows per hectare, based on an experiment that indicated 4 burrows per hectare as the minimum density (in springtime, across a non-fragmented area of at least 300 hectares) which enables the population to absorb fluctuations caused by inter-annual crop rotation changes.

An analysis of the French context led to a revision of such parameters, which were set as follows: density of 2 burrows per hectare in the spring across a non-fragmented area of 600 hectares.

Recovery faculties

The presence of standing wheat until October, combined with a system of anti-predator electric fences, can ensure an average lifespan of released females of 68 days in non-harvested wheat and a survival rate of 36% twenty weeks after their release (Villemey and Eidenschenck, 2011). This lifespan was only 49 days when wheat was harvested in early July 2011. As for breeding, an average of 0.86 litters per released female was observed in non-harvested wheat as opposed to only 0.57 litters on average when wheat was harvested in early July and 0.14 in alfalfa (Villemey *et al.*, 2012). In the Netherlands, where the parameters for the survival of released bred females are similar to the current French data (Villemey and Eidenschenck, 2011), reinforcement measures conducted in a favourable habitat but without any predator control operations resulted in an increase from a few dozens of individuals in 2001 to nearly 1200 burrows observed in 2007. It is to be noted that populations in the wild or derived from population reinforcements, show fluctuations in abundance over time. These phenomena may be related to weather conditions such as, in particular, the frequency and intensity of rainfall events, which delay or advance the harvesting date and modify the abundance of other species of rodents that may serve as prey for the hamster's predators (Muskens, comm. pers.).

1.6 What is the conservation status of hamsters in Alsace?

What is the distribution of hamster populations in Europe?

The common hamster's range stretches from Asia Minor to the Netherlands, Germany and the East of France, passing through Central and Eastern Europe. The common hamster populations subsisting at the western limit of the range are isolated. This applies also to the Alsatian population which is presently separated from those of Germany and the Netherlands. On the whole, the populations of Western Europe are genetically similar, but more differentiated from the populations of Central Europe and Russia for example (Neumann *et al.* 2004, Neumann *et al.* 2005). In particular, the Alsatian population is characterised by low gene variability, and this also concerns the major histocompatibility complex (MHC) which can have an impact on its immunocompetence (Smulders *et al.* 2003).

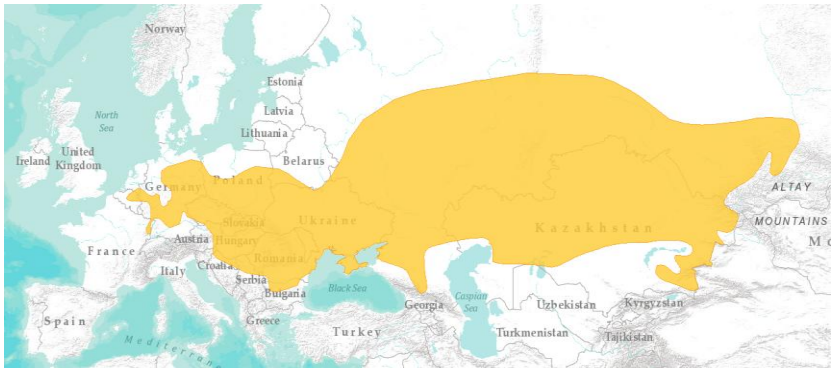


Figure 3. Global distribution of common hamsters - (Source: IUCN 2008)

How are distribution trends evolving in Alsace?

In 1897, the common hamster was present in 387 municipalities, i.e. 41% of the region's 946 municipalities. The end of the 1970s marked the beginning of a sharp reduction in the species' area of presence: in 1983, the species was probably or certainly present in 234 municipalities (Baumgart 1996, Nechay 2000), 90 in 1997 (ONCFS, 2011) and in only 34 municipalities in 2004, despite the efforts of the first conservation plan 2000-2004. However, different sources describe different ranges in the same year[4]. The ONCFS data issued in July 2012 and presented in the figure below are considered the most reliable.

[4] Although Baumgart (1996) indicates the presence of the Hamster in 234 municipalities in 1983, the data sheet of the GEPMA association (ONCFS source) indicates 112 for the same year. In addition, according to information provided by the ONCFS, the presence of the Common Hamster was noted in 129 municipalities in 1995.

1

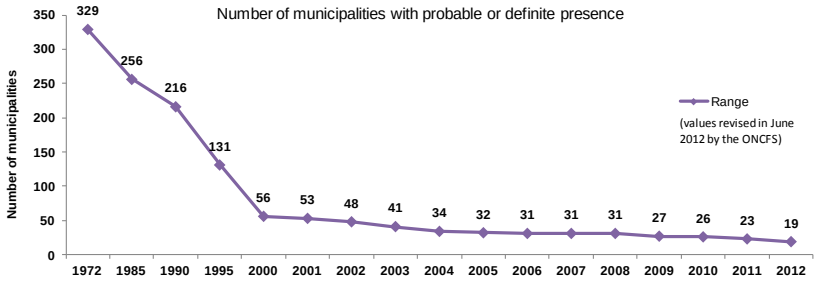


Figure 4. Evolution of the common hamster's range

Although there was connectivity between municipalities across the Alsatian range up until the 1970s, the continuing range shrinkage created discontinuities in the distribution area. In 1995, a clear geographical differentiation appeared, in particular between municipalities hosting hamsters at the boundary of the Haut-Rhin and those situated at the periphery of Strasbourg (see figure below). Whereas the common hamster formed a single population in the past, there have been several geographically isolated populations since 1995. The geographical barriers between the populations led to the definition, in the 2007-2011 NAP, of three separate Priority Action -Areas (PAAs) covering at least 600 hectares of favourable grounds (non-fragmented if possible), characterized by distinct populations.

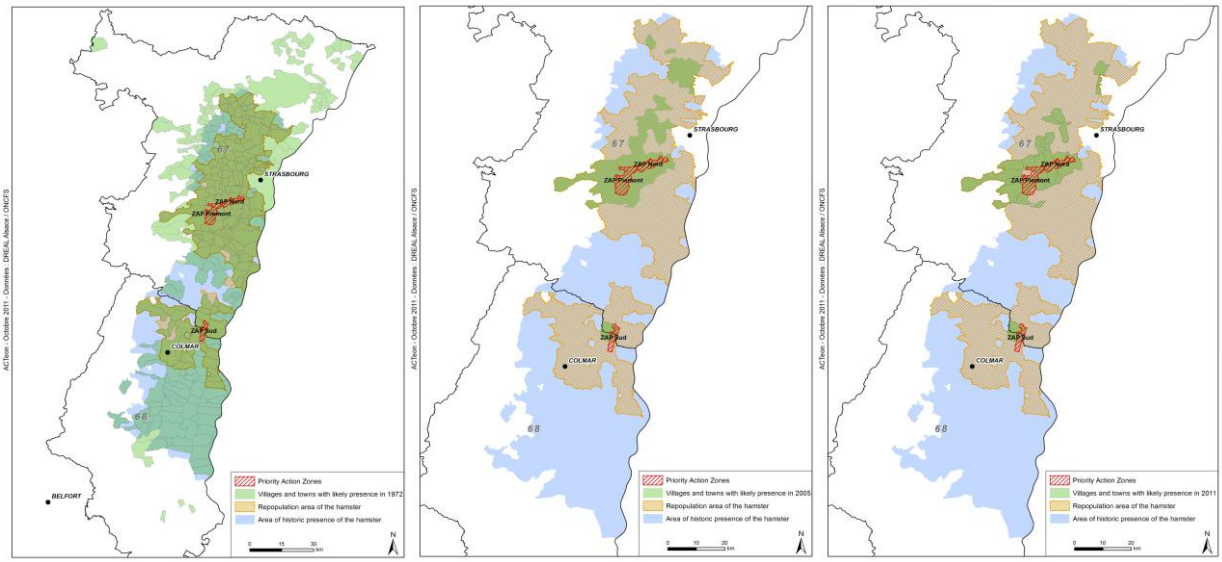


Figure 5. Evolution of the common hamster's range in Alsace (1972, 2005, 2011)

What is the size of the Alsatian common hamster population?

In 2005, the estimated number of hamsters in Alsace was at least 420 (calculated according to the number of burrows counted, source: NAP)[5]. The burrows are counted annually at the end of

5 The actual number of hamsters present in Alsace is not known. Historically published data are estimates based on the number of burrows counted according to the municipalities surveyed or else they are given in terms of density (number of burrows/area of hamster-

hibernation (before breeding), using a semi-exhaustive sampling strategy validated internally by the ONCFS in 2000, on hamster-friendly crops (straw cereals and legumes) in seven "core areas" (five in the Bas-Rhin and two in the Haut-Rhin). This allows for assessing the probable development of the populations on a 3 to 5 year time scale[6], and highlighted a sharp decline in the number of burrows, which dropped from 1167 counted in 2001 to only 174 in 2007 (see Figure 6 below which presents the 3-year average numbers of burrows). The number of burrows has slightly increased since then and has stabilised at around 240 - 280.

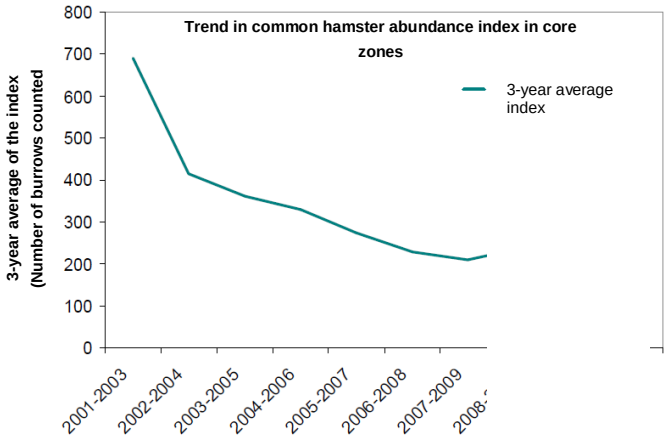


Figure 6. Evolution of the number of burrows in core areas (Source: ONCFS)

What is the viability of the common hamster populations in Alsace?

Several studies based on population genetics show that the hamsters living in Alsace are genetically different from other populations in Central and Eastern Europe and are characterised by strong losses and low gene variability (Smulders *et al.* 1003, Neumann *et al.* 2004, Neumann *et al.* 2005). To ensure a high probability of long-term survival for the hamster populations in Alsace (99% probability of subsisting over more than 20 to 30 generations is generally acknowledged - see Reed *et al.* 2003), it was estimated that each population must have at its disposal at least 300 hectares of non-fragmented favourable grounds (allowing circulation and exchanges of individuals), with an average minimum density of 4 burrows per hectare and a minimum population size of 1500 individuals emerging from hibernation (Kayser 2005 cited in Annex 2 of the 2007-2011 NAP). For compatibility with Alsatian agriculture, the threshold values of 600 hectares of non-fragmented favourable grounds and an average minimum density of 2 burrows per hectare for a population of 1500 individuals emerging from hibernation was used in the 2007-2011 NAP. At the time the 2007-2011 national plan came into effect, existing Alsatian populations did not necessary meet the

friendly crops surveyed). There is no precise figure that indicates the exact number of individuals present in Alsace for a given year. Historically, not all municipalities were thoroughly surveyed. When data do exist, they refer to observations made in July-August (Baumgart 1996), after the breeding period. Some burrows therefore represent juveniles born during the course of the year. In addition, the number of burrows varies from one year to the next, making interannual comparisons highly uncertain.

6 This period would appear to account for and reduce the effect of variations related to crop rotation and the average life expectancy of individuals (<2 years, Nechay 2000).

threshold values. On the other hand, several data recorded by Baumgart (1996) would suggest that these viability conditions were met in 1995. The prevalent population status in that year could therefore be taken as reference.

More recently, ONCFS analyses based on the 2012 survey of burrows (ONCFS 2012) emphasized the fragmented nature of hamster populations in Alsace and the resulting fragility. Two-hundreds burrow were considered here as a critical threshold for a single continuous area, below which there are risks of the sudden disappearance of a population due to stochastic effects affecting the populations[7]. The comparison of the numbers of burrows surveyed in each sector of presence against such threshold values revealed that only the population located to the west of the Piémont PAA (Priority Action Area) may not be exposed to a risk of stochastic effects causing extinction, which can be fast and difficult to control[8].

Beyond this analysis, an assessment of the viability of populations may be further developed, provided that actions aimed at a better knowledge of the genetic status of Alsatian populations in the wild are undertaken.

In conclusion

The information on the current conservation status of the common hamster in Alsace presented so far is summarized in the table on the right-hand side.

Overall, the conservation status of the hamster in Alsace that emerges from the 2007-2011 NAP is considered **unfavourable** or **poor**.

PARAMETERS	CONSERVATION STATUS
Range	-8% of municipalities per year between 2007 and 2011. 22 municipalities in 2011, i.e. 7% of historical range.
Headcount	Estimated headcount = 800 to 1000 individuals, i.e. 18-22% of the viability headcount set by the plan (3x1500 = 4500 individuals in Alsace)
Species' habitats	Attainment of 22% hamster-friendly crops across the PAZs. Improvement of quality of habitat in the PAZs. Loss of quality of habitat outside PAZs. Loss and fragmentation of habitats.
Prospects (in relation to headcount, range and availability of habitat)	Pressures better controlled but persisting impacts (fragmentation, artificialisation, quality of habitat, etc.)
Overall evaluation of Conservation status	**Unfavourable Poor**

Table 1. Review of the current conservation status of the common hamster in Alsace

7 Assessment of the NAP Scientific Committee on 5 June 2012.

8 The ONCFS report underlines that this risk could explain the sudden decline in the hamster populations located in Dorlisheim and Rosheim and in an enclave to the west of the RD 500 road in Obernai, these two sectors having dropped from 29 burrows in 2011 to 0 burrows detected in 2012. A similar phenomenon is reported in the Sibbe reserve in the Netherlands (Lahaye *et al.*, 2010) where the number of burrows dropped by 90% (from 200 to 20) in one year, despite relatively optimal ground cover conditions for the species (hamster-friendly crops and permanent, unharvested ground cover…).

1.7 Threats and limiting factors

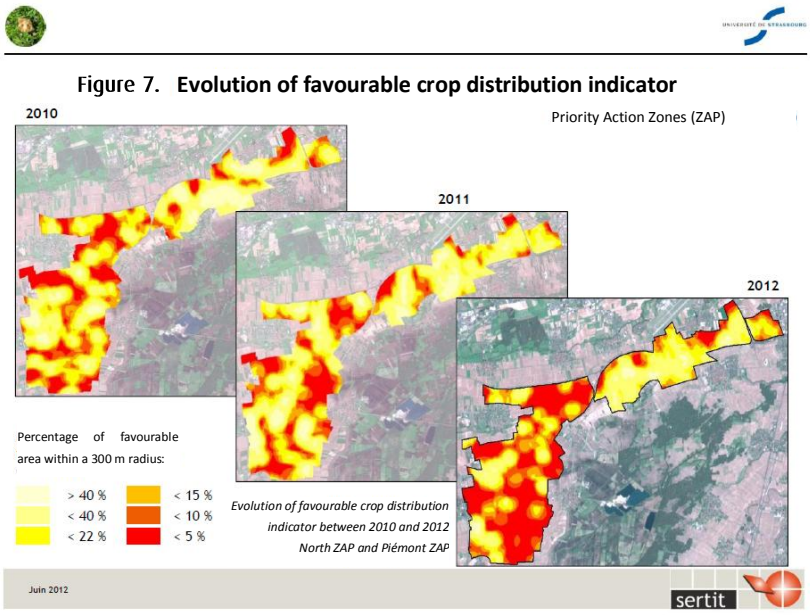
Different threats and limiting factors impact or could impact (directly or indirectly) the viability of hamster populations in Alsace. Pressures on the species include modifications of the quality of the habitat, fragmentation or artificialisation due to changes in land-use, facilitated predation, pollution, diseases, climate change, etc. Each pressure is analysed in more detail in the sections below.

1.7.1 Modification of the quality of the habitat

The hamster's favourite habitat can be found in agricultural areas and, what is more, on land with high agronomic potential. The major changes that have occurred in agriculture in the last 30-40 years have had a direct impact on the hamsters' habitats. In particular:

- The clearest change is the reduction of hamster-friendly crops (winter straw cereals, alfalfa) in favour of corn (maize), although this trend has reversed since 2008 in the PAAs. In terms of species' needs, this change has resulted in a depletion of the hamsters' food supply and the disappearance of ground cover to protect their emergence from hibernation in mid-June during a key period when they need to find abundant food and partners for breeding. The figure below (SERTIT 2012) shows the distribution of hamster-friendly crops in the Piémont PAA from 2010 to 2012, highlighting the magnitude of areas (red, orange, yellow) in which the percentage of favourable crops is below 22%, the target set in the 2007-2011 NAP[9].

Figure 7. Evolution of favourable crop distribution indicator



9 Major bouts of frost in the winter of 2011-2012, which affected winter wheat crops, explain to a large extent the low percentage of hamster-friendly crops in 2012.

- The increase of parcels' size or crop clusters also has an adverse effect on the development of the common hamster. The food supply and protection provided by crops are changing or even disappearing during the animals' active period, obliging the animals to change location to dig new burrows and move their ranges, increasing their vulnerability. The larger the parcels or crop clusters, the greater the move and the related vulnerability, to predation especially, as the distance to the nearest favourable ground cover is longer. During the season, the same individual alternates between different burrows.
- Mechanisation has accelerated farming operations. Harvesting, of cereal crops in particular, is quickly followed by tillage, which suddenly changes the hamster's surroundings, making them hostile (disappearance of cover, protection and buried food, obligation to actively seek another more favourable habitat). The implementation of NCC[10] is expected to modify and mitigate this aspect.
- The introduction of increasingly precocious varieties has advanced cereals' harvesting dates by nearly a month over the last 40 years. This limits the possibility of producing a second or even third litter and also favours winter mortality (insufficient food supply for winter, Kuiters *et al.*, 2011).
- The use of fertilisers and pesticides can cause mortality through direct poisoning, and potentially have longer term effects such as hormono-mimetic effects on reproductive system disorders. Other indirect effects result from the simplification of environments/habitats, as chemicals lead to a reduction of weeds and a lesser availability of invertebrates which are part of the common hamster's diet.
- Overly deep tillage can also cause mortalities. This practice, banned in the list of requirements for agro-environmental measures, is now disappearing.

Overall, changes in practices combining simplification (trend toward monoculture, large parcels or plots of crops with no other plants) and rapidity (fragmentation of plots, much shorter harvesting time, early harvests), have resulted in major modifications of the common hamster's traditional habitat.

[10] Nitrate Catch Crops

1.7.2 Habitat fragmentation

Habitat fragmentation resulting from urban sprawl, the development of linear transport infrastructure and the reduction of hamster-friendly crops in favour of other crops, may be observed at several levels.

- At the individual level, fragmentation has resulted in a reduction of favourable crop areas and/or in scattered areas without any direct connection. As highlighted above, the animal must choose between the risks of 1) predation due to the need to travel greater distances or 2) reduced food hunting, which can cause deterioration of its body condition and/or a reduction of its food supply for hibernation. Habitat fragmentation may also lead to chronic physiological stress or greater vulnerability to certain pathogens (McCallum and Dobson 2002).
- At the population level, fragmentation isolates favourable regions, so that sub-populations progressively lose all breeding connections and face the risk of reduced gene diversity. The gene diversity of populations guarantees their long-term viability (Kayser *et al.* 2005). Due to habitat loss and fragmentation, the hamster populations subsisting in Western Europe are disconnected from each other (La Haye *et al.* 2011). A comparison between the genetic heritage of current populations and that of hamsters subsisting before population fragmentation (La Haye *et al.* 2011) highlights a high degree of inbreeding and genetic drift of the current populations, together with the loss of rare alleles, causing very high homozygosis rate among individuals. The decline in the gene diversity of hamster populations substantially increases the risk of extinction (Kayser *et al.* 2005). In addition, a high degree of inbreeding can also have an adverse effect on hamster breeding success (which is vital for a species with a short lifespan) and, in particular, the number of juveniles per litter[11].

[11] A study carried out in the Netherlands shows that the average size of litters in captivity was 5 juveniles from 2000 to 2003, with 100% Dutch lineage, and that the size rose to 5.9 juveniles per litter from 2004 to 2008, following the integration of breeders from Belgium and Germany (La Haye *et al.* 2008).

1

1.7.3 Artificialisation, land-use changes

Hamsters sometimes occupy habitats at the border with urbanised sectors. These habitats may be under direct pressure from urban sprawl. The narrow physiognomy of the Alsace region, particularly near Strasbourg, accentuates this phenomenon, since available space is more restricted and in high demand. The threat to hamsters' habitats posed by urban sprawl or any other form of artificialisation forces the animals to flee, with some inherent risks: irreversible habitat destruction, habitat and populations' fragmentation and related nuisances such as pollution (see above). The development of the infrastructure network, apart from artificialising land and causing fragmentation, also causes hamster mortality as the hamsters cross roads (road death rate of populations in the wild in 2011 are unknown).

1.7.4 Facilitated predation

As indicated above, predation is the primary cause of mortality according to studies conducted in Germany (Weinhold 1999). However, the hamster is a prey species and is thus naturally subject to a high degree of predation. However, high predation is an issue only if the breeding season is insufficiently long and if the production of juveniles is insufficient to compensate for losses.

As also mentioned above, mortality by predation is high at the time of emergence from hibernation after the opening of the burrow -as it entails a change of location to the most favourable parcels of land- and during the breeding season, especially after harvesting (search for ground cover). The most common predators are ground predators such as weasels (*Mustela nivalis)*, ermines (*Mustela erminea)*, skunks (*Mustela putorius)*, martens (*Martes foina)*, badgers (*Meles meles)* and foxes (*Vulpes vulpes)* (Bihary *et al.* 2008). Among birds of prey, the common hamsters' main predators are buzzards (*Buteo buteo)*, red kites (*Milvus milvus)* and black kites (*Milvus migrans)* (Kuiters *et al.* 2011). Domestic species such as dogs and cats were also identified as occasional predators.

Studies carried out in different European countries show that mortality rates due to predation during the breeding season, as well as the impact of different predators, can vary and they are linked, in particular, to the density of predators on the site. These studies also noted that females, which the population dynamics of the species depend on, are less impacted by foxes than male hamsters are. In the case of species with a short life-span, a high level of breeding must compensate for the high mortality rate. Thus, a 5% yearly survival rate is not incompatible with a growth of hamster's population (Müskens *et al.* 2005). Ground cover is of vital importance since predation pressure on the hamster is correlated with the presence or absence of ground cover (Kuiters *et al.* 2011) which provides shelter and natural protection. Breeding is therefore influenced by the presence and quality of ground cover.

1.7.5 Pollution and other forms of anthropogenic interference

Two major types of pollution may be considered potentially impacting the species:

- Agricultural pollution: farming inputs (pesticides and herbicides in particular) may have a direct or indirect impact on hamsters by eliminating weeds and microfauna on which the hamster feeds. Analyses conducted in Germany noted the presence of low concentrations of numerous pollutants in kidneys, liver, muscles or fatty tissues of common hamsters (KAYSER *et al.* 2001, 2003b). The consequences of these concentrations may include the development of specific diseases and the reduction of fertility and breeding success, although these risks are to be demonstrated. Phytosanitary products, apart from toxic effects, also cause hormonal disturbances via their hormone mimetic function.
- Peri-urban pollution: since hamsters' habitats are sometimes close to urban areas, the animals may be exposed to atmospheric or land pollution caused by human activity. In a perhaps less obvious way, the consequences could be similar to those of agricultural pollution. Light pollution is another form of peri-urban pollution that, as described by some specialists, could cause disturbances by altering the hamsters' perception of the time of day; this, over an extended period of time, could have an impact on the species' behaviour.
- Certain sound emissions are also liable to cause behavioural or physiological disorders among hibernating mammals (*Körtner et al.* 1998). For example, it was shown that for the Syrian hamster, certain noises may cause primiparious females to cannibalize their offspring (http://ehs.uc.edu/lams/data/pdfs/9029.pdf). In the *Sauvegarde Faune Sauvage* [wildlife preservation] stock breeding facilities, it was also observed that too much noise during mating reduces breeding success.

1

1.7.6 Diseases

The common hamster, like the rodent family as a whole, may be subject to different diseases and its natural susceptibility may be increased by the impact of the human-induced pressures described above. The known diseases affecting the species include: tularemia, leptospirosis, listeriosis, Q fever, enteritis, nephritis, ear infections, rabies and other infections caused by bacteria (Pseudomonas, Salmonella, Staphylococcus) and viruses. Numerous cases of internal parasites (protozoa, flatworms, siphonaptera) and external parasites (mites and insects) were also observed. However, diseases are not normally a major mortality factor in small populations (Kayser *et al.* 2003).

1.8 Impact of climate change

Climate change is sometimes listed as a factor liable to have an impact on the development of common hamster populations. Its role in the behaviour of the species and population development is difficult to assess, although it inevitably affects the hamster's habitat and the animal itself.

Since Alsace is at the western boundary of the animal's range, it may reasonably be expected that the impact of climate change is greater at the limits of this area. The climate in Alsace is in fact (slightly) warmer than in other countries in which the species is present, so the animal may more rapidly become susceptible to temperature changes related to climate change.

It was also observed that the species is diminishing naturally in all countries within its range. Economic and land-use conditions are highly variable though, even if production and development models (for agriculture in particular) tend to converge. Climate change could therefore be one of the variables with a share of responsibility for the overall population reduction, although this assumption still requires verification in relation to local agricultural conditions (see Reiners and Encarnação 2011).

1.9 Economic dimension of hamster preservation issues in Alsace

Considering the common hamster's habitat and the general layout of the Alsace plain, protection issues are clearly linked to economic growth issues. The species lives in fact in a region characterised by intensive farming on productive land, coveted by land-use planning, road infrastructure and territorial planning of a relatively narrow and highly populated region.

Efforts made in the 2007-2011 NAP, particularly with respect to the issue of hamster-friendly crops and their structuring, led to the emergence of the principle of conciliation between the development of agriculture and preservation of the species. However, hamster-friendly crops and practices best suited to the species' needs are not necessarily the most cost-effective ones in the current context, as highlighted by gross margin differences between corn and wheat in the range of several hundreds of euros per hectare[12]. The influence of the CAP and the organisation of specialised sectors also have an impact on farmers' economic choices, most often in favour of crops not favourable for hamsters. The current level of hamster-friendly crops may be directly attributed to agro-environmental measures, which compensate for farmers' lost income. The sustainability of perennial crops in the absence of government support could be ensured by the developing of specific value chains, which are likely to offer opportunities for economic development, as in particular:

- The alfalfa value chain, which could be developed around a fodder exchange platform for mountain area breeders and plain area farmers. Research has already been conducted, revealing difficulties in formalising such exchanges;
- Products derived from local wheat, cultivated in a hamster-friendly way and favouring the protection of hamsters, which could be marketed highlighting their "hamster-friendly image", whose marketing strategy could take advantage of a "hamster-friendly image". In some foreign countries, communication strategies focused on food products derived from crops protecting the species allow to provide farmers with higher revenues and internalise the preservation of biodiversity by the market in the final price of these products.

Conciliating the species safeguard and agricultural activity also entails compensation for any crop damage that may be caused by the species. A system that takes certain conditions into account, coordinated by the ONCFS in conjunction with the Alsace DREAL [regional directorate for the environment, planning and housing] has been in effect since 2000.

In the case of road infrastructure, land-use planning or economically-oriented development projects, economic issues regularly create opposition between economic stakeholders and land-use planning stakeholders over the protection of the endangered species.

1.10 Perception, values and cultural aspects

Despite the awareness-building campaigns of the previous action plans, the species remains relatively unnoticed by the general public due to its discreteness and limited presence on agricultural areas. This "purely Alsatian" species could however be part of Alsace's image, as storks are, for example. Generally speaking, the species only exists for stakeholders directly confronted with the issue of its protection, *i.e.* farmers, elected representatives, associations or government services.

---

12 €200 per hectare in 2006, €500 per hectare in 2007 and €50 per hectare in 2008 for non-irrigated corn (Source: Chambers of Agriculture of Haut-Rhin and Bas-Rhin, communication document for Euromaïs 2009).

The relationship between the species and the agricultural world remains ambivalent (see Mechin, C. 2005; 2007; 2011; 2012a & 2012b): the species, which proliferated in the second half of the 20th century and was classified as "pests" due to crop damage, changed to the "protected species" status in the early 90's. Farmers, who were receiving subsidies for hamster destruction campaigns, were then solicited for agro-environmental measures to ensure the protection of the species in a relatively rapid reversal of the situation.

In the areas targeted by actions aimed at the implementation of agro-environmental measures (AEM), farmers have now generally accepted the species and its protection, resulting in an increase in AEM-registered areas (20% of farmers in areas of presence of the species in 2011 were under contract). This acceptance, or simple tolerance by some, which can be restrictive, was made possible by the institutional collaboration of all stakeholders. Nevertheless, other farmers, mainly situated outside these sectors, remain sceptical about the common hamster's "protected species" status and continue to fear the eventuality of hamster population explosions.

The common hamster has not been globally accepted by local representatives: the species, reinforced by its legal status, is often perceived as an obstacle to land-use planning projects. It may be noted that representatives are getting involved and contributing, among other actions, to reinforcement operations. On the other hand, the common hamster is seen by associations as one of the symbols of biodiversity and wildlife areas which need to be preserved in the Rhine valley.

1.11 What expertise can be mobilised in France and abroad?

In France, scientific expertise is mainly driven by the CNRS [French national centre for scientific research] and the ONCFS [French national agency for wildlife]. Expertise on the breeding and reintroduction of hamsters in France is represented by:

- the ONCFS, the technical operator for reintroduction;
- the CNRS which owns a hamster breeding research facility;
- the SFS [Wildlife preservation] association which owns and manages 3 breeding facilities for hamsters intended to be reintroduced (and also conducts internal experiments aimed at improving the behaviour and survival of animals released into the wild).

Other structures have expertise that is mobilised or could be mobilised such as the *Centre de Réintroduction des Cigognes et des Loutres* [Centre for the reintroduction of storks and otters] or the Mulhouse Zoo.

Expertise in the monitoring of hamster populations is provided by the ONCFS with expertise that may be mobilised in the CNRS and in associations or external consultancy and research firms' sectors.

Common hamster areas management combines the expertise of different stakeholders from the region, in particular:

- Government services through the Alsace DREAL [regional directorate for the environment, planning and housing], the DRAAF [regional directorate for food, agriculture and forests], the SGARE [general secretariat for regional and European affairs] or the DDTs [Departmental directorates for regional development];
- The ONCFS, the technical operator for the previous national action plans;
- The agricultural sector with farmers and Chambers of Agriculture;
- The local authorities with the General Councils and municipalities concerned;
- Local environmental associations, in particular Alsace Nature, SFS, ARIENA, GEPMA, APELE, CERPEA, etc.

Scientific expertise on the hamster issue benefited from exchanges between European countries, which were materialised each year by the meeting of the Hamster Workgroup, including the main European scientific experts. Particular mention should be made of the researchers from laboratories such as the "Institut für Faunistik", the "Mammalian Ecology Group" of Justus-Liebig-University in Germany and "Alterra" and "Radboud University Nijmegen" in the Netherlands.

1.12 What conservation actions have already been carried out?

The main legal provisions that have given the common hamster "protected species" status have led to the implementation of a specific policy for the protection of common hamsters in Alsace.

In 1995, a steering committee was set up under the responsibility of the regional Prefect to identify and combine possible intervention options to facilitate the protection of the common hamster.

A first species Preservation Plan was implemented in 2000 for the 2000-2004 period, including awareness-raising actions aimed at agricultural stakeholders, contractual agreements initiatives initiatives with farmers to promote hamster-friendly practices (in particular, the introduction of hamster-friendly crops), as well as hamster population monitoring and reinforcement.

Although the assessment of the first plan identified success factors (e.g. the establishment of a framework for consultation and exchanges, as well as growing acceptance of the species by the farming profession), it concluded that the plan alone was insufficient to halt the decline of the common hamster population.

1

As the objective of preserving the species was not achieved in 2004, the preparation of a second plan, building on the lessons learnt from the first plan, was proposed. The second national action plan was difficult to prepare, especially as it faced a context of conflict (complaint lodged in 2006 with the European Commission for "Failure of a Member State to fulfil obligations – 'Habitat' Directive – Insufficient measures taken to protect the *Cricetus cricetus* (common hamster) species – Destruction of habitats"). It was finally adopted in 2007 and concerned the period 2007-2011.

The second national action plan proposed two separate objectives: 1) to restore viable populations in the three Priority Action Areas (PAAs) previously defined in the plan, and safeguard any other population that could constitute a viable core; and 2) to halt the decline of the population in areas situated near the Strasbourg metropolitan area.

Led by the Alsace DREAL [regional directorate for the environment, planning and housing], with the ONCFS [French national agency for wildlife] as the main operator, and mobilising regional authorities, Chambers of Agriculture, DDTs [departmental directorates for regional development], environmental associations and the CNRS [French national centre for scientific research], the plan included 6 guidelines (and 36 actions): 1) Acceptance of the species by farmers; 2) Protection and restoration of favourable habitats for the common hamster; 3) Monitoring of common hamster populations; 4) Public awareness-raising; 5) Preservation of the species' "Alsatian" genetic origins; and 6) Studies and partnerships.

The second national action plan 2007-2011 was assessed in 2011.

- The assessment underscored the financial efforts made (more than 2.4 million euros) and the involvement of all of the plan's stakeholders in the protection of hamster populations.
- The majority of actions aimed at increasing acceptance in the farming sector were applied and considered successful. Efforts were also made to facilitate access to existing information and monitoring (e.g. via dedicated Websites). The effectiveness of releases was also significantly improved over the course of the plan.
- The second plan led to significant improvements in hamster-friendly crop areas and ensured the relative stabilisation of common hamster populations.
- However, the second plan did not ensure the viability of hamsters in Alsace. The populations' size remains low and the hamsters' current range is shrinking and increasingly fragmented. The assessment of the second plan therefore concluded that efforts initiated must be continued and reinforced in a consistent and coordinated way.
- The assessment nevertheless highlighted insufficient efforts in terms of actions aimed at restoring and protecting favourable habitats, research activities and awareness-raising activities.

1.13 Main uncertainties of the present knowledge base

The analysis of existing knowledge pinpoints the main uncertainties regarding particular components of the hamster system, as well as causal relationships between drivers, pressures and population dynamics.

The table below summarises some of the main uncertainties identified, with additional inputs from the thematic working groups that provided support for the preparation of the 2012-2016 NAP. The items are not necessarily listed in order of priority. Additional themes calling for research and knowledge reinforcement efforts include the following:

- A better knowledge of demographic parameters, life history traits and biological features specific to Alsatian hamster populations (survival rate, breeding, changes of location, causes of mortality, gene diversity);
- Reassessment of the population monitoring method, which was adapted to higher population densities from 10 years ago (detection probability in and outside hamster-friendly crops) but needs to be revisited;
- The choice or selection of hamsters released according to their parentage (genetic distance) but also depending on their individual hibernation strategies (is it best to pick individuals that hibernate with deep and regular hypothermia?) or their temperaments (reactive versus proactive);
- Physiological acclimatisation to the stress of the released hamster's discovery of a new environment.

Table 2. Main sources of uncertainty regarding the common hamster and its habitats in Alsace

What we know	What we don't know
Habitat fragmentation	
Habitat fragmentation leads to the loss of favourable habitats and the isolation of individuals.	1. What are the energy costs and choices regarding spatial use in relation to the perceived risk of predation? 2. What are the effects in terms of response to stress?
Artificialisation, land-use change	
Early harvests and tillage, low degree of ground cover: greater exposure and mortality due to predation, shortened breeding period. Crop rotation: new environment found upon emergence from hibernation, hence greater vulnerability to predation.	3. What is the effect of these factors on the quality of hibernation in terms of ground structure and capacity to procure sufficient food supply? 4. What are the effects of new varieties of wheat on body condition and the quality of hibernation? 5. Determination of the nature of crops that optimise the survival of the species. 6. What is the minimum meshing required for hamster-friendly crops?

1

Modification of the habitat's quality

Anthropisation and creation of new infrastructures, reducing hamster-friendly crops' areas.	What is the impact of these infrastructures on the genetics of the populations and on the long-term viability of the species? What is the typology of natural or artificial obstacles that the species is unable to cross? What are the effects of sound stimuli, or even electromagnetic fields induced by high and very high voltage lines on the physiology, distribution and behaviour of hamsters? (see Detschlander *et al.* 2003)
Predation (vulnerability, perception of the risk of predation) Predation is the primary direct cause of mortality. Delaying harvests or releasing hamsters into electrified enclosures reduces this pressure and helps the survival and recruitment of hamsters.	Indirect effects of predation are not known (Apfelbach *et al.* 2005). What effect do scents left by predators have on the physiology of stress, body condition, immune systems, breeding cycles and effectiveness via disturbance of the secretion of sexual hormones, and the sex-ratio in litters?

Pollution

It has been shown that phytosanitary products may be found in several hamster tissues.	What are the phytosanitary products contents of the hamsters' diet in Alsace? What are the toxic and hormone-mimetic effects of phytosanitary products on hamsters' survivability and breeding performance?

Diseases

Infectious diseases of bacterial origin may be responsible for a variable mortality rate. However not all animals that die from diseases are diagnosed, particularly when this occurs in the burrows or when the carcass is consumed by a predator.	Infection rates according to different types of diseases are largely unknown. Hence there is a need for health monitoring. The prevalence and effect of certain parasites liable to be conveyed by domestic or wild mammals (leptospirosis, piroplasmosis, etc.) on the behaviour and body condition of hamsters are to be determined.

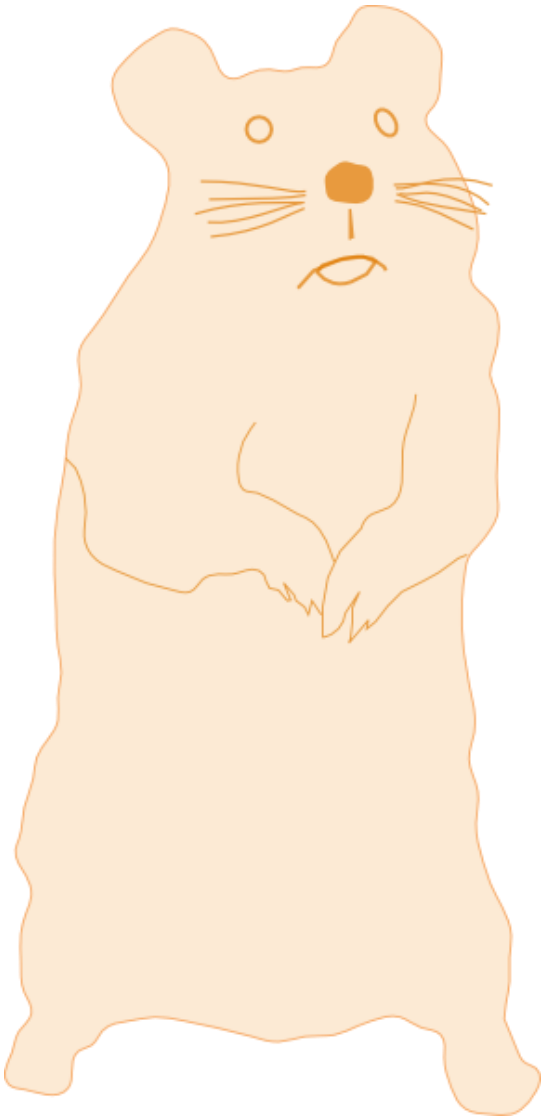
Climate change

Changes have an impact on the quality of soils and ground cover.	Studies have shown that climate change can affect the long-term existence of certain mammals, including rodents. A special study involving historical data and simulations according to different scenarios should be foreseen.

Biology of the species in Alsace

Wild hamsters' activity period generally begins in late March or early April and the period of inactivity (burrows closing) generally begins around mid-October. Gene diversity of the Alsatian populations in the 2000's.	What are the annual, monthly and daily survival and mortality rates of wild populations (by sex, type of crops, according to plot pattern, etc.)? What are the causes of wild animals' mortality? How long is the breeding season? What is the average number of litters or the number of litters according to the type of habitat? What is the genetic diversity of the overall population (distribution of genetic diversity between sub-populations)? Is the low genetic variability of wild individuals and individuals produced in breeding facilities for release sufficient to guarantee the survival or long-term viability of hamsters in Alsace?

2. Needs and challenges of the common hamster conservation with key components of a long-term sustainable strategy



2 From the needs and challenges of the common hamster conservation to key components of a strategy

2.1 Summary of the species' optimal needs

Knowledge of the common hamster's detailed needs is still incomplete but is generally closely linked to its habitat. The species' optimal needs may be characterised as follows:

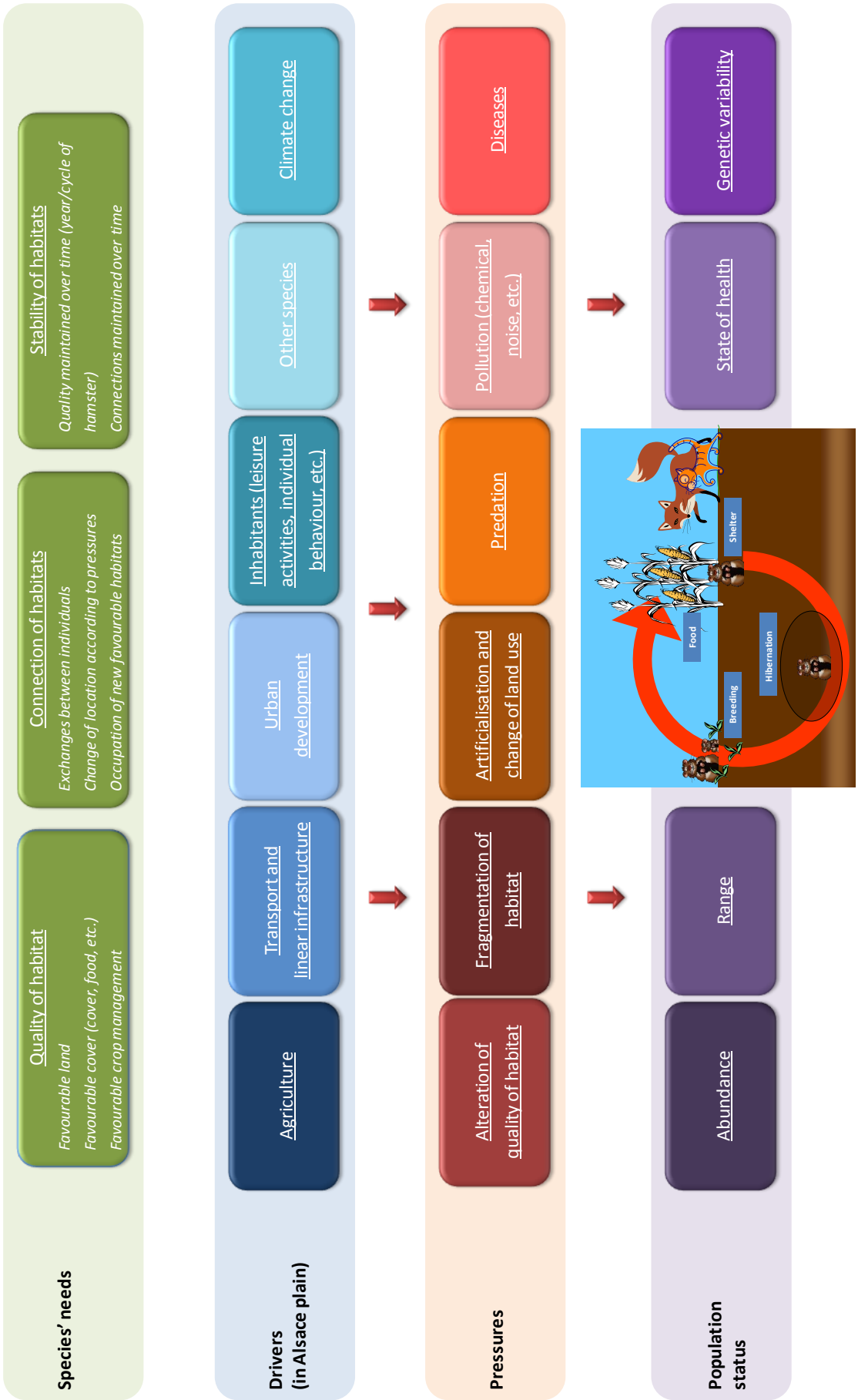
- **Quality of the habitat**, resulting from favourable soil conditions for hamsters to dig their burrows and find food suited to their diet, hamster-friendly crops (type of crop, crop management and agricultural practices) that provide suitable food and cover to reduce the risk of predation and increase the number of litters in the year.
- **Interconnection of habitats,** providing the possibility of travel and encounters (including sufficient surface area) between individuals from the same population, which constitutes the basis for gene diversity, breeding and population growth. The hamster must also be capable of finding areas for retreat in case of strong pressures, mostly anthropogenic, and of occupying new favourable habitats areas.
- **Stability of habitats,** a condition required for the preservation of populations over time and for their viability. It is thus necessary:
    - to dispose of a habitat quality (particularly ground cover) over a yearly period, suited to the common hamster's life cycle and activity periods;
    - to have geographically-coherent favourable habitats in the long term, that do not suddenly change or regress.

2.2 Summary of the main drivers and pressures on the species and its habitats

The figure below roughly presents the main drivers and pressures that affect the viability and conservation status of the common hamster in Alsace. The different items listed as pressures do not have the same impacts on hamster populations. Similarly, some drivers combine exogenous factors that cannot be modified locally (e.g. climate change, reform of the Common Agricultural Policy) and endogenous factors that provide flexibility and adaptation options for existing practices which could be addressed by specific actions in the third national action plan. Although prioritizing the following figure's components is a difficult exercise, predominant factors are presented first.

2

Figure 8. Drivers, pressures and common hamster population status: summary diagram



2.3 From key issues to priorities and responses provided by the 2012-2016 NAP

Building on the consultation implemented in the context of the 2007-2011 NAP assessment, a consultation process including all stakeholders in the conservation of the common hamster in Alsace was implemented in preparation for the 2012-2016 NAP. Based on the assessment results of the previous plan, a collective analysis was carried out as part of the process. It identified the main Strengths, Weaknesses, Threats and Opportunities regarding the protection and conservation of the common hamster and its habitats in Alsace. All of these elements were considered in defining the 2012-2016 NAP, since they influence its implementation, its effectiveness and, *in-fine*, its success.

2

Figure 9. Strengths, Weaknesses, Opportunities and Threats for the conservation of the common hamster in Alsace

The SWOT analysis and key findings were used to define a new course of action for the 2012-2016 NAP structured around adapted responses to the key findings.

Finding 1 - **Mobilisation of the farming profession** has resulted in an increase in the surface areas of favourable crops in areas of presence. However, this increase has not resulted in a parallel increase in hamster population. This underscores the importance of farming practices and crop rotation as key factors for conservation of the common hamster in the Alsace plain.

The 2012-2016 NAP acknowledges the importance of associating **favourable crops** and **favourable farming practices** as essential components of a **common hamster-friendly habitat**, as well as the need for **appropriate meshing of favourable crops spatially and temporally**. With "habitats" still a central thematic guideline, the 2012-2016 NAP proposes:

- **Testing of new combinations of crops and practices** that may provide hamster-friendly habitats, and examination of new economic opportunities for the resulting agricultural products;
- Initiation of a **collective territorial approach** with the farming profession to set up appropriate meshing of favourable crops, in time and space, in and around the areas of presence of the species.

Finding 2 – The quality of **stock breeding** and the effectiveness of common hamster **releases** have improved in recent years. Efforts are to be continued so as to ensure the safety of stock breeding and reduce all risks (including health hazards) in operation, and improve the results of releases (e.g. breeding success of released females).

Following up on the 2007-2011 NAP, the 2012-2016 NAP proposes a **specific guideline entitled "Conserve the species ex situ and reintroduce it effectively"**. This guideline's actions will lead to the diversification of breeding methods as part of a controlled and transparent quality process (systematic implementation of audits for breeding facilities). Actions will also aim towards the continuous improvement of releases, to guarantee better preservation of the species in the release areas (agricultural stability on the release sites during two to three years).

2

Finding 3 – **Urbanization and the development of transport infrastructures** put pressure on hamster habitats and populations, however no solutions were specifically considered. Particular issues concern the passage of obstacles and the connection between populations which can impact population genetics.

A **specific "Avoid, Reduce and Compensate"** guideline is proposed in the 2012-2016 NAP to ensure appropriate linkage between economic and urban development, on the one hand, and preservation and conservation actions on the other. Particular attention will be given to **compensation** (which conditions for well-scaled and effective compensation), and to linkage with the ***Schéma Régional de Cohérence Ecologique*** [Regional Ecological Coherence Scheme]. Specific **awareness-raising actions aimed at elected representatives and local authority technicians** are proposed in the 2012-2016 NAP to integrate common hamster conservation issues in urban and spatial planning documents. In addition, the **elected representatives of concerned local authorities** will be **members of the Territorial Commission** which will ensure information-sharing, awareness-building and prioritisation of proposed actions for concerned regions.

Finding 4 – Levels of support were not even among areas of presence as actions focused on the **Priority Action Areas (PAA) even though numerous specimens were found outside these areas.** Although hamster population monitoring shows that these populations travel, stabilisation was observed in three areas covering about 9300 hectares and encompassing almost all of the known specimens. These areas are defined by the Order in Council of 31 October 2012 on the protection of the habitat of the common hamster (*Cricetus cricetus*), referred to in the document as the "**strict protection area**" (Fig.11).

The 2012-2016 NAP maintains the principle of **priority action in areas of presence of the hamster**. The strict protection area will serve as the basis for the development of actions. A more detailed analysis may be proposed to specify intervention areas for certain actions (reinforcement, tighter agricultural meshing, etc.) within the perimeter. Actions will be carried out within the 9300 hectares, whether specimens are surveyed or not.

Finding 5 – Even if hamster populations did stabilise in the past few years, satisfactory conservation status was not achieved, despite major efforts (human and financial). In addition, recent surveys highlight the fragility of some segments of the population. The proportion of burrows in these segments is far below the critical threshold of 200 burrows, under which there is a risk of the sudden disappearance of the population. **Improvement of the effectiveness** of proposed actions and territorial prioritisation according to observed densities are a key issue for the 2012-2016 NAP. They

should enable a viable population (1500 individuals with a density of 2 animals per hectare) to be reached in the medium term and within the current presence areas.

The 2012-2016 NAP proposes different mechanisms for ensuring the effectiveness of actions and their territorialisation:

- Combination of **spatialised analyses** of hamster habitats and populations and **prioritisation of actions within the Territorial Commission** to ensure synergies, consistency and optimal effectiveness of actions aimed at improving habitats, releases and awareness-raising;
- Preparation of **tests (under different conditions) of new practices (crops, farming practices, methods of crossing of structures, etc.)** to identify the most favourable practices for the different steps in the development cycle of the common hamster;
- **Strict monitoring** of the mobilisation of human and financial resources, the implementation of actions as well as the status of hamster habitats and populations;
- A continuous improvement system will be implemented.

Finding 6 - **Mobilisation of all stakeholders** in the implementation of the NAP and progressive appropriation of conservation issues are a key component for the sustainability of conservation actions. The stakeholders' perception of hamster protection issues evolved during the previous plan, thanks in part to **information and communication** efforts. However, the species is not currently recognised as an emblematic species of biodiversity in the Alsace plain and this calls for collective mobilisation of the stakeholders in a positive conservation approach.

The 2012-2016 NAP follows the same principles of **consultation and transparency** as the consultation approach implemented to prepare the plan. Governance of the plan ensures, at different levels, the mobilisation of each stakeholder according to his/her competencies and responsibilities. A **specific guideline dedicated to "Awareness-raising and Communication"** is proposed in the 2012-2016 NAP, including information and communication actions targeting different publics (farming profession, elected representatives, technicians, young people and inhabitants). Particular attention is given to **changes in stakeholders' and inhabitants' perceptions** which would result from the implementation of the 2012-2016 NAP. A survey is proposed at the beginning and at the end of the plan to assess changes.

2

Finding 7 – The growing involvement of the research community has increased **knowledge** on the common hamster and the effectiveness of actions to improve the viability of hamster populations in Alsace. However, knowledge reinforcement efforts were relatively unstructured and limited in relation to the remaining uncertainties between levers for action, pressures, and habitat and population status, the 2007-2011 NAP having focused little attention on the reinforcement of knowledge.

A **specific "Reinforcement of knowledge" guideline** is proposed in the 2012-2016 NAP. This guideline will address the different issues and themes related to the conservation of the common hamster, according to the key principle of research dedicated to action. The scientific methods proposed and the results obtained will be presented to the NAP **Scientific Committee** for evaluation. The 2012-2016 NAP **mid-term review** (see above) will provide the opportunity to translate the results of knowledge research and reinforcement actions into new operational guidelines of the plan, considered appropriate and effective for the conservation of the common hamster and its habitats.

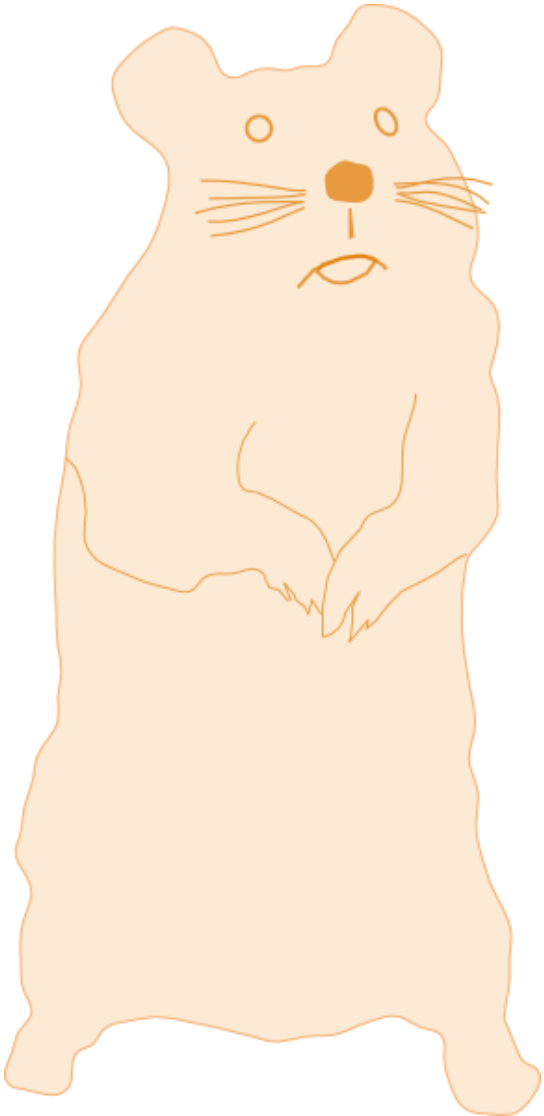
Finding 8 - A **lack of trust and transparency** between involved actors. See for example the sharing of roles and responsibilities between the 2007-2011 NAP Steering Committee and the Territorial Hamster Commission, considered unclear by concerned actors, leading to confusion in decision-making. The issue of the Steering Committee's decision-making efficiency was also raised.

To ensure efficient decision-making, the Territorial Hamster Commission's mandate is not renewed in the 2012-2016 NAP governance. The Steering Committee's mandate is renewed and each guideline coordinator is responsible for conveying questions, conclusions and requests for decisions to the Committee.

Finding 9 – The stakeholders regret the absence of **places for sharing information and technical experiences**, which are an essential component for shared and effective implementation of conservation actions.

Building on the consultation process proposed for the development of the 2012-2016 NAP, **thematic working groups**, coordinated by key organisations in the concerned fields, are proposed in the 2012-2016 NAP.

3. Proposed strategy for the 2012-2016 NAP



3 PROPOSED STRATEGY FOR 2012-2016 NAP

Considering the conservation status of the common hamster in Alsace in 2012, the existing pressures on hamster populations and their optimal needs, the SWOT analysis carried out with all concerned stakeholders, and the assessment of the second 2007-2011 NAP, the third 2012-2016 national action plan for the protection of the common hamster proposes a new, ambitious global strategy led by all actors and stakeholders in the Alsace region.

3.1 LONG-TERM OBJECTIVE FOR THE CONSERVATION OF THE COMMON HAMSTER

The general long-term objective is to ensure the good conservation status of the **common hamster in Alsace** in line with the "Habitats" Directive. Conservation status is considered favourable when the following three conditions are met:

- **Population dynamics** data on the species indicate that the species continues and is likely to continue in the long-term to be a **viable component of natural habitats** to which it belongs;

  and

- **The natural range** of the species **is not declining or liable to decline** in the foreseeable future;

  and

- There is and will probably continue to be a **sufficiently extended habitat** for its populations to be maintained in the long term.

Therefore, ensuring good conservation status of populations means guaranteeing:

- **Extending areas of presence**;
- **Quality habitats** suited to the species' specificities and behaviour;
- A sufficient **number of individuals** and sufficient **connections** between them to ensure the viability of the population and its genetic diversity, moving toward the rebuilding of viable population cores.

3.2 Objectives of the 2012 – 2016 NAP

In order to contribute to achieve good conservation status of the common hamster in Alsace, the 2012-2016 NAP commits to:

- **Conserve the current area of presence (19 municipalities);**
- **Triple the number** of hamsters recorded in comparison to the year 2010 - 2011 and thereby strive towards the viable populations' objective of 1500 individuals;
- Contribute to **improving the habitat quality** of the common hamster in Alsace and thereby: a) ensure a suitable habitat for the entire 2010-2012 presence area b) increase population density in the highest density areas towards the objective of 2 burrows per hectare; and c) facilitate the reconnection of sub-populations.

The means mobilised to achieve these objectives are as follows:

- **Regulations** that guarantee strict protection of the species' rest areas and breeding sites and its habitat;
- **Conservation of the "strict protection area"** identified in 2010-2012 (about 9300 hectares) (Figure 12), controlling urbanization in the sector;
- **Reinforcement of populations** in the **most fragile areas of presence** (areas included in the "strict protection area" but outside high-density areas);
- **Improvement of the quality of the habitat** of the common hamster in Alsace via the implementation of hamster-friendly agricultural ground cover (at least 22% favourable crops, including 1/5 alfalfa across the "strict protection area" as from 2012, and in high-density sectors, 25% in 2012, increasing to 30% in 2016; and survival strips maintained throughout the strict protection area and presence areas).

The **progressive appropriation of the hamster issue** by all **elected representatives and stakeholders** in the region will ensure the sustainability of undertaken actions and of the 2012-2016 NAP's achieved results.

The 2012-2016 NAP will thereby contribute to **giving the hamster a place as an emblematic species of biodiversity in the Alsace plain**.

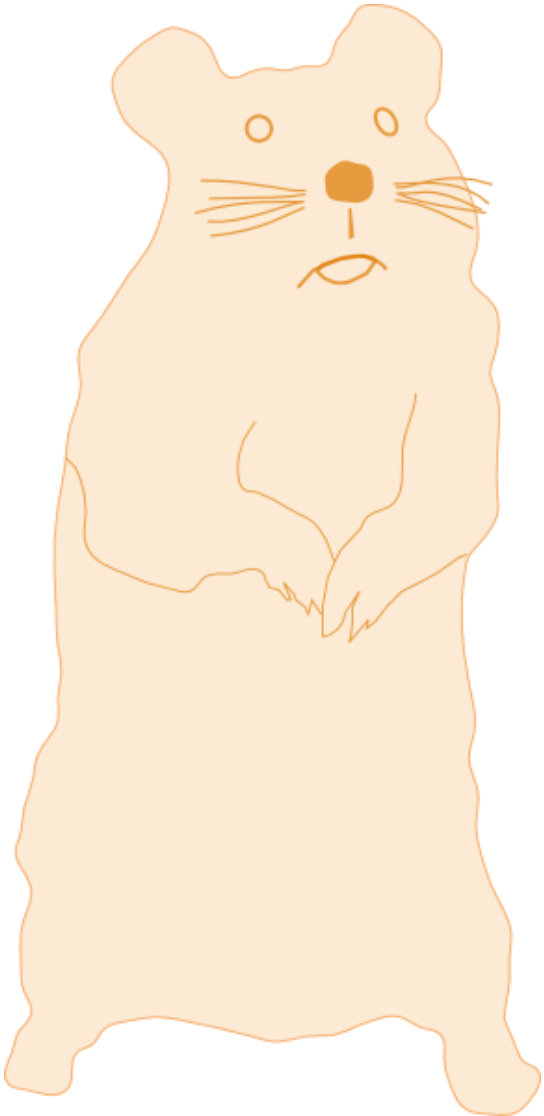
3

3.3 Key principles for implementation of 2012-2016 NAP

The implementation of this strategy will be guided by the following key principles:

- More ambitious action **based on the fundamentals of the previous plan**, regarding both improvements made to certain actions (e.g. progress made in the effectiveness of releases) and the mobilisation of stakeholders (benefit from the mobilisation of the farming profession in the previous plan);
- A **partnership approach** that will guarantee effective mobilisation of all stakeholders, transparency and sustainability of carried out actions;
- **Effective acknowledgment** of the species and its habitats in all **public policy**;
- A systematic search for **positive synergies** between hamster protection, economic development and land-use planning;
- **Effectiveness** of actions carried out and resources allocated, in particular through **regionally coordinated implementation** of knowledge, awareness-building, habitat restoration and population reinforcement actions;
- **Adaptability of actions**, allowing the NAP to be realigned according to the progress made, the experiments carried out and new knowledge made available through the continuous improvement device in place.

4. Which organisation for the operational implementation of the plan?



4 WHICH ORGANISATION FOR THE OPERATIONAL IMPLEMENTATION OF THE PLAN?

4.1 OVERALL STRUCTURE OF THE PLAN'S ACTIONS

The implementation of the NAP's overall strategy is structured around 6 key guidelines presented in the figure below:

- Guideline 1 – **Reinforce knowledge**;
- Guideline 2 – **Restore and protect habitats**;
- Guideline 3 – **Conserve the species ex-situ and reintroduce it effectively**;
- Guideline 4 – **Avoid, Reduce and Compensate**;
- Guideline 5 – **Raise awareness and inform**;
- Guideline 6 – **Support governance of the plan**.

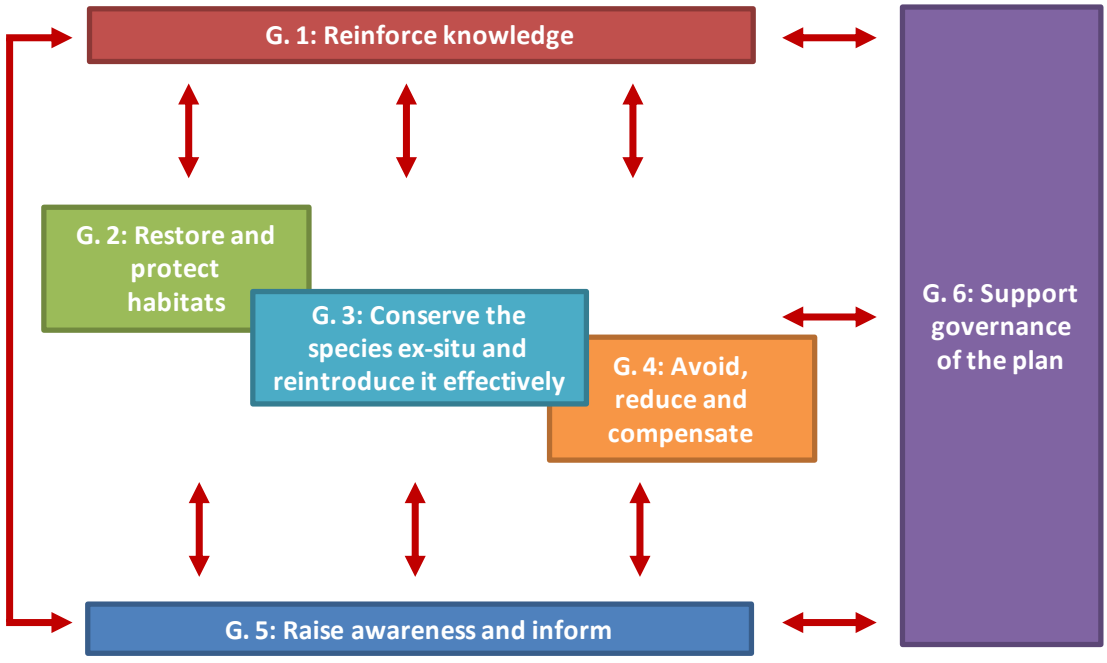


Figure 10. Structuring of 2012-2016 NAP by thematic and cross-cutting guidelines

4.2 Coordinated territorial implementation of actions

The main operational actions proposed in the different guidelines will be **implemented in a coordinated and consistent manner in territories** that host the common hamster and those involved in the future territorial recovery by hamster populations, in line with the short, medium and long-term objectives of the 2012-2016 NAP. This operational and coordinated implementation involving all elected representatives of concerned territories within the Territorial Commission, will allow for:

- **High-density areas increase in populations** to ensure sustainable critical population sizes (> 200 individuals) in the segments by setting up favourable crops (subject to sufficient agricultural area being maintained and farming contracts updated) based on the collective facilitation by farmers involving local authorities and an incentive for a grouped contractualisation of the farming profession. The objective is to reach a viable hamster population over units of several hundreds of hectares with a density close to 2 burrows per hectare.
- **The maintained and enabled species' land recovery in presence areas that are still fragile**. In addition to the meshing of favourable crops and the setting up of survival strips (unharvested straw cereals and/or alfalfa), the habitat restoration actions will be combined to the introduction of bred hamsters to connect segments in which they are present. In municipalities where a reduction of the number of burrows is observed, reinforcements will preferably be organised on the basis of multiannual release contracts in order to recover a viable population dynamic. In some cases, hamsters may be reintroduced into areas that are temporarily dedicated to the species, close to fragile presence areas, so as to ensure that individuals relocate in those areas.
- **The favoured reconnection of populations**, combining urbanization that is consistent with conservation issues, crossable transport infrastructures and the meshing of favourable crops in segments favourable to the reconnection of existing populations;
- **The achievement of the viable population status objective**, giving priority to actions in the "strict protection area" (which includes high-density areas);

4

- An ensured strict protection of all specimens, whichever their location in the Alsace plain;
- A planned future favouring potential hamster development areas, ensuring wide mobilisation of local authorities to valorise good urban planning practices that take into account reservoirs of biodiversity and corridors to be preserved, and streamlining compensation approaches to ensure their effectiveness.

The consistency of the operational actions' implementation proposed in the 2012-2016 NAP is summarised in the figure below, underscoring coherence between action priority and protection and conservation priority.

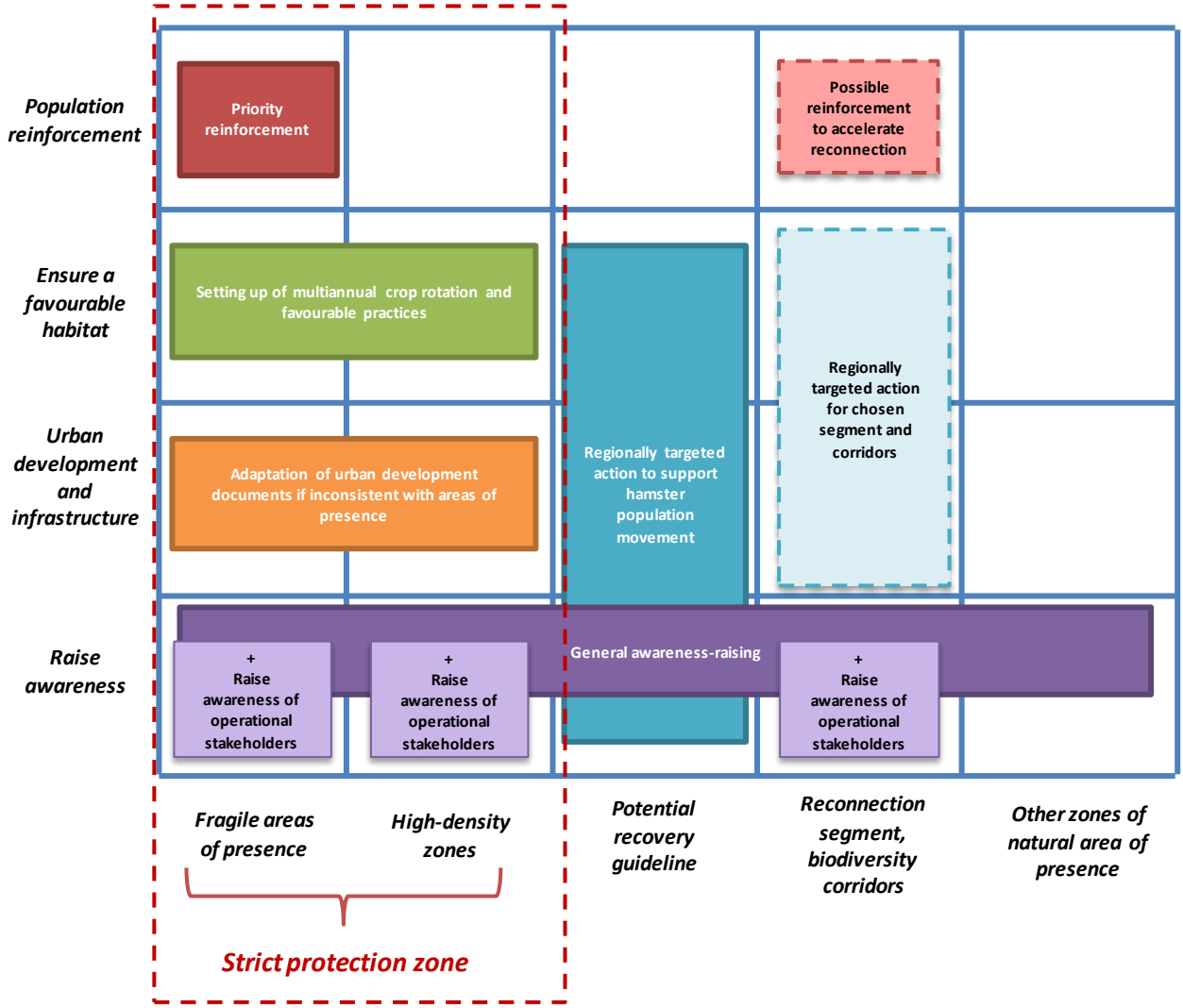


Figure 11. Ensure coherence between operation priority and protection priority in the territorialised implementation of operational actions

- The coordinated implementation that ensures territorial prioritisation of habitat improvement and population reinforcement actions will be based on mapping resulting from the Order in Council of 31 October 2012 on the protection of the habitat of the common hamster (*Cricetus cricetus*), drawn up according to the hamster's 2010-2012 presence areas (location of burrows for the last three years of monitoring). It indicates the highest density areas as well as the potential dispersion of populations.

4

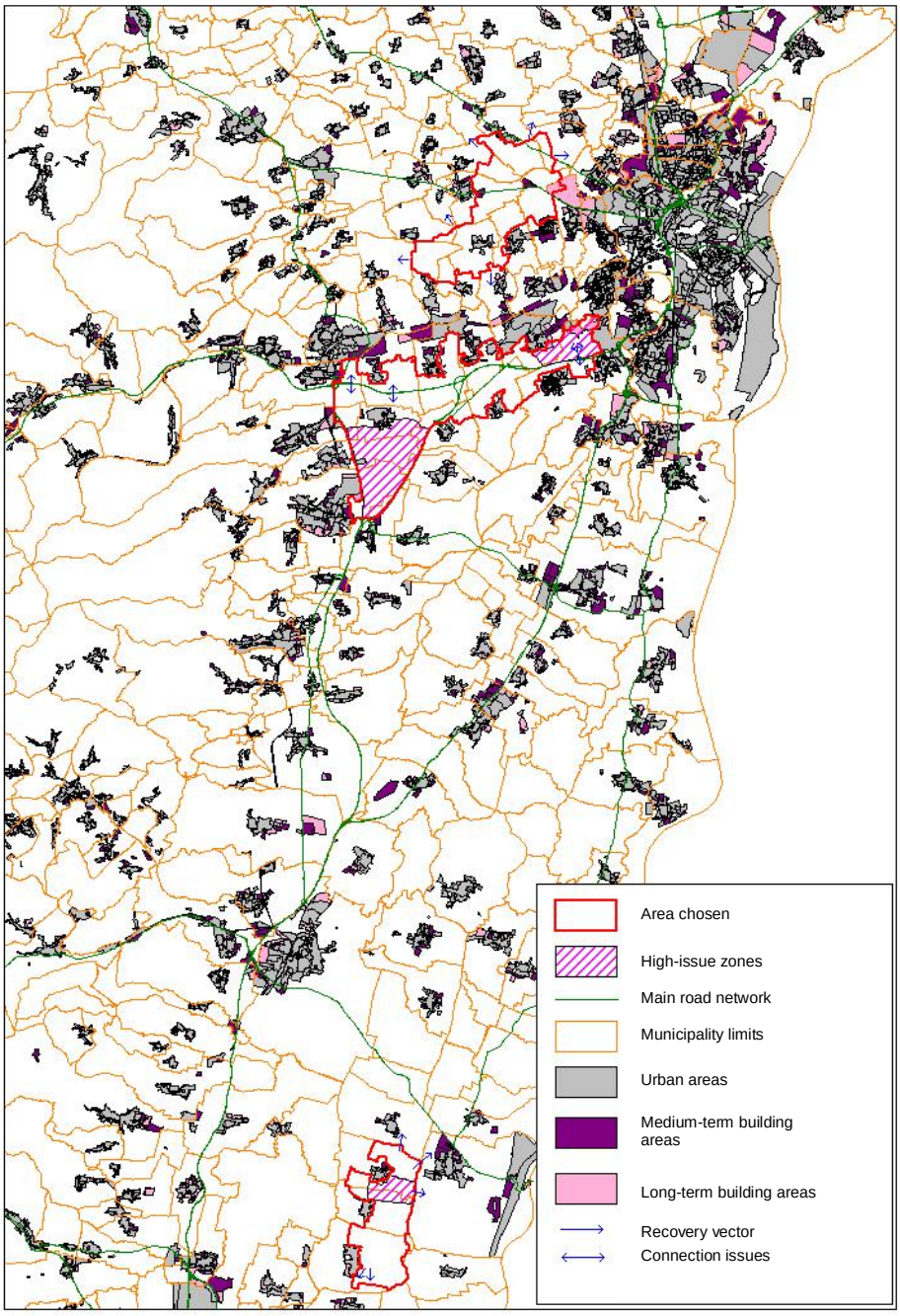


Figure 12. Strict protection area, highest density areas, passage issues and potential dispersion of common hamster populations. Details of areas in Annex 3.

4.3 A GOVERNANCE IN LINE WITH THE CONTEXT AND PROTECTION ISSUES

The governance of the 2012-2016 NAP is structured around three key components:

- The **NAP steering committee**, key decision-making body involving relevant regional actors and stakeholders, as well as representatives of the Ministries (Ecology and Agriculture) to ensure transparency and effective interaction between national and regional/local levels;
- **Thematic working groups of actors and experts**, permanent or ad-hoc and temporary, to facilitate initiation and dialogue and answer questions that emerge in the implementation of NAP actions;
- The **scientific committee** which will give scientific advice on: a) the relevance of the plan's actions and priorities, b) the experimental methods and protocols proposed in knowledge reinforcement actions as well as c) the results obtained through those actions.

The organisation of a symposium during the plan is also proposed. The symposium would serve as a **sharing mechanism** for actors involved in the implementation of the plan, as well as an **interface** with actors, decision-makers and, potentially, inhabitants of the Alsace plain who have a particular interest in the protection of the common hamster.

The figure below presents the overall governance proposed for the 2012-2016 NAP, highlighting its linkage with the governance of the "hamster" compensation offer (pending), the LIFE+ project (pending) and patronage (via the proposed "Hamster+" fund – see below). Linkage with regional governance (pending) in the area of biodiversity needs to be clarified.

4

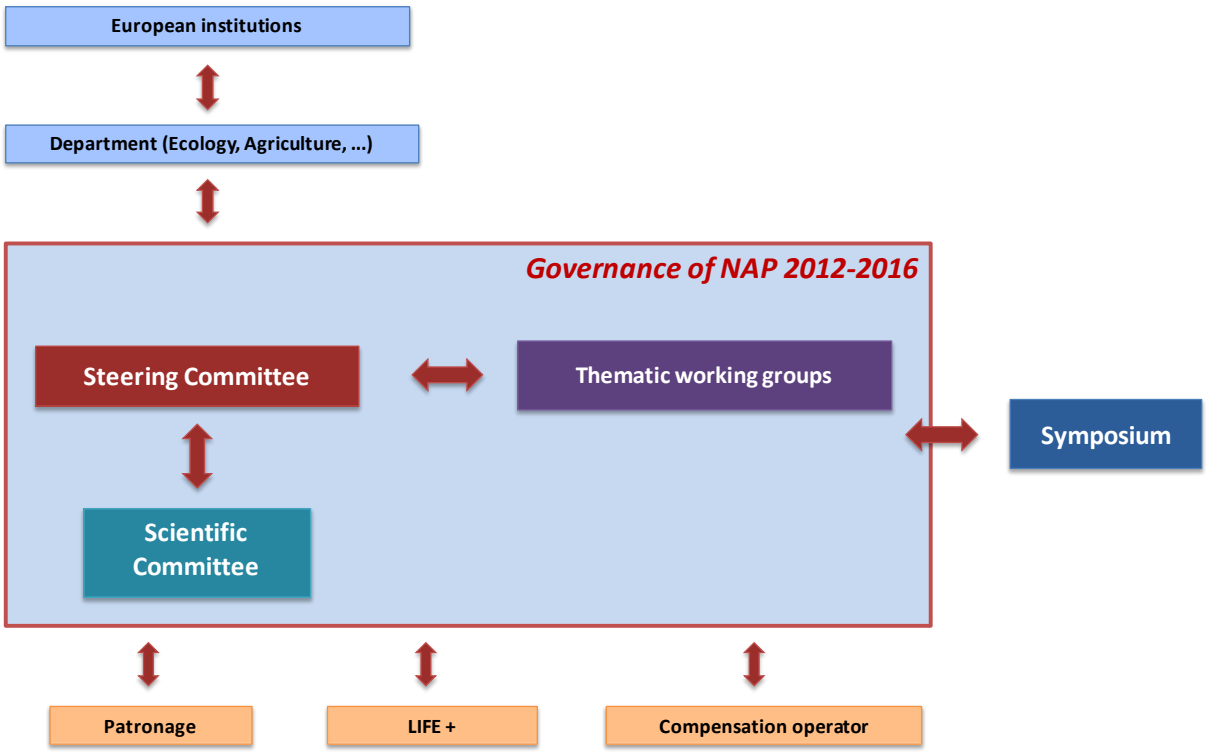


Figure 13. Governance of 2012-2016 NAP: schematic view

The table that follows recaps the role and responsibilities of each level of governance, as well as the stakeholders involved and the functioning of each level. These roles and responsibilities, as well as the members of each level of governance and the thematic guideline coordinators, will be specified by a Prefectural decision (see Annex 1). The governance of the 2012-2016 NAP will be reinforced by the implementation of specific cross-cutting actions aimed at ensuring regular monitoring of the NAP, territorial prioritisation, sharing of information and communication, and mobilisation of additional financial resources.

Table 3. NAP 2012-2016 governance: Roles and responsibilities of its main components

Components	Role and responsibilities	Coordinator/Operator	Members	Operating method & frequency
Steering Committee	Monitoring of implementation of the plan, strategic choices concerning regional orientations, decisions regarding actions to be financed by the "Hamster +" fund, links with parallel initiatives and programmes (e.g. SRCE), structuring with national and European levels	Chairperson: Prefect Secretariat: DREAL	Action coordinators, elected representatives and decision-makers of partner and funding organisations, local authorities, land-use planners, farming profession, environmental associations govt. services, etc.	Two meetings a year with a) a meeting in June focused on the implementation of actions in progress and b) a meeting in December to assess the year gone by, define the overall orientations and links with other regional strategies. Steering Committee decisions
Scientific Committee	Scientific assessment of: a) actions proposed, priorities and results achieved; b) methods and protocols proposed for knowledge reinforcement actions and c) results of those actions. *Ad-hoc* assessment provided to Steering Committee	Chairperson: one of the members of the Committee (appointed by all members) Secretariat: DREAL	10 experts and scientists from other research organisations and European countries	One meeting a year completed by online mobilisation of Scientific Committee members for assessment of documents and scientific choices, and thematic guideline coordinators' requests
Thematic working groups	Organisation and coordination of the activities proposed for a thematic guideline. Definition of priorities for the guideline, preparation of requests to Steering Committee to adapt activities or for additional funding, coordination with the activities of other thematic guidelines. Support for the preparation of proposals to be submitted to the "Hamster+" fund and urging of partners to contribute to the resource centre, etc.	One coordinator per thematic guideline	Partners of thematic guideline actions, organisations and stakeholders interested by the theme	Operating method and frequency defined by the coordination of each thematic guideline as required
Symposium	Mechanism for sharing and information regarding progress and main results achieved, discussions and exchanges among all regional stakeholders in order to identify new questions and key issues to be dealt with in the framework of the plan, collective assessment of plan progress	GEPMA	Event open to all with a wide public of farming profession, elected representatives, associations, interested residents, etc.	A symposium held during the plan to assess the progress of actions and their impacts on habitats and population status.

4

4.4 Operational objectives, principles and indicators for thematic guidelines

The implementation of the overall NAP strategy is structured around five thematic guidelines for which operational objectives, principles and monitoring indicators are proposed, completed by a cross-cutting guideline to ensure the effective implementation of the plan. The following sections present the objectives, key principles and monitoring indicators proposed for each guideline.

4.4.1 Guideline 1: Reinforce knowledge (coordinator: CNRS DEPE)

Despite the **growing implication of the research community** (including Europeans) in the issue of the preservation of hamsters, **numerous uncertainties linger** regarding the relationships between pressures, habitats and populations, and the optimal solutions for restoring the viability of hamster populations. This guideline provides for the implementation of knowledge reinforcement actions "**dedicated to action**" in the fields of biology and species behaviour, habitat and urban planning and infrastructures.

Objectives:

1 - Produce new knowledge on NAP priority questions and issues

2 - Ensure the transfer of knowledge to operational NAP stakeholders and thereby contribute to:

- Improving the effectiveness of NAP operations
- L''amélioration de l'état de préservation du hamster

Key principles:

1 - Understand the animal and its habitat in all states (wild and bred animals)

2 - Promote multidisciplinary and international research

3 - Get operational stakeholders involved in research-action

4 - Ensure the transparency and effectiveness of knowledge reinforcement actions

Monitoring indicators:

Added value of knowledge produced by research actions:

1 - For operational stakeholders: number of plan elements adapted or confirmed by knowledge reinforcement actions

2 - For the scientific community: number of articles published in symposiums, scientific journals, etc.

4.4.2 Guideline 2: Restore and protect habitats (coordinator: DRAAF)

In continuity with the 2007-2011 NAP, this guideline proposes to **expand the range of interventions leading to the improvement and protection of habitats**, combining favourable crops and practices and examining new economic opportunities for the agricultural products that would result from these new crops and practices. It is based on the emergence of a **collective territorial approach with the farming profession** to ensure the establishment of **appropriate meshing of favourable crops in time and space.**

Objectives:

1 - Favour the emergence of a positive collective approach to restoring and protecting habitats in the territories concerned

2 - Develop a dense favourable habitat and meshing of appropriate crops in and around all presence areas and the strict protection area, thereby contributing to achieving an objective of 30% favourable crops in high-density areas and maintaining survival strips near burrows

3 – Set up a survival strip near each burrow (within less than 300 metres)

Key principles:

1 - A consultation and co-building approach bringing together the farming profession, land owners, local authorities and all stakeholders

2 - Consideration of the technical and economic constraints of farms and regions in the preparation of measures and actions

3 - Preparation of attractive incentives that are sufficiently flexible to a) match the diversity of natural and technical-economic contexts encountered in the Alsace plain, and b) ensure the integration of new knowledge to reinforce the effectiveness of the proposed measures

Monitoring indicators:

1 - Number of farms engaged in regional collective approaches aimed at protecting hamsters

2 - Number of farms engaged in individual agro-environmental measures in the context of the NAP

3 – Number of hectares covered by contracts

4 – Percentage of favourable crops in a) presence areas of the species, b) high-density presence areas and c) strict protection area

5 – Percentage of favourable crops in year n within a 300 m radius of year n-1 burrows (agricultural ecological continuity)

6 – Survival strip area within a 300 m radius of the current year's burrows

7 – Density of animals per hectare of utilised agricultural land in presence areas of the species in the strict protection area

4

4.4.3 Guideline 3: Conserve the species ex-situ and reintroduce it effectively (coordinator: ONCFS)

In continuity with the 2007-2011 NAP, this guideline proposes to **reinforce the quality of stock breeding facilities and diversify them**, and improve the **effectiveness of reintroduction actions**. The 2012-2016 NAP underscores the transitional nature of population reinforcement actions, which should eventually cease once the viability of hamster populations is ensured in the Alsace plain.

Objectives:

1 – Produce high-quality stock bred animals in sufficient numbers for the selected priority release areas

2 – Reinforce endangered groups of individuals (below the critical threshold) according to the criteria proposed by the territorial commission, in compliance with a Ministerial authorisation, after consultation with the guideline partners, with the aim of sustaining and increasing the density of the populations present or extending the presence areas .

Key principles:

1 – High-quality breeding with appropriate animals

2 – Reinforcement, a transitional action for the safeguard of the species

3 – High-quality host areas for released animals, without facilitated predation

Monitoring indicators:

1 – Survival rate of animals released after 4 months and 1 year

2 – Breeding rates of females released after 4 months and 1 year

3 – Rate of increase of the number of burrows on release sites after 1 year, 3 years and 5 years.

4.4.4 Guideline 4: Avoid, Reduce and Compensate (coordinator: DREAL)

The 2012-2016 NAP addresses the linkage between urban and land-use planning, on the one hand, and protection and conservation of the hamster and its habitats on the other, in this specific guideline dedicated to the **Avoid, Reduce and Compensate** sequence. The actions proposed mainly target elected representatives and local and territorial authorities, combining **feedback** on current practices, development of **common frameworks** for operational implementation giving **visibility** to local authorities and stakeholders, and **operational actions** such as improvement of the passage of transport infrastructures and reconnection of hamster populations.

Objectives:

1 – Support the effective implementation of the Avoid, Reduce and Compensate sequence

2 – Ensure acknowledgment of the species in urban planning documents, plans and programmes

3 – Contribute to the SRCE [Regional Ecological Coherence Scheme] by identifying reservoirs of biodiversity and corridors for the hamster

4 – Ensure effective and optimal implementation of "hamster-friendly" compensation measures

5 – On the whole, contribute to the emergence of a positive approach on the part of elected representatives and land-use planning stakeholders, guaranteeing future possibilities for recovery

Key principles:

1 – A concerted approach that brings together all of the stakeholders and enables clear, readable (over time) and shared operational ground rules to be defined

2 – Give elected representatives and land-use planners visibility of their projects' compatibility with preservation issues

3 – Provide the greatest possible transparency of upcoming projects during the emergence phase for a shared search for alternatives that avoid all impact on hamsters and their habitats

4 – Ensure a consistent, practical and effective compensation approach

Monitoring indicators:

1 – Percentage of hamsters' area of presence in areas to be urbanised in "PLUs" [Local Urban Planning Schemes] and in graphical "SCOT" [Territorial Cohesion Plans] documents

2 – Surface area of habitats destroyed by projects and number of burrows impacted (under influence + buffer zone) by projects

3 – Number of hectares of favourable crops planted and number of hamsters released in the framework of compensation

4 – Survival rate after 4 months and 1 year of hamster populations released as part of compensation

5 – Number of corridors for hamsters effectively identified by the NAP

4

4.4.5 Guideline 5: Raise awareness and inform (coordinator: GEPMA)

The **Raise awareness and inform** guideline has a dual objective: first, to support the implementation of operational actions in the field and second, to progressively bring about a change in stakeholders' and inhabitants' perceptions, enabling the common hamster to "find its place" as emblematic species of biodiversity in the Alsace plain. This guideline proposes different information and communication actions designed for different target publics, in particular, the farming profession, elected representatives, local authority technicians, young people and inhabitants.

Objectives:

1 – Communication focused on the plan, making it possible to:

- Reinforce the effectiveness of implementation
- Ensure effective inclusion of the "hamster" theme in economic development and land-use planning

2 – Communication focused on biodiversity enabling the hamster to "find its place" as an emblematic species of biodiversity in the Alsace plain

Key principles:

1 – Awareness-raising actions adapted to a diversity of target publics

2 – Communication that is:

Based on partnership and involves key stakeholders and elected representatives

Truly instructive, transparent and objective

Professional and draws on a diversity of media

And includes other biodiversity issues in general

3 - Communication that favours the emergence of a positive dynamic around the species

Monitoring indicators:

1 – Change in perception of inhabitants, young people, elected representatives, stakeholders... between the start and end of the NAP assessed via opinion polls conducted in 2012 and 2016

Number of communication items implemented each year

N.B. Indicators concerning the number of persons affected by an awareness-raising action or the number of organised events are specified for each action.

4.4.6 Guideline 6: Support governance of the NAP (coordinator: DREAL)

The objective of the **Support governance of the NAP** guideline is to ensure the transparency and effectiveness of the implementation of the NAP. This guideline combines the following actions: organisation and reinforcement of governance, monitoring and assessment, mobilisation and sharing of knowledge and searching for additional funding.

Objectives:

1 – The objectives of the cross-cutting actions connected to the governance of the national action plan are the effectiveness and transparency of the implementation of the plan.

2 – The proposed actions pertain to organisation, mobilisation and sharing of information and knowledge, and the mobilisation of financial resources to meet new short-term NAP demands.

Key principles:

1 – A concerted approach, bringing together all of the stakeholders in accordance with their competencies and responsibilities

2 – Effective governance, ensuring the transparency of decisions made

3 – A key role assigned to the regional dimension

4 – Explicit linkage with national and European levels

5 – Overall monitoring of the NAP to ensure effective implementation

Monitoring indicators:

1 – Annual edition of the NAP scoreboard (number of actions in the plan implemented each year, budget invested, monitoring indicator for each action).

2 – Share of budgeted public and private financial resources mobilised each year compared to estimated amounts required.

3 – Number of steering committee, scientific committee and territorial commission meetings each year

4 – Habitat and population monitoring indicators:

- Number of hectares with favourable crops
- Number of burrows surveyed
- Number of municipalities with hamsters present

4

4.5 PROPOSED OPERATIONAL ACTIONS

The proposed actions meet the general and operational objectives of the plan, as well as the operational objectives and principles developed for each thematic guideline. Constructed in partnership with the regional stakeholders involved in each issue, and including the contributions of all participants in the 2012-2016 NAP preparation process, the actions are structured in 38 detailed action sheets for each thematic guideline (see Chapter 6) and the implementation of governance of the plan. The table below recaps the actions proposed, with a proposed level of priority of the actions, highlighting in particular:

- Essential **basic actions** that have a direct (short or medium-term) impact on the conservation status of the common hamster in Alsace and are necessary for the achievement of the 2012-2016 NAP objectives and monitoring;
- **Exploratory and innovative actions** that support and progressively improve the effectiveness of preservation of the species[13].

[13] Some actions combine both basic and innovative components which are kept in a single action sheet to ensure consistency and limit the number of actions proposed by the plan.

Table 4. List of actions planned in the NAP and priorities

Guideline	N°	Actions	Priority	Basic actions	Exploratory & innovative actions
Guideline 1: Knowledge	1.1	Create a controlled-environment hamster research station	2		X
	1.2	Monitor demography and distribution of populations resulting from reinforcements for improved modelling of wild populations' dynamic	2	X	X
	1.3	Complete population monitoring protocols	2	X	
	1.4	Assess the health of wild populations and research the impact on survival and breeding of the animals under controlled conditions	3	X	
	1.5	Experiment with new cultivation techniques	1	X	X
	1.6	Characterise best farming practices	3	X	
	1.7	Research improvement of the crossing of linear infrastructures by hamsters	3	X	X
Guideline 2: Habitat	2.1	Develop and implement a facilitation plan for setting up agricultural measures for the restoration and protection of hamster habitats	1	X	X
	2.2	Develop and implement a catalogue of new agro-environmental measures favourable to the species	1	X	
	2.3	Ensure continuous protection and food supply of hamsters throughout their period of activity	1	X	X
	2.4	Implement collective hamster-friendly crop rotation	1		X
	2.5	Develop agricultural sectors favourable to the development of hamsters	2		X
	2.6	Direct regulation of predators in common hamsters high density areas	2	X	
	2.7	Feasibility study for the creation of dedicated management areas	2	X	
Guideline 3: Breeding and releases	3.1	Implement population reinforcements	1	X	
	3.2	Monitor and improve releases	2	X	
	3.3	Continue ex-situ breeding	1	X	
	3.4	Prepare and implement stock breeding facility specifications and auditing	1	X	
	3.5	Diversify ex-situ breeding	2	X	
	3.6	Improve the quality of stock bred animals released	2	X	

4

Guideline 4: ARC	4.1	Take the hamster theme into consideration in urban and land-use planning documents	1	X	
	4.2	Help to have the hamster theme acknowledged in urban and land-use planning documents	1	X	
	4.3	Implement strict protection of the species and its habitats	1	X	
	4.4	Prepare an environmental equivalence table for the scaling of compensation	1	X	
	4.5	Produce a best practices guide on “reduction”	2	X	
	4.6	Develop local thematic governance regarding compensation	1		X
	4.7	Include the hamster in the ecological coherence scheme	1	X	
	4.8	Study the compatibility of the development of hamsters in certain “urbanised” areas	3		X
Guideline 5: Awareness-raising	5.1	Improve consideration of the species in agricultural themes and its acceptance by the profession	1	X	
	5.2	Contribute to the emergence of a positive hamster dynamic with elected representatives	1	X	
	5.3	Raise young people’s awareness	1	X	X
	5.4	Raise the general public’s awareness	3	X	X
	5.5	Train technicians on hamster protection issues	2	X	
Guideline 6: Cross-cutting	6.1	Ensure annual population monitoring	1	X	
	6.2	Monitor the hamster’s habitat spatially and temporally	1	X	
	6.3	Set up and run a resource centre	2	X	
	6.4	Propose a "Hamster+" fund	3		X
	6.5	Conduct an opinion poll and sociological survey of societal dynamics	3	X	

4.6 Plan implementation timetable

The 2012-2016 NAP will be implemented over a period of 5 years. The table below presents the timetable for the actions during this period.

Table 5. Acton implementation timetable

Guideline	N°	Actions	2012	2013	2014	2015	2016
Guideline 1: Knowledge	1.1	Create a controlled-environment hamster research station	X	X	X	X	X
	1.2	Monitor demography and distribution of populations resulting from reinforcements for improved modelling of wild populations' dynamic	X	X	X	X	X
	1.3	Complete population monitoring protocols	X	X	X	X	X
	1.4	Assess the health of wild populations and research the impact on survival and breeding of the animals under controlled conditions	X	X	X	X	
	1.5	Experiment with new cultivation techniques	X	X	X	X	X
	1.6	Characterise best farming practices	X	X	X	X	
	1.7	Research improvement of the crossing of linear infrastructures by hamsters	X	X			
Guideline 2: Habitat	2.1	Develop and implement a facilitation plan for setting up agricultural measures for the restoration and protection of hamster habitats	X	X	X	X	X
	2.2	Develop and implement a catalogue of new agro-environmental measures favourable to the species	X	X	X	X	X
	2.3	Ensure continuous protection and food supply of hamsters throughout their period of activity	X	X	X	X	X
	2.4	Implement collective hamster-friendly crop rotation	X	X	X	X	X
	2.5	Develop agricultural sectors favourable to the development of hamsters	X	X	X	X	X
	2.6	Direct regulation of predators in common hamsters high density areas	X	X	X	X	X
	2.7	Feasibility study for the creation of dedicated management areas		X			
Guideline 3: Breeding and releases	3.1	Implement population reinforcements	X	X	X	X	X
	3.2	Monitor and improve releases	X	X	X	X	X
	3.3	Continue ex-situ breeding	X	X	X	X	X
	3.4	Prepare and implement stock breeding facility specifications and auditing	X	X	X	X	X
	3.5	Diversify ex-situ breeding	X	X	X	X	X
	3.6	Improve the quality of stock bred animals released	X	X	X	X	X

Guideline 4: ERC	4.1	Take the hamster theme into consideration in urban and land-use planning documents	X	X	X	X	X
	4.2	Help to have the hamster theme acknowledged in urban and land-use planning documents		X			
	4.3	Implement strict protection of the species and its habitats	X	X	X	X	X
	4.4	Prepare an environmental equivalence table for the scaling of compensation		X	X	X	X
	4.5	Produce a best practices guide on "reduction"	X	X			
	4.6	Develop local thematic governance regarding compensation	X	X	X	X	X
	4.7	Include the hamster in the ecological coherence scheme		X			
	4.8	Study the compatibility of the development of hamsters in certain "urbanised" areas			X	X	X
Guideline 5: Sensibilisation	5.1	Improve consideration of the species in agricultural themes and its acceptance by the profession	X	X	X	X	X
	5.2	Contribute to the emergence of a positive hamster dynamic with elected representatives	X	X	X	X	X
	5.3	Raise young people's awareness	X	X	X	X	X
	5.4	Raise the general public's awareness	X	X	X	X	X
	5.5	Train technicians on hamster protection issues	X	X	X	X	X
Guideline 6: Transversal	6.1	Ensure annual population monitoring	X	X	X	X	X
	6.2	Monitor the hamster's habitat spatially and temporally	X	X	X	X	X
	6.3	Set up and run a resource centre	X	X	X	X	X
	6.4	Propose a "Hamster+" fund	X	X	X	X	X
	6.5	Conduct an opinion poll and sociological survey of societal dynamics	X	X	X	X	X

4.7 Duration, monitoring and assessments of the plan

In order to meet the objectives and comply with key principles of the NAP's overall strategy, particular attention will be given to the monitoring and assessment of the implementation of individual operational actions and the 2012-2016 NAP as a whole.

Monitoring of the plan will be materialised by an annual review of the actions initiated, which will present:

- Status of hamster populations (number of burrows surveyed, municipalities and presence areas);
- Status of habitats, whether in hamsters' presence areas, in the strict protection area or in neighbouring areas, with a comparison between different areas used to assess the specific impact of the plan with respect to all climatic, socio-economic and political factors affecting habitats;

- These two common hamster conservation status indicators will be completed by monitoring of a limited number of key indicators pertaining to the "drivers" and their evolution, whether in hamsters' presence areas or in the strict protection area. The following may be monitored: surface area of favourable crops and average parcel size (agriculture), kilometres of roads and road traffic (infrastructures and passage), artificialised areas (urban planning) or number of inhabitants (overall pressure);
- Data on the indicators planned for each action and each guideline;
- Actions implemented, their progress and, conversely, actions not implemented – identifying the main factors impacting (positively or negatively) the implementation of particular actions;
- Sums committed and their distribution among the guidelines and per funder, highlighting difficulties encountered in mobilising certain financial resources or additional financial resources that may have been allocated to the implementation of actions in the plan;
- Report on exchanges within the different governance structures (steering committee, scientific committee, thematic groups), in particular, elements discussed and decisions made that affect the operational implementation of the plan;
- Recommendations to reinforce the effectiveness of the implementation of the NAP submitted to the steering committee for discussion and, if considered relevant, for validation.

The different indicators proposed, specific to a given action or related to a guideline or the overall NAP, will be presented as absolute values and relative values compared to an established threshold (e.g. 2 burrows per hectare or 30% favourable crops) or compared to the value of the indicator for the previous year in order to show progress made from one year to the next.

This information will be presented concisely in a document completed by a scoreboard (an example of a scoreboard that could be prepared for annual monitoring is proposed in Annex II of the 2012-2016 NAP) to be developed by the main guideline and action coordinators under the coordination of the DREAL. The document will be discussed at the steering committee meeting at which the scheduling for the following year will also be presented and discussed.

A **final assessment is also planned at the end of the plan in 2016**, in order to assess the effectiveness of the actions implemented to reinforce the viability of hamster populations in Alsace and to assess the relevance of and/or need for a fourth plan. Based on a technical and financial review produced by the plan coordinator, and contributions by the different thematic guideline and action coordinators, an independent organisation will carry out the final assessment of the plan in the framework of a consultation process that involves all stakeholders.

4

4.8 FINANCIAL ESTIMATE

The cost of the national action plan 2012 – 2016 for the protection of common hamsters is detailed in the table below. The total cost (**theoretical maximum)** of the actions proposed for implementation in the NAP (based on the assumption that all of the actions are implemented) amounts to **10,337,640 euros**[14], with the costs of some actions however not having been reported in their entirety. Certain costs paid by supporting structures, including the costs of project managers of government services (DREAL, DDT and DRAAF) have not all been included or will have to be fine-tuned following a more precise operational definition of the actions. The share of costs requiring NAP-specific funding amounts to **9,523,840 euros**. The following table presents the costs for each of the actions proposed and also indicates the total cost for the PNA.

Table 6. Preliminary financial estimate of 2012-2016 NAP

GUIDELINES	N°	ACTIONS	TOTAL COST (€)	COST FOR NAP (€)
Guideline 1: Knowledge	1.1	Create a controlled-environment hamster research station	1 020 000	675 000
	1.2	Monitor demography and distribution of populations resulting from reinforcements for improved modelling of wild populations' dynamic	35 000	35 000
	1.3	Complete population monitoring protocols	45 160	45 160
	1.4	Assess the health of wild populations and research the impact on survival and breeding of the animals under controlled conditions	545 000	197 000
	1.5	Experiment with new cultivation techniques	174 000	120 000
	1.6	Characterise best farming practices	200 000	200 000
	1.7	Research improvement of the crossing of linear infrastructures by hamsters	80 000	80 000
		Total Guideline 1: Knowledge	**2 099 160**	**1 352 160**

[14] These costs do not include financial compensation granted to members of the farming profession who may locally suffer damage to their crops linked to the common hamster.

Guideline 2: Habitat	2.1	Develop and implement a facilitation plan for setting up agricultural measures for the restoration and protection of Hamster habitats	300 000	300 000
	2.2	Develop and implement a catalogue of new agro-environmental measures favourable to the species	2 250 000	2 250 000
	2.3	Ensure continuous protection and food supply of hamsters throughout their period of activity	200 000	200 000
	2.4	Implement collective hamster-friendly crop rotation	1 500 000	1 500 000
	2.5	Develop agricultural sectors favourable to the development of hamsters	100 000	100 000
	2.6	Direct regulation of predators in common hamsters high density areas	0	0
	2.7	Feasibility study for the creation of dedicated management areas	50 000	50 000
		Total Guideline 2: Habitat	**4 400 000**	**4 400 000**
Guideline 3: Breeding and releases	3.1	Implement population reinforcements	460 080	460 080
	3.2	Monitor and improve releases	78 400	51 600
	3.3	Continue ex-situ breeding	825 000	825 000
	3.4	Prepare and implement stock breeding facility specifications and auditing	25 000	25 000
	3.5	Diversify ex-situ breeding	475 000	475 000
	3.6	Improve the quality of stock bred animals released	20 000	20 000
		Total Guideline 3: Breeding and releases	**1 883 480**	**1 856 680**
Guideline 4: ARC	4.1	Take the hamster theme into consideration in urban and land-use planning documents	0	0
	4.2	Help to have the hamster theme acknowledged in urban and land-use planning documents	30 000	30 000
	4.3	Implement strict protection of the species and its habitats	0	0
	4.4	Prepare an environmental equivalence table for the scaling of compensation	40 000	40 000
	4.5	Produce a best practices guide on “reduction”	40 000	40 000
	4.6	Develop local thematic governance regarding compensation	0	0
	4.7	Include the hamster in the ecological coherence scheme	50 000	50 000
	4.8	Study the compatibility of the development of hamsters in certain “urbanised” areas	190 000	190 000
		Total Guideline 4: ARC	**350 000**	**350 000**

4

Guideline 5: Awareness-raising	5.1	Improve consideration of the species in agricultural themes and its acceptance by the profession	0	0
	5.2	Contribute to the emergence of a positive hamster dynamic with elected representatives	5 000	5 000
	5.3	Raise young people's awareness	100 000	100 000
	5.4	Raise general public's awareness	130 000	90 000
	5.5	Train technicians on hamster protection issues	15 000	15 000
		Total Guideline 5: Awareness-raising	**250 000**	**210 000**
Guideline 6: Cross-cutting	6.1	Ensure annual population monitoring	50 000	50 000
	6.2	Monitor the hamster's habitat spatially and temporally	750 000	750 000
	6.3	Set up and run a resource centre	300 000	300 000
	6.4	Propose a "Hamster+" fund	225 000	225 000
	6.5	Conduct an opinion poll and sociological survey of societal dynamics	30 000	30 000
		Total Guideline 6: Cross-cutting	**1 355 000**	**1 355 000**
		TOTAL	**10 337 640**	**9 523 840**

Total priority 1	**6 759 080**	**6 705 080**
Total priority 2	**2 178 560**	**1 806 760**
Total priority 3	**1 400 000**	**1 012 000**

The cost breakdown according to the different guidelines is presented in the figure below. Restoration and protection of habitats accounts for a third of the estimated costs, ahead of conservation of the species ex-situ and reintroduction actions.

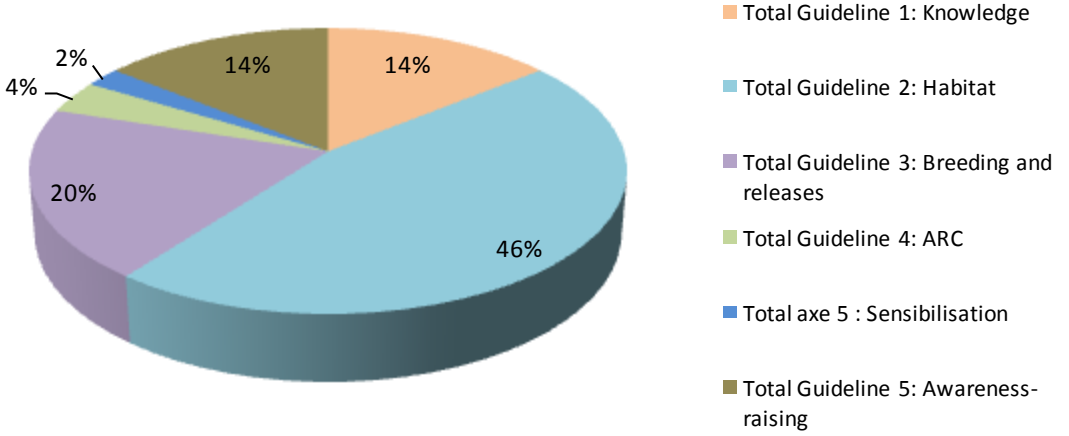
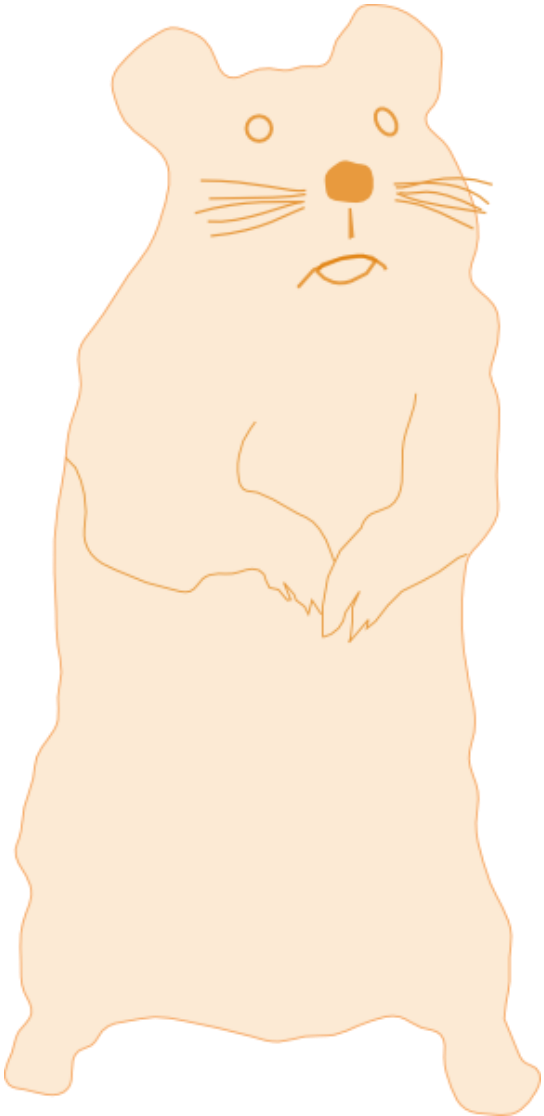


Figure 14. Breakdown of estimated costs according to 2012-2016 NAP guidelines

Different sources of funding for the proposed actions were identified during the preparation of the 2012-2016 NAP. The Alsace Region and General Councils 67 & 68 have agreed to support the implementation of the 2012-2016 NAP along with government services, with the relative importance of the difference sources of funding (for the French government and local authorities in particular) depending on the political priorities of the local authorities and potentially varying from one guideline to another.

Additional sources of funding (European, patronage, research funding, etc.) will be actively sought throughout the 2012-2016 NAP. This funding could enable exploratory and innovative actions (see table below) to be implemented to support and progressively improve the effectiveness of the preservation of the species.

5. Action sheets for the 2012-2016 NAP



5 Action sheets for the 2012-2016 NAP

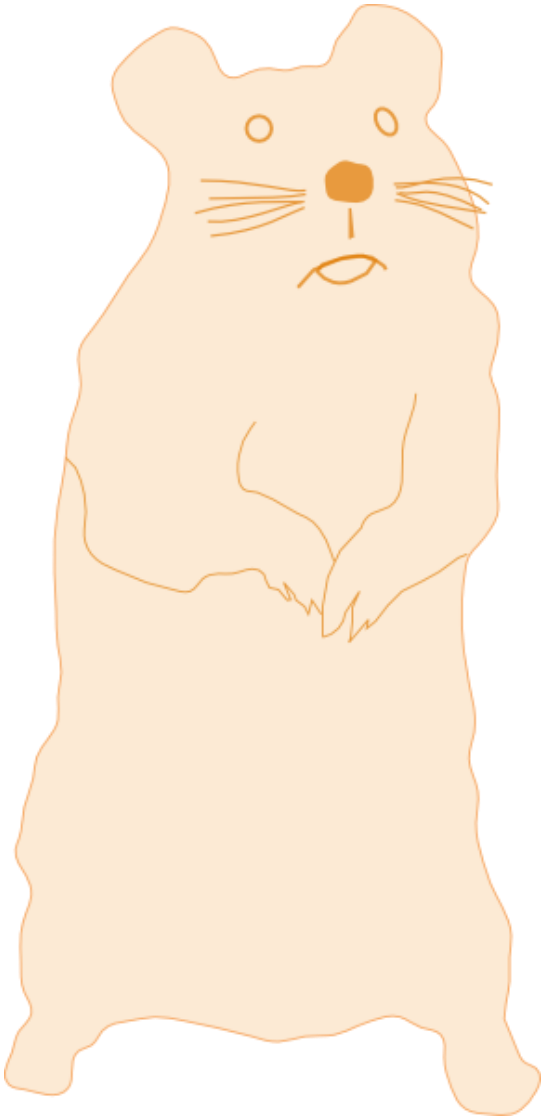
Each action is presented below in a data sheet that describes the action and the stages of the process, highlights operational implementation issues (links with other actions, expected implementation difficulties), indicates the resources (human and financial) needed for its implementation and its provisional timetable, and specifies the governance of the action proposed (project owner, potential partners, expected financers, etc.)

The actions are presented according to the different guidelines that structure the 2012-2016 NAP:

- Guideline 1 – Reinforce knowledge;
- Guideline 2 – Restore and protect habitats;
- Guideline 3 – Conserve the species ex-situ and reintroduce it effectively;
- Guideline 4 – Avoid, Reduce and Compensate;
- Guideline 5 – Raise awareness and inform;
- Guideline 6 – Support governance of the plan.

GUIDELINE 1: REINFORCE KNOWLEDGE

The action sheets for this guideline are classified by theme in order to clearly identify the objective to which each action will contribute.



5

DEVELOP KNOWLEDGE ON BIOLOGY AND BEHAVIOUR OF THE SPECIES

ACTION 1.1	CREATE A CONTROLLED-ENVIRONMENT HAMSTER RESEARCH STATION	PRIORITY 1 2 3

ACTION GUIDELINE	Reinforce knowledge
OPERATIONAL OBJECTIVE	Ensure the transfer of knowledge to NAP operational stakeholders and thereby contribute to improving the effectiveness of NAP interventions
CONTEXT	Get to know the species' biology and, in particular, its dietary needs and breeding, and the link between pathogens and survival
DESCRIPTION OF ACTION	Experimentation under controlled and semi-natural conditions (outdoor enclosures)
STAGES OF PROCESS	Obtaining of DDPP 67 authorisations (capacity, approval), outfitting of nursery facilities, construction of enclosures, start-up of breeding, experimentation: measurement of hibernation and breeding success in enclosures with crops to be defined (historical or particularly new economically favourable crops), measurements under controlled conditions of the effects of pathogens observed on the survival and breeding success of hamsters, study of the link between predation and parasitism
LINKS WITH OTHER ACTIONS	State of health of populations in the wild and study of the impact on survival and breeding, improvement of reinforcements, improvement of stock breeding, favourable habitat
REGION CONCERNED	Fort Joffre (Holtzheim)
MONITORING INDICATORS	Number of species preservation improvement hypotheses tested
EXPECTED DIFFICULTIES	Financial
ACTION COORDINATOR	CNRS (DEPE-IPHC)
EXPECTED PARTNERS	ONCFS, Chamber of Agriculture, INCI, Laboratoire départemental d'analyses (CG 67)
HUMAN RESOURCES NEEDED	1 animal technician part-time, 1 PhD research student
MATERIAL NEEDS	Outfitting of an indoor animal facility with laundry, outfitting of outdoor enclosures, equipment (breeding material, telemetry), operation (food and litter, consumables and material restoration)
ESTIMATED COSTS	Outfitting: €135,000; equipment: €30,000; operation: €30,000 per year; personnel: €52,000 per year; CNRS staff: €69,000 per year (1 research director at 15% of time for management of the station; 1 engineering assistant as technical manager of the station, 100%); experimentation (analyses): €25,000 per year (as from year 2)
TOTAL COST FOR NAP	€165,000 of capital expenditure and €82,000 per year for operation + €25,000 per year (as from year 2)
FUNDING SOURCES	Alsace Region, MEDDE, FEDER, Université de Strasbourg, ANR, Zone Atelier Environnement Urbain, CNRS (staff costs)
PROVISIONAL TIMETABLE	Year 1: Outfitting, construction of enclosures Year 2: Start of breeding and experiments Years 3 to 5: Continuation of breeding and experiments
LINKS WITH OTHER NAPS	
REFERENCES	

5

ACTION 1.2	MONITOR DEMOGRAPHY AND DISTRIBUTION OF POPULATIONS RESULTING FROM REINFORCEMENTS FOR IMPROVED MODELLING OF THE DYNAMIC OF WILD POPULATIONS	PRIORITY 1 2 3

ACTION GUIDELINE	Reinforce knowledge
OPERATIONAL OBJECTIVE	Produce new knowledge on NAP priority questions and issues
CONTEXT	The demographic parameters of wild hamster populations in Alsace are presently unknown. Yet they could provide an understanding as to why certain populations are decreasing and thereby allow action to be taken more effectively to preserve them. To avoid taking wild individuals as samples from high-density presence areas, the collection of demographic parameters by capture-marking-monitoring is planned in sites where population reinforcement is practised. These sites comprise "wild" descendants of in situ bred hamsters and may be preferred locations for monitoring demographic parameters. The data collected can be used to model and gain a better understanding of wild populations as a whole.
DESCRIPTION OF ACTION	Recovery of the data collected for action sheet 3.2 and association with environmental factors (ground cover, crop rotation typology, description of habitat, etc.). Modelling of the dynamic of wild populations and determination of the conditions that ensure the maintaining/development of populations in the Alsatian agricultural framework based on the data collected for action sheet 1.2.
STAGES OF PROCESS	1) Preparation of protocols 2012 2) In situ data collection 2012-2015 3) Analysis and modelling, combining with environmental data (2016)
LINKS WITH OTHER ACTIONS	1.4 Assess the health of wild populations 1.6 Characterise the ecosystem and favourable farming practices 3.2 Monitor and improve releases
REGION CONCERNED	Range of hamster populations resulting from reinforcement operations
MONITORING INDICATORS	Effective modelling of population dynamics
EXPECTED DIFFICULTIES	1) The range of these individuals may be too small for this parameter to be included in modelling.
ACTION COORDINATOR	CNRS
EXPECTED PARTNERS	CNRS CEFE and DEPE, INRA, LIVE, Departmental hunting federations, SENCKENBERG Research Institute
HUMAN RESOURCES NEEDED	Biostatistician for data analysis and support for modelling. Master 2 intern (2016)
MATERIAL NEEDS	No particular need (equipment acquired for action 3.2)
ESTIMATED COSTS	€35,000 Including a 6-month Master 2 internship (2015 or 2016):€ 2580
TOTAL COST FOR NAP	€35,000
FUNDING SOURCES	MEDDE, local authorities, patronage
PROVISIONAL TIMETABLE	Year 1: preparation of protocols Years 2 to 4: in situ data collection Year 5: modelling
LINKS WITH OTHER NAPs	There have still been few attempts at modelling the dynamic of the species in an NAP.
REFERENCES	ONCFS: SWINNEN, 2011

ACTION N°1.3	COMPLETE POPULATION MONITORING PROTOCOLS	PRIORITY 1 2 3

ACTION GUIDELINE	Reinforce knowledge
OPERATIONAL OBJECTIVE	Contribute to improving the effectiveness of NAP interventions
CONTEXT	The initial aim of the ONCFS counting protocol validated in 2000 was to get to know the population development trends (abundance and range). However, it does not enable conclusions to be made with respect to abundance and range and their evolution from one year to another due to certain non-estimated biases (detectability of burrows, numerical relationship between number of burrows and number of individuals, crop rotations resulting in a change of perimeter of the surface area studied, etc.). It is essential to work on the development of new protocols that enable improvement of the interpretative value of the results of counts in a rare species context.
DESCRIPTION OF ACTION	Working methods to be developed for each of the two objectives by a working group including the ONCFS, CEFE-CNRS, CNRS DEPE and/or other organisations with fauna monitoring methods specialists.
STAGES OF PROCESS	This action calls for the redefinition of sampling and data analysis methods for each of the two objectives. It requires a study of the relationship between burrows and individuals over time (2014-2015), and of the probability of detection according to the type of ground cover (all crops and bare land) (2013-2015) and the phase of the annual biological cycle, the observer effect, etc.)
LINKS WITH OTHER ACTIONS	Experiment with new cultivation techniques, ensure annual population monitoring
REGION CONCERNED	Potential area of presence of the species.
MONITORING INDICATORS	Setting up of new protocols.
EXPECTED DIFFICULTIES	Variation of the relationship between number of burrows and number of individuals over the activity period.
ACTION COORDINATOR	ONCFS
EXPECTED PARTNERS	CEFE-CNRS (biostatistician specialised in fauna monitoring methods), CNRS DEPE, Research and development agent, Chamber of Agriculture.
HUMAN RESOURCES NEEDED	1 shared Engineer position (involved in several action sheets for the knowledge guideline) at the ONCFS over the 2012-2013 period specialised in biostatistics. Renewal to be provided for beyond 2013. An agreement for the participation of the CEFE-CNRS (biostatistician) 5 days per year. 2 Master 2 interns. 5 prospectors for application of the protocol in the field.
MATERIAL NEEDS	No particular needs.
ESTIMATED COSTS	Renewal of the biostatistician engineer position at the ONCFS beyond 2013. 2 x 6-month Master 2 internships (2013-2014) supervised by the ONCFS and CNRS CEFE: €5,160 CNRS CEFE statistical supervision-support: €2,500 per year 4 ONCFS experimentation prospectors: €5,500/year
TOTAL COST FOR NAP	€45,160
FUNDING SOURCES	Potentially LIFE+, MEDDE
PROVISIONAL TIMETABLE	Year 1: reflection and preliminary field studies Years 2 and 3: Master 2 internship - land and analyses Years 4 and 5: implementation
LINKS WITH OTHER NAPS	
REFERENCES	

5

ACTION 1.4	ASSESS THE HEALTH OF POPULATIONS IN THE WILD AND RESEARCH THE IMPACT ON SURVIVAL AND BREEDING OF THE ANIMALS UNDER CONTROLLED CONDITIONS	PRIORITY 1 2 3

ACTION GUIDELINE	Reinforce knowledge
OPERATIONAL OBJECTIVE	Produce new knowledge on NAP priority questions and issues
CONTEXT	Not all of mortality causes have been identified. Nothing is known about the pathologies (parasitic diseases, viral/bacterial diseases, cancer, intoxication, emaciation) from which the animals may suffer, or their consequences on their survival and breeding.
DESCRIPTION OF ACTION	The action is aimed at completing the analysis system set up by the ONCFS on carcases collected or living individuals captured during specific operations (e.g. telemetric monitoring carried out by the ONCF) by: 1) Parasitic, bacteriological and serological examinations, energy status, search for heavy metals (in blood samples, rectal smears, coat), autopsy of carcases; 2) Release-recapture of sentinel individuals within wild populations; 3) In parallel, studies under controlled conditions of the effects of identified pathologies over the hamster's annual cycle.
STAGES OF PROCESS	1) Training of stakeholders on the collection of carcases (SANEF, farmers, associations, etc.) and setting up of a protocol for the recovery of carcases collected and living wild individuals captured in the framework of field operations; 2) Application for transport permits for the action partners: 3) Collection and organisation of transfer resulting from the picking up of dead or live individuals in the framework of usual operations and then analyses; 4) Measurements under controlled conditions of the effects of pathogens observed on the survival and breeding success of hamsters; 5) Study of the link between parasitism and predation; 6) Determination of the age at death by a study of the skeleton.
LINKS WITH OTHER ACTIONS	Biodiversity Research Station, Monitoring of wild populations
REGION CONCERNED	Area of presence of the species, Biodiversity Research Station
MONITORING INDICATORS	Monitoring of state of conditions in the long term, and highlighting of impact on the breeding success of the species or the absence of impact
EXPECTED DIFFICULTIES	Permits for sampling on wild animals
ACTION COORDINATOR	CNRS (DEPE, INCI)
EXPECTED PARTNERS	UdS (Institut de Parasitologie), ONCFS, Laboratoire départemental d'analyses (CG 67), Naturaconst@, SFS
HUMAN RESOURCES NEEDED	1 engineer for the collection of samples and measurements in liaison with the ONCFS
MATERIAL NEEDS	Bioimpedance system, small consumable items, telemetry
ESTIMATED COSTS	Equipment: €30,000; analyses, experimentation: €30,000 per year; engineer: €47,000; CNRS staff: €87,000 per year (a researcher working 75% on this action, a research director working 15%, an engineering assistant working 50%)
TOTAL COST FOR NAP	€197,000
FUNDING SOURCES	ANR, MEDDE, CNRS (staff costs)

Provisional timetable	Years 1 to 4: collection of samples and analyses Years 2 to 4: measurements under controlled conditions, link with predation
Links with other NAPs	
References	

5

DEVELOP KNOWLEDGE FOR THE RESTORATION AND PROTECTION OF THE SPECIES' HABITATS

ACTION 1.5	EXPERIMENT WITH NEW CULTIVATION TECHNIQUES	PRIORITY 1 2 3

ACTION GUIDELINE	Reinforce knowledge
OPERATIONAL OBJECTIVE	Produce new knowledge on NAP priority questions and issues
CONTEXT	Crops provide ground cover and dietary resources for the Common Hamster. A major issue is the development of crops that are both hamster-friendly in terms of ground cover timing, quantity and nutritional quality, and also of economic interest to farmers. Factors to be tested concern the nature of crops, harvesting dates, seeding density, presence of weeds, planting dates of in-between crops, meshing of parcels, impact of agronomic parameters on survival and breeding, prey-predator interactions and changes of location of the species. In addition to scientific research in the laboratory (fundamental research, physiology, etc.), in free-range conditions (Fort Joffre station project) or in conventional farming environments (areas of presence of the species), an agro-environmental research platform may be considered with controlled environmental conditions and a network of volunteer farms to take part in the tests as well as participation in the dissemination of results.
DESCRIPTION OF ACTION	1) Choice of existing test sites, Fort Joffre, laboratory, conventional farming area and/or: • setting up of an experimental platform (continuous area that can be temporarily closed), Obernai Lycée Agricole (density of 2 burrows per hectare) could be the preferred site; • setting up of a network of volunteer pilot farms 2) Assessment of the biological interest and impact of the different technical itineraries tested: marking and telemetric monitoring of wild hamsters present in test parcels under controlled conditions. Action initiated in 2012 to study the feasibility and impact of harvesting dates. 3) Agro-economic assessment of the different technical itineraries tested (cultivation type and techniques, harvesting dates, in-between crops, economic benefits, etc.). 4) Inclusion of selected varieties in the variety tests conducted by the Chambers of Agriculture. 5) Dissemination of results, in particular through exchange sessions (visits to pilot farms, research sites).
STAGES OF PROCESS	2012-2014: Biological section: Identify research site or sites, preparation of a protocol and planning of experimentation, management of capture permits, installation of equipment and telemetric monitoring, analysis of results. Agronomic and technical section: selection of appropriate varieties, technological and sanitary analyses, agronomic and economic analyses.
LINKS WITH OTHER ACTIONS	Evolution of favourable farming sectors, population dynamic, improvement of releases
REGION CONCERNED	Area of presence of the species
MONITORING INDICATORS	Number of techniques tested
EXPECTED DIFFICULTIES	The variability of environment parameters could make all generalization a delicate matter.
ACTION COORDINATOR	Chamber of Agriculture
EXPECTED PARTNERS	ONCFS, Bas-Rhin General Council, Comptoir Agricole (technical and sanitary analyses of production) CNRS, INRA, regional authorities, LEGTA Obernai, Naturaconst@, associations, hunting federations, Ministry of Agriculture

5

HUMAN RESOURCES NEEDED	Chamber of Agriculture researcher: 10 days per year. Comptoir agricole researcher: 10 days per year. Staff: €54,000 for a CNRS research engineer for the design and installation of the monitoring system 1 shared ONCFS Engineer position over the 2012-2013 period specialised in biostatistics: telemetric monitoring and interpretation of results. Renewal of the position to be provided for beyond 2013. Organisation of exchange sessions.
MATERIAL NEEDS	Transmitters for telemetry (30 per year): €22,000 Cost of seeds: 1000€/year Cost of sanitary analyses: 1000€/year
ESTIMATED COSTS	€174,000
TOTAL COST FOR NAP	€120,000
FUNDING SOURCES	LIFE+, and compensation offer
PROVISIONAL TIMETABLE	Years 1 to 3: land and analyses Years 4 and 5: development
LINKS WITH OTHER NAPS	
REFERENCES	

ACTION 1.6	CHARACTERISE THE ECOSYSTEM AND FAVOURABLE FARMING PRACTICES	PRIORITY 1 2 3

ACTION GUIDELINE	Reinforce knowledge
OPERATIONAL OBJECTIVE	Produce new knowledge on NAP priority questions and issues
CONTEXT	With respect to the development of hamster populations, both rising and declining, the criterion of 22% favourable crops does not appear to be sufficiently explanatory. Other parameters may influence, such as the distribution of these crops over time (rotation) and space (crop rotation), countryside factors, and anthropic and geo-climatic factors. This entails defining minimum improvements to be made to each component of the environment in order to guarantee the growth of wild populations. This study will fine-tune knowledge of the critical factors regarding the habitat and be used in the definition of compensation.
DESCRIPTION OF ACTION	1) Based on information already available (counting and identification of burrows, mapping of crops (RPG), roads, soil, climate, other countryside structures, etc.), statistical analyses could be made at different levels in order to reveal significant parameters to explain the development of hamster populations (maintaining or disappearance) in certain sectors. 2) It is also possible to compare data on the species' presence with the habitat's quality. The habitat's quality would be assessed using methods that include current knowledge (quality of cultivation throughout the season and spatial and temporal distribution) in certain sectors. 3) The results of the statistical analyses could be used as input into the assessment methods and experimentation with new cultivation techniques and the definition of compensation measures.
STAGES OF PROCESS	For statistical analysis of existing data: 1) Data mining (analysis of data quality); 2) In the event that data is not sufficiently robust for the analyses planned, propose a PhD thesis comprising, in particular, a study of the characterisation of favourable habitats; 3) Statistical analyses of spatial and descriptive data: fragmentation, specific resources, etc.; 4) Define the associations (statistical, spatial, etc.) that can be used to define the habitat; 5) Multicriteria analysis; 6) Collection of new data according to the adjustment of quality to fit objectives; 7) Production of a guide on favourable habitats of the common hamster of Alsace.
LINKS WITH OTHER ACTIONS	Assistance with the setting up of crops and their distribution on the experimental platform; monitoring of habitat; implementation and monitoring of meshing.
REGION CONCERNED	Areas effectively occupied by hamsters during the chosen historical sequence (Obernai, Geispolsheim, Kochersberg)
MONITORING INDICATORS	Publication of a guide on favourable habitats of the common hamster of Alsace
EXPECTED DIFFICULTIES	Data quality (counting performed solely in hamster-friendly crops, less accurate counting of burrows prior to 2009, etc.).
ACTION COORDINATOR	CNRS, LIVE
EXPECTED PARTNERS	O. Keichinger, ONCFS, SERTIT, ARAA, DRAAF, LEGTA Obernai, biostatisticians (LORIA, CEFE, etc.), INRA
HUMAN RESOURCES NEEDED	1 PhD student (€150,000 over 3 years)
MATERIAL NEEDS	€20,000

5

ESTIMATED COSTS	Funding of a thesis: €150,000 Assessment of the quality of the habitat based on RPG available since 2007 and comparison with burrow counts: €50,000
TOTAL COST FOR NAP	€200,000
FUNDING SOURCES	LIFE+
PROVISIONAL TIMETABLE	Years 1 and 2: assessment of quality of habitat Years 2 to 4: funding of a thesis
LINKS WITH OTHER NAPS	Similar work on the habitat of protected species has been done, for example for the little bustard whose habitat is agricultural as well.
REFERENCES	

Develop knowledge on the avoid, reduce, compensate theme

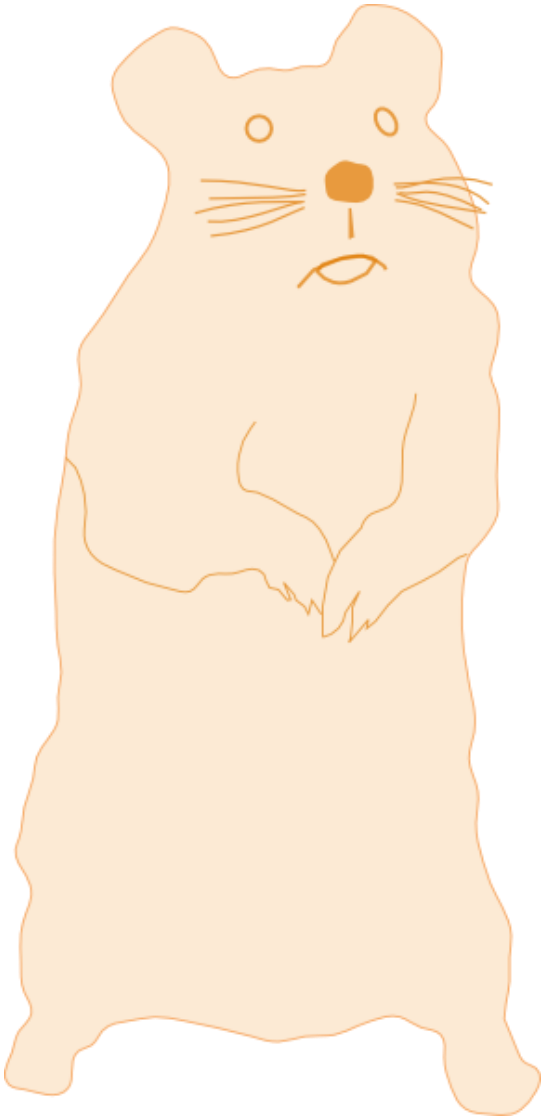
5

ACTION 1.7	RESEARCH IMPROVEMENT OF THE CROSSING OF LINEAR INFRASTRUCTURES BY HAMSTERS	PRIORITY 1 2 3

ACTION GUIDELINE	Reinforce knowledge
OPERATIONAL OBJECTIVE	Ensure the transfer of knowledge to NAP operational stakeholders and thereby contribute to improving the effectiveness of NAP operations and hamster preservation status
CONTEXT	Infrastructure passageways have been built to facilitate the passage of hamsters, limit their habitat fragmentation and provide a link between populations that would be isolated by such infrastructures. In parallel, numerous facilities (buses, bridges, etc.) exist on all linear roads and infrastructures which hamsters may potentially cross. Questions are raised however regarding the actual hamster passage points, the effectiveness of crossing structures (whether or not dedicated to hamsters), their capacity to limit negative impacts of linear infrastructures on hamster populations or the possibility of setting up additional passageways on certain infrastructures to reconnect certain populations.
DESCRIPTION OF ACTION	The action consists of: a) analysis of current crossing of linear infrastructures by hamsters, b) identification of priority passage points that could reconnect isolated populations, and c) implementation of specific actions aimed at improving the crossing of linear infrastructures at points considered as priorities.
STAGES OF PROCESS	1) Literature review of experiments and research in the area of infrastructure crossing, interviews with experts and researches from other countries working on the topic; 2) Based on the monitoring protocol developed and tested by the CNRS for analysing the effectiveness of crossing structures, develop a methodology for identifying the hamsters' main passageways, analysing crossing modes (use of specific infrastructures or not) and their effectiveness and for identifying possible adaptations (construction of new special-purpose infrastructures, adaptation of existing infrastructures, etc.) enabling improvement of crossing opportunities and possibilities of reconnecting populations; 3) Application of the method and data collection; 4) Analysis of results; 5) Preparation of recommendations and best practices regarding crossing; 6) Presentation and discussion of results and recommendations with key stakeholders and experts (meeting/workshop); 7) Identification of priority locations for improving crossing and proposal of suitable crossing modes for the chosen pilot sites; 8) Implementation of projects to improve crossing on pilot sites; 9) Monitoring and assessment of project effectiveness; 10) Editing of a guide on the crossing of linear infrastructures by hamsters.
LINKS WITH OTHER ACTIONS	Knowledge guideline (see, in particular, a link with the project conducted by the CNRS for preparing and testing monitoring protocols)
REGION CONCERNED	Hamsters' presence areas
MONITORING INDICATORS	Publication of a guide on the crossing of linear infrastructures by hamsters
EXPECTED DIFFICULTIES	Limited number of crossing structures and contexts not allowing general recommendations and best practices rules to be established
ACTION COORDINATOR	CNRS (DEPE)
EXPECTED PARTNERS	CG 67, DREAL, Chambers of Agriculture, Land-use planning stakeholders, CG 68, ZAEU and associations
HUMAN RESOURCES NEEDED	

Material needs	Needs defined by monitoring protocol (cameras, etc.) will be specified in the method developed in stage 2
Estimated costs	€80,000 (activities 1 to 6 excluding cost of work for concrete projects implemented and tested on pilot sites) – Costs to be verified in relation to experiences in other countries
Total cost for NAP	€80,000
Funding sources	Infrastructure and compensation offer managers, LIFE+ project (for mobilisation of experiences of other European countries if the LIFE project includes urban and land-use planning issues).
Provisional timetable	Years 1 and 2: implementation of study
Links with other NAPs	Link with the activities of hamster protection actions in other European countries
References	

GUIDELINE 2: RESTORE AND PROTECT HABITATS



5

ACTION 2.1	PREPARE AND IMPLEMENT A FACILITATION PLAN FOR SETTING UP AGRICULTURAL MEASURES FOR THE RESTORATION AND PROTECTION OF HAMSTER HABITATS	PRIORITY 1 2 3

ACTION GUIDELINE	Restore and protect habitats
OPERATIONAL OBJECTIVE	Schedule facilitation actions aiming at achieving the implementation objectives of hamster-friendly agricultural measures
CONTEXT	The percentage of hamster-friendly crops should reach at least 22% of utilised agricultural land in the strict protection area, and 25% in high-density areas in 2012 and 30% in 2016. At the end of 2012, old-generation territorialised AEMs expire. The contracts will have to be renewed according to new provisions aimed at greater effectiveness. To achieve these objectives, a specific facilitation programme must be prepared and set up for farmers in the concerned area.
DESCRIPTION OF ACTION	The action is aimed at preparing a programme to mobilise farmers regarding the measures. It includes explaining the collective crop rotation management measure, after having set priorities, facilitating consultations and supporting contractualisation. And, where it is considered necessary, farmers will be made aware of the option of voluntarily hosting hamster releases to reinforce the population.
STAGES OF PROCESS	1) Preparation of a facilitation plan consistent with the progress of the setting up of hamster-friendly agricultural measures, in cooperation with concerned institutions, namely DREAL, ONCFS, DDTs, Chamber(s) of Agriculture, and possibly General Council(s). The plan should stipulate which actions will be implemented, by whom and at what pace. 2) Designation of facilitation structures 3) Implementation under the direction of the DRAAF of facilitation and monitoring of process
LINKS WITH OTHER ACTIONS	Other guidelines: implementation of agricultural measures and population reinforcement.
REGION CONCERNED	Area of presence and strict protection area (Figure 11)
MONITORING INDICATORS	Number and types of contacts (meeting, individual contacts, etc.) with eligible farmers. Number of farmers reached.
EXPECTED DIFFICULTIES	Finding facilitation structures
ACTION COORDINATOR	Chamber of Agriculture, backed by the DRAAF
EXPECTED PARTNERS	DREAL, DDT, ONCFS Chambers of Agriculture, General Councils, etc.
HUMAN RESOURCES NEEDED	To be defined.
MATERIAL NEEDS	Presentation documents – facilitation agreement
ESTIMATED COSTS	€60,000 per year
TOTAL COST FOR NAP	€300,000
FUNDING SOURCES	MAAF + FEADER
PROVISIONAL TIMETABLE	Year 1: definition Years 2 to 5: implementation
LINKS WITH OTHER NAPS	
REFERENCES	

ACTION 2.2	DEVELOP AND IMPLEMENT A CATALOGUE OF NEW AGRO-ENVIRONMENTAL MEASURES FAVOURABLE TO THE SPECIES	PRIORITY 1 2 3

ACTION GUIDELINE	Restore and protect habitats
OPERATIONAL OBJECTIVE	Ensure at least 22% favourable crops, alfalfa and winter straw cereals, in hamsters' presence areas and the strict protection area, and 25% in 2012 and 30% in 2016 in high-density areas.
CONTEXT	Although the ratio of 22% favourable crops was achieved, the development of the hamster population is still insufficient. The improvement of crops positioning (300 metres between two crops, i.e. the hamsters' maximum travel distance) and the possibility of exceeding the minimum favourable crop ratio of 22% will improve ground cover and food supply, limit spring mortality and favour breeding at the start of the season.
DESCRIPTION OF ACTION	Setting up of rotation with predominantly alfalfa or winter straw cereals, in the context of individual measures. Spring crops (sugar beets, potatoes, cabbage for sauerkraut, etc.) are authorised in the rotation insofar as they do not have an adverse effect on hamsters.
STAGES OF PROCESS	1- Construction and administrative supervision of the new individual territorialised AEMs; 2- Delimitation by the two Ministries' decrees of the eligibility area for the measures: presence area and strict protection area; 3- Implementation of the measures each year; 4- Signing of contracts.
LINKS WITH OTHER ACTIONS	Population monitoring, facilitation, reinforcements.
REGION CONCERNED	Species presence area and strict protection area
MONITORING INDICATORS	Number of contracts and area covered by contracts each year by type of favourable crop
EXPECTED DIFFICULTIES	
ACTION COORDINATOR	DRAAF
EXPECTED PARTNERS	Facilitation defined in action 2.1
HUMAN RESOURCES NEEDED	Graphical Demarcation Survey, GIS
MATERIAL NEEDS	For rotation with 3 years of alfalfa: €551 per hectare for 5 years For rotation with 3 years of cereals: €224 per hectare for 5 years
ESTIMATED COSTS	€2,500,000
TOTAL COST FOR NAP	MAAF + FEADER
FUNDING SOURCES	Year 1: implementation of old territorialised AEMs + zoning + preparation of new territorialised AEMs Years 2 to 5: implementation of new territorialised AEMs
PROVISIONAL TIMETABLE	
LINKS WITH OTHER NAPs	
REFERENCES	Restore and protect habitats

5

ACTION 2.3	ENSURE CONTINUOUS PROTECTION AND FOOD SUPPLY OF HAMSTERS THROUGHOUT THEIR PERIOD OF ACTIVITY	PRIORITY 1 2 3

ACTION GUIDELINE	Restore and protect habitats
OPERATIONAL OBJECTIVE	Favour continuous ground cover to guarantee hamster protection and food supply at the end of the season.
CONTEXT	Due to new techniques and climatic conditions, straw cereal harvesting is done earlier, now beginning in July in Alsace. The absence of ground cover from July to September exposes hamsters to predation and insufficient food supply. Maintaining alfalfa and straw cereal ground cover by not harvesting can enable up to two additional litters per year and ensure effective protection of hamsters until they go into hibernation.
DESCRIPTION OF ACTION	Setting up of refuge areas in uncut alfalfa parcels in summer and also by maintaining 20 m strips of unharvested cereals in the immediate vicinity of burrows.
STAGES OF PROCESS	1- Preparation of specifications and inclusion in the administrative territorialised AEM guidelines 2- Yearly identification of the current year's burrows validated by the ONCFS with the aim of locating unharvested strips as close as possible to burrows 3- Setting up of survival strip territorialised AEMs (may be combined with favourable crop territorialised AEMs) and information panels for third parties
LINKS WITH OTHER ACTIONS	Population monitoring, facilitation, reinforcements.
REGION CONCERNED	Alfalfa and straw cereal parcels located in the area of presence.
MONITORING INDICATORS	Proportion of unharvested crops located near burrows counted in the year (within a 300 m radius).
EXPECTED DIFFICULTIES	The concept of "not harvesting" is difficult for farmers to understand and therefore difficult to implement. It is not customary to leave crops in the field, especially cereals, and particularly wheat. Fears on the risk of an outbreak of other undesirable rodents are an additional difficulty.
ACTION COORDINATOR	DRAAF
EXPECTED PARTNERS	ONCFS, DDT67, DDT 68, DRAAF, Mayors of municipalities concerned, Chamber of Agriculture
HUMAN RESOURCES NEEDED	Facilitation defined in action 2.1
MATERIAL NEEDS	Graphical Demarcation Survey, GIS
ESTIMATED COSTS	€60 per PVC information panel (investment only) Alfalfa: €125 per unharvested hectare per year x spreading coefficient Cereals: €828 per unharvested hectare per year x spreading coefficient
TOTAL COST FOR NAP	Estimate of €40,000 per year, i.e. €200,000
FUNDING SOURCES	MAAF + FEADER
PROVISIONAL TIMETABLE	Year 1: facilitation for maintaining current priority action + construction of new unharvested territorialised AEM strips Years 2 to 5: tracking of burrows and incentive to set up unharvested strips.
LINKS WITH OTHER NAPS	
REFERENCES	

ACTION 2.4	IMPLEMENT COLLECTIVE HAMSTER-FRIENDLY CROP ROTATION	PRIORITY 1 2 3

ACTION GUIDELINE	Restore and protect habitats
OPERATIONAL OBJECTIVE	Enable collective management of favourable crops in small-size parcels that may belong to different owners, according to hamster movement.
CONTEXT	The essential variations of crops from one parcel to another, linked to agronomic requirements and land fragmentation due to the large number of farmers does not take hamster movement into consideration. In particular, from one year to another, the hamster may move around on another farmer's parcel. A collective decision on the choice of crop rotation would enable favourable crops to be located annually as close as possible to burrows. Collective organisation will be implemented at the appropriate level for both the hamster and the preparation of collective crop rotation.
DESCRIPTION OF ACTION	Organisation of at least one collective meeting per year. Each year, at the level of one or more municipalities, in consultation with farmers, an approved collective structure, which the farmers have previously joined, distributes commitments between farmers and determines the precise location of favourable crops as close as possible to burrows. The collective structure may use areas planted with favourable crops as from the threshold of 22%. It will see to it that favourable crops are distributed according to a ratio of 1 to 5 between alfalfa and winter straw cereals. It will also make sure that the refuge areas not harvested annually are positioned appropriately.
STAGES OF PROCESS	1- Construction of new collective territorialised AEMs 2- Delimitation by decrees by the two Ministries of the eligibility area for the measures: strict protection area 3- Formation of a collective structure 4- Distribution of commitments and location of favourable crops in the framework of the approved collective structure 5- Setting up of measures each year 6- Signing of contracts
LINKS WITH OTHER ACTIONS	Population monitoring, faciliation, reinforcements.
REGION CONCERNED	Strict protection area
MONITORING INDICATORS	Number of structures that have set up collective crop rotation. Number of farmers involved. Collectively-managed area.
EXPECTED DIFFICULTIES	
ACTION COORDINATOR	DRAAF
EXPECTED PARTNERS	ONCFS, DDT67, DDT 68, DRAAF, Mayors of municipalities concerned, Chamber of Agriculture
HUMAN RESOURCES NEEDED	Facilitation defined in action 2.1
MATERIAL NEEDS	Graphical Demarcation Survey, GIS
ESTIMATED COSTS	Information day: €600 per farm, based on 1 day for all measures over the 5 years of the plan. Planting of favourable crops (alfalfa and winter straw cereals): €416 per hectare per year for 25% favourable crops, €520 per hectare per year for 40% favourable crops Survival strips: alfalfa: :€125 per unharvested hectare per year, cereals: €828.50 per unharvested hectare per year

5

TOTAL COST FOR NAP	€1,500,000
FUNDING SOURCES	MAAF + FEADER (+ LIFE?)
PROVISIONAL TIMETABLE	Year 1: preparation of new collective territorialised AEMs + delimitation of eligibility area + choice of priority implementation areas Years 2 to 5: distribution and location + implementation of new collective territorialised AEMs
LINKS WITH OTHER NAPS	
REFERENCES	

ACTION 2.5	DEVELOP AGRICULTURAL SECTORS FAVOURABLE TO THE DEVELOPMENT OF HAMSTERS	PRIORITY 1 2 3

ACTION GUIDELINE	Restore and protect habitats
OPERATIONAL OBJECTIVE	Favour the emergence of a positive collective approach to the restoration and protection of hamsters in the regions concerned
CONTEXT	The development of agricultural measures favourable to the species depends exclusively on the aid/compensation mechanisms calculated in relation to shortfalls. The stakes lie in developing economic sectors and/or mechanisms for exchanges of produce that allow environmental added value and additional production costs incurred to be incorporated into the cost of agricultural products. This would allow the development of agricultural practices favourable to the species while, at the same time, tightening the links between the agricultural world and the general public by responsible-citizen and environmentally-responsible purchasing.
DESCRIPTION OF ACTION	Based on evidence of the biological effectiveness of specific agricultural measures, the produce of which may be sold locally or traded with other agricultural sectors, this action would include: 1) a study of the feasibility of the development of specific "hamster" sectors (late wheat/bread, barley/beer, spelt, etc.) and/or the development of produce trading systems (fodder, etc.). 2) a study of the relevance of the creation of a "hamster" label and the production of a specific set of specifications for the granting of the label (guarantee of biological effectiveness, social dimension, short circuit, definition of eligible environmentally-friendly agricultural produce, etc.) 3) monitoring of implementation of the action.
STAGES OF PROCESS	1) Project support and identification of project owners 2) Market study 3) Agricultural economic development 4) Communication aimed at potential customers.
LINKS WITH OTHER ACTIONS	Other habitat actions; communication, awareness-raising
REGION CONCERNED	Area of presence of the species
MONITORING INDICATORS	Surface area of crops linked to a hamster sector.
EXPECTED DIFFICULTIES	Creation of the label; consumer research.
ACTION COORDINATOR	Alsace Region
EXPECTED PARTNERS	Chamber of Agriculture 67, Comptoir agricole, Alsace Region, CUS, CG67, CG 68, Wildlife protection associations, ONCFS, ARIENA, retailers, sellers.
HUMAN RESOURCES NEEDED	Included in the workload plans of supporting structures
MATERIAL NEEDS	Conducting of feasibility studies, identification of volunteering farmers and then industrialists
ESTIMATED COSTS	€100,000
TOTAL COST FOR NAP	€100,000
FUNDING SOURCES	FEADER
PROVISIONAL TIMETABLE	Years 1 and 2: Feasibility study Years 3 and 4: experimentation Year 5: assessment
LINKS WITH OTHER	

5

NAPs	
REFERENCES	This action will use the references available in the Netherlands and Germany

ACTION N°2.6	DIRECT REGULATION OF PREDATORS IN COMMON HAMSTERS HIGH DENSITY AREAS	PRIORITÉ 1 2 3

ACTION GUIDELINE	Restore and protect habitats
OPERATIONAL OBJECTIVE	Minimise the pressure of predation by limiting the number of predators classified as harmful predators in high density areas.
CONTEXT	The hamster is a prey species whose population dynamic is closed linked to interactions with predators. Hamster populations, whether increasing or declining, are characterised by high mortality by predation. Research has shown that the development of a population is favoured by long breeding seasons (2 to 3 litters per female per year), which depend themselves on annual peaks of mortality by predation. Mortality peaks are mainly linked to the sudden disappearance of ground cover during the activity season. Two annual mortality peaks are identified: one at the emergence from hibernation when individuals find themselves on bare ground due to crop rotation (presence of spring crops) and the other in summer when individuals are faced with the absence of ground cover after harvesting. Actions 2.2, 2.3 and 2.4 are aimed at eliminating (summer peak: unharvested crops), delaying (summer peak: late cereals) and minimising (spring peak: appropriate rotation; summer peak: early in-between crops) these mortality peaks. The decline in population status observed in 2012, including in the main areas of presence of the species, entails additional measures to minimise the causes of mortality as much as possible by limiting the presence of predators (foxes, mustelids, etc.) in March-April and from July to September.
DESCRIPTION OF ACTION	The action consists of establishing a programme of shooting and trapping of the hamster's predators (classified as harmful), foxes as the priority, in high density areas, to be implemented from 2013 to 2016, and of assessing it by annual assessment of the abundance of the targeted predators, preferably in March-April and in summer after harvesting. The impact of this action could also be assessed by monitoring the causes of mortality of animals in the wild monitored in the same regions as part of action 1.2. This action, through scientific research, should also provide a better understanding of the interactions between prey and predators and the factors that determine them (levels of abundance of other prey species, small rodents, other predators, weather conditions, etc.).
STAGES OF PROCESS	1- Preparation of a programme of shooting and trapping of foxes and other predators classified as harmful and definition of protocols for assessing the measure (real impact on densities of predators, correlation with the abundance of other species in agricultural environments, relations with rates and causes of mortality observed by capture-marking-monitoring of hamsters in the wild as part of actions 1.2, 1.5 and 3.2). The analysis of existing data (monitoring of hare populations, monitoring of fox shooting, etc.) will contribute to the definition of the protocols. 2- Implementation of the programme in regions defined as being hamster high density areas (liable to evolve in the course of the plan) 3 – Mid-term review and decision whether or not to continue the action on the basis of hamster population monitoring results and the assessment of the impact of agricultural measures. 4- Annual assessment of the programme by analysis of data collected in the field and by monitoring of the causes of mortality identified as part of actions 1.2, 1.5 and 3.2.
LINKS WITH OTHER ACTIONS	This action is complementary with habitat restoration actions. The work on habitats aims to limit the vulnerability of the species related to breaks in ground cover and the regulation of predators aims to reduce the threat of predation in the agricultural environment. The overall risk factor is therefore limited.
REGION CONCERNED	High density areas (redefined in the course of the plan).
MONITORING INDICATORS	-Area concerned by the regulation programme. -Number of foxes shot per 100 hectares -Number of other predators trapped per 100 hectares -Number of field agent days per 100 hectares.

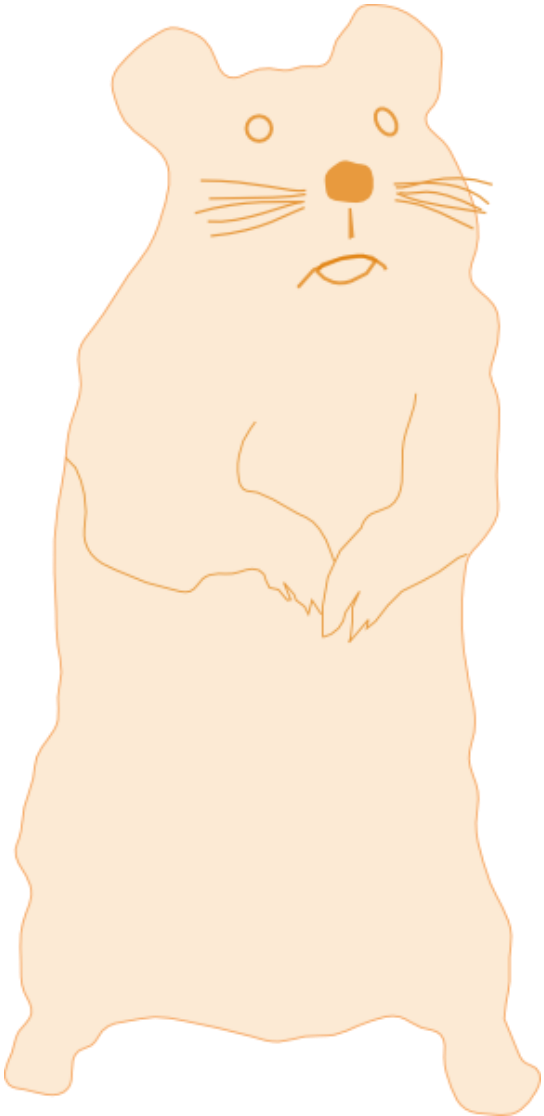
5

EXPECTED DIFFICULTIES	Scientific reviews and feedback on fox shooting have shown that there could be geographical compensation phenomena (immigration) and specific compensation phenomena (increased action by other predators) which may cancel out the effectiveness of such operations. It will be difficult to assess, in the event of fluctuations of hamster populations, what share is due to improvement of the habitat and what share is due to the regulation of predators.
ACTION COORDINATOR	DDT
EXPECTED PARTNERS	FDC67, Wolf-Hunting officers
HUMAN RESOURCES NEEDED	To be defined. End-of-studies internships (Master 2 or BTS) for assessment studies.
MATERIAL NEEDS	To be defined
ESTIMATED COSTS	To be defined
TOTAL COST FOR NAP	
FUNDING SOURCES	To be defined
PROVISIONAL TIMETABLE	2012 – 2013: preparation of programme 2014-2016: shooting, trapping and annual assessment of actions.
LINKS WITH OTHER NAPS	
REFERENCES	Eidenschenck J., Villemey A (ONCFS), 2012, Mise en œuvre du Plan d'action en faveur du Hamster commun (Cricetus cricetus) en Alsace. Etat des connaissances sur la dynamique des populations de hamster commun et ses facteurs déterminants (habitats, prédation...).Quelle stratégie pour la croissance des populations ?

ACTION 2.7	FEASIBILITY STUDY FOR THE CREATION OF DEDICATED MANAGEMENT AREAS	PRIORITY 1 2 3

ACTION GUIDELINE	Restore and protect habitats
OPERATIONAL OBJECTIVE	Develop a dense favourable habitat and meshing of suitable crops in and around all areas of presence of hamsters
CONTEXT	The development of cereal and alfalfa crops alone is not sufficient to develop the populations. Apart from adapting agricultural practices, the other countries concerned are developing segregated population preservation and development approaches, in particular by means of compensation. A conservation approach is defined as being a management mode disconnected from economic issues, which provides greater flexibility in the agro-environmental management system implemented. Management may be assigned to a farmer under contract. These methods will also provide for substantial improvement of the living conditions of all agricultural fauna.
DESCRIPTION OF ACTION	Review conservation methods (type of cover, management methods, minimum surface areas and spatial arrangement needed to guarantee effectiveness). Discuss their advantages/drawbacks in the Alsatian context. Define their place in the NAP and their linkage with integration measures. Propose measures that are tried and proven and verify their effectiveness in Alsace
STAGES OF PROCESS	See above
LINKS WITH OTHER ACTIONS	Knowledge, compensation, populations
REGION CONCERNED	Alsace
MONITORING INDICATORS	Surface area assigned to conservation management
EXPECTED DIFFICULTIES	Acceptability by wildlife associations and farmers
ACTION COORDINATOR	DREAL
EXPECTED PARTNERS	Chambers of Agriculture, SAFER, Établissement public foncier du Bas-Rhin, regional authorities, CDC Biodiversité, project managers
HUMAN RESOURCES NEEDED	Included in the DREAL workload plan
MATERIAL NEEDS	None
ESTIMATED COSTS	€50,000 for the study and proposal of sites phase
TOTAL COST FOR NAP	€50,000
FUNDING SOURCES	MEDDTL, compensations
PROVISIONAL TIMETABLE	Year 2: Feasibility study
LINKS WITH OTHER NAPS	
REFERENCES	"Braunschweig" model in Germany Dutch Hamster 75 or Hamster 100 measure

GUIDELINE 3: CONSERVE THE SPECIES EX-SITU AND REINTRODUCE IT EFFECTIVELY



5

ACTION 3.1	IMPLEMENT POPULATION REINFORCEMENTS	PRIORITY 1 2 3

ACTION GUIDELINE	Breeding and releases
OPERATIONAL OBJECTIVE	Reinforce endangered groups of individuals according to the Ministerial authorisation with the objective of sustaining and increasing the density of the populations present or extending areas of presence
CONTEXT	In sectors where the habitat is restored but densities are too low to enable self-recovery of the populations, reinforcement of populations in the wild may be required. The reinforcement sectors will be determined in year n-1 by the territorial commission on the basis of guidelines validated by the steering committee. The complexity of population reinforcement entails implementation over a period of at least two years per municipality in close partnership with the elected representatives and the farming profession. The objective is to maintain as needed the 2012 release capacity: 500 animals for 8 release sites over the following years. This action calls for the prior granting of a new Ministerial authorisation.
DESCRIPTION OF ACTION	1) For information purposes, a reinforcement per municipality generally calls for two years of releases of 40 to 60 animals, the presence of agro-environmental contracts and/or meshing of locally favourable crops, an annual plenary consultation meeting per municipality in January, the presence of at least 4 hectares of unharvested cereals on strips at least 20 metres wide and/or unharvested alfalfa stands, all of this electrically fenced in, individual meetings with farmers for the signature of unharvested wheat purchase contracts and the localisation of electric fences 2) Overall management of the construction of artificial burrows, installation and maintenance of electric fences. Filing of a "DICT" [Declaration of intent to begin work] if required. 3) Mandatory assessment of reinforcements (survival and breeding)
STAGES OF PROCESS	1) Filing of a request for authorisation of reinforcements if necessary; 2) Implementation of reinforcements on the sites considered priorities (consultation, coordination, assessment, etc.).
LINKS WITH OTHER ACTIONS	"Restore habitats" guideline measures and action sheet 3.2 "Monitor and improve releases"
REGION CONCERNED	Sites considered priorities
MONITORING INDICATORS	- Evolution of the area of presence of the species - Survival rate of released animals
EXPECTED DIFFICULTIES	Obtaining a reinforcement authorisation if required. Active participation of elected representatives and the farming profession.
ACTION COORDINATOR	ONCFS
EXPECTED PARTNERS	Chambers of Agriculture and mayors (consultation), SFS, other breeding facilities, veterinarian (preparation of animals), wildlife associations.
HUMAN RESOURCES NEEDED	Organisation and facilitation of consultation meetings (ONCFS and Chambers of Agriculture in liaison with mayors), individual meetings with farmers (ONCFS and Chambers of Agriculture), preparation of host sites and overall management of service provider, monitoring of marked animals in the field for assessment (see action sheet 3.2). Service providers: approx. €74,500 per year.

Material needs	Electrified nets (68) usable up to 2016: €5,440 in 2013 Batteries (44) usable for 2 to 3 years: €4,400 Energizers (12) usable up to 2016: €1,950 Earth rods (30x3) usable for 1 year: €850 70 transmitters to monitor 10 animals on each site: €10,500 For an initial investment in 2013 of €23,140 Followed by an investment the following years of €15,380 (taking wear and deterioration into account) Maintaining unharvested wheat (estimate of €828 per hectare over 28 hectares): €23,200
Estimated costs	Implementation for 500 animals per year in 2013: €120,840 Implementation for 500 animals per year as from 2014: €113,080
Total cost for NAP	€460,080
Funding sources	MEDDE, local authorities, patronage
Provisional timetable	Year 1 – 1st group of municipalities Year 2 – 2nd group of municipalities Year 3 – 3rd group of municipalities Year 4 – 4th group of municipalities Year 5 – 5th group of municipalities
Links with other NAPs	
References	ONCFS assessments of reinforcements in 2010 and 2011.

5

ACTION 3.2	MONITOR AND IMPROVE RELEASES	PRIORITY 1 2 3

ACTION GUIDELINE	Breeding and releases
OPERATIONAL OBJECTIVE	Improve population reinforcement protocols
CONTEXT	Experimentation with a new reinforcement protocol in 2010 and 2011 led to greater control of the implantation of stock bred animals (nearly 1 litter per female reintroduced).). There is certainly still room for improvement of the factors that impact survival beyond the year of the release. The objective is now to systematically ensure the persistence of populations (over subsequent generations) on host sites connected to the host site in order to contribute more effectively to the restoration of functional meta-populations.
DESCRIPTION OF ACTION	In an experimental approach based on the assessment by marking/telemetric monitoring of what becomes of the animals released and their descendants, an attempt will be made to isolate technical factors that improve survival and breeding rates of stock bred hamsters and their descendants (multiannual management of host sites, release dates and techniques, etc.) in order to find out which environmental conditions are sufficient to guarantee the development of released populations. In the light of feedback on experience in Germany (Hesse) and the Netherlands, the effectiveness of the creation of source parcels (stable release sites, not harvested for 3 years) to maintain dynamic population cores and create the dispersion of juveniles into neighbouring favourable parcels will be assessed. The demographic data collected annually will be used for action sheet 1.2 (modelling of populations in the wild).
STAGES OF PROCESS	1) Develop experimentation on 4 sites to determine the conditions required for the persistence of hamster populations on each reinforcement site. Various configurations and provisions for multiannual management of host parcels and their environments may be tested. 2) During each reinforcement operation, include marking of a sample of released bred animals to seek statistical correlations between survival and breeding indicators for released animals (year 1) and their descendants (years 2, 3 and 4) and the typology of release conditions and/or multiannual management of host sites. 3) On the experimental sites (host parcels + periphery), thorough counting in the spring and autumn to assess total population dispersion. Capture-marking of juveniles in summer to study individual dispersions up to entry into hibernation. 4) Annual analysis of results and adaptation of management recommendations.
LINKS WITH OTHER ACTIONS	Population reinforcement, action sheet 3.1 Monitoring of demographics and modelling, action sheet 1.2
REGION CONCERNED	All population reinforcement sites.
MONITORING INDICATORS	Survival rate and breeding parameters of released stock bred animals and their descendants. Multiannual persistence of populations on host sites. Dispersion of populations to neighbouring parcels.
EXPECTED DIFFICULTIES	Funding
ACTION COORDINATOR	ONCFS
EXPECTED PARTNERS	SFS, CNRS, European partners, zoos, geneticists, farming profession, veterinary schools
HUMAN RESOURCES NEEDED	ONCFS engineer, shared biostatistics specialist for coordination of experimentation and analysis of results.

Material needs	60 transmitters per year for monitoring of individuals + surgical operations for implantation. Receiver + Biologger (with detection equipment) to mark and monitor juveniles annually and find out their capability to disperse, GIS
Estimated costs	€40,000 for telemetric equipment and technical costs (marking of adults) for 4 years €7,200 for surgical implantation (240 transmitters in 4 years). Purchase of 360 biologgers (marking of juveniles) + detection equipment =€4,400. Renewal of ONCFS Engineer position for 2014, 2015, 2016: €100,000 0.5 equivalent full-time person for marking and monitoring + mapping of crops. €26,800, i.e. 4 contractors hired for a 5-week period for 4 years = 100 days/agent for thorough counting of reinforcement (reinforcement parcel + neighbouring parcels)*4 years
Total cost for NAP	€51,600 excluding human resources mobilised
Funding sources	MEDDE, regional authorities, project owners with compensation obligations ?
Provisional timetable	Year 1: search for sites Years 2 to 5: experimentation and monitoring
Links with other NAPs	
References	

5

ACTION 3.3	CONTINUE EX-SITU BREEDING	PRIORITY 1 2 3

ACTION GUIDELINE	Breeding and releases
OPERATIONAL OBJECTIVE	Produce high-quality stock bred animals
CONTEXT	During the period 2007-2011, the *Sauvegarde Faune Sauvage* [Wild Fauna Preservation] breeding facilities qualitatively and quantitatively developed the production of stock bred animals fit for life in the wild. The 600 animals currently included in the facilities meet a set of specifications validated by the ONCFS (recommendations regarding zootechnical, health, genetic and behavioural management) and provide about 500 high-quality animals per year for releases. *Sauvegarde Faune Sauvage* also contributes to the development of knowledge of the common hamster. The production of specimens to be released is planned as much as possible in order to adapt the number of animals produced in secured areas selected for releases.
DESCRIPTION OF ACTION	Continued operation and improvement of the 3 SFS breeding units and cooperation with the ONCFS for the organisation of reinforcements (selection of animals according to the configuration of reinforcement sites and in order to optimise the probability of survival and in-situ breeding); Reflection on and application to the ethics of the future of non-released animals.
STAGES OF PROCESS	Continuation of routine management and improvement of breeding and releases.
LINKS WITH OTHER ACTIONS	Biodiversity research station Improvement of reinforcements Diversify ex-situ breeding
REGION CONCERNED	Alsace
MONITORING INDICATORS	- Number of hamsters from 0 to 1 year old in breeding facilities per year - Number of breeding structures - Number of different breeding methods tested
EXPECTED DIFFICULTIES	The number of specimens to be produced in the year n should be planned according to the secured area for releases in the year n-1, since the secured area parameter for the year n is only known afterwards. It is essential to limit overpopulation in the breeding structures as much as possible after release phases.
ACTION COORDINATOR	SFS
EXPECTED PARTNERS	ONCFS
HUMAN RESOURCES NEEDED	To be defined
MATERIAL NEEDS	Zootechnical material, sanitary equipment, material for control of housing parameters.
ESTIMATED COSTS	Annual operation: €165,000 at SFS, Shared ONCFS engineer position as support for breeding facility network organisation.
TOTAL COST FOR NAP	€825,000
FUNDING SOURCES	MEDDE, Alsace Region, land-use planning stakeholders, regional authorities, patronage
PROVISIONAL TIMETABLE	Years 1 to 5: operation and annual audit from 2012 to 2016
LINKS WITH OTHER NAPs	The exchange of practices and, if justified, of bred hamsters, with Dutch and German breeding facilities will be continued.
REFERENCES	Breeding results exchanged at the international hamster symposium

ACTION 3.4	PREPARE AND IMPLEMENT BREEDING FACILITY SPECIFICATIONS AND AUDITING	PRIORITY 1 2 3

ACTION GUIDELINE	Breeding and releases
OPERATIONAL OBJECTIVE	Produce appropriate quantities of high-quality bred animals to fit the hosting capacities of the secured priority release regions
CONTEXT	4 structures currently house a thousand bred common hamsters: *Sauvegarde Faune Sauvage* and *Centre de Réintroduction des Cigognes et des Loutres de Hunawhir*, CNRS-INCI in Strasbourg, SFS breeding facilities, Citadelle de Besançon, Parc de l'Orangerie de Strasbourg. Other structures are likely to breed hamsters in the future in response to a call for the creation of new breeding facilities. The genetic diversity of the stock, which particularly influences the size of litters, and the maintaining of the initial genetic pool, are essential factors for the effectiveness of future reinforcement operations. Control and harmonisation of the methods used for genetic management (nomenclature and procedure) and the management of health, diet, mating, impregnation and stress are an essential condition for guaranteeing the production of high-quality bred hamsters.
DESCRIPTION OF ACTION	Sharing of specifications compatible with the sanitary and veterinary recommendations of the DDPP, including the management of zootechnical and genetic data with all breeding facilities wishing to supply animals for releases. Verification of compliance with specifications by the organisation of annual audits. Annual audit reporting meeting (exchanges regarding zootechnical parameters, breeding methods, ongoing experimentation, and discussion of management recommendations; exchanges of individuals, health management.)
STAGES OF PROCESS	1) Preparation of a set of specifications common to breeding facilities wishing to participate in the restoration of the species compatible with the recommendations of the DDPP; 2) Transmission of common breeding facility specifications to all known facilities for alignment on a voluntary basis (but mandatory for breeding facilities wishing to contribute to the reinforcement programme). Include in specifications a procedure for managing zootechnical and genealogical data that enables them to be shared 3) Organisation of annual audits in all of the breeding units based on the annually updated specifications (DDPP or veterinary office for the health and regulatory part, in the presence of the ONCFS in charge of validation) 4) Organisation of an annual audit reporting meeting and exchanges regarding zootechnical protocols and data. The managers of other European breeding facilities may be invited to this meeting.
LINKS WITH OTHER ACTIONS	Improvement of the quality of the animals released, Continuation and diversification of hamster breeding facilities.
REGION CONCERNED	French and European breeding facilities
MONITORING INDICATORS	Number of participating breeding facilities
EXPECTED DIFFICULTIES	None
ACTION COORDINATOR	ONCFS
EXPECTED PARTNERS	SFS, Mulhouse zoo, CNRS, European breeders and other specialists
HUMAN RESOURCES NEEDED	Organisation in charge of annual audits (2 days/year)

5

MATERIAL NEEDS	
ESTIMATED COSTS	€5,000 per year
TOTAL COST FOR NAP	€25,000
FUNDING SOURCES	MEDDE
PROVISIONAL TIMETABLE	Year 1: design of format and exchanges Year 2: exchanges Year 3: exchanges Year 4: exchanges Year 5: exchanges
LINKS WITH OTHER NAPs	
REFERENCES	This action is in line with those conducted in the framework of the 2007 – 2011 NAP

ACTION 3.5	DIVERSIFY EX-SITU BREEDING	PRIORITY 1 2 3

ACTION GUIDELINE	Breeding and releases
OPERATIONAL OBJECTIVE	Produce high-quality stock bred animals
CONTEXT	There are two other French breeding structures separate from the SFS: a facility at the Strasbourg CNRS and one in the Hunawihr stork reintroduction centre. The CNRS facility (a Chronobiotron structure) was created in 1990. It ensures the breeding and maintaining of colonies under fully controlled environmental conditions. The reinforcement of these 2 additional breeding structures is being promoted due to increased provisional needs for hamsters to be produced for release during the 2012-2016 period (restoration and compensation), and the need to diversity the genetic stock of breeding facilities and secure the stock from the health and structural viewpoints, as well as the interest of experimenting with other breeding methods that could possibly lead to better survival of the animals released.
DESCRIPTION OF ACTION	1) Study to determine additional needs for animals, quantitatively, qualitatively or in terms of diversification of breeding methods; 2) Obtaining of DDPP 67 permits (capacity, approval), choice of stock animals, outfitting, construction of breeding enclosures and/or breeding buildings; 3) Start of breeding in compliance with call for project specifications; 4) Cooperation of the new structures with the ONCFS for the organisation of reinforcements; 5) Reflection on and application to the ethics of the future of non-released animals.
STAGES OF PROCESS	1) Continuation of routine management and improvement of breeding and releases; 2) Study of needs and definition of call for project specifications; 3) Evolution of new breeding structures.
LINKS WITH OTHER ACTIONS	Biodiversity research station Improvement of reinforcements Continuation of ex-situ breeding
REGION CONCERNED	Alsace
MONITORING INDICATORS	- Number of hamsters and distribution by age group - Number of breeding structures - Number of different breeding methods tested
EXPECTED DIFFICULTIES	The setting up of new breeding structures will call for securing of the related budgets
ACTION COORDINATOR	DREAL
EXPECTED PARTNERS	SFS, CNRS (DEPE and INCI), Centre for the reintroduction of storks and otters, Mulhouse zoo, Besançon zoo, Laboratoire départemental d'analyses 67 and 68, Veterinarian in charge of breeding facilities, European breeding facilities.
HUMAN RESOURCES NEEDED	According to the number of operational sites in the long term, 2 to 4 equivalent full-time persons in breeding facilities
MATERIAL NEEDS	Zootechnical material, sanitary equipment, material for control of housing parameters.
ESTIMATED COSTS	Annual operation: €85,000 at the biodiversity research station, €10,000 at the Mulhouse zoo. Shared ONCFS engineer position for support of breeding facility network organisation. (see action sheet 3.3)
TOTAL COST FOR NAP	€475,000, i.e. €95,000 per year for 5 years

5

FUNDING SOURCES	MEDDE, land-use planning stakeholders, regional authorities, patronage
PROVISIONAL TIMETABLE	Year 1: decision to issue call for projects Year 2: Setting up of production of specimens in the structures Years 3 to 5: Operation and cross-audits
LINKS WITH OTHER NAPS	The exchange of practices and, if justified, of bred hamsters, with Dutch and German breeding facilities will be continued
REFERENCES	Breeding results exchanged at the international hamster symposium

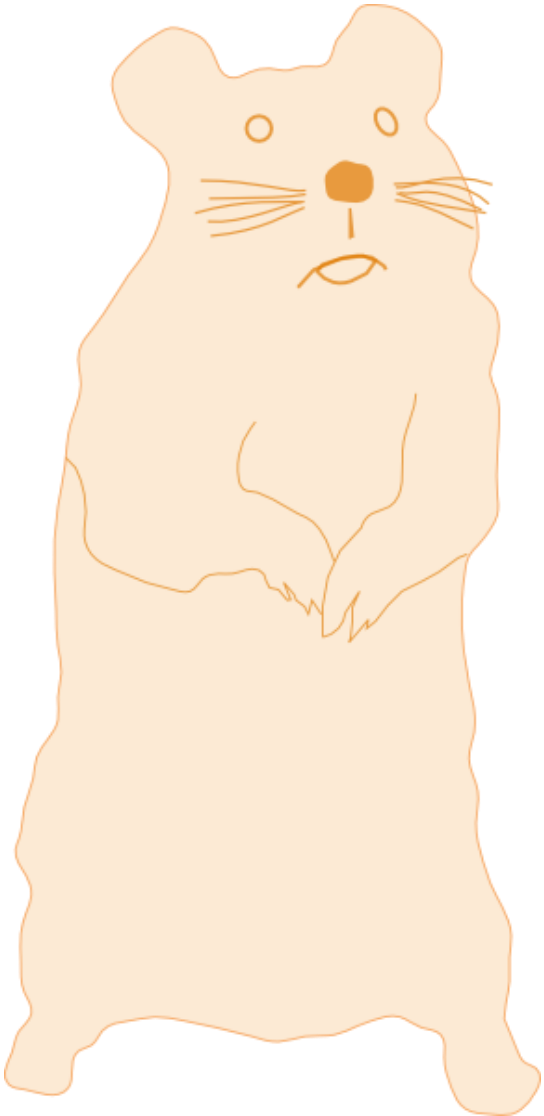
ACTION N°3.6	IMPROVE THE QUALITY OF STOCK BRED ANIMALS RELEASED	PRIORITÉ 1 2 3

ACTION GUIDELINE	Breeding and releases
OPERATIONAL OBJECTIVE	Produce high-quality stock bred animals
CONTEXT	Population reinforcements by stock bred animals are characterised by a high initial mortality rate due to difficulties adapting to the host site. Despite gains made with respect to the survival of released animals, there is still certainly a margin for improvement of the quality of bred animals (behaviour, genetics and health of bred animals).
DESCRIPTION OF ACTION	1) Definition of criteria for selecting individuals the most fit for survival and breeding and for the transmission of traits favourable to the persistence of reintroduced populations: genetic criteria (link with size of litters, etc.) and health criteria. 2) Testing of the selection criteria on survival and in-situ breeding with a constant method and then varying the reinforcement method
STAGES OF PROCESS	1) Creation of a working group between Alsatian breeding structures for the preparation of a common work programme (2012) 2) Conducting of a health, behaviour and genetics survey in the breeding facilities (2012-2013) and creation of an Alsatian genealogical database 3) If needed, preparation of an exchange programme between breeding facilities and, if justified, sampling of wild hamsters in Alsace or abroad for genetic diversification of breeding 4) Continuation of improvement of breeding conditions (breeding methods, behavioural studies, diet, limitation of impregnation and acclimatisation to stress, genetic monitoring) 2012-2016
LINKS WITH OTHER ACTIONS	Population reinforcement
REGION CONCERNED	Definite area of presence of the species
MONITORING INDICATORS	- Production of common breeding facility specifications - Survival rates and breeding parameters of released animals; - Evolution of genetic diversity in breeding facilities - Size of litters
EXPECTED DIFFICULTIES	Permits to capture wild animals for transfer to breeding facilities. Setting up of a concerted approach regarding the future of animals not fit for release
ACTION COORDINATOR	ONCFS
EXPECTED PARTNERS	CNRS (INCI, DEPE), SFS, other European breeding facilities, zoos, geneticists, farming profession, veterinary schools, Laboratoire départemental d'analyses
HUMAN RESOURCES NEEDED	Operation of breeding facilities – Facilitation of 3 meetings per year – PhD students, interns, etc.
MATERIAL NEEDS	Operation of breeding facilities
ESTIMATED COSTS	€10,000 for the initial genetic study in 2012 and €10,000 for the renewal of the study in 2016. (assessment of genetic analysis: €70 per individual)
TOTAL COST FOR NAP	€20,000
FUNDING SOURCES	MEEDE, regional authorities

5

PROVISIONAL TIMETABLE	Year 1: setting up of working groups and preparation of specifications Year 2: genetic study, setting up of selection criteria, search for sites Years 3 to 5: monitoring of results and initiation of exchanges
LINKS WITH OTHER NAPS	The setting up of an ex situ conservation programme is a solution adopted in other NAPs
REFERENCES	The Dutch references will be utilised

GUIDELINE 4: AVOID, REDUCE AND COMPENSATE



5

ACTION 4.1	TAKE THE HAMSTER THEME INTO CONSIDERATION IN URBAN AND LAND-USE PLANNING DOCUMENTS	PRIORITY 1 2 3

ACTION GUIDELINE	Avoid, reduce and compensate
OPERATIONAL OBJECTIVE	Ensure systematic and full consideration of the species in urban planning documents, plans & programmes
CONTEXT	The assessment of the last plan highlighted limited linkage between protection actions and urban/land-use planning. One of the ways to ensure this linkage is to effectively consider the hamster theme in urban planning documents (PLU and SCoT), with the updating of these documents providing an opportunity for linkage.
DESCRIPTION OF ACTION	The objective of this action is to amend urban and land-use planning documents, particularly in the hamsters' area of presence and the strict protection area so as to limit as much as possible the planning of projects liable to impact hamster populations but without thereby impacting the consistency of regional projects.
STAGES OF PROCESS	1) Determination of sectors classified for urban planning within the hamsters' area of presence and mapping by government services 2) Notification of local authorities of the areas at stake by government services 3) Analysis of scenarios of acknowledgment of this information by local authorities 4) Updating, if necessary, of planning documents to include consideration of the hamster theme
LINKS WITH OTHER ACTIONS	Knowledge guideline, other ARC actions, "awareness-raising" guideline (direct link with actions targeting elected representatives and local authority technicians), link with action 4.2
REGION CONCERNED	Area of presence of the species and strict protection area
MONITORING INDICATORS	- Number of hectares of the area of presence and strict protection area open to urban planning - Number of urban planning documents reviewed
EXPECTED DIFFICULTIES	Appropriation of issues by elected representatives and local authority technicians
ACTION COORDINATOR	DREAL
EXPECTED PARTNERS	Mayors of municipalities concerned, ADEUS, CG 68, CR, DREAL, CUS, associations, DDT, stakeholders, etc.
HUMAN RESOURCES NEEDED	Local authority technicians
MATERIAL NEEDS	Research costs
ESTIMATED COSTS	€0 apart from the cost of research by regional authorities and human resources mobilised
TOTAL COST FOR NAP	€0
FUNDING SOURCES	
PROVISIONAL TIMETABLE	Year 1: Diagnosis of the situation Years 2-5: Implementation of the approach
LINKS WITH OTHER NAPS	Hermann Tortoise NAP
REFERENCES	

ACTION 4.2	HELP TO HAVE THE HAMSTER THEME ACKNOWLEDGED IN URBAN AND LAND-USE PLANNING DOCUMENTS	PRIORITY 1 2 3

ACTION GUIDELINE	Avoid, reduce and compensate
OPERATIONAL OBJECTIVE	Ensure systematic and full consideration of the species in urban planning documents, plans & programmes
CONTEXT	The assessment of the last plan highlighted limited linkage between protection actions and urban/land-use planning. One of the ways to ensure this linkage is to effectively consider the hamster theme in urban planning documents (PLU and SCoT), with the updating of these documents providing an opportunity for linkage.
DESCRIPTION OF ACTION	The objective of this action is to develop guidelines that would facilitate consideration of the hamster theme in the updating of urban and land-use planning documents, in particular in the connective corridors between hamster populations. Examples that illustrate the incorporation of the hamster theme in such documents will also be produced. These examples may be used as inspiration for elected representatives and technicians involved in updating.
STAGES OF PROCESS	1) Creation of a land-use planner-stakeholders working group 2) Review of existing experiences of integration of the hamster theme in urban and land-use planning documents and assessment of their relevance and effectiveness (environmental) 3) Identification of "best practices" 4) Workshop/meeting for sharing and discussion with key stakeholders (workshop focused on a concrete case with field visit, mobilisation of mapping prepared as part of activity 4.1, etc. in order to understand the operations and concrete stakes of best practices) 5) Preparation of guidelines and "best practices" sheets 6) Dissemination of guidelines and sheets (see specific training on the subject in the framework of actions proposed for the "awareness-raising" guideline
LINKS WITH OTHER ACTIONS	Knowledge guideline, other ARC actions, "awareness-raising" guideline (direct link with actions targeting elected representatives and local authority technicians), link with action 4.1
REGION CONCERNED	
MONITORING INDICATORS	- Report presenting guidelines and examples of best practices - Number of participants in sharing and discussion workshop
EXPECTED DIFFICULTIES	Appropriation of issues by elected representatives and local authority technicians
ACTION COORDINATOR	To be defined
EXPECTED PARTNERS	ADEUS, CG 68, CG 67, CR, CUS, associations, DDT, stakeholders, etc.
HUMAN RESOURCES NEEDED	
MATERIAL NEEDS	Research costs
ESTIMATED COSTS	€30,000
TOTAL COST FOR NAP	€30,000
FUNDING SOURCES	Land-use planning stakeholders, CUS, land-use planners and infrastructure managers, LIFE+ (if it includes urban and land-use planning issues)
PROVISIONAL TIMETABLE	Year 2: implementation of the approach
LINKS WITH OTHER NAPS	Hermann Tortoise NAP
REFERENCES	

5

ACTION 4.3	IMPLEMENT STRICT PROTECTION OF THE SPECIES AND ITS HABITATS	PRIORITY 1 2 3

ACTION GUIDELINE	Avoid, reduce and compensate
OPERATIONAL OBJECTIVE	Ensure protection of specimens and their habitat
CONTEXT	Due to its protected species status, the hamster is covered by strict protection. This action focuses on the few (structuring or one-off) public or private projects liable to impact the species' habitat that will be authorised. Directives will be given to the project owners in order to ensure that the species is given due consideration in their projects at different stages. The management of these projects must be exemplary and be considered very early in the process in order to safeguard against any major threats to the species' populations. All provisions showing that all scenarios have been considered and the one with the least impact has been adopted must be reported. The burrows map will be used for this purpose as well as mapping of the species' habitat.
DESCRIPTION OF ACTION	The action includes all of the following: • Controlling the number of requests for exemption from protection of the species (see action 4.1) • Ensuring strict compliance with exemption conditions (no other alternatives, maintaining of the conservation status of the species, etc.) • Ensuring control and implementation of the environmental requirements associated with the project, in particular reduction of the loss of connectivity and compensation for the destruction of habitats
STAGES OF PROCESS	• Notify project promoters and elected representatives in the areas concerned of the issues as soon as such projects are announced (dissemination of maps, specific notifications) • Establish a standardised protocol for initial status reports, establish a list of possible impact reduction measures (see action sheet 4.4) and the conditions of application • Establish a scale of compensation measures (see action sheet 4.4), on the basis of multiplying factors that account for the species' needs, the level of priority of the site for conservation of the species, population status and the habitat's potential • Determine a strategy for possible support measures (reinforcement operations) • Participate, from coordination to support for the project owner and, if need be, develop specific assistance
LINKS WITH OTHER ACTIONS	Knowledge guideline, other ARC guideline actions
REGION CONCERNED	Areas of presence of the species and strict protection area
MONITORING INDICATORS	- Number of exemptions granted per year - Number of inspections made
EXPECTED DIFFICULTIES	The political and economic stakes of particular projects may be high
ACTION COORDINATOR	DREAL
EXPECTED PARTNERS	Land-use planning stakeholders, CG 67 & 68
HUMAN RESOURCES NEEDED	Included in the workload plans of the DREAL, DDTs and ONCFS wildlife police services
MATERIAL NEEDS	GIS
ESTIMATED COSTS	

Total cost for NAP	
Funding sources	
Provisional timetable	Years 1 and 2: updating of land-use planner guide (see action sheets 4.4) Years 1 to 5: implementation
Links with other NAPs	
References	

5

ACTION 4.4	PREPARE AN ENVIRONMENTAL EQUIVALENCE TABLE FOR THE SCALING OF COMPENSATION	PRIORITY 1 2 3

ACTION GUIDELINE	Avoid, reduce and compensate
OPERATIONAL OBJECTIVE	Ensure the effective and optimal implementation of "hamster-friendly" compensation measures
CONTEXT	There is still much debate as to the scaling of compensation measures in relation to the value of hamster habitats and populations negatively impacted by land-use planning or economic development plans. The equivalence between degraded habitats and compensated habitats is still an uncertain factor for which land-use planners and farmers would like more transparency and certainty in order to incorporate the matter into the preparation of their projects. Apart from adapting agricultural practices, the other countries concerned are developing conservation approaches to the preservation and development of populations, in particular for compensation. A conservation approach is defined as being a management mode disconnected from economic issues which provides greater flexibility in the agro-environmental management implemented. Management may be assigned to a farmer under contract.
DESCRIPTION OF ACTION	The objective of this action is to produce an equivalence table between the "environmental value" of the degraded habitat (according to its importance for existing and potential hamster populations, quality of the habitat, etc.) and the quantity and quality of compensation measures (how many hectares, with what ground cover, spatial diversity, etc.). Based on the list of all projects that have benefited from compensation measures and foreign experiences, the action consists of collecting the characteristic data of the compensation measures implemented together with their context to assess their effectiveness. The results obtained will be shared with land-use planners, funders and all stakeholders in order to identify possible improvements in the future implementation of compensation measures.
STAGES OF PROCESS	1) Set up a working group of stakeholders, researchers and scientists to implement the action 2) Specify the guidelines for the action and the grading table; in particular, define what a "compensation measure" is and is not, classifying the measures in groups according to whether or not compensation is based on surface area 3) Identify the main levels of quality of the habitat that could be affected by degradation and represent quality levels for compensation measures 4) Prepare the first draft of the equivalence table – based on existing knowledge (see knowledge guideline) and research considered complementary, if necessary 5) Do benchmarking, comparing the equivalence table with: 1) practices pertaining to different regions and biodiversity issues; 2) equivalences used in other European countries (Hamster and wider) 6) Organise a stakeholders' workshop to present the table and its justification 7) Based on the previous two stages, adapt the table and submit it to the plan steering committee for assessment and proposal of modifications 8) Submission of the proposed equivalence table to the CNPN for assessment 9) Presentation of the final version, potentially adapted following the CNPN assessment, for validation by the steering committee. 10) Set up of thematic working group or local commission dedicated to compensation for continued feedback reporting and to ensure a continuous improvement process for the duration of the plan in conjunction with the local structure coordinating experimentation with a compensation offer.
LINKS WITH OTHER ACTIONS	Knowledge guideline Habitats guideline Other ARC guideline actions Experimentation with a compensation offer
REGION CONCERNED	All areas in which compensation offers have been implemented in the past years.

Monitoring indicators	- Production of an equivalence table - Number of sharing workshop participants - Setting up of a dedicated thematic working group / local commission
Expected difficulties	Importance of mobilising all common hamster protection stakeholders. Difficulty assessing the effectiveness of certain measures due to a lack of sufficient information on initial status "before implementation of compensation measure" => a specific approach will have to be devised for this.
Action coordinator	DREAL
Expected partners	Land-use planning stakeholders, CG 67 & 68, associations, farming profession, SAFER
Human resources needed	Included the DREAL's workload plan
Material needs	DREAL GIS tools
Estimated costs	€40,000, including a) a service provider to mobilise and structure information on the concept of environmental equivalence in France and other European countries and b) a survey of all project owners who have been affected by compensation measures for hamster protection
Total cost for NAP	€40,000
Funding sources	Land-use planning stakeholders, land-use planners and infrastructure managers
Proviso au sensnal timetable	Year 2: Production of the table and updating of land-use planners' guide Year 3: stakeholders' workshop and CNPN assessment Years 4 and 5: implementation and monitoring
Links with other NAPs	Experiences collected regarding compensation measures for other species will be analysed, as well as feedback on experimentation with a compensation offer in Crau
References	Compensation measures in Germany or Holland Work in progress and references of the national group on the "Avoid, reduce and compensation" approach: - Mc Kenney, B. Kiesecker, J. 2009. Policy Evolution for Biodiversity Offsets: A review of offset frameworks. Environmental Management (2010) 45: 165-176. - European Commission. 2007. Guideline document regarding article 6, paragraph 4 of the "Habitats" directive completing the "Managing Natura 2000 Sites" brochure. - Bas, A. and Gaubert, H. 2010. La directive « Responsabilité environnementale » et ses méthodes d'équivalence. Collection Etudes et documents n°19. MEEDDM/CGDD. http://intra.cgdd.i2/IMG/pdf/ED19c_cle255ea6.pdf - 2010 (August 2010 draft version). "Espèces protégées, aménagements et infrastructures" Guide - Recommendations for the acknowledgment of issues linked to protected species and for the management of exemption procedures within the meaning of articles L. 411-1 and L. 411-2 of the environmental code in the framework of land-use planning and infrastructure projects. MEDDE/DEB. - Work in progress by Fabien Quétier (post-doctoral researcher) on environmental equivalence. - Stratégie Nationale pour la Biodiversité 2011-2020 http://www.developpement-durable.gouv.fr/IMG/pdf/SNB_2011-2020WEB.pdf - Barnaud G. and Coïc B. 2011. Mesures compensatoires et correctives liées à la destruction des zones humides: revue bibliographique et analyse critique des méthodes – Convention Onema-MNHN, 119p.

5

ACTION 4.5	PRODUCE A BEST PRACTICES GUIDE ON "REDUCTION"	PRIORITY 1 2 3

ACTION GUIDELINE	Avoid, reduce and compensate
OPERATIONAL OBJECTIVE	Support the effective implementation of the "Avoid, reduce and compensate" hierarchy
CONTEXT	The issue of structuring between land-use planning and protection of the common hamster is often limited to the issue of compensation, and the "appropriate" level of compensation in relation to the loss incurred by the hamster and its habitats. In particular, the issue of the "reduction" of the impact, via "best practices" in land-use planning and urban planning has received little attention so far.
DESCRIPTION OF ACTION	The action should: 1) identify existing and potential best practices that limit as much as possible the impact of projects (economic development, infrastructure, land-use and urban planning) on hamster habitats and populations 2) Assess best practices and compare their advantages and drawbacks 3) Share best practices with the key land-use planning stakeholders
STAGES OF PROCESS	1) Literature review of existing practices that reduce impacts on habitats and hamsters – for different types of projects 2) Preparation of a grid for assessing impacts (environmental, social, economic) and application of the grid to identify the advantages and drawbacks of the practices 3) Identification of the application of best practices (in France, in other European countries) and preparation of concise communication datasheets describing the best practices 4) Organisation of a sharing workshop to present the results, discuss them and amend them. The workshop will also be used to assess the relevance of the results obtained (see monitoring indicators) 5) Preparation of a best practices guide based on the results of the previous steps for dissemination to land-use planners
LINKS WITH OTHER ACTIONS	Knowledge guideline, other ARC guideline actions
REGION CONCERNED	Entire Alsace plain
MONITORING INDICATORS	- Number of participants in sharing workshop - and satisfaction with results and best practices developed - Number of copies of the guide disseminated
EXPECTED DIFFICULTIES	Importance of mobilising future project participants in the workshop
ACTION COORDINATOR	CUS
EXPECTED PARTNERS	Land-use planning stakeholders, CG 67 & 68
HUMAN RESOURCES NEEDED	
MATERIAL NEEDS	
ESTIMATED COSTS	€40,000, including printing of the guide
TOTAL COST FOR NAP	€40,000
FUNDING SOURCES	Land-use planning stakeholders, land-use planners and infrastructure managers, LIFE+ (if it includes urban land-use planning issues)

Provisional timetable	Years 1 and 2: production of the guide and updating of land-use planners' guide
Links with other NAPs	
References	

5

ACTION 4.6	DEVELOP LOCAL THEMATIC GOVERNANCE REGARDING COMPENSATION	PRIORITY 1 2 3

ACTION GUIDELINE	Avoid, reduce and compensate
OPERATIONAL OBJECTIVE	Organisation, mobilisation and sharing of information and knowledge, mobilisation of funding to meet new short-term NAP demands.
CONTEXT	Compensation is a system set up in projects that impact hamsters and it has not been accepted by all. A local thematic governance structure should be set up in order to apply the principles of effectiveness and adaptability of actions and a partnership approach for the mobilisation of all stakeholders, providing a real positive dynamic around the acknowledgment of the protection of the species in development and transparency policies.
DESCRIPTION OF ACTION	Setting up of a local commission on the theme of compensation for local coordination of compensation programmes and sharing of feedback on the different types of compensation and their effectiveness with regard to the impact of projects.
STAGES OF PROCESS	1) Formation of the commission and validation of its operating rules; 2) Long-term operation.
LINKS WITH OTHER ACTIONS	This action is connected to the actions on improvement of the habitat and population restoration (Guideline 2). There may be a link with communication actions (Guideline 5) if it is considered useful to have a specific awareness-raising action aimed at project owners or land-use planners.
REGION CONCERNED	
MONITORING INDICATORS	Number of meetings of the commission
EXPECTED DIFFICULTIES	Normally none
ACTION COORDINATOR	DREAL
EXPECTED PARTNERS	Regional Council, General Councils, Mayors' associations, Chambers of Agriculture, associations, scientific experts, government services, SAFER.
HUMAN RESOURCES NEEDED	Included in the DREAL's human resources
MATERIAL NEEDS	None
ESTIMATED COSTS	None (unless there are specific wishes to travel to other regions, e.g. to meet with stakeholders in the Cossure operation or to analyse examples of compensation monitoring, particularly in other European countries)
TOTAL COST FOR NAP	€0
FUNDING SOURCES	N/A
PROVISIONAL TIMETABLE	Year 1: setting up of the commission, preparation of its operating mode, validation of experimentation with a compensation offer; Years 2 to 5: long-term operation with 2 meetings a year.
LINKS WITH OTHER NAPS	It could be considered useful to examine the compensation provisions used for other protected species in other regions or other European countries and derive examples of best practices.
REFERENCES	

ACTION 4.7	INCLUDE THE HAMSTER IN THE ECOLOGICAL COHERENCE SCHEME	PRIORITY 1 2 3

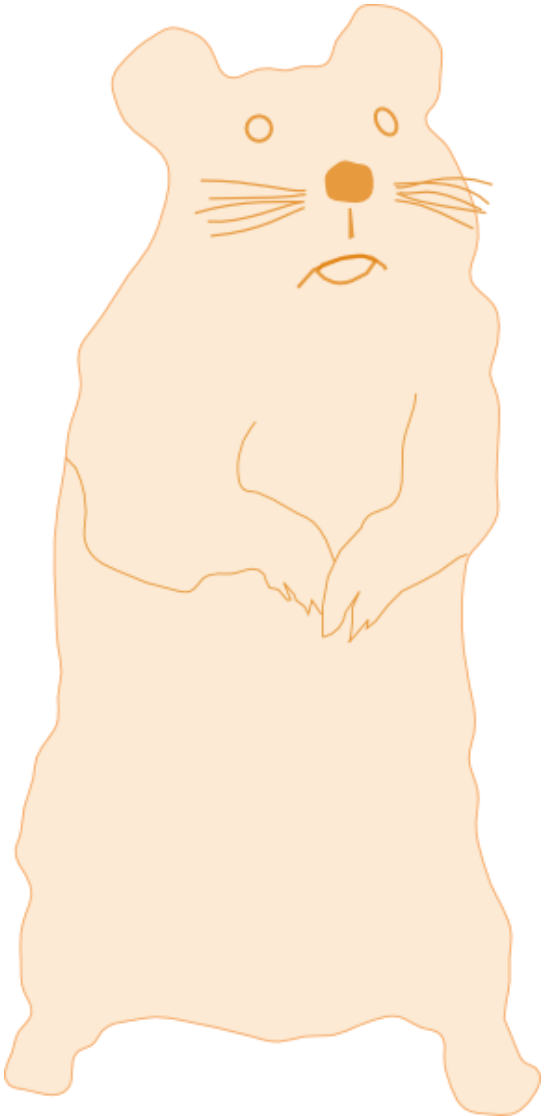
ACTION GUIDELINE	Avoid, reduce and compensate
OPERATIONAL OBJECTIVE	Support the effective implementation of the "Avoid, reduce and compensate" hierarchy Contribute to the SRCE [Regional Ecological Coherence Scheme] by identifying reservoirs of biodiversity and corridors for the hamster Ensure acknowledgment of the species in urban planning documents, plans & programmes
CONTEXT	In the framework of the SRCE, the reservoirs of biodiversity to be maintained and recovered and the corridors to be preserved for the common hamster in Alsace should be defined. Urban planning documents should take the SRCE into account.
DESCRIPTION OF ACTION	This action will enable the precise location of hamster-friendly habitat areas in Alsace. It should be backed by the use of clearly identified criteria, particularly the knowledge bases developed during the plan. However, to remain compatible with the delivery times for the SRCE, initial mapping will be established to be used by the SRCE to account for the reservoirs of biodiversity and corridors necessary for the preservation of this species.
STAGES OF PROCESS	1) Define the knowledge to be mobilised for the study: soil, favourable ground cover, impassable obstacles, historical presence of the species 3) Mapping 4) Presentation of results to local stakeholders 5) Validation and integration in the framework of the SRCE after consultations 6) Information and training of stakeholders, particularly persons in charge of urban planning documents for acknowledgment
LINKS WITH OTHER ACTIONS	Knowledge and habitat guidelines
REGION CONCERNED	Alsace
MONITORING INDICATORS	Production of the map and updating if need be
EXPECTED DIFFICULTIES	Acceptance of local stakeholders in a timetable restricted by the production of the SRCE
ACTION COORDINATOR	DREAL
EXPECTED PARTNERS	ONCFS, DDT, CG 67 and CG 68, CNRS, local authorities.
HUMAN RESOURCES NEEDED	A project manager
MATERIAL NEEDS	Mapping tool and data
ESTIMATED COSTS	€50,000
TOTAL COST FOR NAP	€50,000
FUNDING SOURCES	Potentially LIFE+, MEDDE
PROVISIONAL TIMETABLE	Year 2: production of the map
LINKS WITH OTHER NAPS	Link with the SRCE
REFERENCES	ARAA soil map Data on CARMEN

5

ACTION 4.8	STUDY THE COMPATIBILITY OF THE DEVELOPMENT OF HAMSTER IN CERTAIN "URBANISED" AREAS	PRIORITY 1 2 3

ACTION GUIDELINE	Avoid, reduce and compensate
OPERATIONAL OBJECTIVE	Support the effective implementation of the "Avoid, reduce and compensate" hierarchy
CONTEXT	Discussions during the assessment of the last plan and the preparation of the future plan addressed several times the issue of compatibility between a certain level of urban planning and the development of the hamster population. Several times, mention was made of the example of the town of Vienne (with contradictory information depending on the meetings), as well as the possibility of associating PAZs and hamsters or of letting the species develop in public green spaces
DESCRIPTION OF ACTION	The objective of this action is to review the existing experiences of "hamsters in urbanised areas" in the different European countries, and to define what could be "acceptable" urbanised conditions compatible with the development of hamster populations.
STAGES OF PROCESS	1) Bibliographical research and interviews with stakeholders and key European experts 2) "Case study" sheets describing the "urban" context and state of habitats/population 3) Based on the key factors impacting hamster habitats and populations, identify forms of urban organisation that could be consistent with the conditions required for the development of hamster populations 4) Reporting 5) Applied research: carry out releases in an existing test activity area and study the evolution of the population
LINKS WITH OTHER ACTIONS	Knowledge guideline, other ARC guideline actions, compensation offer
REGION CONCERNED	Alsace
MONITORING INDICATORS	A research report
EXPECTED DIFFICULTIES	Difficulty finding current examples of integration between urbanised areas and the presence of hamsters (reluctance on the part of municipalities to see hamsters progressing in urban areas for fear of being limited in their development afterwards)
ACTION COORDINATOR	CUS, ZAUE
EXPECTED PARTNERS	University, land-use planners, local elected representatives, companies
HUMAN RESOURCES NEEDED	Phase 1 to 4: 2 Master 2 interns monitoring of experimentation • multidisciplinary work with a thesis (€150,000)
MATERIAL NEEDS	Access to information
ESTIMATED COSTS	€40,000 to conduct initial research and a test €150,000 for a thesis
TOTAL COST FOR NAP	€190,000
FUNDING SOURCES	Regional authorities, land-use planners and infrastructure managers, LIFE+ (if it includes urban land-use planning issues)
PROVISIONAL TIMETABLE	Years 3 and 4: bibliographical research and case studies Year 5: applied research (1st year)
LINKS WITH OTHER NAPS	
REFERENCES	

GUIDELINE 5: RAISE AWARENESS AND INFORM



5

ACTION 5.1	IMPROVE CONSIDERATION OF THE SPECIES IN AGRICULTURAL THEMES AND ITS ACCEPTANCE BY THE PROFESSION	PRIORITY 1 2 3

ACTION GUIDELINE	Raise awareness and inform
OPERATIONAL OBJECTIVE	Communication focused on the plan to reinforce the effectiveness of its implementation and ensure the effective integration of the "hamster" theme in economic development and land-use planning policies
CONTEXT	Acceptance of the species by the farming profession has improved with the implementation of the NAP 2007 - 2011, in particular via the engagement of the Chambers of Agriculture and farmers' unions. More than 20% of the farmers in areas of presence of the species in 2011 were under hamster protection contracts.
DESCRIPTION OF ACTION	1) Writing of articles (agricultural and/or non-agricultural press) and dissemination in all media to: • communicate about the results of each campaign (favourable crops, contracts, counting, etc.) • highlight agricultural action with other stakeholders • communicate about the results of agricultural experimentation (link with Improve knowledge guideline) and/or existing sectors and those to be created 2) Participation of farmers in awareness-raising/communication operations aimed at the general public and elected representatives (organised events with school children at the time of releases, personal accounts, link with other actions of the Awareness-raising guideline, etc.) 3) Organisation of an annual meeting per sector in the strict protection area to review the year gone by, exchange, prepare the following campaign, report changes, expectations, etc. (possibly combined with an annual meeting that could emerge in the framework of experimentation with collective crop rotation and sharing of experiences of farmers from other countries).
STAGES OF PROCESS	All of the actions may be set up as of the first year, and continued throughout the plan on an annual basis
LINKS WITH OTHER ACTIONS	Links with experimentation actions of the "Reinforce knowledge" and "Restore habitats" guidelines Links with other actions of this guideline
REGION CONCERNED	- Strict protection areas as the priority to favour a local dynamic - Rest of the Alsace plain for communication about agricultural actions and the involvement of professionals
MONITORING INDICATORS	Number of articles published in the press in *L'Est Agricole* and the *Le Paysan du Haut-Rhin*
EXPECTED DIFFICULTIES	Mobilisation beyond contractualisation
ACTION COORDINATOR	Chambers of Agriculture
EXPECTED PARTNERS	Chambers of Agriculture and farming profession, ONCFS, DREAL and government services, GEPMA, other associations
HUMAN RESOURCES NEEDED	Human resources required for general organisation of the action in the field and to serve as a reference advisor for the farming profession: 1/4 equivalent full-time person
MATERIAL NEEDS	No specific material needs
ESTIMATED COSTS	Covered in-house by Chambers of Agriculture
TOTAL COST FOR NAP	Cost covered in the costs of other actions – not estimated here
FUNDING SOURCES	Chambers of Agriculture, Alsace Region

Provisional timetable	Years 1 to 5: implementation
Links with other NAPs	
References	

5

ACTION 5.2	CONTRIBUTE TO THE EMERGENCE OF A POSITIVE HAMSTER DYNAMIC WITH LOCAL ELECTED REPRESENTATIVES	PRIORITY 1 2 3

ACTION GUIDELINE	Raise awareness and inform
OPERATIONAL OBJECTIVE	Communication focused on the plan to reinforce the effectiveness of its implementation and ensure the effective integration of the "hamster" theme in economic development and land-use planning policies
CONTEXT	The hamster theme is currently not well understood and not well accepted by municipalities' elected representatives and local authorities of areas in which hamsters are present or that represent favourable habitats for hosting hamsters and contributing to their preservation. To ensure the sustainability of protection actions, it is essential to ensure understanding and progressive appropriation by the elected representatives of concerned municipalities, and also by the elected representatives of the EPCI, General Council & Regional Council.
DESCRIPTION OF ACTION	The action consists of: 1) Identification of interested/involved reference elected representatives ready to liaise with other elected representatives and government services/steering committee on hamster protection issues. These elected representatives could be invited to the NAP steering committee meetings as observers to ensure that they receive as comprehensive information as possible to facilitate their role as reference elected representatives in relation to their peers. 2) Participation in symposiums and events involving elected representatives (e.g. "hamster" issue included in annual meetings or technical meetings of the mayors of Alsace/Bas-Rhin/Haut-Rhin, regional council and general council events, etc.) to present the issues and actions implemented to protect hamsters. These short and targeted operations could be accompanied by feedback from elected representatives who have participated in hamster protection actions. 3) Preparation and dissemination of a specific newsletter to elected representatives (twice a year), with the information in the newsletter used to supply district gazettes and facilitate the sharing of information with inhabitants
STAGES OF PROCESS	Year 1: identification of reference elected representatives and knowledge sharing meetings Throughout the NAP: information newsletter to elected representatives, participation in symposiums and events, organisation of working group meetings with elected representatives in the chosen regions
LINKS WITH OTHER ACTIONS	This action is connected to other awareness-raising actions, in particular those aimed at awareness-raising of the general public which will also affect elected representatives. It is also linked to the actions of the "Avoid, reduce and compensate" thematic guideline, as well as those of the "Protect and restore habitats" thematic guideline with which it should be implemented logically and consistently so as to ensure effective support of the actions aimed at elected representatives. And it is also connected to the general communication and information actions of the governance guideline included in the "resource centre" action sheet.
REGION CONCERNED	Areas with current or potential hamster presence in the Alsace plain, elected representatives of other areas to ensure general information and reinforce the appropriation of the hamster species as an emblematic species of the Alsace plain
MONITORING INDICATORS	- Number of operations in events involving elected representatives - Number of regional commission working group meetings - Number of elected representatives involved in these meetings
EXPECTED DIFFICULTIES	Identification of volunteering reference elected representatives
ACTION COORDINATOR	To be defined

Expected partners	Mayors' association, CG67, CG 68, DREAL, ONCFS, CNRS, , environmental associations
Human resources needed	Human resources required to organise the action (including preparation and dissemination of the newsletter to elected representatives) included in the human resources of the Regional Council for implementation of the NAP
Material needs	No particular material needs have been identified at the action sheet preparation stage.
Estimated costs	The total budget for the action is estimated at €5,000 (printing of documents/slide shows, cocktail events, etc.)
Total cost for NAP	€5,000
Funding sources	Regional authorities
Provisional timetable	Years 1 to 5: implementation
Links with other NAPs	Links with the different actions aimed at communication and information about environmental protection, linkage between economic development and environment, sustainable development, biodiversity, etc. targeting elected representatives at different levels.
References	

5

ACTION 5.3	RAISE YOUNG PEOPLE'S AWARENESS	PRIORITY 1 2 3

ACTION GUIDELINE	Raise awareness and inform
OPERATIONAL OBJECTIVE	Communication focused on the plan to reinforce the effectiveness of its implementation and ensure the effective integration of the "hamster" theme in economic development and land-use planning policies
CONTEXT	The objective of the restoration of the common hamster to favourable conservation status entails the development of populations and their redeployment in their natural range. The sharing of this objective by the inhabitants and stakeholders of the region is a necessary condition for the long-term success of the National Action Plan (NAP). The common hamster issue must be considered in the more global context of biodiversity preservation issues.
DESCRIPTION OF ACTION	The action specifically targets the youngest publics (1) in classrooms (Cycle 3) using existing provisions ("PEJ: Protéger l'Environnement J'adhère") and existing tools (Exhibition), and those being produced (teaching kit) or studied. The plan is for fifteen or so operations (20 h each) to be carried out annually in all of the municipalities in the current or potential area of presence of the species. More special-purpose actions are proposed, such as (2) operations to support NAP actions (Prospecting, population reinforcement operation, etc.) or (3) operations to respond to various requests (ad hoc operations in junior or senior high schools including those in the agricultural sectors)
STAGES OF PROCESS	Finalisation of tools. Additional training of facilitators. Communication aimed at teachers. Experimentation in 2012 in ten or so classes.
LINKS WITH OTHER ACTIONS	Action connected to all NAP actions.
REGION CONCERNED	Areas of presence of the common hamster (Priority 1). Rest of Alsace (Priority 2)
MONITORING INDICATORS	Number of operations carried out per year
EXPECTED DIFFICULTIES	None
ACTION COORDINATOR	ARIENA
EXPECTED PARTNERS	Wildlife initiation centres, GEPMA, National Education, CMJ, ONCFS, Municipalities, Farmers, Land-use planners, etc.
HUMAN RESOURCES NEEDED	((1) Contracted facilitators (300 hours/year) + (2 and 3) special-purpose event participants (50 hours/year)
MATERIAL NEEDS	/
ESTIMATED COSTS	€20,000 per year (1: €17,500 in the framework of the "PEJ", 2 and 3: €2,500 special-purpose operations)
TOTAL COST FOR NAP	€100,000
FUNDING SOURCES	Potentially LIFE+, MEDDE, Alsace Region, regional authorities, CUS, patronage
PROVISIONAL TIMETABLE	Year 1: Experimentation Years 2 to 5: awareness-raising
LINKS WITH OTHER NAPS	Broader reflection on raising young people's awareness of biodiversity through NAPs may be begun under the direction of the MEDDE
REFERENCES	

ACTION 5.4	RAISE THE GENERAL PUBLIC'S AWARENESS	PRIORITY 1 2 3

ACTION GUIDELINE	Raise awareness and inform
OPERATIONAL OBJECTIVE	Communication focused on the plan to reinforce the effectiveness of its implementation and ensure the effective integration of the "hamster" theme in economic development and land-use planning policies
CONTEXT	Hamsters are generally not well-known by inhabitants and the general public. Moreover, due to their history, they have not found their place as an emblematic species of Alsatian biodiversity. No one acknowledges individual responsibility (diffuse) for the current conservation status. Overall awareness of their existence, their protection issues and their position in biodiversity issues will reinforce awareness of their need for protection and preservation. There are currently documentaries and exhibition posters, but they will need to be updated and completed, in particular to illustrate the involvement of key stakeholders and the implementation of pilot actions.
DESCRIPTION OF ACTION	The action consists of organising and updating different tools for raising public awareness and making regular use of the media (local press, television, etc.) to share "neutral"/balanced information on the hamster preservation issue: 1) Preparation of a communication strategy – presented and validated by the plan steering committee 2) Preparation of a general public "hamster" brochure for distribution during general public events 3) Travelling "hamster" exhibition in major public places (train stations, public spaces of regional authorities, town halls or communities of municipalities, friends-of-nature centres, etc.) – which could also be presented at different events/conferences 4) Regular preparation of articles for the regional press The question has been raised as to the development of key messages and a "slogan" that would structure the communication actions, as well as a mascot that could be easily identified by the general public and would ensure recognition and continuity in communication actions. 5) Organisation of discussion evenings facilitated by NAP stakeholders
STAGES OF PROCESS	Year 1 – General public brochure Hamster exhibition Y Years 1, 2 & 3 – Use of existing posters for travelling exhibitions Years 1 to 5 – Organisation of discussion evenings Year 3 – Updating of posters with preparation of additional posters targeting stakeholders and actions Production of documentary video-clips, in particular with the participation of plan stakeholders, showing new activities, etc. Years 4 & 5 – travelling exhibition with additional posters Other activities: throughout the NAP, according to opportunities encountered
LINKS WITH OTHER ACTIONS	This action is connected all of the 2012-2016 NAP actions, with each action contributing via its processes and results to providing inputs for general public communication actions. It will also contribute to awareness-raising on the part of elected representatives, in particular when the travelling exhibition is held in the premises of the Region, General Councils, town halls, etc. It will be consistently developed with the communication and integration actions included in the "resource centre" (see governance guideline).
REGION CONCERNED	Alsace plain, Alsace region
MONITORING INDICATORS	- Number of brochures distributed - Number of venue-days for exhibitions - Number of conferences and discussion evenings held

5

	- Number of articles published in the press and number of television appearances
EXPECTED DIFFICULTIES	
ACTION COORDINATOR	GEPMA
EXPECTED PARTNERS	All plan partners according to communication actions and content, Centre Régional de la Documentation Pédagogique
HUMAN RESOURCES NEEDED	Human resources and communication expertise required for implementation of the action
MATERIAL NEEDS	Material for travelling exhibition
ESTIMATED COSTS	1. "General public" brochure: €20,000 2. Travelling exhibition (additional posters): €10,000 3. Other communication actions: costs internalised in existing human resources + professional communication support (€10,000 per year) 4. Discussion evenings: €10,000 per year Total costs: €130,000
TOTAL COST FOR NAP	€90,000
FUNDING SOURCES	Potentially LIFE+, MEDDE, Alsace Regions, DRAAF, Foundation
PROVISIONAL TIMETABLE	Years 1 to 5: awareness-raising actions
LINKS WITH OTHER NAPS	The preparation of this type of action must be closely linked with the general public awareness-raising actions conducted at the regional level concerning biodiversity in general.
REFERENCES	

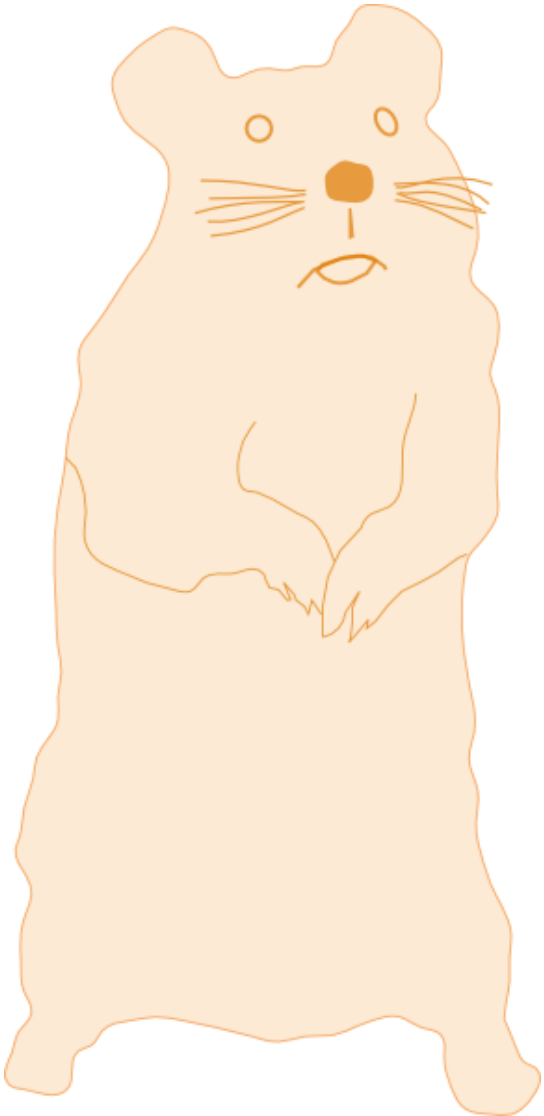
ACTION°5.5	TRAIN TECHNICIANS ON HAMSTER PROTECTION ISSUES	PRIORITY 1 2 3

ACTION GUIDELINE	Raise awareness and inform
OPERATIONAL OBJECTIVE	Communication focused on the plan to reinforce the effectiveness of its implementation and ensure the effective integration of the "hamster" theme in economic development and regional land-use planning policies
CONTEXT	The hamster theme is currently not well understood and not well accepted by design office technicians and local authorities of areas in which hamsters are present or that represent favourable regions for recovery and thereby contribute to the viability of the populations. However, the technicians of these structures are not sufficiently familiar with all the issues of the hamster theme and therefore have difficulty developing consistent arguments to present to their elected representatives or directors.
DESCRIPTION OF ACTION	The action consists of: 1. Production of a small instructive guidebook that includes and concisely presents existing knowledge and provides answers to the main questions regarding hamsters, their habitats and the linkage between hamster protection and land-use planning. The guidebook will include clear illustrations and positive feedback from elected representatives or stakeholders involved in the issue (in France or elsewhere) who have found solutions that reconcile protection and land-use planning/economic development. To ensure effective targeting of the guidebook, a survey will be conducted at the start of the plan in order to understand the technicians' "demand" and their initial level of knowledge. 2. Organisation of two training sessions (fifteen or so technicians for each day-and-a-half long session) on the hamster theme, with participation by ONCFS project managers, researchers, elected representatives and technicians for their feedback, etc. The sessions will include field work organised at times when participants can "see activities" (e.g. release, counting of burrows, particular practices used by farmers, etc.). The training courses will be given to local authority technicians and also to the technicians of associations or other organisations partnering in the future plan. 3. Setting up of an electronic assistance address "hamster@alsace.gouv.fr" organised/managed by the DREAL to provide answers to questions asked by technicians facing various problems. 4. A survey of technicians at the end of the plan to assess the success of the action. The survey is mentioned here "as a reminder" since it is included in a specific governance guideline sheet.
STAGES OF PROCESS	1) Survey of technicians and production of guidebook 2) Organisation of training sessions
LINKS WITH OTHER ACTIONS	This action is connected in particular with the action aimed at awareness-raising of elected representatives, as well as with the actions of the "Avoid, Reduce, Compensate" thematic guideline of the 2012-2016 NAP. Logical linkage between the actions over time is to be proposed. It also benefits from all of the knowledge produced in the other guidelines to propose positive illustrations of actions carried out by different stakeholders with the aim of protecting hamsters.
REGION CONCERNED	Technicians of areas of presence and strict protection area of hamsters, technicians of associations and departmental or regional partners
MONITORING INDICATORS	- Production of guidebook - Number of technicians trained - Improvement of appropriation of hamster issues by technicians
EXPECTED DIFFICULTIES	Availability of technicians for training days

5

ACTION COORDINATOR	DREAL
EXPECTED PARTNERS	Alsace mayors' association, CG 67 & CG 68, Alsace Region, ONCFS, Chambers of Agriculture, association
HUMAN RESOURCES NEEDED	Human resources required for the organisation of this action included in human resources of the DREAL for implementation of the NAP
MATERIAL NEEDS	No particular material needs were identified at the action sheet preparation stage. It is assumed that rooms for the training sessions will be provided by the local authorities.
ESTIMATED COSTS	The total cost is estimated at €15,000 (according to activities carried out by the DREAL as contract work) split as follows: 1. preliminary survey of technicians: conducted by DREAL as contract work; 2. production of guide: €8,000; 3. printing of guide: €2,000; 4. organisation expenses for two training sessions: €1,000
TOTAL COST FOR NAP	€15,000
FUNDING SOURCES	MEDDE, regional authorities
PROVISIONAL TIMETABLE	Year 1: survey of technicians and production of guide Years 2 to 5: organisation of training sessions
LINKS WITH OTHER NAPS	This type of action must be conducted in line with other training actions for technicians covering themes related to biodiversity and the protection of natural resources.
REFERENCES	

GUIDELINE 6: CROSS-CUTTING ACTIONS



5

ACTION 6.1	ENSURE ANNUAL POPULATION MONITORING	PRIORITY 1 2 3

ACTION GUIDELINE	Cross-cutting action linked to governance
OPERATIONAL OBJECTIVE	Organisation, mobilisation and sharing of information and knowledge, mobilisation of funding to meet new short-term NAP demands
CONTEXT	The ONCFS counting protocol validated in 2000, based on the enumeration of the species' burrows in April in winter straw cereals and parcels of alfalfa and clover, must be implemented annually in the relevant regions. The protocol could also be improved according to the conclusions of action sheet 1.3.
DESCRIPTION OF ACTION	Annual organisation of prospecting campaigns in all municipalities with the definite presence of hamsters in the course of the last two years, in all municipalities with limits less than 600 metres from the burrows enumerated in the last two years, in all municipalities with historical presence in which the status of the species is to be confirmed.
STAGES OF PROCESS	1) Selection of areas to be prospected from the list of municipalities defined above (favourable soil and ground cover) 2) Preparation of field map sheets 3) Obtaining of Prefectural orders permitting entry into private parcels (DDT 67 and 68) 4) Organisation of prospecting operations in April (initial training sessions, counting per se, validation of burrows); integration of the new enumeration protocol as soon as it is validated 5) Mapping of burrows validated (ONCFS) and favourable crops (DREAL) 6) Analysis of results and reporting (ONCFS). In parallel, reflection regarding possible adaptations of the protocol techniques for continuous improvement and, in particular, to respond to a context in which fewer indicators of the presence of the species will be proposed in accordance with action sheet 1.3.
LINKS WITH OTHER ACTIONS	Action sheet 1.3. Improvement of protocols and population monitoring
REGION CONCERNED	Prospecting areas
MONITORING INDICATORS	- Monitoring
EXPECTED DIFFICULTIES	Maintaining human resources
ACTION COORDINATOR	ONCFS
EXPECTED PARTNERS	DREAL, DDT 67 and 68 (regulatory support), Chambers of Agriculture (awareness-raising support), wildlife associations
HUMAN RESOURCES NEEDED	ONCFS: 1 Technician position for validation of burrows (4 months) + organisation of field work (16 contractors for the month of prospecting) Commissioned and sworn agents: 75 agent days (integrated in establishment operation) 1 Engineer position (data analysis and reporting) (included in establishment operation up to and including 2013) DREAL: 0.25 equivalent full-time person (mapping work)
MATERIAL NEEDS	5 service vehicles for a month. Automatic photo traps. Plastic containers for the collection of evidence. A laptop computer. A camera.
ESTIMATED COSTS	€50,000

Total cost for NAP	€50,000
Funding sources	MEDDE, managers of upcoming projects or having compensation and monitoring obligations
Provisional timetable	Years 1 to 5: implementation of protocol
Links with other NAPs	This action is in continuity with the 2007 – 2011 NAP.
References	

5

ACTION 6.2	MONITOR THE HAMSTER'S HABITAT SPATIALLY AND TEMPORALLY	PRIORITY 1 2 3

ACTION GUIDELINE	Cross-cutting action linked to governance
OPERATIONAL OBJECTIVE	Organisation, mobilisation and sharing of information and knowledge, mobilisation of funding to meet new short-term NAP demands.
CONTEXT	The hamster's habitat, understood in the broad sense to refer to all arable land situated on common hamster-friendly soil, is covered by several monitoring systems: CAP data at the origin of annual mapping of all crops declared to the CAP, mapping of favourable crops done by the ONCFS in the framework of annual monitoring and SETIT photo-interpretation mapping of all natural environments situated on soil favourable to the species. In the framework of the 2012-2016 NAP, there is a proposal to develop a more in-depth analysis of the annual and inter-annual spatial distribution of favourable crops. This will make it possible to project a mapping view of the areas that offer the species space for development over several cycles.
DESCRIPTION OF ACTION	1) Sharing of needs and diagnosis tools that can be mobilised to develop multiannual mapping of the favourable or unfavourable character of the species' habitat. 2) Spatial and temporal mapping of the species' habitat carried out annually according to the method developed in Year 1. 3) Assessment of meshing of favourable land-use.
STAGES OF PROCESS	1) Definition of specifications in partnership; 2) Mapping of land-use; 3) Analysis of the distribution of multiannual favourable crops and ecological continuity; 4) Evolution of assessment methods (indicators).
LINKS WITH OTHER ACTIONS	Characterisation of favourable habitats, agricultural measures per parcel or per farm.
REGION CONCERNED	Alsace
MONITORING INDICATORS	Indicators of the quality of favourable crop distribution, ecological continuity and interannual ground cover
EXPECTED DIFFICULTIES	Setting up of a common definition of favourable habitats, funding sources
ACTION COORDINATOR	DREAL
EXPECTED PARTNERS	SERTIT, CETE, DRAAF, Chambers of Agriculture, regional authorities, associations, ONCFS
HUMAN RESOURCES NEEDED	Included in the SERTIT workload plan
MATERIAL NEEDS	Geographical information (satellite images, etc.) Tools for image processing, GIS and database management
ESTIMATED COSTS	Assessment of continuity: between €30,000 and €50,000 per year depending on the number of analyses, also scalable according to the cost of satellite data.
TOTAL COST FOR NAP	€400,000 to €750,000
FUNDING SOURCES	MEDDE, regional authorities
PROVISIONAL TIMETABLE	Years 1 to 5: Monitoring of meshing

Links with other NAPs	This action is in continuity with the 2007-2011 NAP
References	Environmental observatory of the European Hamster in Alsace: regular monitoring from satellite imagery - 18th Meeting of the International Hamster Workgroup - Strasbourg, October 2011

5

ACTION N°6.3	SET UP AND RUN A RESOURCE CENTRE	PRIORITY 1 2 3

ACTION GUIDELINE	Cross-cutting action linked to governance
OPERATIONAL OBJECTIVE	Organisation, mobilisation and sharing of information and knowledge, mobilisation of funding to meet new short-term NAP demands
CONTEXT	Information on hamsters, whether scientific, biological, legal, management, etc. or on the progress of the NAP is dispersed and difficult for the target publics (scientists, elected representatives, technicians, young people, the general public) to understand. This situation must be improved by applying the principles of a partnership approach, transparency and effective mobilisation of all stakeholders.
DESCRIPTION OF ACTION	Setting up and operation of a species resource centre in charge of implementing a scientific database and communication tools between researchers and a Website on the progress of the NAP. Organisation of a symposium in the course of the plan bringing together all of the stakeholders back-to-back with one of the year's steering committee meetings. Writing of a biannual Hamster newsletter on the half-yearly progress of the NAP tailored to the target publics. Definition and implementation of a relevant communication plan.
STAGES OF PROCESS	1) Determination of the centre's legal structure and operating resources; 2) Setting up; 3) Long-term operation
LINKS WITH OTHER ACTIONS	The resource centre's vocation is to become the vessel and place for the dissemination of all of the knowledge acquired or implemented for the species during the plan as well as information on the progress of the NAP. Guideline 5 actions
REGION CONCERNED	
MONITORING INDICATORS	Creation of the resource centre Number of annual recipients of the Hamster Info newsletter.
EXPECTED DIFFICULTIES	Definition of a legal structure and procurement of long-term operating resources.
ACTION COORDINATOR	GEPMA
EXPECTED PARTNERS	DREAL, CNRS, ONCFS, regional authorities, Chambers of Agriculture, LEGTA Obernai, CEDS, other plan partners gathering information on the species
HUMAN RESOURCES NEEDED	One part-time employee
MATERIAL NEEDS	A room equipped with conventional office automation equipment and equipment for the production and dissemination of tools on the species
ESTIMATED COSTS	The total budget is estimated at €300,000, i.e. €100,000 over the last 3 years of the plan
TOTAL COST FOR NAP	€300,000
FUNDING SOURCES	MEDDE, regional authorities, CUS, patronage, compensation obligation support actions by project owners
PROVISIONAL TIMETABLE	Year 1: definition of the legal structure and funding sources; Year 2: setting up, recruitment; Years 3 to 5: operation.

Links with other NAPs	The resource centre should integrate hamster preservation issues in the framework of broader biodiversity preservation issues. Contacts and information will therefore be sought above and beyond the case of the hamster.
References	

5

ACTION 6.4	PROPOSE A "HAMSTER+" FUND	PRIORITY 1 2 3

ACTION GUIDELINE	Cross-cutting action linked to governance
OPERATIONAL OBJECTIVE	Mobilisation of funding to meet new short-term NAP demands.
CONTEXT	This action is aimed at putting into practice the key principles of a partnership approach, transparency and adaptability of plan operations. The actions implemented in the framework of the plan may bring forth new one-off questions to be clarified with a certain level of urgency and for which answers must be found in order to improve the effectiveness of the operations proposed in the other themes. In addition, knowledge about the hamster or the progress of the plan is diffuse and difficult for the target publics to grasp. All of the partners wish for an improvement of the communication tools relating to the species, scientific knowledge, including European, and the progress of the NAP itself.
DESCRIPTION OF ACTION	The action consists of setting up a "Hamster+" fund to finance actions aimed at reinforcing knowledge that, as a priority, can improve the conservation status of the species in the field, but are not financed elsewhere, as well as communication actions focused on the species or on the progress of the plan. The fund is managed by its Management Board made up of the founding members backed by 1) the steering committee for the establishment of priority issues to which the fund should respond or communication actions to be initiated and 2) the scientific committee for the assessment and choice of proposals. Research or communication projects will generally be limited to a maximum duration of 12 months. Exceptions may however be made for structuring actions that are considered essential for the smooth functioning of the 2012-2016 NAP. Apart from criteria related to the relevance and quality of proposals, criteria such as "young researchers/young stakeholders" or mobilisation of key stakeholders could be used to choose the proposals to be funded.
STAGES OF PROCESS	Year 1: Definition of the legal structure, financing provisions and operating rules of the fund, identification of the first issues. Year 2: Launch of the first call for projects, assessment of the first proposals and contractualisation Year 3 to 4: Implementation of the projects chosen in year n-1 and launch of new calls for projects with assessment/selection and contractualisation Year 5: Implementation of the projects chosen in Year 4 and assessment of the success, relevance and effectiveness of the action.
LINKS WITH OTHER ACTIONS	This action is connected to all of the actions of the 2012-2016 NAP and the projects financed by the fund must respond to the priority issues identified in the framework of the different thematic guidelines. The fund may respond in particular to the expectations of certain companies or project owners to carry out patronage actions or actions in support of compensation measures for hamsters as an emblematic species of the biodiversity of the Alsace plain.
REGION CONCERNED	Entire Alsace region
MONITORING INDICATORS	Number of projects funded
EXPECTED DIFFICULTIES	Setting up of the legal structure and funding required. The small size of the annual budget proposed could limit the range of the actions funded.
ACTION COORDINATOR	DREAL, with support from 1) the steering committee to define priority actions and 2) the scientific committee to guide the choice of scientific proposals selected and funded and 3) the Fund's Management Board for the final choice and determination of the amounts allotted.
EXPECTED PARTNERS	Diversity of potential scientific and operational partners for the actions submitted for the call for projects and funding.

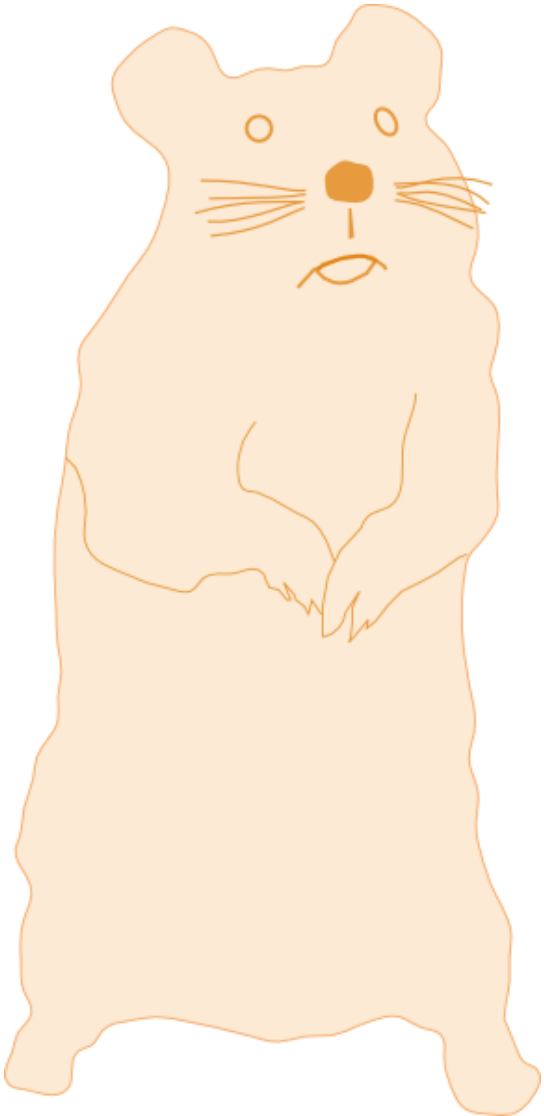
Human resources needed	Human resources required to coordinate this action integrated in the human resources of the DREAL for implementation of the NAP
Material needs	No particular material needs have been identified at the action sheet preparation stage. Some proposals submitted for calls for proposals for the "Hamster +" fund may however include requests for (limited) funding for particular equipment.
Estimated costs	The total budget for the action is estimated at €225,000
Total cost for NAP	€225,000
Funding sources	MEDDE, Alsace Region, other regional authorities, private partners in the framework of patronage or support actions, etc.
Provisional timetable	Year 1: Definition of the structure. Year 2: Launch of the first call for projects Years 3 and 4: Implementation of projects Year 5: Assessment of the approach.
Links with other NAPs	This type of action, if considered successful, could serve as an example for a future Regional "Biodiversity+" Fund which would provide financial support for the implementation of projects aimed at improving knowledge in the field of biodiversity (including common hamsters).
References	DREAL

5

ACTION 6.5	CONDUCT AN OPINION POLL AND SOCIOLOGICAL SURVEY OF SOCIETAL DYNAMICS	PRIORITY 1 2 3

ACTION GUIDELINE	Cross-cutting action linked to governance
OPERATIONAL OBJECTIVE	Organisation, mobilisation and sharing of information and knowledge, mobilisation of funding to meet new short-term NAP demands.
CONTEXT	It is quite difficult to grasp the general public's opinion regarding the species and its protection.
DESCRIPTION OF ACTION	1) Conducting of two opinion polls in 2012 and 2016 and comparative analysis of changes; 2) Consultation meetings (participative democracy) based on a concrete situation; 3) Sharing and exchange of information. Debating of difficult themes. Obligation for a constructive summary to be produced after the meetings.
STAGES OF PROCESS	1) Conducting and analysis of opinion polls; 2) Setting up of a meeting of "ordinary" people in each of the 7 identified areas of presence (forming of consistent groups of municipalities).
LINKS WITH OTHER ACTIONS	The observations resulting from the first opinion poll will be used to orientate general public awareness-raising. The sociological survey will link up the "experimentation with new cultivation techniques" action of the "Knowledge" guideline with the "Implementation of favourable multiannual crop rotation" of the "Habitats" guideline.
REGION CONCERNED	For the opinion polls: the entire Alsace region. For the sociological survey: all of the districts with presence of the species (19 municipalities in 2012) and, in a second step, future recovery municipalities.
MONITORING INDICATORS	- Conducting of two opinion polls - Number of meetings held for the sociological survey
EXPECTED DIFFICULTIES	None identified
ACTION COORDINATOR	Sociology Laboratory of the Université de Strasbourg
EXPECTED PARTNERS	Chamber of Agriculture of the Haut-Rhin, Chamber of Agriculture of the Bas-Rhin, DDAF 67 and 68, ONCFS, farmers' unions, Copvial, etc.
HUMAN RESOURCES NEEDED	For the opinion polls, the human resource requirements will be ensured by the service provider's personnel. A term-contract (doctoral student) for the monitoring, coordination and formatting of the results (over 3 years) for the sociological analysis.
MATERIAL NEEDS	Office equipment: €500 per year
ESTIMATED COSTS	Opinion polls: cost to be defined €30,000 over 3 years (three full months per year) for the sociological survey
TOTAL COST FOR NAP	Opinion polls: cost to be defined €30,000 for the sociological survey
FUNDING SOURCES	CIFRE contract
PROVISIONAL TIMETABLE	Years 1 and 5: conducting and analysis of opinion polls Years 2 to 4: coordination and processing of results of the sociological survey
LINKS WITH OTHER NAPs	
REFERENCES	

Glossary

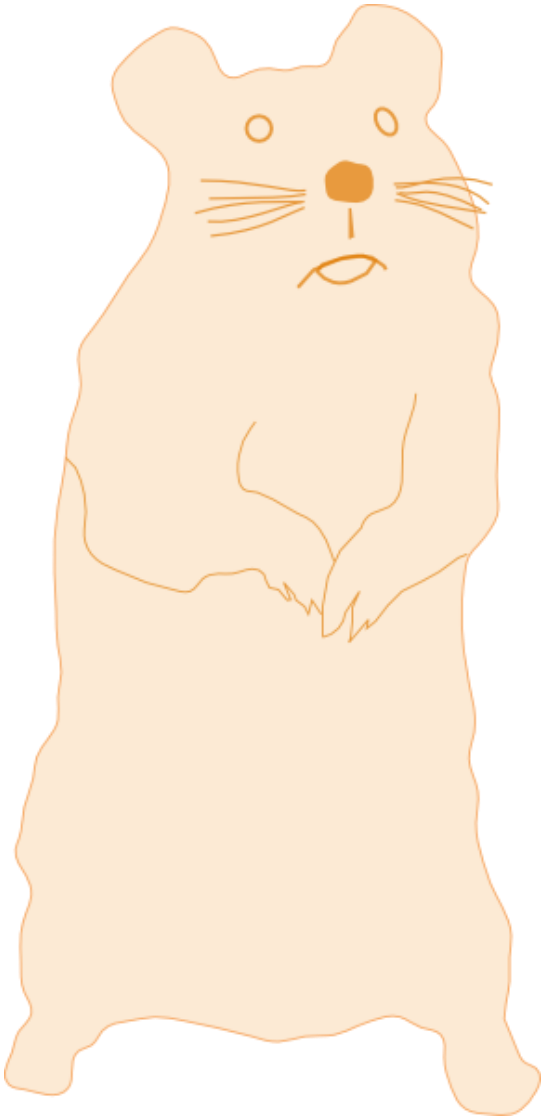


GLOSSARY

Presence area	Area defined by the Ministerial Order of 6 August 2012: Common hamster-friendly surface areas located within a 600 metre radius of burrows recognised over the past two years, which are not separated from the recognised burrows by an area unfavourable to the species more than 300 metres wide, or by an impassable obstacle.
Strict protection area	Protection perimeter defined by the Habitat Order of 31 October 2012 regarding the protection of the habitat of the common hamster (Cricetus cricetus).
Habitat	The concept of "habitat" is not yet specifically defined in the legal or biological sense. It is agreed here that the term refers to all arable land situated on hamster-friendly soil.
Recovery	Natural expansion of hamster populations in sectors historically occupied by the species. Recovery actions are aimed at supporting this dynamic.
AIP	Analysis of Potential Impacts
CC	Municipal map
CJE	European Court of Justice
CG	[French] General Council
CNPN	[French] national wildlife protection council
CR	[French] Regional Council
CUS	Urban Community of Strasbourg
DDT	[French] Departmental Directorate for regional development
DRAAF	[French] Regional directorate for food, agriculture and forests
DREAL	[French] Regional Directorate for the environment, planning and housing
EIR	Residual impact study
EPCI	[French] public establishment for inter-municipal co-operation
JEFS	Fallow land/Environment/Wildlife
LEGTA	French] agricultural secondary school for general, technological and vocational education
MAAP	[French] Ministry of agriculture, food and fisheries
AEM	Agro-environmental measure
MEDDE	[French] Ministry of ecology, sustainable development and energy
ONCFS	[French] national agency for hunting and wildlife

AEP	Agro-environmental programme
PLU	French] Local urban planning plan
NAP	National Action Plan for the protection of hamsters
POS	[French] land-use plan
SAU	Utilised agricultural land
SCOT	Regional consistency scheme
SFS	Wild Fauna Preservation association
SWOT	Strengths, Weaknesses, Opportunities, Threats
PAA	Priority Action Area

Bibliography



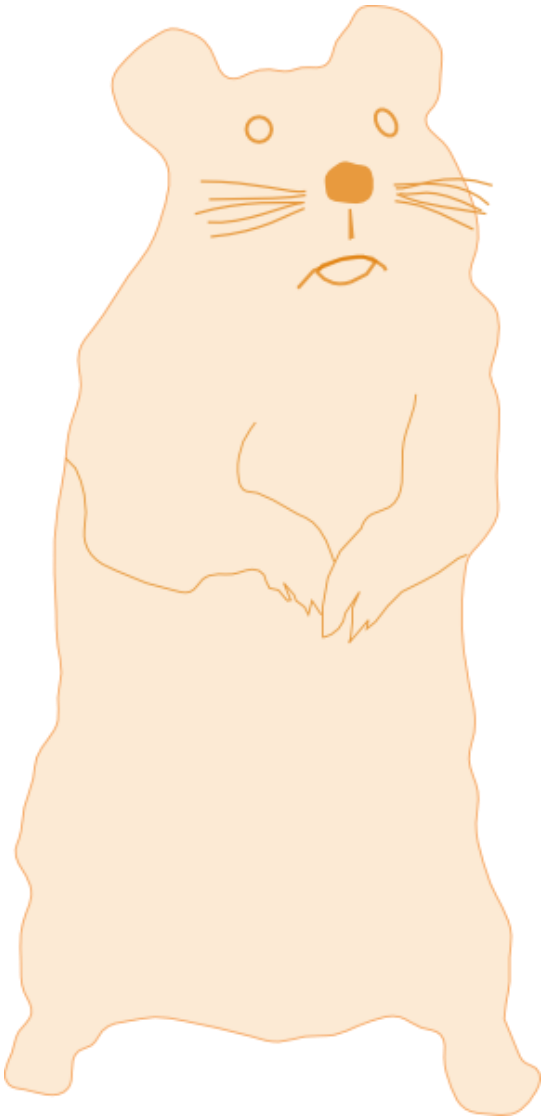
BIBLIOGRAPHY

- Amand B., Duponteil A., Grandmougin B., Strosser P., (ACTeon), Boos M. (Naturaconsta), Keichinger O., 2011, évaluation du plan national d'actions 2007 – 2011 en faveur du hamster.
- Apfelbach, R., C.D. Blanchard, R.J. Blanchard, R.A. Hayes et I.S. McGregor. 2005. The effects of predator odors in mammalian prey species: A review of field and laboratory studies. Neurosc. Behav. Reviews. 29: 1123-1144.
- Baumgart G. 1996. Le hamster d'Europe (Cricetus cricetus L. 1758) en Alsace. 1) Données anciennes et récentes (1546-1995). 2) Hypothèses sur les causes de sa régression. Rapport Office National de la Chasse. 267 p.
- Bihari Z., Horvath M., Lanszki J., Heltai M. (2008) Role of the Common Hamster in the diet of natural predators in Hungary. In: The Common Hamster: Perspectives on an endangered species. Biosystematics and ecology Series n°25. Millesi E, Winkler H, Hengsberger R. Pp 61-68.
- Canguilhem, B., J-P. Vaultier, P. Pévet, G. Coumaros, M. Masson-Pévet and I. Bentz. 1988. Photoperiodic regulation of body mass, food intake, hibernation, and reproduction in intact and castrated male European hamsters, Cricetus cricetus. J. Comp. Physiol. A 168: 549-557.
- Darrow, J.M., M.J. Duncan, A.Bartke, A. Bona-Gallo and B.D. Goldman. 1988. Influence of photoperiod and gonadal steroids on hibernation in the European hamster. J. Comp. Physiol. A. 163: 339-348.
- Deutschlander, M.E., M.J. Freake, S.C. Borland, J.B. Philipps, R.C. Madden, L.E. Anderson and B.W. Wilson. 2003. Learned magnetic compass orientation by the Siberian hamster, Phodopus sungorus. Anim. Behav. 779-786.
- DREAL Alsace, 2011, Hamster commun d'Alsace. Fiche de presentation.
- Eidenschenck, J. et A. Villemey. 2012. Mise en oeuvre du Plan d'action en faveur du Hamster commun (Cricetus cricetus) en Alsace État des connaissances sur la dynamique des populations de hamster commun et ses facteurs déterminants (habitats, prédation...). Quelle stratégie pour la croissance des populations ? Rapport ONCFS 29pp.
- Kayser, A | Voigt, F | Stubbe, M 2001. First Results on the Concentrations of Some Persistent Organochlorines in the Common Hamster Cricetus cricetus (L.) in Saxony-Anhalt. Bulletin of Environmental Contamination and Toxicology [Bull. Environ. Contam. Toxicol.]. Vol. 67, no. 5, pp. 712-720. Nov 2001.

- Kayser, A., 2004. Impact of the projet for the construction of a Southern Beltway on the Common hamster populations in the Alsace. Assessment report for ONCFS. 28p
- Kayser, A., 2005, subm. Contemplation about minimum viable population size in common hamsters. In LOSINGER (2005, subm). Hamster biology and ecology, policy and management of hamsters and their biotope.
- Kayser, A., Weinhold, U., Stubbe, M. 2003. Mortality factors of the common hamster Cricetus cricetus at two sites in Germany. Acta Theriologica, 48(1): 47-57
- Körtner, G. X. Song and F. Geiser 1998. Rhythmicity of torpor in a marsupial hibernator, the mountain pygmy-possum (Burramys parvus) under natural and laboratory conditions. J Comp Physiol B (1998) 168: 631-638.
- Kuiters A.T., La Haye M.J.J, Müskens G.J.D.M.and R.J.M. Van Kats. 2011. Perspectieven voor een duurzame bescherming van de hamster in Nederland. Alterra Wageningen. 128 p
- La Haye, M. (2008). Is there a future for common hamster (Cricetus cricetus) in Western Europe? In: Cricetinae Internationals Ehrensymposium, Sächsischen Akademie der Wissenschaften, Stuttgart/Leipzig: 54-59.
- La Haye, M.J.J., Müskens, G.J.D.M., Van Kats, R.J.M., Kuiters, A.T., Spiepel, H. (2010). Agri-environmental schemes for the common hamster (Cricetus cricetus). Why is the Dutch project successful? Aspects of Applied Biology 100, 117-124.
- La Haye M. J. J., Neumann K., Koelewijn H.P. (2011) Strong decline of gene diversity in local populations of the highly endangered Common hamster (Cricetus cricetus) in the western part of its European range. Conservation genetics.
- Le Louarn, H., Quéré, J.-P. (2003). Les rongeurs de France. INRA Ed. (Institut National de la Recherche Agronomique), Paris. 256p
- Lima, S.L. and P.A. Bednekoff. 1998. Temporal variation in danger drives antipredator behavior: the predation risk allocation hypothesis. Am. Nat. 153: 649-659.
- LPO France, Deuxième plan national d'action en faveur de l'Outarde canepetière 2011 - 2015.
- Mac Leod R., Mac Leod C.D., Learmonth J.A., Jepson P.D., Reid R.J., Deaville R. et Pierce G.J. 2007. Mass-dependent predation risk and lethal dolphin–porpoise interactions. Proc. R. Soc. B. 274: 2587-2593.

- McCallum, H.and A. Dubson. 2002. Disease, habitat fragmentation and conservation. Proc. R. Soc. Lond. B 1504: 2041-2049.
- Mechin, C. 2005. Pour une approche ethnologique de la sauvegarde du Grand Hamster en Europe, in proceedings of international symposium on the Common Hamster (Cricetus cricetus L.), Strasbourg, ONCFS.
- Mechin, C. 2007. La gestion de l'espace rural et périurbain et les enjeux de sauvegarde d'une espèce protégée: la situation du hamster commun (Cricetus cricetus L.) en Alsace. Actes du colloqie: les mondes ruraux à l'épreuve des sciences sociales, Dijon, INRA, pp. 373-385.
- Mechin, C. 2011. Une espèce protégée qui dérange: le Hamster commun (Cricetus cricetus L.) en Alsace, in Anthropozzologica, 46-1, pp. 47-60.
- Mechin, C. 2012a. La manipulation des espèces animales. Réflexion anthropologique sur la qualification du sauvage. Economie rurale, n0327, pp. 143-151.
- Mechin, C. 2012b. Une fable moderne: la cignogne et le hamster en Alsace. In Dalla Bernardina (dir.) L'appel du sauvage, Rennes, Pressures Universitaires, pp.147-157.
- MEDAD & DIREN Alsace, 2007, Plan d'action 2007 - 2011 pour le hamster commun (Cricetus cricetus) en Alsace.
- MEDAD & DREAL PACA, Plan national d'actions en faveur de la Tortue d'Hermann (Testudo hermanni hermanni) 2009 - 2014.
- Monecke, S., A. Malan et P. Pevet. 2011. Long term temperature recordings in European Hamsters. Proceedings of 18th meeting of the international hamster workgroup. Strasbourg. p.17-19.
- Müskens G.J.D.M., La Haye M.,Van Kats R.J.M. (2005) Re-establishement of a viable network population of the Common hamster in south limburg, the Netherlands. Impact of crop management and survival stripson burrow distribution in the release sites. In: The Common hamster Cricetus cricetus, L 1758. Hamster biology and ecology, policy and management of hamsters and their biotope. Proc. 12th Inter. hamsterworkgroup, October, 16th 18th 2004, Strasbourg, Losinger I. ed., Paris: O.N.C.F.S., 2005. Pp 59-62
- Nechay, G. (2000). Statut des hamsters Cricetus cricetus, Cricetus migratorius, Mesocricetus Newtoni et d'autres espèces de hamster en Europe. Conseil de l'Europe Ed. 77 p
- Neumann, K., H. Jansman et al. 2004. Multiple bottlenecks in threatened western European populations of the common hamster Cricetus cricetus (L.) Cons. Gen. 5: 181-193.
- Neumann, K., J.R. Michaux, et al. 2005. Genetic spatial structure of European common hamsters (Cricetus cricetus): a result of repeated range expansion and demographic bottlenecks. Mol. Ecol., 14: 1473-1483

- ONCFS, 2011, Mise en œuvre du Plan d'action (Actions 3-2 et 3-3) en faveur du Hamster commun (Cricetus cricetus) en Alsace. Actualisation de l'aire de répartition de l'espèce en 2011 et tendances d'évolution de l'abondance de l'espèce sur certains territoires.
- ONCFS, 2012. Mise en œuvre du Plan d'action en faveur du Hamster commun (Cricetus cricetus) en Alsace. Actualisation de l'aire de répartition de l'espèce en 2012 et tendances d'évolution de l'abondance de l'espèce sur certains territoires. Discussion et perspectives.
- Reed, D.H., J.J. O'Grady, B.W. Brook and J.D. Ballou and R. Frankham. 2003. Estimates of minimum viable population sizes for vertebrates and factors influencing those estimates. Biological Conservation 113: 23-34.
- Reiners, T.E. and J.A. Encarnação 2011. Impact of climate and agriculture on persistence of common hamsters in central Germany. Proceedings of 18th meeting of the international hamster workgroup. Strasbourg. p.34.
- Scaffrath J. and U. Weinhold. 2011. Behaviour, habitat use mortality and population ecology of reintroduced Common hamsters (*Cricetus cricetus*) in intensively used agricultural areas in northern Baden-Würtenberg, Germany. Proceedings of 18th meeting of the international hamster workgroup. Strasbourg. p.44.
- SERTIT. 2012. Occupation des sols au printemps 2012 dans l'aire de présence du grand hamster d'Alsace. Analyse spatio-temporelle d'imagerie satellite. Rapport final – Phases 1 et 2.
- Villemey A. & Eidenschenck J. (ONCFS), 2011, Mise en œuvre du Plan d'action (Guideline 5) en faveur du Hamster commun (Cricetus cricetus) en Alsace. Renforcement des populations de Hamster commun 2011. Protocole et bilan.
- Wassmer, T. 2004. Body temperature and above-ground patterns during hibernation in European hamsters (Cricetus cricetus L.). J. Zool. 262:281-288.
- Wassmer, T. et F. Wollnik. 1997. Timing of torpor bouts during hibernation in European hamsters (Cricetus cricetus L.) J. Comp. Physiol. B 167: 270-279.
- Weinhold U. (1999) http://www.institut-faunistik.net/feldhamster/mortalitaet.html
- Wencel, M.-C., Losinger, I., Migot, P. (2001). Le Grand hamster. ONCFS publications. 68 p
- Zhang, JX., C. Cao, H. Gao, Z-S. Yang, L. Sun, Z-B. Zhang, Z-W. Wang. 2003. Effects of weasel odor on behavior and physiology of two hamster species. Physiol Behav. 79: 549-552.
- Ziomek, J. A. Banaszek, G. Stachurski. 2011. Circadian and seasonal activity of the Common Hamster in a mosaic of arable fields in Central Europe. Proceedings of 18th meeting of the international hamster workgroup. Strasbourg. p.45.



Annexes

ANNEXES

Annex 1: Prefectural decision on the governance of the national action plan for the protection of common hamsters in Alsace for the period 2012-2016

Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE

PRÉFET DE LA RÉGION ALSACE

DECISION N°2012/122 DU 22 NOV. 2012
RELATIVE A LA GOUVERNANCE DU PLAN NATIONAL EN FAVEUR DU HAMSTER COMMUN EN ALSACE POUR LA PERIODE 2012 – 2016

LE PRÉFET DE LA RÉGION ALSACE,

VU le plan national d'action en faveur du hamster commun en Alsace pour la période 2012 – 2016

VU la décision du 8 septembre 2010 du Préfet de la Région Alsace relative au comité de pilotage régional de mise en œuvre du plan d'action pour le Hamster commun en Alsace,

DECIDE

Article 1 :

La gouvernance du plan national d'action en faveur du hamster commun en Alsace pour la période 2012 – 2016 est composée de :

- un comité de pilotage,
- un comité scientifique
- des groupes de travail thématiques

Article 2 : Comité de pilotage

Le comité de pilotage est présidé par le préfet de région ou son représentant.

Il a pour rôle de :

- piloter la déclinaison stratégique du plan national en actions prioritaires pour la préservation de l'espèce, les territoires concernés et les moyens financiers nécessaires ;
- assurer le suivi de la mise en œuvre opérationnelle du plan dans ses composantes technique et financière, notamment dans le cadre de bilans annuels ;
- articuler les actions du plan avec les autres actions de préservation de l'espèce engagées au niveau national ou communautaire;
- évaluer la cohérence, l'efficacité et l'efficience des mesures du plan d'action, ainsi que définir, en tant que besoin, les axes d'évolution et de reconduction de ce plan.

Il se réunit deux fois par an environ.

Le comité de pilotage comprend les membres suivants :

- <u>représentants des collectivités territoriales :</u>
  - le président du conseil régional d'Alsace ou son représentant
  - le président du conseil général du Bas-Rhin ou son représentant
  - le président du conseil général du Haut-Rhin ou son représentant
  - le président de la communauté urbaine de Strasbourg ou son représentant
  - le président de la communauté d'agglomération de Colmar ou son représentant
  - le président du SCOTERS ou son représentant
  - le président du SCOT Colmar, Rhin, Vosges ou son représentant
  - le président du SCOT du Piémont des Vosges ou son représentant
  - le président de l'établissement foncier du Bas-Rhin ou son représentant
  - le président de l'association des maires du Bas-Rhin ou son représentant
  - le président de l'association des maires du Haut-Rhin ou son représentant
- <u>représentants de la profession agricole et des chasseurs :</u>
  - le président de la chambre régionale d'agriculture ou son représentant
  - le président de la chambre d'agriculture du Bas-Rhin ou son représentant
  - le président de la chambre d'agriculture du Haut-Rhin ou son représentant
  - le président de la fédération départementale des syndicats d'exploitants agricoles du Bas-Rhin ou son représentant
  - le président de la fédération départementale des syndicats d'exploitants agricoles du Haut-Rhin ou son représentant
  - le président de la fédération départementale des chasseurs du Bas-Rhin ou son représentant
  - le président de la fédération départementale des chasseurs du Haut-Rhin ou son représentant
- <u>profession des aménageurs lotisseurs :</u>
  - le président de la chambre d'Alsace du syndicat national des aménageurs lotisseurs ou son représentant
- <u>associations d'éducation à l'environnement ou de protection de la nature :</u>
  - le président d'Alsace Nature ou son représentant
  - le président du Groupement d'Étude et de Protection des Mammifères d'Alsace ou son représentant
  - le président du Centre d'Études, de Recherches et de Protection de l'Environnement en Alsace ou son représentant
  - le président de l'Association pour la Protection de l'Environnement de Lingolsheim et ses Environs ou son représentant
  - le président de l'association Sauvegarde Faune Sauvage ou son représentant
  - le président de l'association régionale pour l'initiation à l'environnement et à la nature en Alsace ou son représentant

- experts :

  - un représentant de l'administration centrale du ministère de l'environnement
  - un représentant de l'administration centrale du ministère de l'agriculture
  - le président du comité scientifique du plan national d'action ou son représentant
  - le président de l'Office national de la chasse et de la faune sauvage ou son représentant
  - la directrice du département Ecologie, Physiologie et Ethologie de l'Institut Pluridisciplinaire Hubert Curien du Centre National pour la Recherche Scientifique ou son représentant
  - le directeur de l'exploitation agricole du lycée d'Obernai
  - le directeur de l'association pour la relance agronomique en Alsace ou son représentant

- services de l'État :

  - le préfet du Haut-Rhin ou son représentant
  - le secrétaire général de la préfecture du Bas-Rhin ou son représentant
  - le directeur régional de l'environnement, de l'aménagement et du logement d'Alsace ou son représentant
  - le directeur régional de l'alimentation, de l'agriculture et de la forêt d'Alsace ou son représentant
  - le directeur départemental des territoires du Bas-Rhin ou son représentant
  - le directeur départemental des territoires du Haut-Rhin ou son représentant
  - le sous préfet d'arrondissement de Sélestat-Erstein
  - le sous-préfet d'arrondissement de Molsheim

Le président du comité de pilotage peut en outre inviter ponctuellement, en raisons des points inscrits à l'ordre du jour, toute personne qualifiée susceptible de contribuer à ses travaux.

Le secrétariat du comité de pilotage est assuré par la direction régionale de l'environnement, de l'aménagement et du logement.

Article 3 : Comité scientifique

Le comité scientifique a pour fonction de fournir un avis au comité de pilotage sur :

- les protocoles de recherche mis en œuvre dans le cadre du plan national d'action ;
- l'évaluation des résultats obtenus ;
- les nouvelles actions de recherche à lancer pour favoriser la préservation du hamster en Alsace et évaluer la pertinence et l'efficacité du plan à ce sujet.

Il se réunit environ deux fois par an.

Il désigne un président en son sein et fonctionne par consensus. Les avis divergents sont signalés dans les compte-rendus ou rapports du comité.

Le comité scientifique est composé de personnalités désignées intuitu personae, disposant d'une expertise scientifique reconnue pour la préservation du hamster ou d'espèces voisines :

- M. Patrick Giraudoux, enseignant-chercheur à l'Université de Franche-Comté

- M. Jean-François Cosson, directeur de recherches à l'Institut National de la Recherche Agronomique
- Mme Christiane Denys, professeur au Muséum National d'Histoire Naturelle :
- M. Pierre Migot, directeur des études et de la recherche à l'Office National de la Chasse et de la Faune Sauvage
- M. Tobias Erik Reiners, Université Justus-Liebig de Giessen, Allemagne
- M. Gerard Muskens, Université Radboud de Nimègue, Pays-Bas
- M. Maurice Lahaye, Université Radboud de Nimègue, Pays-Bas
- Mme Véronique Verbist, Agence flamande de la nature et des forêt, Belgique
- M. Ulrich Weinhold, Institut für Faunistik, Heiligkreuzsteinach, Allemagne

Le secrétariat du comité scientifique est assuré par la direction régionale de l'environnement, de l'aménagement et du logement.

Article 4:

La décision du 8 septembre 2010 du Préfet de la Région Alsace relative au comité de pilotage régional de mise en œuvre du plan d'action pour le Hamster commun en Alsace est abrogée.

Le Préfet,

Stéphane BOUILLON

Annex II: Preliminary proposal of scoreboards for NAP monitoring

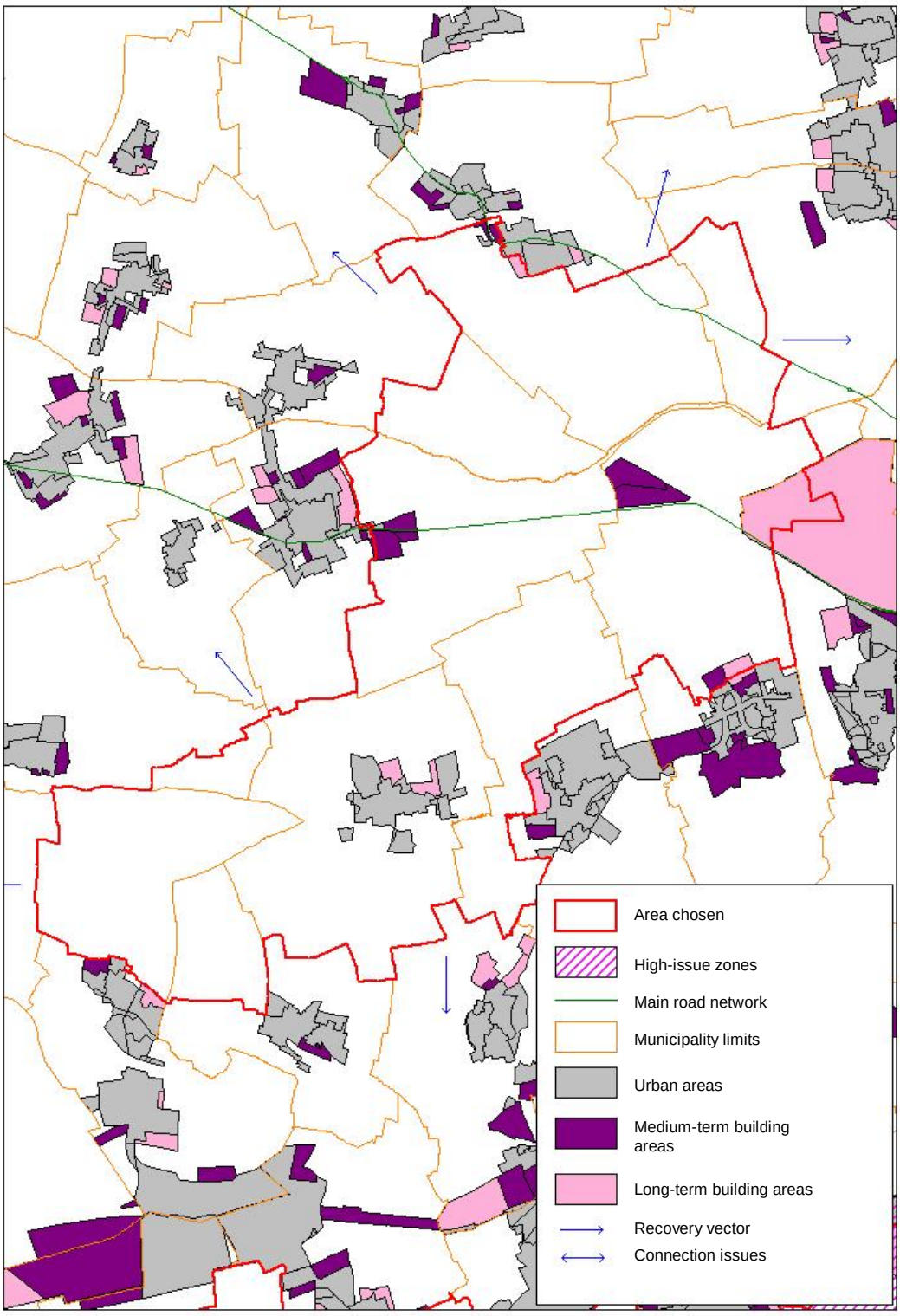
Table 1 – Hamster Population and Habitat Conservation Status						
Indicator	**Qualitative Description**	**Indicator (and unit)**	**Value year n-1**	**Value year n**	**% evolution**	**Lessons and comments**
Number of burrows surveyed						
Area of presence						
Surface area with favourable crops						
Density of burrows						
Indicators of evolution of associated levers and pressure	For example: surface areas of favourable crops in Alsace plain & average size of parcels (habitat), kilometres of roads and road traffic (infrastructures and passage), artificialiased surface areas (urban planning), number of inhabitants (overall pressure)					
Overall assessment	*General text and recommendations*					

Table 2 – Operational Implementation of 2012-2016 NAP guidelines and actions										
Guideline	**General description of implementation of guideline during the year**	**Indicators (and units)**	**Values year -1**	**Values year n**	**% evolution**	**Action**	**Status of action**	**Financial resources mobilised Year *n***	**Financial resources mobilised to date in €**	**Financial resources mobilised to date as % of total cost**
Guideline 1 – Reinforcement of knowledge		**Number of publications**	*4**	*6**	*+50%**	**Action 1.1**	*In progress**	*35 k€**	*50 k€**	*25%**
						Action 1.2	*Finalised**	*10 k€**	*10 k€**	*85%**
		Number of adaptations of operational actions	*0**	*0**	-	**Action 1.3**	*Not started**	-	-	*0%**
						Action 1.4	*Abandoned**	-	-	-
						Etc.				
						Guideline		*45 k€**	-	*15%**
Overall assessment of Guideline 1	*General text and recommendations*									
Guideline 2										
Guideline 3										
Guideline 4										
Guideline 5										
Guideline 6										
Overall assessment of operational implementation of NAP	*General text and recommendations*									

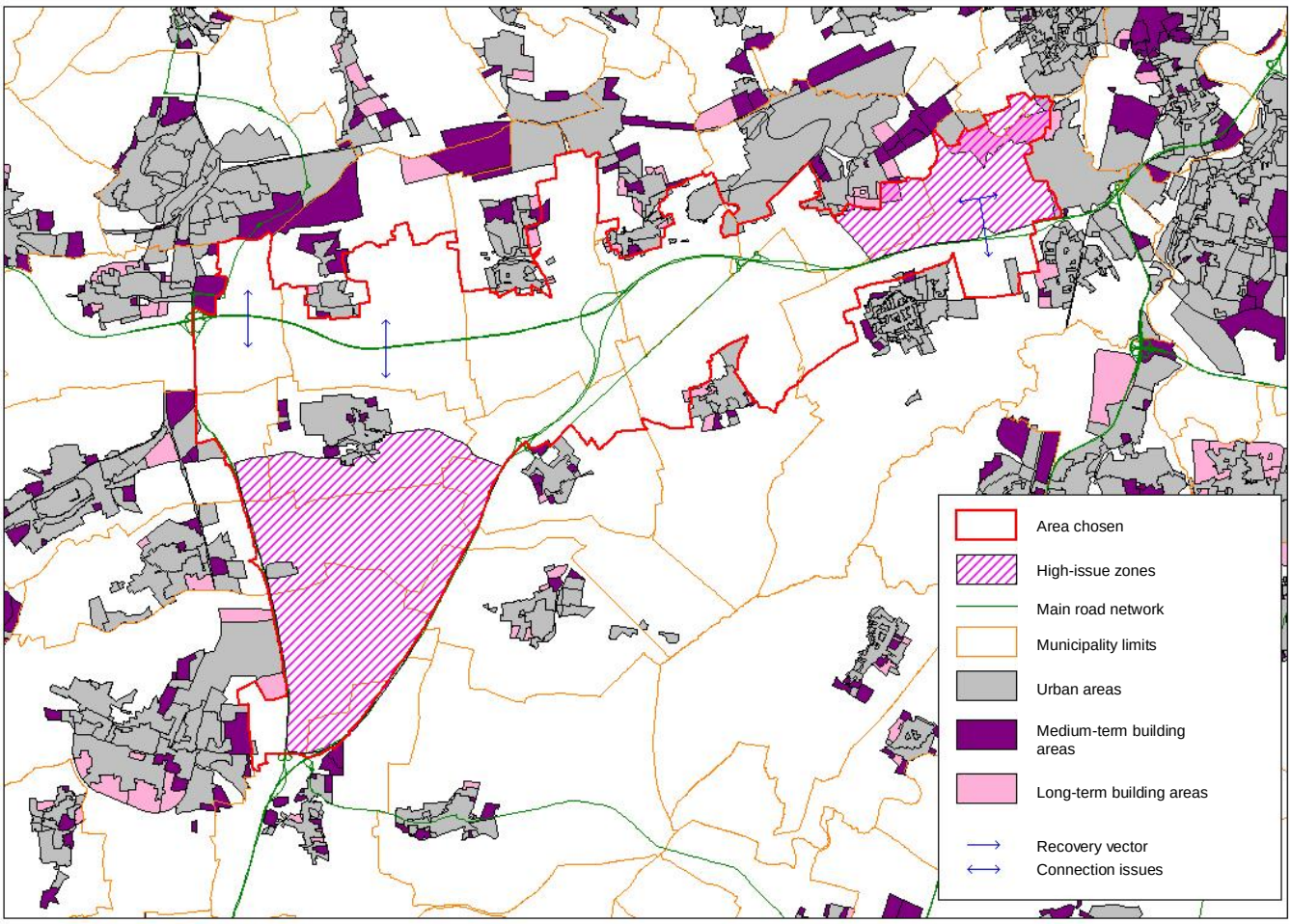
Table 3 – Governance of 2012-2016 NAP					
Level of governance		**Number of meetings**	**Average number of participants per meeting**	**Main recommendations and decisions**	**Difficulties encountered**
Steering Committee		*2**	*70**	*Decision to limit the number of Territorial Commission meetings to 2* *Proposal for adaptation of scoreboards for NAP monitoring**	
Territorial Commission					
Scientific Committee					
Thematic working groups	**Reinforcement of knowledge**				
	Habitats				
	Conservation *ex-situ* and reinforcement				
	ERC				
	Awareness-raising and communication				
	Support for governance				
Overall assessment of governance of NAP	*General text and recommendations*				

* Values and indications given as illustrations

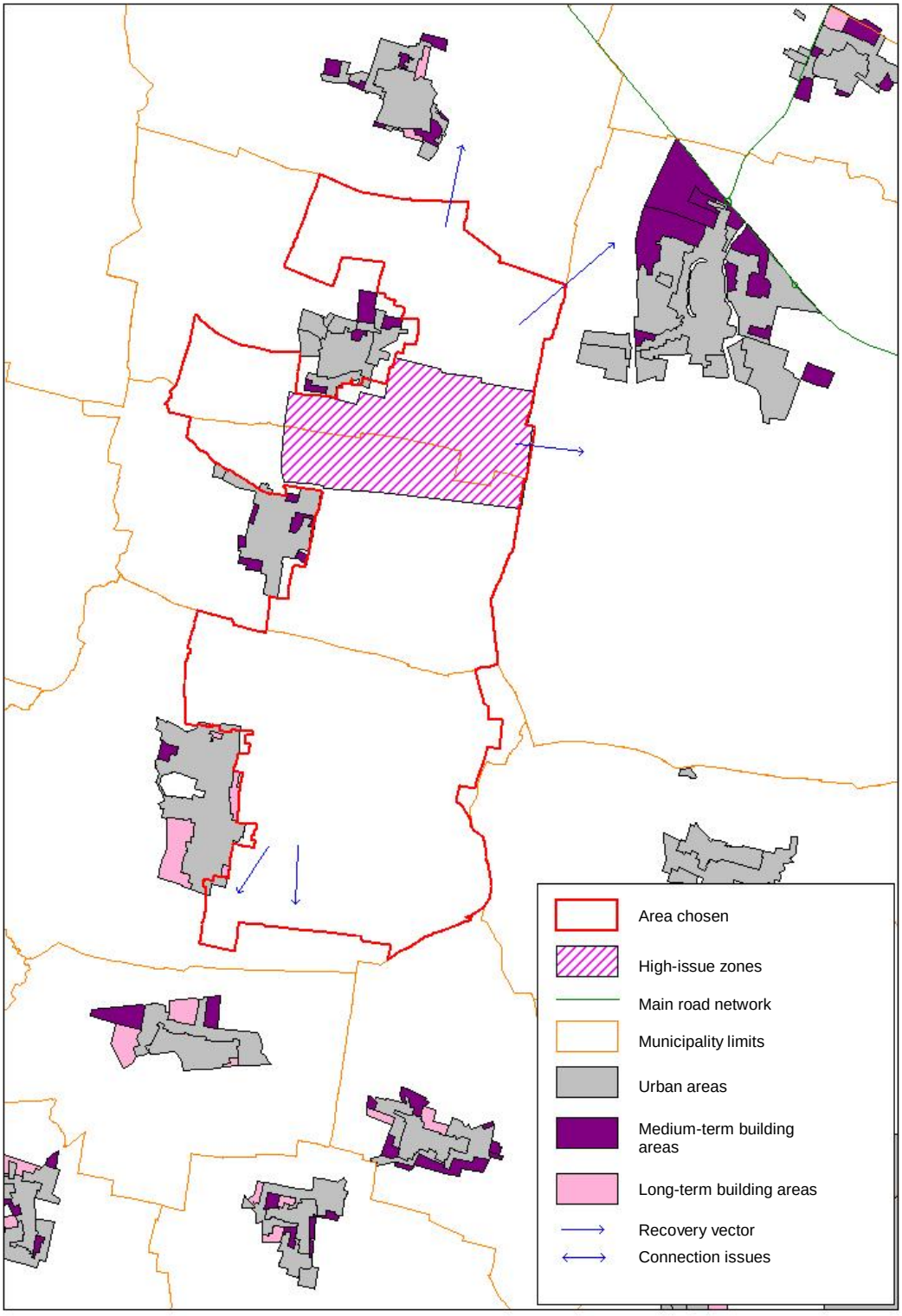
Annex III: Detailed view of strict protection area, highest density areas, passage issues and potential dispersion of common hamster populations.



North zone



Central zone


Area chosen
High-issue zones
Main road network
Municipality limits
Urban areas
Medium-term building areas
Long-term building areas
Recovery vector
Connection issues

South zone

November 2012

Written by: Brice AMAND, Agathe DUPONTEIL & Pierre STROSSER (ACT*eon*)

Mathieu BOOS (NATURACONST@)

Assisted by the NAP preparation monitoring committee and stakeholders of the regions involved in the issue, as well as DREAL Alsace Hamster mission members.

Ministère de l'Écologie,
du Développement durable
et de l'Énergie

92055 La Défense Cedex
Tél. 01 40 81 21 22

www.developpement-durable.gouv.fr