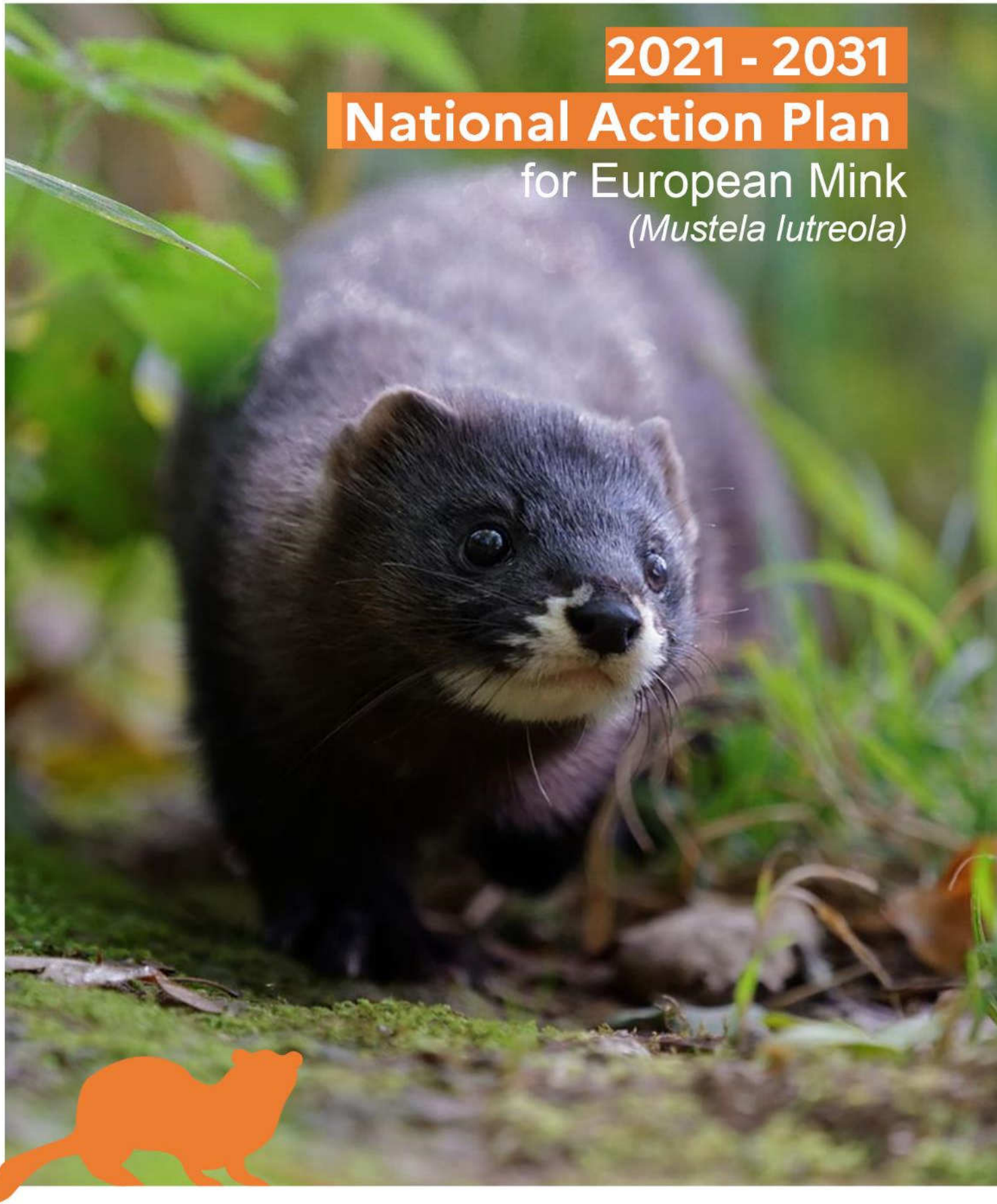
MINISTÈRE
DE LA TRANSITION
ÉCOLOGIQUE

Liberté
Égalité
Fraternité



2021 - 2031
National Action Plan
for European Mink
(Mustela lutreola)

Cover photos: European Mink© Matthieu Berroneau

2021 – 2031
National Action Plan
for European Mink
(*Mustela lutreola*)

Document citation

Direction Régionale de l'Environnement, de l'Aménagement et du Logement (DREAL), Groupe de Recherche et d'Investigation sur la Faune Sauvage (GRIFS), Cistude Nature, Office Français de la Biodiversité (OFB). Octobre 2021. Plan National d'Actions en faveur du Vison d'Europe (*Mustela lutreola*) 2021-2031. 174p.

Validity

Document presented to the Scientific Council 3rd May 2021 (see annex n°1), the Steering Committee 1st June 2021 (see annex n°2) and the National Council for the Protection of Nature 17th June 2021 (see annex n°3).

Project coordinators

- Aurore Perrault, Nouvelle-Aquitaine Regional Environment, Planning and Housing Directorate (DREAL)
- Maylis Fayet, Nouvelle-Aquitaine Regional Unit of the French Biodiversity Agency (OFB)

Editors

- French Biodiversity Agency (OFB): Maylis Fayet, Christelle Bellanger and Yoann Bressan.
- Wildlife Research and Investigation Group (GRIFS): Thomas Ruys.
- "Cistude Nature" Nature Protection Association: Nolwenn Pons.
- Nouvelle-Aquitaine Regional Environment, Planning and Housing Directorate (DREAL): Aurore Perrault.

Monitoring committee for drafting the PNA

Ministry and decentralised state organs
Ecological Transition Ministry
DREAL Nouvelle-Aquitaine
DREAL Occitanie
DREAL Pays de la Loire

3rd PNA Steering Committee and Scientific Council members (see annexes n°4 and n°5)

Acknowledgements

The 3rd PNA editorial team would like to express their deep gratitude to all the organisations and persons who participated in implementing actions for the European Mink, whether within the 1st PNA, 2nd PNA or PNAi frameworks, together with all participants in the workgroups, Scientific Council and Steering Committee. Let us hope that this commitment continues throughout 3rd PNA and that new complementary partnerships will be created to save the European Mink in France and throughout Europe.

Finally, the team also thanks the "Species and Biological Communities" Commission of the National Council for the Protection of Nature for its constructive remarks and sound advice.

Table of contents

Abstract

The European Mink (*Mustela lutreola*, Linnaeus 1760) is the most threatened mammal in France and the most threatened small carnivore in Europe. It was classified by IUCN as "critically endangered" in the French (2017), European (2012) and World Red Lists (2011). To limit the decline of this species, several National Action Plans (PNA) have been implemented: 1st PNA (1999-2003), 2nd PNA (2007-2011) and PNAi (2015-2021). In addition, a LIFE Mink program is also underway (2017-2022). Despite efforts made, these various programs have not improved the status of the species in France. This document is the 3rd PNA in support of the European Mink. This 10-year plan (2021-2031) defines the actions to be carried out in France to re-establish a favourable conservation status for the species. For this, 13 actions have been defined and divided into 5 work themes: improvement of knowledge on the European Mink, conservation of European Mink with a strategy of translocation in the natural environment and a breeding program, limitation of the impact of American Mink and other non-native species on the European Mink, combat other threats found in nature affecting the European Mink, communication and training programs on the European Mink and the action of the 3rd PNA.

Introduction

The European Mink (*Mustela lutreola*, Linnaeus 1760) is classified as "critically endangered" on the French (2017), European (2012) and worldwide (2011) IUCN Red Lists (MNHN, 2020a). Formerly widespread throughout Europe, its world geographical range is limited to some isolated populations in Eastern Europe (Russia, Ukraine, Romania and Estonia) and a western population divided between northern Spain and southwest France. Having lost 85% of its range and 90% of its European population during the 20th century (Maran *and al.*, 2016), the European Mink is now one of the most threatened small carnivores in the world.

Identified at the end of the 19th century in 40 French departments with large populations in the Southwest and in Normandy with more scattered data in the east of the country (de Bellefroid, 1999), its populations have declined steadily and been greatly reduced since the beginning of the 20th century. The population in France is estimated at under 250 individuals in the wild (UICN France *and al.*, 2017).

Currently, in France, the main threats facing the European Mink are the drying out and degradation of wetlands, the deterioration of water quality, competition with an invasive species, the American Mink, and road casualties (DREAL and ONCFS, 2019). Other significant causes can be added, including diseases, poisoning and accidental destruction caused by the combatting of pest species …

In the face of this steady decline of the European Mink in France, the Ministry of Ecology set up a 1st and 2nd National Action Plan (PNA) from 1999-2003 (DIREN and GREGE, 1999) and 2007-2011 (GEREA and DIREN, 2007), completed by a so-called "intermediary" PNA (DREAL and ONCFS, 2015a) in 2015 up into the validation of the present 3rd PNA. 1st PNA focused on gathering considerable knowledge of the species while 2nd PNA focused mainly on taking action against these threat factors and creating a breeding conservancy. Finally, PNAi made operational the above breeding facility and implemented a strategy organised to combat the American Mink. It is however to be noted that the discontinuity of these programmes and the succession of different leaders has not facilitated the implementation of actions in the field and no improvement in the conservation status of the species has been observed.

The objective of this 3rd PNA is therefore to provide a certain stability and continuity in the actions to be implemented over the next 10 years in order to save the European Mink in France. This involves refining the achievements of the initial PNAs with actions divided into 5 work axes (enhance knowledge about the European Mink, conservation breeding of European Mink and strategy for translocation into the wild, limit the impacts of American Mink and other non-native species on European Mink, contribute to the good status of European Mink habitats and combat other threats in the wild, and communication and training on the European Mink and the actions of 3rd PNA), to breathe new life into the preservation of the European Mink in France.

List of abbreviations

ANSES: French Agency for Food, Environmental and Occupational Health & Safety, *Agence Nationale de la Sécurité Sanitaire de l'Alimentation, de l'Environnement et du travail*

CEREMA: Centre for Studies and Expertise on Risks, the Environment, Mobility and Planning, *Centre d'Etudes et d'Expertise sur les Risques, l'Environnement, la Mobilité et l'Aménagement*

CNPN: National Nature Protection Council, *Conseil National de la Protection de la Nature*

COPIL: Steering Committee, *Comité de Pilotage*

CS: Scientific Committee, *Comité scientifique*

DDCSPP: Departmental Directorate for Social Cohesion and the Protection of Populations, *Direction Départementale de la Cohésion Sociale et de la Protection des Populations*

DDT(M): Departmental Directorate for Territories (and the Sea), *Direction Départementale des Territoires (et de la Mer)*

DIREN: Regional Directorate for the Environment, *Direction Régionale de l'Environnement*

DOCOB: Natura 2000 management plan, *Documents d'Objectifs*

DREAL: Regional Environment, Planning and Housing Directorate, *Direction Régionale de l'Environnement, de l'Aménagement et du Logement*

EAZA: European Association of Zoos and Aquaria

EEP: European Endangered species Program

FTE: Full-Time Equivalent

GREGE: Environment Management Research and Study Group*, Groupe de Recherche et d'Etude pour la Gestion de l'Environnement*

GRIFS: Wildlife Research and Investigation Group, *Groupe de Recherche et d'Investigation sur la Faune Sauvage*

GTT: thematic workgroup, *Groupe de Travail Thématique*

IUCN: International Union for the Conservation of Nature

LPO: League for the Protection of Birds, *Ligue pour la Protection des Oiseaux*

OFB: French Biodiversity Agency, *Office Français de la Biodiversité*

ONCFS: National Hunting and Wildlife Agency, *Office National de la Chasse et de la Faune Sauvage*

PCB: Polychlorobiphenyls

PNA: National Action Plan, *Plan National d'Actions*

PNAi: intermediate National Action Plan, *Plan National d'Actions intermédiaire*

SFEPM: French Society for the Study and Protection of Mammals, *Société Française pour l'Etude et la Protection des Mammifères*

SINP: Nature and Landscape Information System, *Système d'Information sur la Nature et les Paysages*

List of figures

List of tables

I. European Mink: state of knowledge

1. Systematics

The European Mink (*Mustela lutreola*) belongs to the Mustelidae family and the subfamily Mustelinae (Linnaeus 1761).

Historically the European Mink was considered to be a form of the European Polecat (*Mustela putorius*) and was commonly referred to as "*being something between martens on the one hand and otters on the other*" (Vogt, 1884). Certain common names used up until the 20th century included: "small polecat", "otter-headed polecat", "water polecat", "marsh polecat", "webbed-footed polecat" (Montlezun De, 1905; de Bellefroid and Rozoux, 2005).

The European Mink and the American Mink (*Mustela vison* or *Neovison vison*) are two distinct species. Their strong morphological, ecological and ethological resemblance results from the evolutionary convergence probably due to the use of similar habitats on different continents (Youngman, 1982; Masuda and Yoshida, 1994; Davison *and al.*, 1999). The large genetic distance between these two species is such that hybridisation is impossible (Ternovsky, 1977; Skorupski, 2020).

The European Mink and the European Polecat are likewise distinct but closely related species (Youngman, 1982; Davison *and al.,* 1999 and 2000; Sato *and al.*, 2003). They are genetically closer than the European Mink and the American Mink (Youngman, 1982; Michaux *and al.*, 2004). Although rare, hybridisation between the European Mink and the European Polecat is possible and has been noted in the wild (see paragraph I.6.g).

2. Morphology

The European Mink is a small mammal which exhibits marked sexual dimorphism (adult males: 568 g to 1.530 kg with an average of 864 g - 45 to 60 cm; adult females weigh between 327 g to 670 g with an average of 506 g - 42 to 51 cm; GREGE, unpublished data on a Western population). It has the typical morphology of Mustelids with a long slender body, a strong thick neck, a slightly flattened head, a short and wide snout with relatively short limbs. The ears are small and round, protruding only slightly from the fur. The coat is dark brown with darker coloured paws and tail (Trouessart, 1884; Acloque, 1900).

The high-density fur of the European mink limits temperature loss when immersed in water. The undercoat fur is brownish grey, distinguishing it from the European Polecat which has a yellowish-coloured undercoat and very dark black guard hairs.

The European Mink has a white spot on the snout extending from the lower to the upper lip where it is regular, symmetrical and does not extend the top of the nose. The spot of varying shape on the lower lip rarely extends beyond the corner of the lips (de Bellefroid and Rosoux, 2005).

The American Mink generally has a single white spot on the lower lip and can be partial or absent. When this spot extends to the lower lip, it is irregularly shaped and asymmetrical.

The European Polecat also has a white spot on the snout, on the lower and upper lips but extending further because it goes over the top of the snout (rhinarium). In addition, it generally has a more marked, lighter face and white on the edges of the ears. There may be an absence of these characteristics in young polecats and melanistic individuals. Distinction must therefore be based on undercoat colour (de Bellefroid and Rosoux, 2005).

Figure 1: Distinguishing features of the European Mink, the European Polecat and the American Mink (© Nolwenn Pons - PNA Vison d'Europe)

3. Distribution and abundance

a. Wild populations in Europe

The European Mink historically occupied a large part of Western Europe extending from the Urals to the Atlantic, the Northern Balkans, from the Caucasus to the Pyrenees, excluding Sweden, Norway, Denmark and Italy (Maran and Hentonnen, 1995).

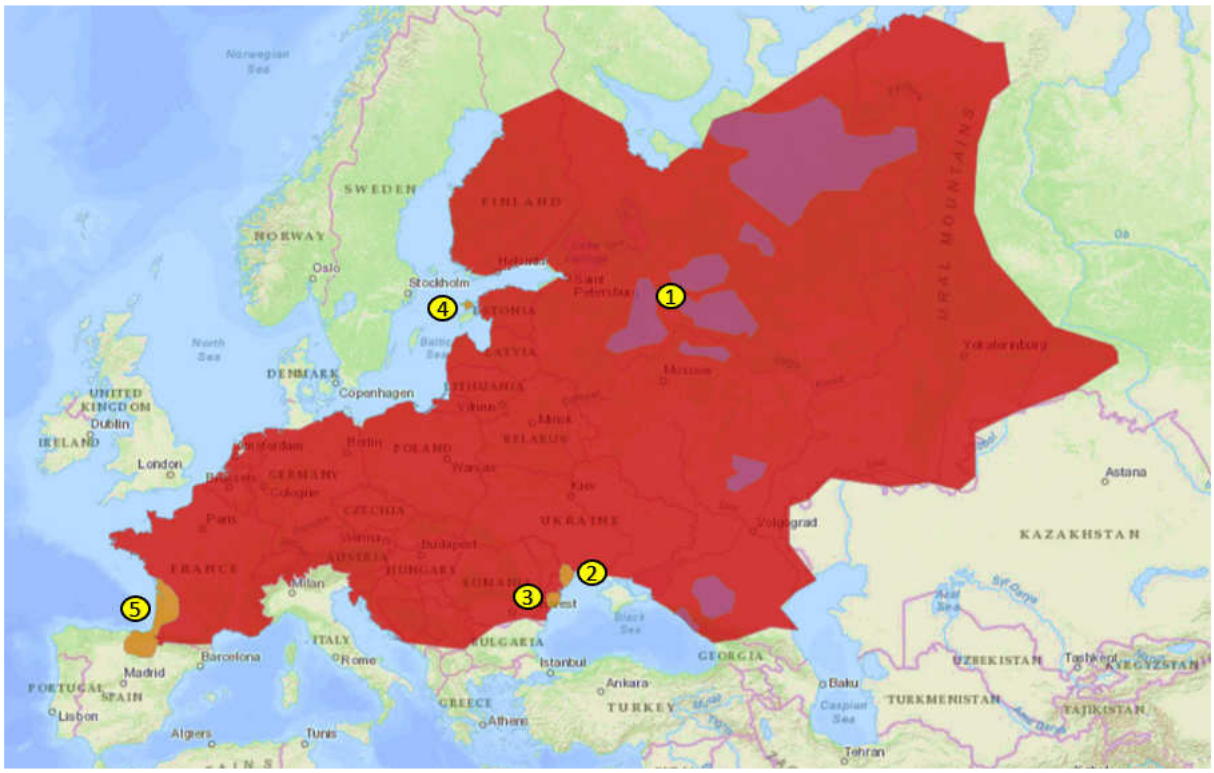


Figure 2: Historical and current range of the European Mink ©IUCN (Maran and al., 2016); in orange "present", in grey "possibly extinct" and in red "extinct" 1. Russia, 2 Ukraine, 3 Romania, 4 Estonia, 5 France-Spain

However, since the 1850s (Novikov, 1939), its range has fallen by 90% with an exponential decrease from the second half of the 20th century, leading to the extinction of the species in many countries (Sidorovich, 2000; Maizeret *and al.*, 2002).

The species today is divided between the East and the West in five regions of Europe:

- The eastern core, divided into isolated fragments between Russia, the Danube delta to the border with Ukraine and Romania and Estonia where a population was introduced on the Hiiumaa Islands from 2000.
- The western core, divided into 2 isolated fragments in northern Spain and southwest France.

All these populations are in a very precarious situation (Maran *and al.*, 2016). The latest estimation is just a couple of thousand individuals: 1000 to 1500 in Romania, 500 in Spain, less than 250 in France, 100 in Estonia, and unknown but probably very low numbers in Ukraine and Russia (Maran *and al.*, 2017a).

b. Wild population in France

In France, the history of the presence of the European Mink is rather mysterious. The first undeniable mention of the presence of the species was a specimen collected in Poitou in 1831 and now included in the collection of the National Natural History Museum. This specimen was mentioned for the first time by a naturalist from Tours in a work about the mammals of France (Franc, 1838). It was reported in forty or so departments at the end the 19th century and the beginning of the 20th century (see maps below; DIREN Aquitaine and Mission Vison d'Europe, 2003; de Bellefroid and Rosoux, 1998).

Genetic study of the Western and Eastern core revealed a low divergence rate (genetic bottleneck), which could be explained by colonisation from a small number of founder individuals. This study also backs the hypothesis of a relatively recent arrival of the species in Western Europe (Libois *and al.*, 2002; Michaux *and al.*, 2004; Zuberogoitia *and al.*, 2018). In fact, historical data from the Netherlands dating back 2300-2100 BC (Van Bree, 1961) implies that the European Mink was present throughout Central and Western Europe and the numbers had declined for unknown reasons. The species would have partially recolonised its original area of distribution starting from a limited number of individuals having immigrated long-distance from a refuge (Youngman, 1982; Zuberogoitia *and al.*, 2016). In addition, its late discovery in Spain in 1951 implies the progressive colonisation of individuals from France (Rodriguez de Ondarra, 1955; Youngman, 1982). Another hypothesis of introduction by humans was also suggested (Michaux *and al.,* 2005) but there is no probing evidence to support this (Zuberogoitia *and al.*, 2018; Skorupski, 2020).

Since the beginning of the 20th century, French populations have shrunk drastically. In the 1950s, European Mink were only found on the Atlantic Coast, in the Cher and the Loir-et-Cher departments. At the end of the 1980s they were found in slightly over one-tenth of the territory and were then found only in 7 departments (Aquitaine and Charentes regions) at the end of the 1990s (Maizeret *and al.*, 1998; Maizeret *and al.*, 2002). In just 20 years, the species thus lost half of its range (DIREN Aquitaine and Mission Vison d'Europe, 2003).

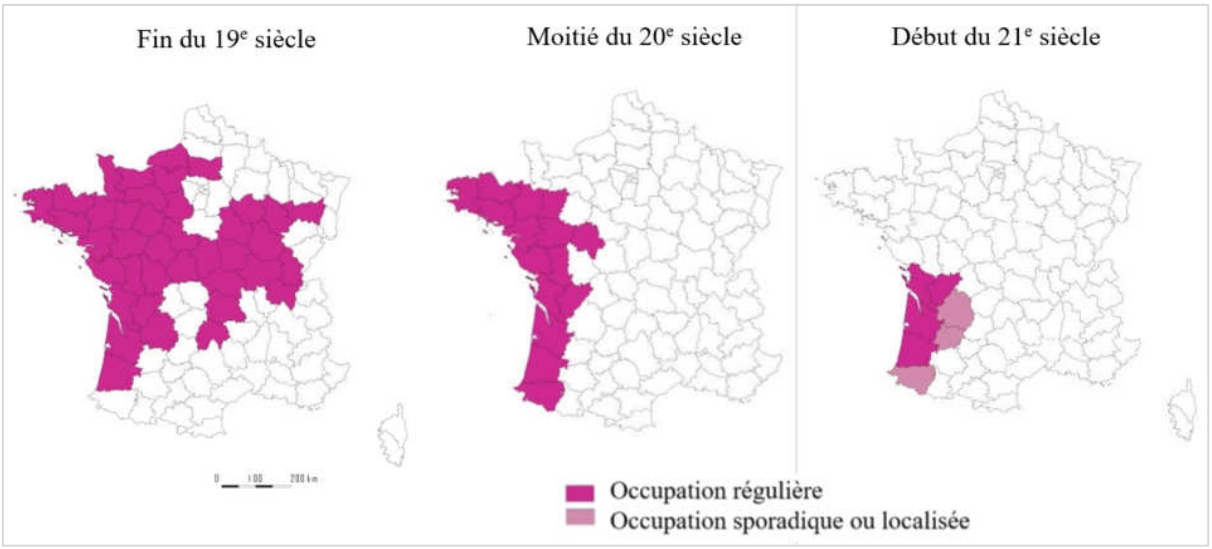
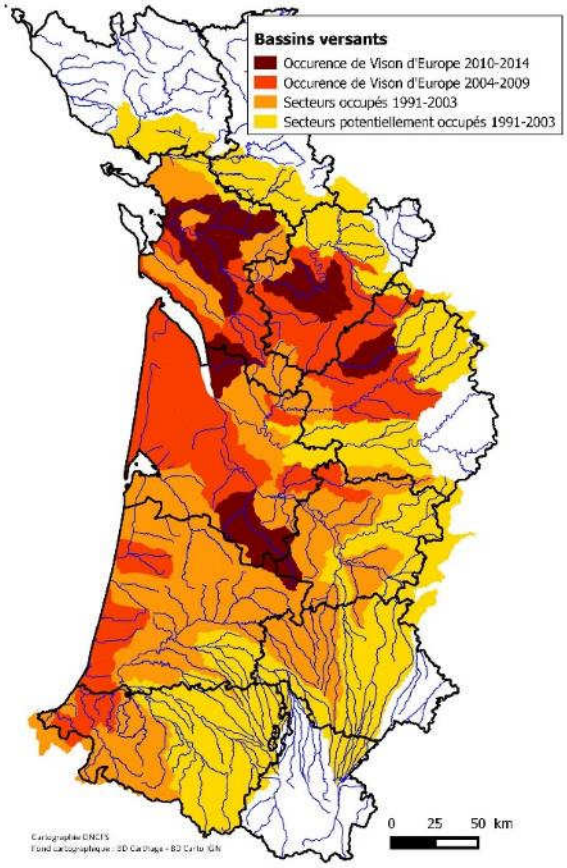


Figure 3: Evolution of the range of the European Mink in France
(Maps on the left: Bellefroid and Rosoux, 1998; Map on the right Maizeret and al. 2002)



The population is currently estimated at under 250 individuals. In 2014 (see map below), its range covered 156 river basin subsectors (definition in Mission Etalab and DINSIC, 2021). Since then, the species has been confirmed in Charente-Maritime (Marais de Rochefort, Marais Poitevin Regional Natural Park), in Charente (Charente river basin north of Angoulême, river basins of the Tude and the Lizonne south of Angoulême) and in Pyrénées-Atlantiques (south of Bayonne). An update of this map is expected within the framework of the 3rd PNA. In the meantime, it remains relevant.

Figure 4: Range of the European Mink in France (1991-2014) (DREAL and ONCFS, 2015b)

c. Translocated populations

Given the conservation status of wild populations of European Mink, several countries have carried out translocation programmes (definition *in* IUCN, 2013) in the wild. According to the countries, studies carried out and results published are more or less available and detailed:

- In Russia on the Kuril Islands, 388 European Mink were introduced between 1981 and 1989: 134 on Kunashir Island (1981-1985) and 254 on Iturup Island (1986-1989). Seven were captured in the wild (Russia) and the others were from conservation breeding centres (Shvarts and Vaisfeld, 1993; Shvarts and Vaisfeld, 1995; Ternovskaya *and al.,* 2006). To date, these introductions have resulted in a small population on Kunashir Island (FGBU, 2018). The conservation status of the species is unknown and success factors are unavailable.
- In Russia, on Valaam Island (Lagoda lake), 11 European Mink were translocated between 1982 and 1986. To date, no populations seem to have resulted, without failure factors being identified (Tumanov and Roznov, 1993; Shvarts and Vaisfeld, 1993).
- In Tadjikistan (in Central Asia), 108 European Mink were translocated in 1988 along the Sindighira river. No results on the success of these operations are available (Saudskj, 1989).
- In Estonia, where the European Mink had disappeared, 562 individuals were released on Hiiumaa Island and some on Saarema Island between 2000 and 2015 (Maran, 2007; Maran *and al.,* 2017b). The 10 individuals released on Saarema Island did not survive but other releases are expected in the coming years (Maran *and al.*, 2017a; Maran *and*

al., 2017b). However, since 2016, the population of European Mink re-introduced in Hiiumaa is estimated at 65 individuals, of which 75 % are born in the wild. The population is considered to be established on the island and re-introductions have stopped. The size of the populations is however not sufficient to be considered viable in the long term. Historically, re-introductions on Hiiumaa Island have been carried out in several stages:

- American Mink eradication campaigns were carried out from 1998 to 1999, enabling the island to be declared free of this species in March 2002 (Macdonald *and al.*, 2002).
- 1st re-introduction phase (2000-2003): 172 eastern individuals born in captivity were re-introduced (Maran *and al.*, 2017b; Podra, 2021), 25% of them died within the first 10 days. The rate of survival was 50% after 1.5 months. In total, 59% of mortalities were due to predation/aggression (predominantly by foxes and dogs). The age and number of generations in captivity were not shown to influence the survival rate of re-introduced individuals. Despite greater mobility of males, they survive more than females. After 1 month, the food diet and habitats are comparable to wild individuals (Podra *and al.*, 2012).
- 2nd re-introduction phase (2004-2015): the 390 re-introduced eastern individuals were either born in built enclosed areas on the island or in semi-natural breeding enclosures in Tallinn (Maran *and al.,* 2017). There are few data providing statistics on their adaptation or causes of mortality.

- In Spain, after implementing operations to fight against American Mink, re-introductions were made with varying objectives:
  - Objective to increase the wild population (data and results of releases carried out in 2019 and 2020 are not yet available):
    - In the Salburua wetland in Alava (Maran *and al.*, 2017b; Podra, 2021), 27 European Mink were released between 2008 and 2010. These western individuals were born in captivity: conservation breeding centres or pre-release enclosed areas in the wild. In the end, 78 % of the individuals released died, the majority by predation (mammals or raptors), of which 6 were killed by male American Mink. In order to continue the programme, 7 supplementary individuals were released in 2018: 4 died within the first 30 days and at least 2 individuals were still alive after 2 months.
    - In the Basque Country (Gomez, 2018), 11 individuals were released in 2017: 5 of which died within 30 days and at least 1 individual was still alive after 4 months.
    - In the Rioja (Gomez, 2018), 8 individuals were released in 2018. No deaths occurred, 6 individuals were still alive after 1 month and the fate of the 2 others is unknown.
  - Objective of helping to colonise new territories: 8 individuals were released in Aragon in 2017 (Gomez, 2018), 7 of them died within the first 15 days.
- In Germany, reintroductions of eastern European Mink were carried out in two regions. While proof of reproducing in the wild was provided in 2015, no viable population seems to have been established (Seebas pers. com. 2016 and Brandt pers. com. 2020 *in* Podra 2021):
  - In Sarre, 162 European Mink born in captivity were released between 2006 and 2013. Out of the 63 individuals radiotracked, 38 % survived the first 2 months (Peters *and al.*, 2009; Klaumann *and al.*, 2013 unpublished).
  - In Lower Saxony, 219 European Mink born in captivity were released between 2010 and 2020. The minimum survival rate is estimated at 25 % after 2 months (OSSM, 2011; Luers and Brandt, 2014; Brandt com. pers, 2020 *in* Podra 2021). The causes of mortality identified were predation and road casualties.

The results of translocations therefor vary depending on the country and the year. It is difficult to identify the main and/or joint causes of failure (pers. comm. Maran, 2019). The most critical period would seem to be the first month and a half after being released (Maran *and al.*, 2009; Podra *and al.*, 2012).

Before carrying out relocations, it is essential to identify and reduce threat factors, notably those related to the American Mink (Podra, 2021). In addition, success or failure parameters must be defined beforehand (Podra, 2021).

Translocations alone cannot ensure the preservation of the species. Priority should be given to a strong conservation policy for the species in its natural environment.

Given the steady decline of the species in France, the idea of a project emerged in the end of the late 1990's, after creating conservation breeding centre(s) as a prerequisite. While these centres emerged from the 2nd PNA, no translocations have been implemented as yet (DIREN and GREGE, 1999; DIREN and GEREA, 2007; DREAL and ONCFS, 2019).

4. Species statuses

a. Conservation status

The European Mink is listed as "Critically endangered" in the French (2017), European (2012) world (2011) and IUCN Red Lists (MNHN, 2020a). This is the last stage before declaring the species extinct in the wild.

Its status has once again been evaluated as "Unfavourably bad" in the Atlantic region during the last report of Article 17 on evaluating the state of preservation of habitats and species of the Fauna Flora Habitats Directive in France (UMS Patrinat, 2019).

b. Protection statuses and related regulations

The European Mink is a protected species at both international and national level.

In Europe, it is listed in Annex II of the Bern Convention of 19 September 1979 on the "Conservation of wildlife and natural habitats". This lists the species as a "strictly protected wildlife species" (Council of Europe, 1979).

It is also listed in Annexes II and IV of the EU Directive "Fauna Flora Habitats" of 21 May 1992 as a priority species for the EU. This directive imposes a strict protection of the species in its natural distribution area and provides the designation of Special Areas of Conservation in the Natura 2000 network. This designation must contribute to re-establishing the European Mink with a favourable conservation status.

On the basis of the Law on the protection of nature (10 July 1976), the Ministerial decree of 17 April 1981 establishes the list of protected mammals in France, including the European Mink. The European Mink is also listed in the Ministerial decree of 9 July 1999 establishing the list of protected and endangered vertebrate species in France whose range exceeds the area of a department (Ministry of Planning and the Environment, 1999).

The Inter-ministerial decree of 23 April 2007 highlights that it is forbidden, on national territory at all times to "*destroy, alter or deteriorate breeding grounds or resting places […] to destroy, mutilate, capture, remove, intentionally disturb, or mount, […] transport, hawk, put up for sale, sell or buy back specimens*" of the European Mink (Ministry of Ecology and

Sustainable Development, 2007). Dispensations for protection can however be granted as set forth in Article L. 411-2 of the Code of the Environment, provided that the conservation of the species is not jeopardised (Code of the Environment).

Changes in the trapping regulations also enable the preservation of the species:

- The Ministerial decree of 4 March 1986 forbids jaw traps fitted with teeth or notches (Ministry of the Environment, 1986). This was completed on 16 December 1994 with a new Ministerial decree forbidding all types of jaw traps (Ministry of the Environment, 1994);
- The Ministerial decree of 6 April 2007 forbids poisoning Coypu (*Myocastor coypus*), and Musk Rat (*Ondrata zibethicus*) since 2009, which limits the risk of accidently poisoning European Mink (Ministry of Agriculture and Fishing, 2007);
- The Ministerial decree of 14 July 2013 forbids "killing" traps and conditions the use of trap cages in areas with a proven or potential presence of European Mink (under 200 m from a watercourse) in order to reduce the risk of accidental destruction of the species. It also provides for an escape exit from April to July to protect females during the gestation and suckling period (Ministry of Ecology, Sustainable Development and Energy, 2013).

5. Biology and ecology

a. Habitat

The European Mink is found in wetlands. It can explore all parts of water basins and is rarely more than 150 meters from a watercourse (Danilov and Tumanov, 1976). It lives in vast territories in which it particularly uses certain zones and habitats including: rivers, streams, marshes, canals and swamps (Zuberogoitia and Zabala, 2003; Fournier *and al.*, 2007). It likes densely vegetated wetlands (riverine forests, wetlands, tall grass fringes, and stands of helophytes, sedges and rushes) (de Bellefroid, 1997; de Bellefroid and Rosoux, 2000; Fournier *and al.*, 2007). The presence of brambles is also important as they offer both resting places and feeding sites protected from predators and extreme temperatures (Zabala *and al.*, 2003).

Dens are preferably set up a few meters away from water (Fournier *and al.*, 2007). Most dens are on the ground, protected by dense vegetation (Zabala *and al.*, 2003; Fournier *and al.*, 2007) and can be re-used (Galy-Fajoue and GREGE, 2020). Cavities located between tree roots appear to be used more in winter (Fournier *and al.*, 2007) along with, but to a lesser degree, burrows, piles of wood, empty tree trunks, or under piled up logs (Zabala *and al.*, 2003; Galy-Fajoue and GREGE, 2020).

Cultivated areas can also be occupied provided that the vegetation structure offers enough cover to allow individuals to move safely to a more favourable area (Zabala and Zuberogoitia, 2002). The capacity for European Mink to tolerate a small-scale alteration of its habitat has not been clearly determined (Zabala and Zuberogoitia, 2002; Zuberogoitia *and al.*, 2012).

b. Territoriality and pattern of activity

The home range of the European Mink varies between 0.6 km and 17 km from watercourses, i.e., 3.6 ha to 100 ha of river habitats (Fournier *and al.*, 2008; Palomares *and al.*, 2017). Males European Mink can have home ranges 5 times larger than females (Palomares *and al.*, 2017). A male home range can cover the territory of several females (Garin *and al.*, 2002; Palomares *and al.*, 2017). Males appear more mobile than females (Fournier *and al.*, 2008) and daily distances covered vary depending on the individual and the season. Some males move long distances, notably during the mating season (35 km as the crow flies), and even change watershed to find a female (Fournier *and al.*, 2008) or during dispersion phases (70 km

between 2 captures of a young, tagged individual; (pers. comm. Fournier, 2021). The study and interpretation of these parameters is difficult with very low-density populations and fragmented habitats. It is therefore necessary to continue these works.

The European Mink seems above all active at night (Palazon and Ruiz-Olmo, 1998; Garin *and al.*, 2002) and at dusk (Palomares *and al.*, 2017), but daytime activities can be observed (Palazon and Ruiz-Olmo, 1998; Palomares *and al.*, 2017) particularly for males during the breeding season (Garin *and al.*, 2002).

c. Diet

The European Mink is a small, generalist and opportunist carnivore, which needs approximately 140-180 g to fulfil its daily food requirements (Heptner *and al.*, 2001; Podra *and al.*, 2012).

Stomach-content and faeces analyses carried out in Europe (Ognev, 1962; Heptner *and al.*, 1974; Palazon *and al.*, 2004) and in France (Chanudet and Saint Girons, 1981; Libois *and al.,* 1998; Libois, 2001) reveals that the European Mink consumes amphibians, birds (notably Anatidae), small mammals (mainly rats and voles), fish and to a lesser extent reptiles, insects and eggs in varying proportions according to the study. The European Mink's diet varies according to its habitats, the diversity of fauna, seasons and the availability and accessibility of food resources (Sidorovich *and al.*, 2001; Podra *and al.*, 2012) and the season (Libois *and al.*, 1998; Sidorovich *and al.*, 2001; Podra *and al.*, 2012).

Significant differences in individual diets have been reported with some "specialising" in a certain type of prey (Libois and Fellous, 1998; Libois *and al.*, 1998; Libois, 2001; Haage *and al.*, 2017).

Finally, when prey is plentiful, the European Mink may store food for subsequent consumption (Letacq, 1922; Stubbe, 1993; Heptner *and al.*, 1974).

d. Reproduction and lifespan

Mustelids are solitary and territorial animals. Males and females do not approach each other except for short periods during the breeding season and a male can mate with several females (de Bellefroid and Rosoux, 2005). The European Mink breeds only once a year and the ovulation of the female is triggered by mating (Mead, 1989; Dunstone, 1993). Active searching for females by the males starts early winter, while the oestrus cycle of females occurs from March to June (Mazzola-Rossi, 2006; Kiik *and al.*, 2017). The oestrus cycle lasts between 1 to 10 days, 5 days on average (Mazzola-Rossi, 2006) and the female can go in heat up to 3 times in the event of non-breeding (Moshonkin, 1983). Gestation lasts between 39 and 44 days and, without deferred ovo-implantation (Amstislavsky and Ternovskaya, 2000), with births taking place from April to August. In the wild, on average, the European Mink litter is smaller than those of the American Mink and the Polecat (respectively 3.4, 7.5 and 5.4 young) (Fournier-Chambrillon *and al.*, 2010). Litters can vary from 1 to 7 young, 4 on average, and the females raises them alone and suckles them for 10 weeks (Mazzola-Rossi, 2006). The young become fully independent within 2.5 to 4 months (Ternovskii, 1977). Juvenile mortality is estimated at around 25 % (Camby, 1990) in the wild and 7.3 % in breeding centres (Kiik *and al.*, 2017). Sexual maturity is reached the year after birth, at an average age of 10 months (Youngman, 1990; Dunstone, 1993).

During the first months of their lives, the young gain on average 5 to 10 g daily. This fast growth requires a rich and regular diet (ONCFS, 2016). Females consume large quantities of food and water during this period.

Studies by radiotracking reveal that European Mink demonstrate 2 to 4 active phases for every 24-hour cycle (Palazon and Ruiz-Olmo, 1998). These active phases usually last under 2 hours (Fournier *and al.*, 2008) and they correspond to hunting periods for the animals to feed. When the female is rearing her young, she returns to the den after each hunting period to suckle them.

Concerning the age pyramid of wild western populations, the study of 145 carcasses of European Mink in France and Spain (Navarra) revealed that 59 % of the individuals were under 1 year old, 25 % between 12 to 24 months, 13 % between 2 to 4 years and 4 % over 4 years old and one individual was more than 6 years old (Amblard, 2013; Fournier-Chambrillon *and al.*, 2013).

e. Population genetics

A genetic study was carried out for the 1st PNA, which demonstrated that the western nucleus was characterised by genetic homogeneity (DIREN Aquitaine and Mission Vison d'Europe, 2003; Michaux *and al.*, 2005). However, this nucleus is not genetically isolated from eastern nuclei: all European populations of the European Mink make up one genetic management unit (a term used to describe populations which share a sufficiently common genetic pool to be managed jointly in conservation plans) even if they are far apart geographically (Cabria *and al.*, 2015).

Since 2018, Spanish teams have tested the breeding of individuals from both nuclei in their conservation breeding centres. To date, no negative impacts have been identified on first, second or third generations (pers. comm. Podra, 2020; Skorupski, 2020).

6. THREATS AND LIMITING FACTORS

Since the last century, European Mink populations have disappeared from most of the countries that made up their range. Many hypotheses have been put forward to explain this decline: the destruction/fragmentation of habitats, competition or transmission of diseases from the American Mink, hunting and trapping, road casualties, population genetics, climate change, etc. (Sidorovich *and al.*, 1995; Maran *and al.*, 1998; Lode *and al.*, 2001). None of these causes alone however can explain this situation and their degree of impact may vary over time and according to geographic locations.

In most regions in Eastern Europe, the decline of the European Mink started prior to the arrival of the American Mink and is attributed more to damage to habitats and, to a lesser extent hunting, producing a fragmentation of populations (Maran, 2007; de Bellefroid, 1999). On the other hand, recent extinctions may be related to the arrival of the American Mink, which has been added to the other factors.

In France, initial hypotheses concerning the north to south decline of the species (de Bellefroid, 1997) seem to need to be seen in relative terms given the fragmentation of populations. The most probable hypothesis appears to be linked to multifactor consequences (de Bellefroid and Rosoux, 2005; Lode *and al.*, 2001). Destroyed habitats, degraded water quality, road casualties, secondary poisoning and trapping for the fur significantly weakened and isolated population nuclei thus exposing them to an even greater threat with the arrival of the American Mink (Fournier and Maizeret, 2003; Maran, 2007).

It would therefore appear that the key factors of the overall decline of European Mink populations throughout the world vary based on location and time period (Maran, 2007). The causes are however always multifactor and essentially based on factors of anthropogenic origin. Combined factors act in synergy and increase individual impacts (Baillie *and al.*, 2004).

a. Habitat destruction and degradation

One of the clearly identified threats to the European Mink is the destruction, deterioration and fragmentation of wetlands (Maran *and al.*, 1998; DIREN and GEREA, 2007). The first mentions of the impact of loss of habitat on populations of European Mink goes back to the 19th century (Claudius, 1866; Lowis, 1899). For mustelids, the holding capacity of habitats and their food potential plays a particularly decisive role in population dynamics (Powell *and al.*, 1985; Korpimaki *and al.*, 1991). The decline of the European Mink appears to be linked to the transformation of natural habitats, especially due to intensification of agriculture, destruction of hedgerows and land drainage (Ruiz-Olmo *and al.,* 2002; Lode *and al.*, 2001).

In Central Europe, most rivers have been channelised (Maran and Henttonen, 1995), leading to the artificialisation of riverfronts, damage to riverine forests along with leaching of the beds of waterbodies. In addition, there are dams which alter habitat and disrupt ecological continuity accompanied by a barrier effect regarding movement between certain very vulnerable small populations (Ruiz-Olmo *and al.,* 2002).

The loss of wetlands in the range of the European Mink is difficult to measure, but a significant proportion has been drained, notably for agriculture (IFEN, 2002). During the 20th century, over half of wetlands disappeared in Europe and throughout the world (Matthews and Luthi, 1993; Secretariat of the Ramsar Convetion, 2021) including France (Bernard, 1994; Public service - wetlands, 2021). This loss of wetlands has caused a decline in resting, breeding and hunting habitats and a decline in prey availability (Zabala *and al.,* 2006) for European Mink. Dens on the ground may be a vulnerability factor by subjecting the animal to a higher predation risk when in less flooded areas (GEREA and DIREN Aquitaine, 2007).

In the late 20th century, water pollution was suspected as being a factor in the decline of European Mink, without being able to prove it in a first instance (Schropfer and Paliocha, 1989). Over half of the watercourses in France were listed as "polluted" after 1983 (Lode *and al.*, 2001). Generally speaking, European Mink tend to avoid polluted watercourses (organic and nitrogenous waste, phosphorus, heavy metals, pesticides and other micro-pollutants) but would appear to be less sensitive to nitrates (Lode, 2002). Negative effects on the reproduction of American Mink have been shown with high concentration of polychlorinated biphenyls (PCBs, over 50 µg/g - Jensen *and al.*, 1977) or with long-term exposure (0.1mg/individual/per day; Brunstrom *and al.*, 2001). However, tissue analysis of European Mink in Spain revealed average PCB levels of 122.5 µg/g in 4 individuals (Lopez-Martin *and al.*, 1994). While the sample numbers are low, it is legitimate to question the impact of PCB on European Mink. Furthermore, a French study showed that heavy metals (Cu, Zn, Hg and Cd) appear not to play an important role in the decline of European Mink (GREGE-ARPEN, 2004). The capture of European Mink, alive or dead, is rare so it is difficult to carry our ecotoxicological studies.

b. Direct and indirect competition with the American Mink

1. Origin and regulations

The American Mink was originally from North America and was introduced to most of Europe including France for the fur trade (Léger and Ruette, 2005) in the 1920's and 30's with intensification in farming after World War II (Maran and Hentonnen, 1995; Lode *and al.*, 2001).

In France, American Mink is cited in Annex I of the decree of 14 February 2018 (Ministry of Ecological and Solidarity Transition, 2018) related to the prevention of introduction and spreading of invasive exotic animal species in Metropolitan France. Therefore, "*the introduction of live specimens to a natural environment, whether voluntary, through negligence or carelessness is forbidden*". However, it is not listed in Annex II and "*the introduction in Metropolitan France, the keeping in captivity, the transport, the use and trade of live specimens of mentioned species […] can be authorised by administrative authorities*". In fact, keeping in captivity is authorised solely in establishments for public presentation and in fur farms with licences and prefectural authorisation, even if there is only one individual

concerned (Ministry of Ecology and Sustainable Development, Ministerial decree of 10 August 2004).

2. Sources of feral populations of American Mink

In Europe, escapes from fur farms (Maran and Henttonen, 1995; Lode *and al.*, 2001) or intentional releases further to (vandalism by animal rights organisations, intentional releases further to the bankruptcy of certain farms - Maizeret, 1990; Ruiz-Olmo *and al.*, 1997; Hammershoj, 2005; Zuberogoitia *and al.*, 2012) are the main sources for the establishment of feral populations of American Mink. There may be other sources: accidental escapes during transport, deliberate releases or escapes from sites with other owners than fur farms (zoos, health centres, licensed private individuals, etc.)

The first American Mink farm opened in France in 1926 in Haute-Savoie, and the number of French farms peaked in 1959 with over 600 farms declared by the French Syndicate of American Mink Breeders (Leger, 2005). In 2014, France was the 13th producer country with 0.5% of world production (Fur Europe, 2015). There are currently just 2 farms in France, and none are located in the zone of the PNA for the European Mink. Moreover, the government has announced the closing of American Mink farms in France by 2025 (Government, 2021).

To prevent and manage the effects of illegal releases of American Mink, some countries have set up emergency procedures. In order for this system to be effective, it must be combined with maintaining an animal surveillance strategy system (compliance with regulations). In the past 20 years, major efforts have made in France by some breeders to limit these animal escapes, especially in areas with potential presence of European Mink (Leger *and al.*, 2018). Moreover, vigilance is required given the craze for exotic pets, in which the American Mink seems to be included (pers. comm. Fournier, 2019).

3. European range of the American Mink and population dynamics

The American Mink can now be widely found in more than 20 European countries in the wild (Reid *and al.,* 2016). It has an invasive character there and can spread over long distances through mountains (Fraser *and al.*, 2013), waterbodies, rivers and watercourses (Bevanger and Henriksen, 1995). The average dispersal distance observed for juvenile American Mink in the United Kingdom is approximately 19 km, but some individual's natal dispersal distance is 138 km (Lambin *and al.*, 2011). In addition, the breeding rate of the species seems to change significantly over the various invasion stages: higher rates appear in expanding populations than in stable populations, enabling very rapid colonisation (Melero *and al.*, 2015). In Spain, sharp growths in ranges of the American Mink were reported with a 17-fold increase in distribution area in under 30 years (Podra and Gomez, 2018).

4. French range of the American Mink and population dynamics

In France, monitoring carried out on the species has identified 3 continually expanding feral populations (Leger *and al.,* 2018, see map below):

- In Brittany with an expansion toward departments of Normandy and of the Pays de la Loire.
- In the Southwest with the merging of 3 initial nuclei in the Adour and the Garonne basins (Hautes-Pyrénées, Pyrénées-Atlantiques, Gers and Landes departments) and extending toward Gironde and Lot-et-Garonne.
- In southeast Occitanie with the merging of 3 initial nuclei (departments of Aude and Tarn, and Spain) and with the population still spreading.

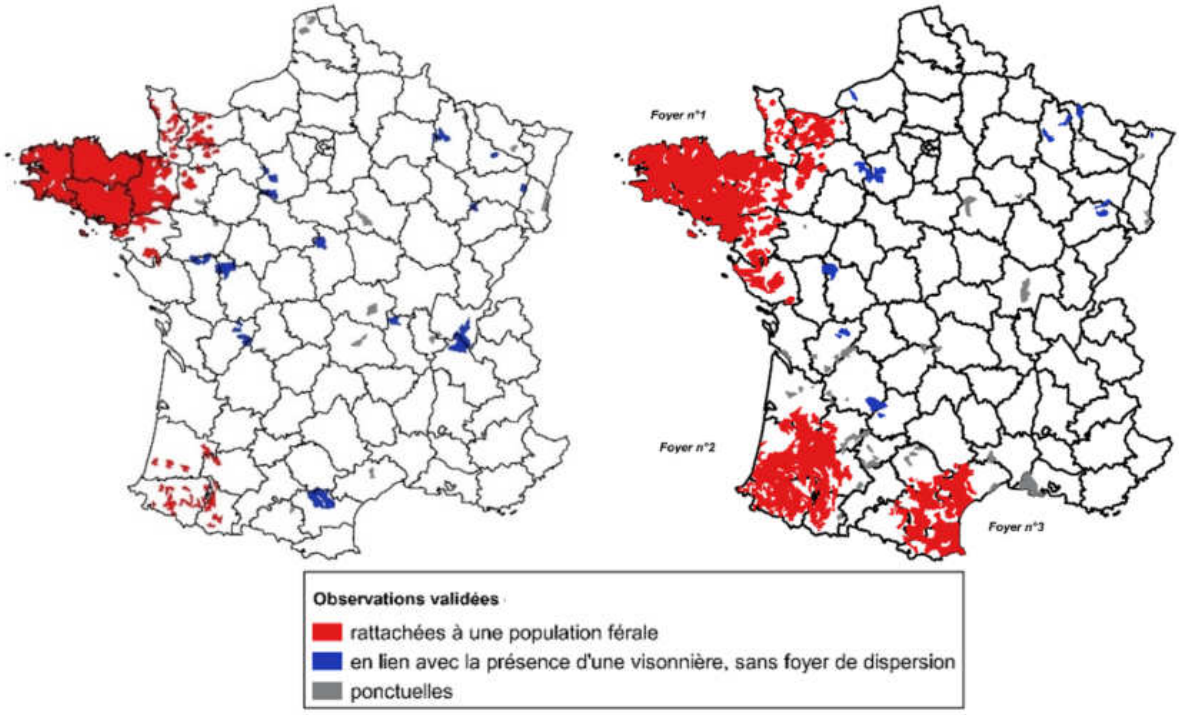


Figure 5: Evolution by river basin subsectors of observations of American Mink collected between 1990 and 2015 (on the left) and 2000-2015 (on the right) in France
(on the left Leger and Ruette, 2005); on the right Leger and al., 2018)

In Charente department, during the 1990's, considerable data was collected from an active fur farm. Intensive monitoring using mink rafts did not reveal a feral population (the last data date from 2012 - GREGE, 2014). In Dordogne, the vandalism of a fur farm in 2009 led to the establishment of a feral population. This population continues to be highlighted every year notably on the Céou River with the capture of individuals by trapping (Leger *and al.*, 2018).

1. Negative interactions between the American Mink and the European Mink

Hybridisation between the two species of Mink (European and American) is not biologically possible (Ternovsky, 1977; Skorupski, 2020).

Nonetheless, the American Mink is in direct competition with the European Mink for food resources and the use of habitats (Maran *and al.*, 1998; Sidorovich, 2000; Sidorovich *and al.*, 2000). While both Mink are semi-aquatic, the American Mink appears to have better adaptation skills for selecting habitats and its morphology makes it a better swimmer (Ternovsky, 1977; Maran and Henttonen, 1995). It is therefore a better opportunistic predator which adapts easily to different habitats (Kauhala, 1996; Sidorovich *and al.,* 1998). The American Mink is among the species which has the greatest impact on indigenous fauna as it affects at least 47 species (Genovesi *and al.*, 2012) including several carnivores such as the European Mink, European Polecat and Stoat (Sidorovich and Macdonald, 2001; Sidorovich and Solojev, 2007; Zuberogoitia *and al.*, 2012).

Finally, the American Mink is on average 20 to 40% heavier than the European Mink and has higher breeding rates (Danilov and Tumanov, 1976; Sidorovich, 1992, 1993; Fournier-Chambrillon *and al.*, 2010). While the American Mink shows a certain degree of tolerance intraspecific, it only tolerates European Mink when over 200 m away (Sidorovich, 2000). The European Mink is thus forced to go to less favourable habitats (Sidorovich, 2000; Sidorovich *and al.*, 2000), putting them in danger (risk of road casualties or predation, for example) and

fragmenting their already weakened populations (Maran and Henttonen, 1995; Sidorovich, 2000; Sidorovich *and al.*, 2000). Moreover, mortality of European Mink from the aggression of American Mink has been observed (Podra, 2021). When the two species occur together, European Mink populations decline while American Mink increase (Maran and Henttonen, 1995).

In France, the decline of the European Mink began before the arrival of the American Mink (de Bellefroid, 1999). The aggressive behaviour of American Mink, particularly males, towards European Mink could be one of the aggravating factors for the disappearance of European Mink in certain sectors without fully explaining the fall in populations in the west of France (Maran *and al.*, 1998; Sidorovich *and al.*, 1999; Sidorovich, 2000; Lode *and al.*, 2001).

c. Road casualties

Since the 1980's with increased road infrastructures and traffic, roadkill has significantly affected wildlife and notably European Mink (Palazon *and al.*, 2012; de Bellefroid and Rosoux, 2005). With the species' protection and the ban on trapping it for fur, road casualties have become a main threat factor. This cause of death concerns 71% and 54% of European Mink carcasses found in Navarra (1999-2001) and France (1987-2008) respectively (unpublished data, Founier-Chambrillon *and al.*, 2013). The scale of the road network in France represents a major obstacle for the movement of the European Mink. Although the European Mink is semi-aquatic, it favours crossing on dry land along the banks of rivers to go under an infrastructure. If the path is interrupted by a bridge, the European Mink will climb the embankment and cross the road, exposing it to the risk of collision (LPO *and al.*, 2017). Indeed, because the European Mink population density is low, they travel large distances to find partners, resulting in higher collision risk.

Most road casualties occur during two periods of the year: March to April/May and mid-July to September/November corresponding respectively to the breeding season and the emancipation of inexperienced young (Arambarri, 1997; GEREA and DIREN Aquitaine, 2007; Palazon *and al.*, 2012).

d. Hunting and accidental destruction (other than road casualties)

European Mink were officially hunted for a long time in many countries until being listed as a protected species (Maran and Henttonen, 1995; see paragraph 1.4.b). Historically, fur trapping played a major role in reducing the population notably in France. Out of 205 carcasses reported between 1900 to 1998, 85% of the cases of mortality were due to trapping (de Bellefroid and Rosoux, 1998). In the west of France between 1965 and 1997, a study of European Mink carcasses showed that 75% of the deaths were caused by trapping. This raises the question of its role in the extinction of the species in Brittany (Lode *and al.*, 2001).

Moreover, combatting species likely to cause damage (particularly the European Polecat) or invasive exotic species (Coypu, Musk Rat, American Mink) is also a source of accidental destruction of European Mink. Individuals can be eliminated due to confusion between species, the use of lethal traps, secondary poisoning by anti-coagulants and bad keeping conditions in cage-traps (hypothermia, hyperthermia, dehydration, drowning, etc.). Between 1991 and 2003, 7% of the carcasses collected in the PNA area were due to an error in identification during operations carried out combatting species likely to cause damage (DIREN Aquitaine and Mission Vison d'Europe, 2003).

Since this time, changes in regulations (see paragraph 1.4b) initiated during the 1st PNA have decreased the effects on European Mink of the control methods used. Chemical control is limited in France, notably rodenticides (Ministry of Agriculture and Fishing, 2007). In addition,

trapping American Mink (authorised all year) has restrictions depending on the departments for the use of category 1 and 2 traps, 200 m from the banks, in order to protect European Mink. Shooting American Mink following the regulation on invasive exotic species is strictly forbidden, given the major risks of confusion with European Mink. Moreover, in the application zone of the PNA, a selective escape exit for cage-traps is mandatory during the European Mink breeding season from April to July included. Finally, in departments concerned by this regulation, "reference" contact persons are nominated by prefectural decree. They are intended to help with recognising species in order to limit identification mistakes, especially between the European Polecat, American Mink and European Mink.

The accidental destruction of European Mink can also occur during works in wetlands (rotary slashing etc.) (Collectif, 2003).

e. Diseases and parasites

The decline of the European Mink could in part be due to infectious agents propagated by or introduced by various species (Henttonen and Tolonen, 1983; Henttonen, 1992). In fact, wild carnivores are sensitive to many pathogenic agents transmitted by wild or domestic species. The impact of these factors on European Mink has not, as yet, been sufficiently documented (Maran and Henttonen, 1995; Maran and Robinson, 1996).

In France, the circulation of Aleutian Disease Virus (particularly deadly for Mustelids) has been detected in both European Mink and American Mink (DIREN Aquitaine and GREGE, 1999) and also in other small carnivores (European Polecat, Genet (*Genetta*), Pine Marten (*Martes martes*) and Beech Marten (*Martes fouina*) throughout the range of the European Mink. American Mink seem to play a major role in introducing and also spreading this virus since they have a higher prevalence of the virus than other species (Fournier-Chambrillon *and al.*, 2004a; Manas *and al.*, 2016). To date however, it has not been possible to highlight a possible role of this pathology in the decline of the European Mink.

Distemper is transmitted by canids, can cause substantial deaths depending on the strain, and was detected in European Mink in France (Philippa *and al.*, 2008). This disease can contribute to a drastic reduction in population nuclei as observed in Navarra with numbers decreasing 4-fold in a few years (Fournier-Chambrillon *and al.*, In press. 2020).

Concerning leptospirosis, high seroprevalence was demonstrated along with the circulation of serovars which could potentially cause symptoms (Moinet, 2008; Moinet *and al.*, 2010).

Various analyses have been carried out on parvoviruses and other pathogenic agents but the small number of individuals available for analysis makes it impossible to conclude on the level of circulation of these diseases in French populations of the European Mink (DIREN Aquitaine and Mission Vison d'Europe, 2003).

European Mink are also carriers of a much richer helminthic parasite fauna than American Mink. They host a larger number of worms and more pathogenic species (Anisimova, 2004; Torres *and al.*, 2008). European Mink are this subject to high parasite pressure, which can be an aggravating factor by making animals more vulnerable to causes of mortality. This parasitism may also reflect a population that is in poor health (DIREN Aquitaine and Mission Vison d'Europe, 2003).

SARS-CoV-2, at the origin of COVID-19, appeared at the end of 2019 in humans (paragraph drawn up based on data available on the World Organisation for Animal Health, 23 March 2021). The spreading of the COVID-19 virus in humans is solely the result of interhuman transmission, essentially through the respiratory tract. The French Agency for Food, Environmental and Occupational Health Safety (ANSES) specifically state that there is no epidemiological role in wild and domestic animals in the maintaining or the spreading of the virus in France.

Felines (domestic and wild cats), American Mink and dogs have been infected by SARS-CoV-2 based on close and prolonged contact with previously infected humans. The SARS-CoV-2 infection in American Mink in farms is characterised by respiratory diseases and a high mortality rate (Shuai *and al.,* 2020). American Mink infected on farms have been detected in several countries (Denmark, Netherlands, Spain, Italy, and France). In early November 2020, the World Organisation for Animal Health published a guide with recommendations on farms susceptible to SARS-CoV-2 (World Organisation for Animal Health, 16 November 2020). In France, the first case of an American Mink infected by SARS-CoV-2 at a farm was detected on 22 November 2020 (French Government, 2020). The animals were culled over the next few days.

It appears that Mustelids can be susceptible (MNHN, 2020b; European Food Safety Authority, 2021), the risk is therefore that SARS-CoV-2 may be transmitted to wild populations of carnivores and added to the list of already known diseases which threaten the European Mink. Within the framework of both PNAi and the LIFE VISON programme, the implemented protocols were adapted to limit the risk of transmission toward wild fauna (World Organisation for Animal Health *and al.*, 202l).

Finally, a programme of toxicological and ecotoxicological analyses was set up during the 1st PNA. Toxicological analyses revealed the presence de rodenticide residues (DIREN Aquitaine and Mission Vison d'Europe, 2003), mainly during autumn and winter. Ecotoxicological analyses (heavy metals, PCB, organochlorine pesticides) revealed low concentrations, much lower than toxicity thresholds (DIREN Aquitaine and Mission Vison d'Europe, 2003). Based on these findings, these pollutants appear not to play a major role in the decline of the European Mink.

f. Predation by carnivores

Undoubtedly, like other species, the European Mink suffers from opportunistic food chain predation. Predation in a natural food chain, however, cannot cause the disappearance of a species as the predator/prey balance is respected. In the case of the European Mink, a specific predator causing an imbalance to the species has not been highlighted (Maran and Henttonen, 1995; Sidorovich *and al.*, 1999; Sidorovich *and al.*, 2000). On the other hand, 13% and 21% of carcasses collected respectively between 1999 and 2013 in Navarre, and 1987 and 2008 in France, were due to predation mainly by carnivores, notably domestic (Fournier-Chambrillon *and al.*, 2013).

g. Population genetics

The effect of isolation of populations (Lode, 1999; see paragraph I.3.b) and the low genetic diversity of European Mink populations (see paragraphI.5.e) leads to heightened sensitivity of the species to all threat factors (Michaux *and al.*, 2005).

In addition, European Mink and European Polecat are two genetically very close species (Davison *and al.,* 2000; Sato *and al.*, 2003; Lode *and al.*, 2005) which can hybridise with breeding between a female European Mink and a male European Polecat (Tumanov and Abramov, 2002; Cena *and al.*, 2003; Lode *and al.*, 2005). The hybrids produced are viable but only the females are fertile (Ternovsky and Ternovskaya, 1994). To date, this phenomenon rarely occurs in the wild (<3%) (Tumanov and Abramov, 2002; Lode *and al.*, 2005; Cabria *and al.*, 2011). There would appear to be no major competition between European Mink and European Polecat since they have different ecological niches (Libois, 2001; Sidorovich, 2000, 2001). Nevertheless, the decline in populations of European Mink and locally European Polecats may modify the probability of inter-specifies encounters and the risks of genetic

introgression (Maran *and al.*, 1998; Lode *and al.*, 2005). This risk is therefore a factor that needs to be monitored.

h. Competition with the Raccoon

In France, there are 3 large Raccoon (*Procyon lotor*) population nuclei: the oldest in the northeast of France coming from the joining of historical nuclei in Aisne and Alsace/Lorraine/Vosges; 2 more recent in Gironde and Auvergne departments (Leger and Ruette, 2014; Maillard *and al.*, 2020). Since 2013, data has started to be recorded in Charente and Charente Maritime departments (LPO *and al.*, 2020) implying the formation or expansion of an until-now unsuspected cluster, close to the nucleus of European Mink.

To date, the Raccoon and its impact have been studied very little in Europe. Recent studies (Bartoszewicz *and al.*, 2008; Fischer *and al.*, 2017; Duscher *and al.,* 2018) have focused on population density, range and diet. All the studies agree on the need for supplementary data to evaluate the ecological, economic and sanitary consequences of expanding populations. Evaluating its potential consequences on the conservation of European Mink is necessary as it consumes a significant share of aquatic prey (amphibians, crayfish), develops quickly and may dwell in the same habitats as the European Mink, while remaining opportunistic (Salgado, 2018; LPO *and al.*, 2017). It also potentially carries diseases affecting carnivores which could be transmitted to wild populations.

i. Climate change

Since the 19th century, the quantity of greenhouse gases has increased considerably under the pressure of human activity. From 1880-2019, the average temperature around the world has increased by nearly 1 degree, affecting the weather while upsetting the water cycle (NASA, 2020). The Intergovernmental Panel on Climate Change confirms that climate change exacerbates the heavy pressure of humans on ecosystems leading to the 6th species extinction crisis (IPCC, 2014).

In terms of aquatic habitats, climate change is reflected by intensifying periods of drought and floods. These phenomena, combined with overall temperature increases, may alter the habitats of the European Mink and also the quantity and the quality of food resources.

II. Previous and current programmes in connection with the western nucleus

Numerous programmes have been, or are still being, implemented for the French population of European Mink:

Programme name	Period	Coordinator	Facilitating organisation(s)	Scope of action
1st PNA	1999-2003	DIREN Aquitaine	SFEPM and GREGE	11 departments (16, 17, 24, 32, 33, 40, 47, 64, 65, 79, 85)
2nd PNA	2007-2011	DIREN Aquitaine	ONCFS	
PNAi*	2015-2020	DREAL Nouvelle-Aquitaine	ONCFS and Cistude Nature	
LIFE VISON	2017-2022	LPO	LPO, GREGE and CD17	8 Natura 2000 sites in the Charente Basin in France (departments. 16 and 17)

Table 1: French programmes for the European Mink

* With the agreement of the National Nature Protection Council (CNPN) and the Environment Ministry, the Intermediate PNA was administrated under simplified governance (no Steering Committee or Scientific Council), with support from existing bodies such as the CNPN and the Scientific Council of the National Hunting and Wildlife Agency (OFB on 1st January 2020). This specific administrative system gave it the name "Intermediate PNA" rather than "3rd PNA".

The first two were Restoration Plans. By convention, we will refer to them as 1st PNA and 2nd PNA. Globally, it should be borne in mind that 1st PNA mainly focussed on knowledge, whereas 2nd PNA, PNAi and LIFE VISON concern the management of the species and its habitats. These programmes are specifically presented below.

1. 1ST NATIONAL ACTION PLAN (1999-2003)

The imperative need to conserve the European Mink led France to establish a 1st National Restoration Plan for the period 1999 to 2003 (DIREN and GREGE, 1999). Its national facilitation was entrusted to the Environment Management Research and Study Group (GREGE) and the French Society for the Study and Protection of Mammals (SFEPM) under the coordination of the Aquitaine Regional Directorate for the Environment (DIREN). During this period, four main objectives were defined (to be achieved through 16 main actions):

- European Mink survey campaigns to gather information about the species' distribution and its diet;
- Identification of factors threatening the population;
- Initial actions to limit the impact of these factors, notably adapting trapping practices;
- Integration of the European Mink into the Natura 2000 policy.

A first attempt at breeding in captivity in France was carried out at the Thoiry Zoo (Yvelines department) in 2000. This initiative, supported by the Ministry of the Environment, was not successful.

The assessment report of the actions implemented during the course of 1st PNA was drawn up in 2003 (DIREN Aquitaine and Mission Vison d'Europe, 2003). All actions from the 1st PNA continued during the transitional phase up to 2006 while waiting for the 2nd PNA.

2. 2ND NATIONAL ACTION PLAN (2007-2011)

With 4 specific objectives and 74 actions set up, the 2nd National Action Plan for the restoration of the European Mink (GEREA and DIREN, 2007) was coordinated by the Aquitaine Regional Environment Directorate (DIREN) and facilitated by the National Hunting and Wildlife Agency (ONCFS) from 2007 to 2011. The four specific objectives oriented the subsequent actions:

- Placing the conservation of the European Mink in the centre of public policies, especially those concerning the conservation management of wetlands;
- Protecting European Mink *in situ*;
- Establishing all the conditions required for implementing a population translocation (reinforcement/reintroduction) programme;
- Developing facilitation and communication.

Three major axes of intervention were prioritised:

- Breeding and resettling European Mink in the plan's area of intervention;
- Adapting trapping practices (replacing lethal traps) and ways of regulating pest species (stoppage of chemical control using Bromadiolone), and controlling the American Mink through a network of specially trained trappers;
- Limiting road casualties.

For this 2nd PNA there was an assessment report, but it was not validated by the DIREN, nor presented to CNPN. Thereafter, from 2011 to 2015, the PNA was not facilitated.

3. INTERMEDIATE NATIONAL ACTION PLAN

In 2015, an "intermediate" National Action Plan (DREAL and ONCFS, 2015) was defined for the intervening period before the drawing up of a 3rd PNA. The DREAL Nouvelle-Aquitaine coordinated the programme together with ONCFS, in charge of scientific and technical facilitation, and the association Cistude Nature, which facilitated the partner networks.

Its work focussed on 3 main actions:

- Updating knowledge about the distribution of European Mink by a programme of targeted surveys in areas where the species was recently present, in compliance with a detailed protocol homogenously applied over the whole area covered;
- Continuing to fight American Mink. This action aimed at protecting the last remaining areas occupied by European Mink from the extension of American Mink populations. This coordinated monitoring and targeted fight strategy against American Mink was based on a network of mink rafts to detect their footprints;

- Implementing a European Mink conservation breeding project: Zoodyssée, owned by the Deux-Sèvres Departmental Council, was selected for this project and its breeding centre opened in 2015. A second breeding centre was already holding individuals, this is Calviac Zoological Reserve (Dordogne department).

In parallel, other actions were also carried out, in particular:

- Limiting mortality risks due to road casualties by adjustments to civil engineering works and sections of linear infrastructure, targeting priority areas;
- Seeking innovative techniques to identify European Mink, American Mink and European Polecat based on evidence of their presence in the wild;
- Checking that active American Mink fur farms were escape-proof;
- Sharing knowledge communication tools aimed at the general public and professionals (posters, conferences, training, films...);
- National coordination of the various programmes in favour of the species, sharing knowledge with European partners.

An assessment report of this intermediate PNA was drawn up and validated by the DREAL and CNPN (DREAL and ONCFS, 2019).

4. LIFE VISON Programme

A LIFE Nature and Biodiversity programme, called LIFE VISON (French for Mink) "Conservation of the European Mink and associated species of community interest, and habitats of the Charente Basin" LIFE 16NAT/FR/000872, started in September 2017 (LPO *and al.*, 2017). It aims to maintain and ideally increase the European Mink population in one of the species' last remaining bastions, the Charente Basin. The programme covers 8 Natura 2000 sites situated in the Charente and Charente-Maritime departments with the implementation of 23 actions. Coordinated by the League for the Protection of Birds (LPO) in partnership with the (GREGE) and the Charente-Maritime Departmental Council, the programme lasts 5 years (01/09/2017 to 30/11/2022) and is almost 75% financed by the European Union (total budget 3 954 771 €).

The principal objectives of the programme are to:

- Reduce the causes of European Mink mortality: road casualties, trapping, competition with American Mink;
- Increase the surface area of favourable habitats, improve ecological corridors, secure land tenure and set up reglementary measures in estates of interest for the conservation of Mink in Europe;
- Locate and characterise different population nuclei and enhance knowledge about the sensitive breeding season and characterise habitats to manage them in the most appropriate possible way;
- Promote the European Mink as a top-priority flagship species to highlight the importance for biodiversity of water quality and riverine woodlands. Encourage the involvement of local stakeholders in issues connected to European Mink and ensure that all operations affecting watercourses take the European Mink fully into account.
- The actions of the LIFE VISON programme are being and will continue to be implemented simultaneously and in coordination with the implementation of the 3rd PNA for the European Mink. Annual progress reports about this LIFE programme are available on the dedicated website (www.lifevison.fr). Works whose results are already

available have been directly integrated in this 3rd PNA although, for simplification, the financial costs are not reiterated in this document. They are presented separately in the LIFE VISON programme.

5. SPANISH LIFE PROGRAMMES

In Spain, 3 LIFE programmes have been implemented for the European Mink.

The 1st programme was LIFE GERVE "Ecosystem management of rivers in European Mink habitats" (2005-2007). It focused on restoring and securing the habitats of the European Mink on a community interest site in the region of Navarre in Spain. The objective was to ensure a viable population of European Mink in the region and provide the species with potential of expanding (LIFE GERVE, 2007). This project:

- Restored the riparian habitats of the Aragon and Arga rivers systems in order to improve habitat connectivity;
- Monitored and reduced competition with American Mink;
- Implemented an information campaign and support for recreational users, particularly anglers, focused on improving their knowledge on the species and its habitats.

In the continuity of this programme, a LIFE+ programme called Territorio Vison "Restoration of river territory: a crucial area for the European Mink" (2011-2016) focused on restoring river habitats along the lower Aragon and Arga rivers in the Navarre region to increase the population of European Mink. This programme was structured around 2 actions (LIFE Territorio Vison, 2020):

- Habitat management: promoting good practices and restoring the riverine ecosystem;
- Conducting a communication and participation campaign: creating communication tools, environmental education actions, societal cooperation and participation in implementing the project.

The LIFE Lutreola Spain project "New approaches in the conservation of European Mink in Spain" was implemented from 2014 to 2019 in the Basque country, the Rioja, Aragon and the Valencian Community. The principal objectives of this project (Life Lutreola Spain, 2020) are to:

- Eradicate population nuclei of American Mink within its range and in areas where the European Mink is found;
- Increase the viability of the wild European Mink population through the reintroduction of new individuals and the creation of new population nuclei. To do so, conservation breeding centres were set up based on 10 founding individuals (captured in Spain between 2004 and 2010). They number some 50 individuals at present (pers. comm. Podra) ;
- Create a more effective monitoring network to assess the situation of both mink species.

Given the similarity of the actions implemented and the borders shared by the two countries, the French and Spanish teams work in close collaboration in order to benefit from the latest advances and carry out the most coherent and appropriate actions possible.

6. EU *EX-SITU* EUROPEAN MINK CONSERVATION PROGRAMME

All known wild populations of European Mink are close to extinction. A conservation management programme was therefore set up Europe-wide. The objective of these conservation breeding centres is to supply European Mink in view of being re-introduced into the wild.

The first birth of European Mink in captivity occurred in a zoo in Moscow (Russia) in the early 1930's. An EEP (European Endangered species Programme) for the European Mink, led by Tiit Maran, was started in 1991 (at the initiative of the European Association of Zoos and Aquaria). This programme coordinated and standardised the actions set up by various countries that wanted to get involved in the *ex-situ* conservation of European Mink (Estonia, Spain, France, etc.). As of 30th April 2017, the EEP *ex-situ* population consisted of 267 individuals (140 males and 127 females) bred in 26 different centres and spread over 10 different countries. All these individuals result from 22 founding individuals from the northeast and centre of Russia. On average, over the last 5 years, there have been 121 births per breeding season (Maran *and al.*, 2017a).

Moreover, since 2018, individuals have been exchanged between the EEP and the Spanish breeding programme (LIFE Lutreola Spain programme – see paragraph II.5). The breeding of western and eastern individuals has already produced 2 successive generations. Consideration is being given in Spain to translocating these individuals (pers. comm. Podra, 2021).

Within the framework of PNAi, France participated in defining the principal objectives of this captive breeding programme which are presented in the Long-term European Mink Management Plan (Maran *and al.*, 2017a):

- Maintain a metapopulation (i.e. a set of populations covering the range of the species) with at least 85% of the initial genetic diversity of European zoos and other breeding centres for 50 years;
- Encourage and support any viable action in Europe for population translocation;
- Maintain coherence and mutual reinforcement between *in-situ* and *ex-situ* conservation actions;
- Raise awareness among zoo visitors about the urgency of the European Mink's situation and the damage caused by invasive species including the American Mink;
- Support research into European Mink conservation and encourage the general public and research institutes to become involved,
- Raise awareness and encourage the European Union and other decision-makers to draw up legislation and policies favourable to the European Mink.

Regular exchange enables the various countries concerned to benefit from the latest advances in the captive breeding of European Mink.

In France, the Zoodyssée Wildlife Park (in Deux-Sèvres department) and Calviac Zoological Reserve (in Dordogne department) have joined this EU European Mink conservation programme and thus help to safeguard the species. It should be noted that Zoodyssée's European Mink breeding centre was constructed in the framework of the 2nd PNA and can hold up to 60 individuals. These two conservation breeding centres participate in raising public awareness through educational programmes on the conservation of the European Mink. Moreover, in 2021, the Park of Isle (in Saint-Quentin, Picardie department) introduced 2 European Mink from the EEP, no longer able to breed because of their age, to raise public awareness.

III. Issues and organisational arrangements of the 3rd PNA

1. What is 3rd PNA?

a. Definition of a PNA (MTES, 2018)

National Action Plans (PNA in French) are operational strategic tools aimed at ensuring the maintenance or reestablishment of a favourable conservation status for wild fauna and flora species that are threatened or of particular interest. This tool is enacted when the other public environmental and sectoral policies, including reglementary nature protection tools, are deemed to be insufficient for achieving this objective.

Indeed, some species are particularly threatened, especially due to human activities. These threats can result in the increased scarcity, even extinction, of such species over all or parts of the areas where they live.

When numbers fall too low or the species has disappeared, translocation operations (population reinforcement or reintroduction) can also be carried out by a PNA.

A PNA is therefore a tool for mobilising the various stakeholders concerned (institutional, academic, socio-economic and associations) in favour of a threatened species, which defines a medium or long-term strategy (5 to 10 years) and aims to:

- Organise coherent monitoring of populations of the one or more species concerned;
- Implement coordinated actions favourable to the restoration of these species or their habitats;
- Inform the stakeholders concerned and the general public;
- Facilitate the integration of the protection of the species into human activities and public policies.

National Action Plans are non-binding and based on collective mobilisation of stakeholders who have the capacities to act in favour of the threatened species.

b. Conservation issues for the European Mink in the 3rd PNA

Despite the efforts made in the various programmes for the European Mink, the status of the species remains very worrying, as shown by its "critically endangered" status. The 3rd PNA should enable the implementation of field actions to preserve the last individuals in the wild. To do this, the PNA must ensure **effective coordination and unite all the stakeholder** involved with the species.

The main knowledge issue is the **finalisation of the update of the species' range**, which was started in 2015 as part of PNAi. Updated presence data will enable increased efforts to preserve European Mink habitats in the identified population nuclei.

In addition, the actions of the 3rd PNA will make it possible to combat the factors that threaten the European Mink, primarily the destruction and fragmentation of its habitats. In 2015, the European mink's distribution area covered 156 hydrographic sub-sectors, i.e., 87,316 km^2, and 52,712 km of watercourses (classes 1 to 6 of the IGN BD Carthage database). As the European Mink is an "umbrella species", its protection benefits its entire ecosystem. Thus, the actions of this 3rd PNA will support the **protection of wetlands** and the species that live there.

The significant efforts carried out to **improve infrastructures** under the PNAi will be continued and extended to all sectors likely to host the European Mink in order to limit road accident mortality as much as possible.

The fight against American Mink will be maintained in areas where the two species are likely to come into contact and monitoring will be continued to prevent its spread to areas where the European Mink is present.

The conservation of the European Mink *in situ* will be complemented by **conservation breeding** at the Zoodyssée and the Calviac Zoological Reserve. The first encouraging results of reproduction in 2019 and 2020 at Zoodyssée need to be built upon. The translocation strategy for European Mink from the breeding centres will be drafted at the start of the implementation of the 3rd PNA.

Finally, the species remains unknown to both decision-makers and the general public. **Suitable communication** will be carried out to raise awareness of the species' conservation.

The issues at stake in this 3rd PNA are therefore as follows:

- Maintaining and restoring the remaining populations of European Mink in the wild by preserving its habitats and restoring ecological continuity;
- Containing the expansion of the American Mink;
- Ensuring the conservation of the species through conservation breeding with the aim of translocation into the natural environment;
- Coordinating actions in the field and ensuring cooperation at national and international level.

c. Duration and area of implementation of the 3rd PNA

In order to be able to act on a lasting basis, it was decided, in agreement with the Environment Ministry, that this PNA would have a duration of 10 years, i.e., from 2021 to 2031. It should be remembered that the previous PNAs were shorter: 1st PNA (1999-2003), 2nd PNA (2007-2011), intermediate PNA (2015-2020). Moreover, the Ministry explicitly requested that the actions implemented in the framework of the intermediate PNA should continue until the 3rd PNA is validated and launched.

The area of action of 3rd PNA is identical to that of 2nd PNA, i.e. 11 departments belonging to three regions of France (see map below):

- Nouvelle-Aquitaine: Pyrénées-Atlantiques, Landes, Lot-et-Garonne, Dordogne, Gironde, Charente-Maritime, Charente, Deux-Sèvres ;
- Pays de la Loire: Vendée ;
- Occitanie: Hautes-Pyrénées, Gers.

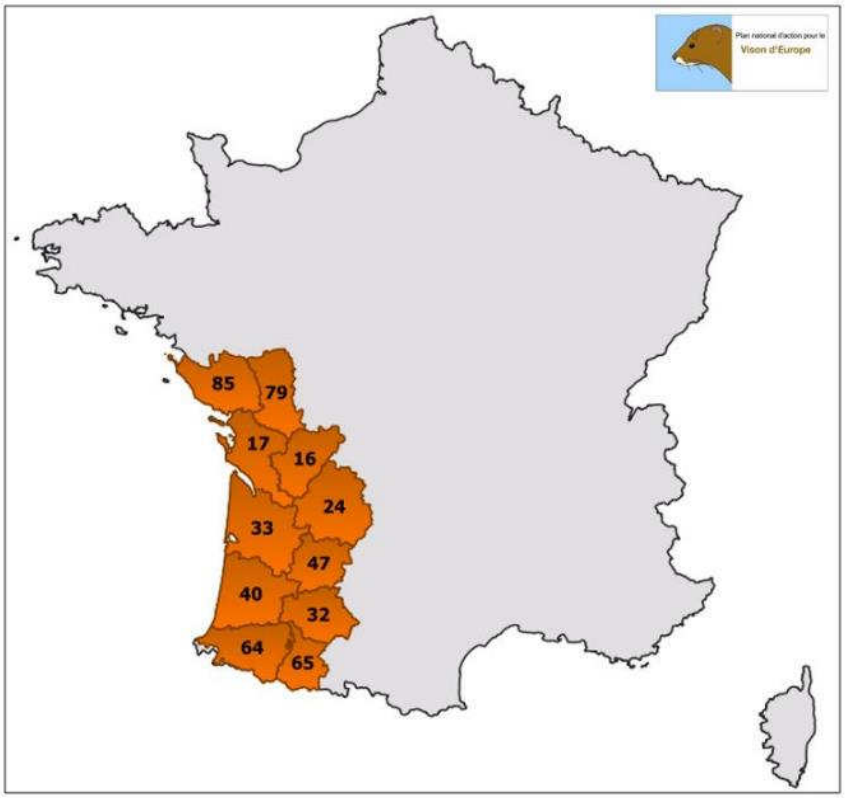


Figure 6: Area of implementation of the 3rd PNA

This scope of action enables actions both in the area where the European Mink is present (area of presence at the beginning of the 20th century which was taken into account for the 1st PNA) and its potential recolonisation range. However, the scope of action will be adapted in function of the development of the species' range. For the relevance of certain actions (e.g., controlling the American Mink), this scope could also be adapted.

d. Monitoring and assessment of the 3rd PNA

The coordinators and facilitators of the 3rd PNA will be responsible for drawing up an annual assessment report of the actions carried out, summarising the information gathered. The Steering Committee (COPIL) will thus be able to examine the actions carried out and define or redefine the strategic directions and actions to be implemented the following year. After validation, this assessment report will be communicated to the partners of the 3rd PNA and made available on the coordinating DREAL's website.

An overall assessment of the PNA and its implementation will be carried out at the half-way stage and presented to the CNPN. The objective of this mid-term assessment will be to evaluate the implementation of actions with regard to the objectives of the plan and, if possible, their efficacy so as to make any necessary readjustments.

Concerning the final assessment, it should measure the efficacy of the 3rd PNA with regard to the conservation status of the species and objectives fixed. It will be carried out 10 years after the launching of the 3rd PNA. The final assessment report will detail for each action the resources implemented and the results obtained. It may be decided to prolong the plan if such a decision proves appropriate. Regardless of the scenario, this final assessment could provide input for the drawing up of a 4th PNA, if required.

In any event, as for PNAi, conservation actions must not be interrupted during the carrying out and drawing up of the mid-term and final assessments, or before the subsequent PNA.

2. GOVERNANCE

a. Steering Committee (COPIL)

To date, the COPIL of the 3rd PNA includes 59 organisations (see annex n°4). However, this may change over time especially in function of changes to certain organisations or the PNA's scope of action.

The principal objective of the COPIL is to define the PNA's strategic and budgetary directions. It is a decision-making and validation body. To achieve this, the COPIL will:

- Monitor the progress of the PNA's implementation;
- Annually assess the actions carried out according to the schedule;
- Define the priority actions to be carried out the following year, together with the human and financial resources required, based in particular on the opinions and proposals expressed by the Scientific Committee of the PNA and the CNPN.

The COPIL will meet at least once a year upon invitation by the coordinating DREAL. Beforehand, an assessment report on the year just ended will be sent to each member in order to evaluate the progress made for each planned action and a forecast for the following year. The COPIL will be coordinated by the DREAL.

Finally, if required, the COPIL may propose the setting up of thematic workgroups (see paragraph III.2.c).

b. Scientific Council (CS)

The Scientific Council of the 3rd PNA currently includes 8 permanent members (see annex n°5), both national and international, designated *intuitu personae* on the basis of their scientific competencies regarding the European Mink. In addition, external experts may occasionally be invited to participate in one or more specific CS meetings.

These persons will be specialists in one or more subjects covered by the CS meeting. They may be proposed by the coordinating DREAL, the PNA facilitator, a CS member, the CNPN or a COPIL member.

The role of the CS will be to provide expertise on various scientific subjects (global questions or particular points) to assist the COPIL, the coordinating DREAL and PNA facilitator with the implementation, prioritisation or reorientation of actions. A member of the CS may be invited to the COPIL as rapporteur.

The CS will meet as often as required on invitation by the coordinating DREAL. In order to be as efficient as possible, documents may be translated in order to be accessible to all

members, and discussions will mainly be held in English. The CS will be consulted about the various scientific subjects via physical meetings, videoconference and/or participative collaboration. The CS will be presided by the PNA facilitator, supported by the coordinating DREAL.

c. Thematic workgroups

In order to draw up 3rd PNA, the members of the COPIL have already participated in the following thematic work groups (GTT) (see annexe n°6):

- Improving knowledge about the European Mink;
- European Mink breeding and conservation strategy;
- Communication and funding;
- The fight against the American Mink;
- The fight against the other threat factors and improving habitats favourable to European Mink.

The objective of these GTT was to propose the themes to be covered in the 3rd PNA. The full set of proposals enabled the construction of a provisional programme of 13 actions and 31 sub-actions that served as the basis for drawing up this 3rd PNA.

By decision of the COPIL and/or proposal by the coordinating DREAL or the CS, new GGTs could be set up during the course of the PNA. Their objective would mainly be to produce content concerning operational actions to be submitted to the COPIL for decision-making and validation. These GTT would be facilitated by the coordinating DREAL, supported by the facilitator. Reports on their work may be transmitted to the CNPN.

3. Roles of the PNA coordinator and facilitator

a. Coordinator

The Environment Ministry:

- Coordinates the approval of the PNA;
- Designates the PNA's coordinating DREAL;
- Gives the instructions to the prefects to implement the PNA;
- Disseminates the plan at national level;
- Carries out the inter-ministerial consultations;
- Is involved by the coordinating DREAL in choosing the PNA facilitator;
- Carries out the monitoring of the plan by the intermediary of the coordinating DREAL;
- Allocates the budgets required for facilitating the PNA;
- Takes part in steering committee meetings;
- Transmits information about the actions carried out to the European Commission.

The coordinating DREAL of the 3rd PNA:

- Is delegated to steer the PNA;
- Chooses the facilitator of the PNA, with which it is the major interlocutor, in association with the Environment Ministry;
- Defines the work of the facilitator in compliance with the strategy of the PNA;
- Is responsible for the successful implementation of the facilitation carried out by the facilitator;
- Is in charge of the financial management of the PNA;
- Is in charge of the communication strategy;
- Manages the budgets allocated by the Environment Ministry;
- Defines, in association with the facilitator, the composition of the COPIL;
- Coordinates the COPIL and performs the secretarial work;
- Calls the CS meetings;
- Disseminates the PNA to the partners associated in the implementation of the PNA;
- Disseminates information to the Environment Ministry and other DREAL;
- Liaises with the CNPN;
- Performs reglementary checks in association with the facilitator;
- Centralises all production and data stemming from the PNA with the help of the facilitator;
- Supports the facilitator in drawing up the annual assessment reports, mid-term assessment report and final assessment report of the PNA and is responsible for their dissemination.

The Environment Ministry has designated DREAL Nouvelle-Aquitaine as the delegated coordinating and steering body for the 3rd PNA for the European Mink. **The coordination of the 3rd PNA requires the equivalent of 1 full time post** (only 0.5 FTE allocated in the framework of the PNAi).

b. Facilitator of the PNA

The facilitator of the PNA:

- Facilitates the plan and ensures the implementation of the actions it manages;
- Facilitates the networks of partners;
- Facilitates the CS and performs the secretarial work;
- Centralises, processes and analyses the data and information transmitted by all the partners;
- Contributes to the financial management of the PNA;
- Contributes to the communication strategy of the PNA;
- Ensures the high scientific quality of the studies and protocols implemented in the framework of the PNA, in particular the axis concerning knowledge improvement, and oversees the correct dissemination of knowledge;
- Performs reglementary checks in association with the DREAL;
- Provides expert scientific consultancy;
- Provides the scientific content for communication actions and training;
- Prepares the annual assessment reports and action programmes to be submitted to the COPIL, supported by the coordinating DREAL;
- Draws up the annual assessment reports, mid-term assessment report and final assessment report of the PNA, supported by the coordinating DREAL;
- Presents, defends and promotes the PNA's actions to international partners;
- Carries out the presentations to the CNPN, supported by the coordinating DREAL.

The facilitator of the 3rd PNA will be chosen by the coordinator, DREAL Nouvelle-Aquitaine, after validation of the 3rd PNA. **The facilitation of the 3rd PNA requires the equivalent of 4 full time posts** (only 0.5 FTE allocated in the framework of PNAi).

4. PARTNERS

a. Stakeholders involved at national and regional level

The main technical and/or financial partners of the PNA are:

- The associated DREAL: the PNA extends over 3 regions, in addition to the coordinating DREAL of Nouvelle-Aquitaine, DREAL of Occitanie and DREAL of Pays-de-la-Loire will also be involved;
- State services: Departmental territorial (and marine) directorates, departmental directorates for social cohesion and the protection of populations etc.
- Local authorities: Regional Councils, Departmental Councils, groupings of local authorities, Conurbation authorities, River syndicates etc.
- Other public organisations: French Biodiversity Agency (OFB), National Natural History Museum (MNHN), National Forests Agency (ONF), Water Agencies, National Centre for Scientific Research (CNRS), universities, Centre for Studies and Expertise on Risks, the Environment, Mobility and Planning (CEREMA), veterinary schools …
- Nature protection associations;
- Natural area management authorities: Regional Natural Parks, National Parks, National and Regional Nature Reserves, Natural Area Conservancies …
- Socio-professional stakeholders: hunters (National Hunters' Federation, Departmental Hunters' Federations …), anglers (National Federation for Fishing in France, Departmental Anglers' Federations …), trappers (National Union of associations of licensed Trappers in France, Departmental Trappers' Associations …), planners, constructers and transport infrastructure managers, environmental consultancies …

b. Dissemination of results and promotion of the network of partners

All the results and analyses obtained in the framework of the 3rd PNA are public and will be uploaded to the French platform of the Nature and Landscape Information System (SINP). This information will also be available on the websites of the DREAL Nouvelle-Aquitaine and of the facilitator. Progress reports will be produced.

In order to ensure recognition of all partners, without whom the implementation of the 3rd PNA would be impossible, they will be cited in the name of the "network of partners of the 3rd PNA for the European Mink" in all communication media concerning the results of the PNA.

IV. Actions to be implemented under the 3rd PNA

1. What is an action file?

a. Action file organisation

In total, 13 actions divided into 31 sub-actions have been defined for implementation within the framework of the 3rd PNA for the European Mink in France in order to achieve the determined objectives. They are grouped according to 5 work axes (see table below): enhance knowledge about the European Mink, conservation breeding of European Mink and strategy for translocation into the wild, limit the impacts of American Mink and other non-native species on European Mink, contribute to the good status of European Mink habitats and combat other threats in the wild, and communication and training on the European Mink and the actions of 3rd PNA.

Some actions are subdivided into sub-actions because they do not necessarily have the same priority. Thus, each sub-action is assigned a priority level:

- "**Priority 1**": highest priority level: priority actions to be implemented imperatively during the 3rd PNA
- "**Priority 2**": intermediate priority level: operations to be implemented as much as possible
- "**Priority 3**": lowest priority level: actions implemented depending on opportunities and time available.

Finally, not all actions can or need to be implemented simultaneously throughout the PNA. Their implementation period(s) are therefore given in each file. The global schedule of 3rd PNA is presented in Part VI of this document.

Axis 3: Limit the impact of the American Mink and other non-native species on the European Mink	
Action 3.1: Fight against the sources of the introduction of American Mink into the wild	71
Action 3.2: Fight against the American Mink in the wild	76
Action 3.3: Study the potential impact of other non-native species on the European Mink	83
Axis 4: Contribute to the good status of European Mink habitats and fight against the other threats in the wild	
Action 4.1: Fight against the loss of habitats favourable to the European Mink	86
Action 4.2: Fight against accidental destruction of European Mink	90
Axis 5: Communication and training on the European Mink and the actions of 3rd PNA	
Action 5.1: Develop and implement a communication strategy	97
Action 5.2: Organise training courses to raise awareness about the European Mink and its conservation issues	100

Table 2: Work axes and actions of the 3rd PNA for the European Mink

b. Action file template

The 13 action files of the 3rd PNA are all based on the template presented below (see Table 3). In accordance with the recommendations of the Ministry, they were all written in such a way as to be freestanding.

Action n°X.X	Action name	
Work axis	Overall orientation to which the action file responds	
Context and issue(s)	Context of the action and associated issues that lead to the proposal of this action file	
Objective(s)	Action objective(s)	
Action description	Sub-action n°X.X.1: sub-action name	Priority 1, 2 or 3
	Content of the sub-action (method, etc.) to be implemented to achieve the objectives	
	Sub-action n°X.X.1: sub-action name	Priority 1, 2 or 3
	Content of the sub-action (method, etc.) to be implemented to achieve the objectives	
	Sub-action n°X.X.1: sub-action name	Priority 1, 2 or 3
	Content of the sub-action (method, etc.) to be implemented to achieve the objectives	
Leader(s) and potential partners	**Action leader(s):** they are the main organisers of the action and are responsible for resources and results. **Partners:** non-exhaustive list of organisations that can be mobilised to implement the action	

Implementation schedule	Provisional periods for carrying out sub-actions
Action scale	Area of implementation of the action or sub-actions (if different)
Other species that may benefit	Example(s) of other priority species for public action that may benefit from the action
Monitoring and achievement indicator(s)	Indicator(s) enabling the implementation of the action to be monitored over the years and to assess its effectiveness
Deliverable(s)	Deliverable(s) resulting from the action in order to achieve the objective
Financial assessment	Financial estimation of the cost of the action, over the 10 years of implementation of 3rd PNA
Reference document(s) (non-exhaustive)	Main publication(s) and other document(s) on which the implementation of the action is based

Table 3: Action file template

2. Axis 1: Enhance knowledge about the European Mink

a. Action 1.1: Monitor trends in the range of the European Mink

Action n° 1.1	Monitor trends in the range of the European Mink
Work axis	Enhance knowledge about the European Mink
Context and issue(s)	**Context:** After a drastic decline in the range of the European Mink during the 20th century, by the beginning of the 21st century this range only included 7 departments in the South-West of France (Maizeret and al., 2002). The 1st PNA (1999-2003) carried out nearly 1,000 prospecting campaigns to identify the species in Charente-Maritime, Charente, Dordogne, Gironde, western Lot-et-Garonne, western Landes and the far west of the Pyrenees-Atlantiques (GEREA, DIREN Aquitaine, 2007). Between 2003 and 2016, no survey campaigns were implemented since this action was not planned as part of the 2nd PNA (2007-2011). Only a few random data were collected, making it impossible to have detailed knowledge on the range of European Mink (DREAL Aquitaine, 2012).

	Within the framework of the intermediate PNA, an update of the European Mink distribution map was produced (OFB and DREAL, 2020). To construct this map, all available data at the end of 2014 on the European Mink was used, whether opportunistic or from survey campaigns. Based on this new map, a sampling strategy via new survey campaigns was determined. This protocol targets as a priority the sectors presenting recent species presence data (post 2004) and uses cage-trap surveys. Indeed, when the PNAi was launched, the use of cage-traps was the only standardised method available to identify the species with certainty. On 31/12/2018, 55% of these campaigns had been performed out of the 533 planned (ONCFS, 2019). In an attempt to develop and standardise new, less invasive survey methods than cage-traps, two pilot studies have also been carried out as part of the PNAi: • Environmental DNA analysis which, for now, did not yield satisfactory results for the European Mink (Steinmetz *and al.*, 2018) • Use of a dog for the olfactory detection of European and American Mink faeces. Given this experimental study is still in progress, it has not yet been the subject of a summary report (Sentilles *and al.*, 2018). In the framework of the LIFE VISON 2017-2022 programme (LPO *and al.*, 2017) alternative methods for detecting European Mink are currently being tested: baited-camera traps, hair traps and footprint tunnels. The utilisation of these detection alternative methods appears promising and complementary to cage-traps (Dupuy and GREGE, 2020). Experimentation is to be continued. In the framework of the LIFE Lutreola SPAIN programme, a study on the detection of European Mink by the environmental DNA technique was also implemented in 2019. It seems to provide encouraging results and deserves to be pursued (Vincent Wildlife Trust, Salford University, Wildlife Conservation Research Unit and Tracsatec – publication pending). **Issues:** Sound knowledge of the current range of the European Mink is essential since it serves as a basis for assessing the conservation status of the population and implementing priority actions on the sectors at stake.
Objective(s)	• Update the European Mink distribution map with scientifically validated data • Have effective methods for monitoring changes in the range of European Mink over time and space throughout the PNA's area of application

Action description	Sub-action n°1.1.1: Update the European Mink distribution map with validated data	Priority 1

Complete the implementation of the 1st phase of the PNAi survey protocol:

On 31/12/2020, 16 % of the 569 survey campaigns remained to be carried out (see annex n°7). The 3rd PNA will therefore make sure these surveys are completed in accordance with the planned protocol (see annex). However, it may be adapted according to the data collected (e.g., if a European Mink is found at the border of the surveyed area), the results obtained by the other methods being developed (see sub-action n°1.1.2 below) and according to the opportunistic data collected.

Set up a 2nd phase of the PNAi survey protocol:

A second phase of the protocol may begin in parallel with the first. However, in the event of limited financial resources or reduced human resources, priority will be given to the completion of the 1st phase. For this 2nd phase, the survey protocol may evolve to include indirect survey techniques and will consist in surveying certain sectors:

- Having already been surveyed but unable to attest to the presence of European Mink (e.g., protocol interrupted due to vagaries in the weather, historical data not having resulted in the recent detection of the species);
- Not surveyed during the 1st phase because not part of the priority sectors;
- Presenting uncertain data (e.g., recurrent presence of Mink sp.).

The utilisation of several survey methods and their repetition over time may be necessary.

Define the areas of presence of the European mink:

An updated European Mink distribution map will be developed using a method for analysing and interpreting distribution data. This method will have to be defined and validated collectively so that it can be reproduced each time the species' distribution map is updated (every 5 years). It will have to take into account all the distribution data collected, regardless of the method from which it is derived. Finally, particular attention will be paid to taking cross-border knowledge into account.

These results will be used to draw up national and international reports on the conservation status of the European Mink (Habitats Directive, Red List of Endangered Species, etc.)

Development and organisation of a continuous species monitoring protocol in France:

Based on the results of sub-action 1.1.2 (see below), a new protocol will have to be prepared to determine the most effective combination of detection methods to date to determine the presence of the species.

	This protocol will have to be applied on an ongoing basis in order to continue recording the species' distribution data throughout the duration of 3rd PNA. This ongoing species protocol will be adapted and updated as necessary.
	Sub-action n°1.1.2: Assess and compare alternative methods to capture survey campaigns — **Priority 2**
	Continue assessing alternative methods: Testing of alternatives to cage-traps as methods for the detection of the European Mink will be continued and finalised. Priority will be given to the hair trap method (with genetic analysis) possibly coupled with footprint traps. The techniques of environmental DNA and the use of dog will dog for the olfactory detection be continued, depending on the possibilities and opportunities. **Comparison and assessment of the alternative methods tested:** The 3rd PNA must give rise to a comparative assessment of the techniques that can potentially be used to detect the European Mink. To this end, the results of the LIFE VISON programme on the use of hair, footprint and camera traps will need to be analysed and compared (detection rate, environmental variables, periods) with the results of the cage-trap survey campaigns. The comparison of methods as a whole should lead to the continued improvement and regular updating of the protocols used in sub-action n°1.1.1. For example, the protocol may propose one or more combined methods depending on the sector under consideration. Finally, the combined method(s) must be standardised, transferable and applicable on a large scale. **Continuous monitoring of alternative methods:** Throughout 3rd PNA, particular attention will be paid, both nationally and internationally, to implementing or assessing any new alternative techniques that could potentially be used to obtain data on the presence of the European Mink in France.
Leader(s) and potential partners	**Action leaders:** • Coordinating DREAL of the PNA • PNA facilitator • LIFE VISON **Action partners:** Nature protection associations, environmental consultancies, departmental trappers' associations, local authorities, Centres for Environmental Initiatives, Natural Area Conservancies, French Biodiversity Agency (OFB), fishing and aquatic environment protection federations, departmental hunters' federations, departmental pest control federations, natural area management authorities, zoos, LIFE Lutreola Spain …

<table>
<tr><td>Implementation schedule</td><td>
<table>
<tr><th>Sub-action</th><th>2022</th><th>2023</th><th>2024</th><th>2025</th><th>2026</th><th>2027</th><th>2028</th><th>2029</th><th>2030</th><th>2031</th></tr>
<tr><td>N°1.1.1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>N°1.1.2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>Action scale</td><td>

Pyrénées-Atlantiques, Landes, Gironde, Lot-et-Garonne, Dordogne, Charente, Charente-Maritime, Deux-Sèvres and Vendée
In function of the results of the data collected, the action could also be implemented in the following areas: Hautes-Pyrénées, Gers and other departments if necessary

</td></tr>
<tr><td>Other species that may benefit</td><td>All species whose presence can be detected during surveys, particularly those in aquatic habitats and watercourses</td></tr>
<tr><td>Monitoring and achievement indicator(s)</td><td>

Number of surveying campaigns carried out, by type of method used
Number of hydrographic sub-sectors surveyed per year
Number of methods tested

</td></tr>
<tr><td>Deliverable(s)</td><td>

Detailed assessment of the 1st phase of the surveying protocol
Detailed assessment of the 2nd phase of the surveying protocol
Methodology for interpreting the data to qualify the areas where the European Mink is present in France
Distribution maps of European Mink in France
Comparative assessments of techniques potentially used to detect the European Mink

</td></tr>
<tr><td>Financial assessment</td><td>

Facilitator time: 31 500 €/year
Minimum cost of implementation: 40,000 €/year for "classic" surveying (including partner costs and equipment), 100 000 €/year for the deployment of other methods.

</td></tr>
<tr><td>Reference document(s) (non-exhaustive)</td><td>

DIrection Régionale de l'ENvironnement (DIREN) et GEREA. Juin 2007. Deuxième Plan National de Restauration du Vison d'Europe 2007-2011 [en ligne]. 199p. Disponible sur : http://www.nouvelle-aquitaine.developpement-durable.gouv.fr/le-vison-d-europe-a10771.html. [Consulté le 22.09.2020].
Direction Régionale de l'Environnement, de l'Aménagement et du Logement (DREAL) Aquitaine. Aout 2012. Deuxième Plan national d'actions du Vison d'Europe (2007-2011) - Bilan technique et financier (tome 1).127p.
Directions régionales de l'Environnement, de l'Aménagement et du Logement (DREAL) et Office National de la Chasse et de la Faune Sauvage (ONCFS). 2015. Programme intermédiaire en faveur du Vison d'Europe (2015-2017) [en ligne]. 24p. Disponible sur : http://www.nouvelle-aquitaine.developpement-durable.gouv.fr/le-vison-d-europe-a10771.html. [Consulté le 22.09.2020].
Dupuy, M. 2020. Evaluation de l'efficacité de deux méthodes de détection du Vison d'Europe (Mustela lutreola (Linnaeus, 1760)). GREGE / LIFE VISON. Rapport de stage Master 2 - Biodiversité et

</td></tr>
</table>

	Suivis Environnementaux 2019-2020 - Université de Bordeaux. 40p. • Ligue pour la Protection des Oiseaux (LPO), Conseil Départemental de la Charente-Maritime, Groupe de Recherche et d'Etude pour la Gestion de l'Environnement (GREGE). 26 Avril 2017. LIFE16 NAT/FR/000872-Conservation of the European Mink and associated community interest species and habitats of the Charente River Basin. • Maizeret, C., Migot, P., Rosoux, R, Chusseau J.P., Gatelier, T., Maurin, H., Fournier-Chambrillon, C. 2002. The distribution of the European Mink (Mustela lutreola) in France: towards a short-term extinction? Mammalia T66 n°4 p525-532. • Sentilles J., Bellanger C., Fayet M., Steinmetz J., Guinot-Ghestem M. 2018. Un chien de détection pour le suivi des espèces invasives ? Faune Sauvage N° 321, p26-27. • Steinmetz, J., Ruette, S., Ruys, T., Jean, P, Dejean, T. 2018. Vers une nouvelle méthode de détection des espèces de mammifères semi-aquatiques : étude pilote et approche « Metabarcoding ADNe ». Faune Sauvage, 2ème trimestre 2018, n°319, p.11-17.

b. Action 1.2: Characterise European Mink populations

Action n° 1.2	Characterise European Mink populations
Work axis	Enhance knowledge about the European Mink
Context and issue(s)	**Context:** With the intermediary PNA's (DREAL and ONCFS, 2019) and LIFE VISON programme's (LPO *and al.*, 2017) surveys, some population nuclei have recently been revealed. Nevertheless, we have very little information on their characteristics (sex ratio, proof of reproduction, production of young …). In the framework of the LIFE VISON programme (LPO *and al.*, 2017), the GPS/VHF tagging of females and males is providing further information. As of 31 December 2020, 4 males and 2 females are tagged and monitored (LPO *and al.,* 2020). In the framework of PNAi (DREAL and ONCFS, 2019) and of the LIFE VISON programme (LPO *and al.*, 2017), samples are systematically taken (after capture and also via hair traps and gathering faeces). Genetic analysis of these samples provides information for characterising population nuclei. In addition, various studies have been carried out concerning the habitats and territories used by European Mink (Fournier *and al.*, 2007; Fournier *and al.,* 2008; de Bellefroid, 1999). Information concerning the fine-scale utilisation of territory by females or males (in function of year or their age) could be completed in order better to target the management measures to set up.

<table>
<tr><td></td><td colspan="2">Issues:
In order to effectively protect the last remaining wild populations of European Mink in France, it is essential to know more about the species. Indeed, better knowledge of its population nuclei, habitats, home ranges and movements will make it possible to better define the areas to be protected and/or restored. This will also make it possible to target potential areas where future translocations of European Mink will take place and to identify improvements to be before implementing them.</td></tr>
<tr><td>Objective(s)</td><td colspan="2">• Characterise the structure of population nuclei
• Improve knowledge about the utilisation of habitats and occupation of territory</td></tr>
<tr><td rowspan="4">Action description</td><td>Sub-action n°1.2.1: Characterise European Mink population nuclei</td><td>Priority 1</td></tr>
<tr><td colspan="2">To characterise wild populations of European Mink in France, the first step is to determine their structures: nuclei, isolated individuals, production of young, filiation, hybridisation rate with European Polecat. Various methods can be used: surveys, monitoring individuals by radiotracking, collection of genetic material. To do this, the national and international scientific partnerships that have been set up, particularly in the field of genetics, will have to be consolidated.</td></tr>
<tr><td>Sub-action n°1.2.2: Improve knowledge about the utilisation of habitats and occupation of territory</td><td>Priority 2</td></tr>
<tr><td colspan="2">To improve knowledge about the utilisation of habitats and occupation of territory, studies could be carried out on: home ranges, habitats, types of dens, diet. Various methods can be used: surveys, monitoring individuals by radiotracking, collection of genetic material.</td></tr>
<tr><td>Leader(s) and potential partners</td><td colspan="2">Action leaders:
• Coordinating DREAL of the PNA
• PNA facilitator
• LIFE VISON

Action partners:
Nature protection associations, environmental consultancies, departmental trappers' associations, local authorities, Centres for Environmental Initiatives, Natural Area Conservancies, fishing and aquatic environment federations, departmental hunters' federations, departmental pest control federations, natural area management authorities, zoos with captive European Mink, French Biodiversity Agency (OFB), LIFE Lutreola Spain, veterinary schools, genetics laboratories…</td></tr>
</table>

<table>
<tr><td>Implementation schedule</td><td>
<table>
<tr><th>Sub-action</th><th>2022</th><th>2023</th><th>2024</th><th>2025</th><th>2026</th><th>2027</th><th>2028</th><th>2029</th><th>2030</th><th>2031</th></tr>
<tr><td>N°1.2.1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>N°1.2.2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>Action scale</td><td>Areas of known presence of European Mink</td></tr>
<tr><td>Other species that may benefit</td><td>None</td></tr>
<tr><td>Monitoring and achievement indicator(s)</td><td>

Number of nuclei characterised and number of associated characterisation campaigns (by type of method)
Number of samples genetically analysed
Number of individuals monitored
Number of studies on the utilisation of habitats and the occupation off territory

</td></tr>
<tr><td>Deliverable(s)</td><td>Publication(s) of acquired knowledge</td></tr>
<tr><td>Financial assessment</td><td>

Facilitator time: 22 000 €/an
Minimum cost of implementation: 150 000 €/an

</td></tr>
<tr><td>Reference document(s) (non-exhaustive)</td><td>

De Bellefroid, M.N. 1999. Etude biogéographique de l'évolution de la population de Vison européen, Mustela lutreola, en France. Statut, répartition, écologie, facteurs de déclin et stratégie de conservation pour l'espèce. Diplôme doctoral de recherche. Université de Rennes I. 93p.
Direction Régionale de l'Environnement, de l'Aménagement et du Logement (DREAL) et Office National de la Chasse et de la Faune Sauvage (ONCFS). 2019. Évaluation du Plan National d'Actions intermédiaire 2015-2018 en faveur du Vison d'Europe (Mustela lutreola).
Fournier, P., Maizeret, C., Fournier-Chambrillon, C., Ilbert, N, Aulagnier, S., Spitz, F. 2008. Spatial behaviour of European mink Mustela lutreola and polecat Mustela putorius in southwestern France. Acta Theriol., 53, 4:343-354.Fournier, P., Maizeret, C., Jimenez, D., Chusseau, J.P., Aulagnier, S., Spitz, F. 2007. Habitat utilization by sympatric European mink Mustela lutreola and polecats Mustela putorius in south-western France. Acta Theriologica, 52:1-12.
Fournier, P., Maizeret, C., Jimenez, D., Chusseau, J.P., Aulagnier, S., Spitz, F. 2007. Habitat utilization by sympatric European mink Mustela lutreola and polecats Mustela putorius in south-western France. Acta Theriologica, 52:1-12.
Ligue pour la Protection des Oiseaux (LPO), Conseil Départemental de la Charente-Maritime, Groupe de Recherche et d'Etude pour la Gestion de l'Environnement (GREGE). 26 Avril 2017. LIFE16 NAT/FR/000872-Conservation of the European Mink and associated community interest species and habitats of the Charente River Basin.
Ligue pour la Protection des Oiseaux (LPO), Conseil Départemental de la Charente-Maritime, Groupe de Recherche et d'Etude pour la

</td></tr>
</table>

	Gestion de l'Environnement (GREGE). Septembre 2020. Rapport d'avancement LIFE Vison du 01/01/2019 au 31/12/2019. 194p.

c. Action 1.3: Monitor the health status of European Mink populations

Action n° 1.3	Monitor the health status of European Mink populations
Work axis	Enhance knowledge about the European Mink
Context and issue(s)	**Context**: Since the 20th century, the reasons for the decline of the European Mink have been complex and multi-factorial. The factors involved are mainly habitat loss, competition with the American Mink, accidental destruction (road casualties, trapping) and diseases (Maran and Henttonen, 1995; DIREN Aquitaine, 2003). It has long been hypothesised that the decline of the European Mink could be partly due to the presence of infectious agents introduced by the American Mink (Maran and Henttonen, 1995) but to date the studies carried out, in particular on Aleutian Disease have not been able to show a major impact of this pathology on European Mink populations. However, wild carnivores are susceptible to many pathogens transmitted by domestic species and the impact of all these factors on the European Mink needs to be further investigated (Maran and Henttonen, 1995; Maran and Robinson, 1996). In the framework of 1st PNA (DIREN Aquitaine and Mission Vison d'Europe, 2003) and various subsequent studies (see paragraph I.6.e), the prevalence of certain pathogenic factors has been highlighted in the European Mink and more generally among Mustelids in France. This is notably the case for Aleutian Disease, distemper, leptospirosis and certain intestinal parasites. However, these pathogens consumed separately do not seem to be responsible on their own for the decline of the European Mink in France, but their diversity shows that the European Mink is under heavy health pressure. Ecotoxicological studies (DIREN Aquitaine, 2003) have also shown that the European Mink carry residues of anticoagulants used in rodent control. In the framework of the intermediate PNA (DREAL and ONCFS, 2019) and the LIFE VISON programme (LPO *and al.*, 2019), captured individuals are weighed and hair samples are taken for the European Mink, the European Polecat and the American Mink. Faeces and any corpses are also collected. All this is subject to physical and digital referencing in the sample library. These are all potentially available elements for trying to better understand the different health pressures impacting this species.

	Issues: In order to effectively preserve the wild French populations of European Mink, it is necessary to better understand the mortality factors that affect it. It is therefore important for 3rd PNA to work on identifying and monitoring present or emerging pathologies in the European Mink, but also within the various species that are vectors of pathologies that can affect it (wild carnivores and other groups to be defined). Given the current estimate of the European Mink population in France (less than 250 individuals in the wild), each animal is important. However, whether opportunistically or during the studies implemented as part of the PNA, it is possible to be confronted with the discovery of an individual whose state of health is a cause for concern. In this case, it is advisable to reflect on its future.
Objective(s)	• Enhance knowledge about the health status of wild populations of European Mink • Have a protocol for the management of individuals in distress • Structure, feed into and develop the PNA's sample library
Action description	**Sub-action n°1.3.1: Draw up and implement a health monitoring programme for the European Mink** — **Priority 2** **Definition and prioritisation of the fields of analysis to be carried out:** The first stage will consist in defining and prioritising the fields of analysis to be carried out (toxicology, bacteriology, virology, etc.). Particular attention will be paid to the zones bordering the action area of the 3rd PNA (national and international) in order to exchange information efficiently and as quickly as possible in the event of a health alert. **Preparation of a protocol for the collection and storage of samples:** According to the defined fields of analysis, a sample collection and storage protocol will specify the types of samples to be taken, the precautions to be taken, the places and methods of storage as well as the referencing to be carried out. This protocol aims to harmonise current practices between the various operators. Pending this particular protocol, the collection and storage procedures currently implemented will remain underway. **Implementation of the collection and storage protocol:** Once the sample collection protocol has been defined and validated, all the samples already collected (during previous programmes) will be analysed and, if possible, brought into compliance with the defined storage methods. **Implementation of health analyses:** On the basis of the samples collected and referenced, health analyses will be carried out. The causes of mortality will systematically be sought. To this end, close links with laboratories authorised to carry out analyses,

biologists and scientific partners, both nationally and internationally, will be created in order to mobilise the appropriate skills. In the event of mortality clusters, the network SAGIR ("Monitor wildlife diseases to Act") will be mobilised.

Sub-action n°1.3.2: Develop and implement a protocol for the management of individuals in distress — **Priority 1**

The discovery of a European Mink whose state of health is a cause for concern must be followed by validated and organised actions in order to act as effectively as possible. In this case, the future of the animal (rehabilitation and release or sublethal examinations contributing to the improvement of knowledge) should be considered based on targeted veterinary examinations.

A document entitled "Protocol for the Care of a European Mink in Distress - Conduct and Veterinary Care" has been under preparation since late 2019. It is being prepared with the help of a group of veterinarians specialising in wildlife and the species. This document is deliberately kept short and concise so that it can be consulted quickly in the event of an emergency situation. In particular, it assembles an evaluation grid system and a diagnostic unit to manage and decide on the fate of the individual in distress. It will be necessary to finalise this document and ensure its implementation. The event of a European Mink individual being brought to a care centre will also be taken into account.

However, pending validation, the diagnostic cell may still be activated in the event of the discovery of a European Mink in distress. Finally, in the event of the discovery of an individual in distress in a cross-border area, coordination with the country concerned will be implemented as quickly as possible.

Leader(s) and potential partners

Action leader:

- Coordinating DREAL of the PNA
- PNA facilitator
- LIFE VISON

Action partners:

Environmental protection associations, environmental consultancies, departmental trappers' associations, local authorities, Centres of Initiatives for the Environment, Natural Area Conservancies, French Biodiversity Agency (OFB), fishing and aquatic environment federations, departmental hunters' federations, departmental pest control federations, managing authorities of natural areas, zoos, veterinarians specialised in the European Mink and small mammals, SAGIR network …

Implementation schedule

Sub-action	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
N°1.3.1										
N°1.3.2										

Action scale	• Sub-action 1.3.1: 3rd PNA application area • Sub-action 1.3.2: France
Other species that may benefit	Monitoring the health status of European Mink populations will make it possible to collect information useful for monitoring the health, at least, of small carnivores in France.
Monitoring and achievement indicator(s)	• Number of samples in compliance • Number of samples analysed per field of study
Deliverable(s)	• Summary of fields of analysis to be carried out • Protocol for collecting and storing samples • Review of studies carried out • Protocol for caring for a European Mink in distress
Financial assessment	• Facilitator time: 14 500 €/year • Minimum cost of implementation: 20 000 €/year
Reference document(s) (non-exhaustive)	• DIrection Régionale de l'ENvironnement (DIREN) Aquitaine et Mission Vison d'Europe. Décembre 2003. Plan National de Restauration du Vison d'Europe 1999-2003 Bilan [en ligne]. 114p. Disponible sur : http://www.nouvelle-aquitaine.developpement-durable.gouv.fr/le-vison-d-europe-a10771.html. [Consulté le 22.09.2020]. • Direction Régionale de l'Environnement, de l'Aménagement et du Logement (DREAL) et Office National de la Chasse et de la Faune Sauvage (ONCFS). 2019. Évaluation du Plan National d'Actions intermédiaire 2015-2018 en faveur du Vison d'Europe (*Mustela lutreola*). • Ligue pour la Protection des Oiseaux (LPO), Conseil Départemental de la Charente-Maritime, Groupe de Recherche et d'Etude pour la Gestion de l'Environnement (GREGE). 26 Avril 2017. LIFE16 NAT/FR/000872-Conservation of the European Mink and associated community interest species and habitats of the Charente River Basin. • Maran, T., Henttonen, H. 1995. Why is the European mink (*Mustela lutreola*) disappearing? A review of the process and hypotheses. Acta Zoologica Fennica, 32 : 47-54. • Maran, T., Robinson, P. 1996. European mink, *Mustela lutreola* (Linnaeus, 1761), captive breeding and husbandry protocol. Vol 1. EMCC et Tallinn Zoo. 33p.

d. Action 1.4: Organise the gathering and use of data with their producers

Action n° 1.4	Organise the gathering and use of data with their producers
Work axis	Enhance knowledge about the European Mink
Context and issue(s)	**Context:** At international level, the subject of the European Mink been regularly published in scientific journals. Several European countries are still actively working on it. The data and information contained in the bibliography published or under study are a solid basis for the implementation of the 3rd PNA actions. No action relating to the collection of data (bibliographical or species presence data) was undertaken within the framework of the first two PNAs (DIREN, 2003; DREAL, 2012). On the other hand, as part of the intermediate PNA, a database has been created (including previous data) containing as exhaustive a list as possible on the presence of the European Mink, American Mink and European Polecat within the scope of the PNA (DREAL and ONCFS, 2019). In the framework of the LIFE VISON programme (LPO *and al.*, 2017) several types of data are collected: presence/absence of target species, study methods, habitats used. These data are compiled in databases of their own which are transmitted to the PNA. Numerous data sources exist, notably via online collaborative platforms. These may include presence data for the European Mink, American Mink and European Polecat. At the end of 2018, this work was initiated by the intermediary PNA (ONCFS, 2019) with the "Faune Aquitaine" database (managed by the LPO and BirdLife International). However, this work must be continued and also carried out with other existing databases in order to ensure the inclusion of reliable data in the 3rd PNA database. Finally, following the drafting of PNAi (ONCFS, 2019), a major effort has been made by the coordinators and facilitators of the intermediate PNA to centralise the various scientific publications available in each of the structures. A bibliographical database has thus been created on all subjects related to the European Mink and is regularly amended. **Issues:** In order to be as efficient as possible, it is important to make use of advances, studies carried out, acquired experience and the latest data collected in order to avoid re-initiating subjects that have already been analysed. Indeed, whether in the framework of the PNA for the LIFE VISON or other programmes, many French structures have produced and/or are still producing data. They may be opportunistic data (observations, accidental or deliberate trapping, causalities) or data from species protocols (European Mink surveys, American Mink control operations). As these data often come from various partners, they must be clearly identified so that the results can be used together. These data

	will thus be able to be used in particular for updating the distribution maps and orienting the implementation of actions.	
Objective(s)	• Have available a database that is as exhaustive as possible • Define a common framework for the use of data with producer partners • Have an up-to-date bibliography that is as complete as possible	
Action description	**Sub-action n°1.4.1: Manage and feed the databases relating to the implementation of the PNA**	**Priority 1**
	Management and maintenance of the PNA's "European Mink, American Mink, European Polecat" presence database: The various actions of the PNA contributing to the improvement of knowledge (see axis n°1) provide data that should be compiled, organised and updated. To this end, they will be assiduously integrated into the "European Mink, American Mink, European Polecat" presence database throughout the 3rd PNA implementation period. Consideration may be given to optimising the management of existing databases. **Management and maintenance of the 3rd PNA sample library:** Samples awaiting collection from partners or freshly collected will be centralised as quickly as possible to the storage locations defined and referenced physically and digitally as defined by the collection protocol (see action n° 1.3).	
	Sub-action n°1.4.2: Gather data produced by partners and define a common framework for their use	**Priority 2**
	Identification of data producers: Within the framework of their own programmes, various organisations produce data in connection with the European Mink. A census will therefore be carried out in order to list these data producers and holders (Road Service, "Faune Aquitaine" website, Aquitaine Wildlife Observatories, LPO, Departmental Territorial Directorates, trappers, etc.). This list will be amended as necessary during the 3rd PNA implementation period. **Drafting and implementation of a charter for the provision and use of data:** In order to guarantee transparency and recognition of partners, a charter for the provision and use of data will be drawn up. This document will specify a timetable for the transmission of data and the terms and conditions for citing the data source partners (according to the types of use). Once drawn up, this charter will be proposed to all potential data-producing partners and will guarantee the continuous feedback of information to the 3rd PNA. All recovered data must be integrated into the PNA database as quickly as possible, after verification (validation of the accuracy and reliability of the data and the absence of any	

duplicated data in the PNA database) and the attribution of a single username. This data-sharing will be highlighted in the framework of the PNA.

An online platform could be considered to simplify the transfer of data from partners to the PNA. This platform could enable the online input of the results of European Mink surveying (see sub-action n° 1.1.1 and action n° 1.2) and the results of actions fighting against the American Mink (see sub-action n° 3.2.1).

Sub-action n°1.4.3: Produce and update a bibliographical summary on the European Mink	Priority 3

A database of scientific publications related to the European Mink has been created within the framework of the intermediate PNA. Monitoring of all national and international work relating to the various PNA actions will have to be maintained throughout the 3rd PNA implementation period.

Leader(s) and potential partners

Action leaders:

- Coordinating DREAL of the PNA
- PNA facilitator
- LIFE VISON

Action partners:

Nature protection associations, environmental consultancies, departmental trappers' associations, local authorities, Centres of Initiatives for the Environment, Natural Area Conservancies, French Biodiversity Agency (OFB), fishing and environment protection federations, departmental hunters' federations, departmental pest control federations, managing authorities of natural areas, zoos …

Implementation schedule

Sub-action	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
N°1.4.1										
N°1.4.2										
N°1.4.3										

Action scale

- Sub-actions n° 1.4.1 and n°1.4.2: priority in the 11 departments of the 3rd PNA (Pyrénées-Atlantiques, Hautes-Pyrénées, Gers, Landes, Gironde, Lot-et-Garonne, Dordogne, Charente, Charente-Maritime, Deux-Sèvres and Vendée) then the neighbouring departments (Haute-Garonne, Tarn-et-Garonne, Lot, Corrèze, Haute-Vienne, Vienne, Maine-et-Loire, Loire-Atlantique)
- Sub-action n°1.4.3: national and international

Other species that may benefit

European Polecat

Monitoring and achievement indicator(s)	• Number of data integrated into the database • Number of samples collected • Number of signatories to the charter for the provision and use of data • Number of bibliographical references collected
Deliverable(s)	• List of data producers in the area of action of 3rd PNA • Charter for the provision and use of data • Results map of the implementation of the PNA protocols: surveys for European Mink and fighting against the American Mink
Financial assessment	• Facilitator time: 13 500 €/year • Minimum cost of implementation: 5 000 €/year
Reference document(s) (non-exhaustive)	• DIrection Régionale de l'ENvironnement (DIREN) Aquitaine et Mission Vison d'Europe. Décembre 2003. Plan National de Restauration du Vison d'Europe 1999-2003 Bilan [en ligne]. 114p. Disponible sur : http://www.nouvelle-aquitaine.developpement-durable.gouv.fr/le-vison-d-europe-a10771.html. [Consulté le 22.09.2020]. • Direction Régionale de l'Environnement, de l'Aménagement et du Logement (DREAL) Aquitaine. Aout 2012. Deuxième Plan national d'actions du Vison d'Europe (2007-2011) - Bilan technique et financier (tome 1).127p. • Direction Régionale de l'Environnement, de l'Aménagement et du Logement (DREAL) et Office National de la Chasse et de la Faune Sauvage (ONCFS). 2019. Évaluation du Plan National d'Actions intermédiaire 2015-2018 en faveur du Vison d'Europe (*Mustela lutreola*). • Ligue pour la Protection des Oiseaux (LPO), Conseil Départemental de la Charente-Maritime, Groupe de Recherche et d'Etude pour la Gestion de l'Environnement (GREGE). 26 Avril 2017. LIFE16 NAT/FR/000872-Conservation of the European Mink and associated community interest species and habitats of the Charente River Basin.

3. Axis 2: Conservation breeding of European Mink and strategy for translocation into the wild

a. Action 2.1: Perpetuate/strengthen European Mink conservation breeding in France and strengthen its integration within the European Endangered species Programme (EEP)

Action n° 2.1	Perpetuate/strengthen European Mink conservation breeding in France and strengthen its integration within the European Endangered Programme (EEP)
Work axis	Conservation breeding of European Mink and strategy for translocation into the wild
Context and issue(s)	**Context:** All known wild populations of European Mink are close to extinction. At European scale, conservation breeding centres have therefore been set up. The aim is to preserve the genetic diversity of the species and, if necessary, conduct translocation operations into its natural habitat. The first birth in captivity of a European Mink took place in Russia in the early 1970s, then a European Endangered Species Programme (EEP) was set up in 1991 at the initiative of the European Association of Zoos and Aquaria (EAZA) to coordinate the actions of the various countries involved in *ex-situ* conservation and to guarantee at least 85% of the initial genetic biodiversity in breeding centres for at least 50 years (Maran *and al.*, 2017a). To support European Mink breeders, a breeding and care guide was developed by the EEP and the Lutreola Foundation in 2006 (Foundation Lutreola, 2006). Within the framework of 1st PNA, Europe-wide genetic analysis of populations was carried out: the Franco-Spanish population seems to be characterised by extreme genetic homogeneity, whether on the basis of mitochondrial or microsatellite markers. Moreover, since the alleles characterising western mink are also found in several eastern individuals the Franco-Iberian population does not appear to be genetically isolated from the other populations and should not be considered as a distinct management unit (DIREN Aquitaine et Mission Vison d'Europe, 2003; Skorupski, 2020). At European level, since 2015 (Cabria *and al.*, 2015), the three European populations of European Mink (Russia-Estonia-Belarus, Romania, France-Spain) constitute a single genetic management unit (a term which groups together populations sharing a sufficiently common genetic heritage to be jointly managed in conservation plans for endangered species) even if they are geographically far apart. A first compilation of breeding programmes worldwide was produced in 2014 by ONCFS in order to contribute to the launch of a breeding centre in France (ONCFS and DREAL, 2014). Two organisations are raising European Mink in France and are associated with the EEP. They are the Zoodyssée Animal Park (Villiers-en-Bois, in Deux-Sèvres department) and the Calviac Zoological Reserve (Calviac-en-

	Périgord, in Dordogne department). These two centres have a conservation objective to release European Mink into the wild. They both keep animals from the EEP of the eastern population. Regular contact is maintained with the EEP coordinator in order to carry out the most judicious crosses from a genetic point of view. During the first 5 breeding seasons, no births took place in France. It was only in 2019 that the first kits were born in Zoodyssée. There are currently about thirty European Mink in French breeding centres. Like other breeding centres in Europe, the French centres are facing problems in the reproductive behaviour of males (aggressiveness or passivity) with the causes remaining unidentified for the moment (Kiik *and al.*, 2013; Kneidinger *and al.*, 2018). To get around this problem, a first study on artificial insemination was carried out in France in 2019 and should be continued in 2020 (DREAL and ONCFS, 2019; Santucci, 2019). Furthermore, stereotypical behaviour (repetitive movements for no apparent reason) has also been observed. France's kit production is not yet regular enough to consider the release of individuals into the wild. Nevertheless, these first births are encouraging, and it is advisable to prepare as far in advance as possible for possible translocations in France (see action n° 2.1). In 2021, Park of Isle (Saint-Quentin, in Picardie department) received two European Mink from the EEP that could no longer contribute to reproduction (due to their age) for public awareness-raising. **Issues:** Once the wild populations of European Mink have been identified (see axis n°1), the absence of American Mink verified (see axis n°3) and other sources of threats minimised (see axis 4), translocation actions can be envisaged (see action n° 2.2). To achieve this, it is essential to ensure that European Mink breeding is effective and quantitatively and qualitatively provides a supply of individuals suitable for translocation into the wild. Further consideration needs to be given to individuals no longer able to contribute to reproduction needs to be continued so as to avoid the saturation of conservation breeding centres.
Objective(s)	• Reinforce/strengthen the capacities of the two current breeding centres • Obtain individuals suitable for translocation into the natural environment, both quantitatively and qualitatively • Continue to improve European Mink reproduction methods, whether natural or assisted • Strengthen the networking of French European Mink breeding centres • Strengthen the position of French European Mink breeding centres in the EEP
Action description	**Sub-action n°2.1.1: Feedback on European Mink breeding practices and updating of reference documents** — **Priority 1**
	A summary table was drawn up in November 2014 and served as a basis

for the drafting of the "Conservation strategy scenarios for the future breeding of the European Mink at the Zoodyssée Animal Park, France" (ONCFS and DREAL, 2014). This document will have to be updated to take into account the latest European Mink breeding experiments. To this end, a consultation of all existing European Mink breeding centres will be organised by means of a questionnaire. This questionnaire will cover as broadly as possible all the aspects of the conservation breeding centres and should enable feedback to be given on breeding practices and success rates or failure factors. This feedback will be summarised in a table which will serve as a basis for the drafting of the planned management guide in sub-action n°2.1.2. In addition, the organisation of a European meeting/seminar on the breeding of the European Mink could be proposed to the members of the EEP. This could be an opportunity for the different breeders to share their experiences.

Sub-action n°2.1.2: Draw up guidelines together with the EEP of appropriate management for French breeding centres	Priority 2

On the basis of feedback regarding sub-action n°2.1.1, "*Breeding guidelines*" (Foundation Lutreola, 2006) and the "*Programa de conservación ex situ del Visón Europeo en España*" (Spanish Government, 2006), the most conclusive parameters to improve the efficiency of French breeding centres will be compiled. In particular, this guide will provide a precise description of the monitoring protocols to be set up according to the reproduction cycle. It will also define the terms and conditions for integrating French breeding centres into the EEP. The most conclusive parameters to improve the efficiency of French breeding centres will have to be compiled. In particular, this guide will precisely describe the monitoring protocols to set up in function of the reproductive cycle. It will also define the management methods for individuals from French breeding centres in collaboration with the EEP (transfers of individuals, management of non-breeders…).

Increased effort will be made throughout the 3rd PNA to ensure that it contributes to the continuous improvement of European Mink breeding centres. Thus, any material or logistical means that has proved its relevance (e.g., cameras to monitor contact during the breeding period, equipment of a dedicated veterinary room) in one or more other breeding centres will be communicated to the various French breeding centres.

Sub-action n°2.1.3: Contribute to the EEP, in particular by carrying out studies	Priority 3

Throughout 3rd PNA, France will continue to take part in the meetings proposed by the EEP in order to encourage exchanges between the different organisations working on the European Mink in other countries. The French team may travel where necessary, in order to benefit from direct feedback from foreign teams working on European Mink breeding.

France can also contribute elements to the EEP to improve the overall efficiency of *ex-situ* management of the European Mink. This involves

<table>
<tr><td></td><td>studying the stereotyped behaviours seen in France and continuing research on artificial insemination and the setting up of a sperm bank. Depending on the initial results, the issue of embryo transfer (European Polecat surrogate mother) could also be explored. Another aspect of the study could be reflection on semi-captive breeding, i.e., at the translocation site.

All these ideas could be evoked during the European meeting/seminar on the breeding of the European Mink and could be proposed to the members of the EEP (see sub-action n°2.1.1). Finally, presentations of projects and initial results may be given during one of the European symposia on Mustelids.</td></tr>
<tr><td>Leader(s) and potential partners</td><td>Action leaders:
Coordinating DREAL of the PNA
PNA facilitator
Zoodyssée Animal Park
Calviac Zoological Reserve
Action partners:
EEP, European Mink breeding centres, veterinary schools and other national or international experts that can be mobilised …</td></tr>
<tr><td>Implementation schedule</td><td>
<table>
<tr><th>Sub-action</th><th>2022</th><th>2023</th><th>2024</th><th>2025</th><th>2026</th><th>2027</th><th>2028</th><th>2029</th><th>2030</th><th>2031</th></tr>
<tr><td>N°2.1.1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>N°2.1.2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>N°2.1.3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>Action scale</td><td>Sub-action n°2.1.1: European countries
Sub-action n°2.1.2: France
Sub-action n°2.1.3: Europe</td></tr>
<tr><td>Other species that may benefit</td><td>Other species covered by an EEP</td></tr>
<tr><td>Monitoring and achievement indicator(s)</td><td>Carrying capacity of French European Mink breeding centres
Number of European Mink in French breeding centres
Number of couples put in contact with each other per year
Number of European Mink born in France per year
Number of studies carried out contributing to the EEP</td></tr>
<tr><td>Deliverable(s)</td><td>French guide to European Mink breeding centres
Study report on assisted breeding techniques
Annual assessment report of the European Mink breeding season for each French establishment keeping them</td></tr>
</table>

Financial assessment	• Facilitator time: 10 500 €/year • Minimum cost of implementation: 60 000 €/year
Reference document(s) (non-exhaustive)	• Amstislavsky, S., Kizilova, E., Ternovskaya, Y., Zudova, G., Lindeberg, H., Aalto, J., Valtonen, M. 2006. Embryo development and embryo transfer in the European mink (*Mustela lutreola*), an endangered mustelid species. Reproduction, Fertility and Development, 2006, 18, 459-467. • Cabria, M.T., Gonzalez, E.G., Gomez-Moilner, B.J, Michaux, J.R, Skumatov, D., Kranz, A., Fournier, P., Palazon, S., Zardoya, R. 2015. Patterns of genetic variation in the endangered European Mink (*Mustela lutreola* L., 1761). BMC Evolutionary Biology, 15-141. • DIrection Régionale de l'ENvironnement (DIREN) Aquitaine et Mission Vison d'Europe. Décembre 2003. Plan National de Restauration du Vison d'Europe 1999-2003 Bilan [en ligne]. 114p. Disponible sur : http://www.nouvelle-aquitaine.developpement-durable.gouv.fr/le-vison-d-europe-a10771.html. [Consulté le 22.09.2020]. • Direction Régionale de l'Environnement, de l'Aménagement et du Logement (DREAL) et Office National de la Chasse et de la Faune Sauvage (ONCFS). 2019. Évaluation du Plan National d'Actions intermédiaire 2015-2018 en faveur du Vison d'Europe (*Mustela lutreola*). • Foundation Lutreola. 2006. European Mink (*Mustela Lutreola*, Linnaeus 1761), Captive breeding and husbandry protocol. 74p. • Gouvernement d'Espagne. 2006. Programa de conservación ex situ del Visón Europeo en España [en ligne]. 59p. Disponible sur: http://lifelutreolaspain.com/fr/projet-life-lutreola-spain/documents. [Consulté le 22.09.2020]. • Kiik, K., Maran, T., Nagl, A., Ashford, K., Tammarut, T. 2013. The causes of the low breeding success of European mink (*Mustela lutreola*) in captivity. Zoo Biol. 32(4), 387-393. • Kneidinger, N., Nagl, A., Kiik, K., Shwarzenberger, F., Maran, T. 2018. The individual courtship behaviour of male European mink (*Mustela lutreola*) is a good indicator for their breeding success. Applied Animal Behaviour Science 205, 98-106. • Maran, T., Podra, M, Harrington, L.A., Macdonald, D.W. 2017. European mink: restoration attempts for a spices on the brink of extinction. Biology and Conservation of Mustelids. Edited by David W. Macdonald, Chris Newman, and Lauren A. Harrington: Oxford University Press. 19p. • Office National de la Chasse et de la Faune Sauvage (ONCFS) et Directions Régionales de l'Environnement, de l'Aménagement et du Logement (DREAL). Octobre 2014. Scénarii de stratégie de conservation pour le futur élevage de Visons d'Europe au parc animalier Zoodyssée à Chizé, France. 22p. • Santucci S. 11 Juillet 2019. Thèse vétérinaire : Développement de l'insémination artificielle chez le Vison d'Europe (*Mustela lutreola*) : étude expérimentale. Ecole vétérinaire d'Alfort. 196p. • Skorupski, J. 2020. Fifty years of research on European mink *Mustela lutreola* L., 1761 genetics: where are we now in studies on one of the most endangered mammals? Genes, 27p.

b. Action 2.2: Define and implement a strategy for translocation into the wild

Action n° 2.2	Define and implement a strategy for translocation into the wild
Work axis	Conservation breeding of European Mink and strategy for translocation into the wild
Context and issue(s)	**Context:** Several countries have already carried out operations to translocate the European Mink into the wild (see paragraph I.3.c), with varying results depending on the country and the year. Although no exact causes have always been identified, France needs to benefit from these experiences and from the IUCN guide (IUCN, 2013) to deduce its own translocation strategy. In particular, it appears to be essential to control /reduce the threat factors de before implementing any operation. In France, the first elements for the setting up of a conservation breeding centre were developed during 1st PNA (DIREN Aquitaine and Mission Vison d'Europe, 2003). To build on this, 2nd PNA included a specific action to prepare for a translocation programme (DIREN and GEREA, 2007). This led to the development of a method for determining the most favourable territories for European Mink (Agence Gaiadomo, 2012). An initial summary of worldwide translocation experiments was carried out in 2014 by the ONCFS in order to contribute to the launch of a breeding centre in France (ONCFS and DREAL, 2014). Following this, a conservation strategy for the European Mink associated with French breeding was deduced, proposing three possible scenarios in function of the following parameters: • *Ex-situ* conservation with or without translocation; • If translocation: reinforcement or reintroduction. While the aims of the conservation breeding centres with regard to translocation have been established, the translocation methods have not yet been defined (DREAL and ONCFS, 2019). **Issues:** Based on the assessment of the data concerning the presence of European Mink (see axis n°1), American Mink control (see axis n°3) and the reduction of mortality factors (see axis n°4), translocation actions may be targeted and envisaged. This 3rd PNA must therefore include the possibility of releasing individuals into the wild. Depending on the geographical sectors concerned (estimation of the habitat's carrying capacity, state of the present population, etc.), it will be important to clearly define the translocation objective: conservation or reinforcement, as well as the strategy implemented. Moreover, since the birth of the first European Mink in Zoodyssée, the probability of there being a phase of translocation of individuals born in captivity into the wild has increased.
Objective(s)	• Define a global strategy for translocation (reintroduction or reinforcement) into the wild in France • Implement this strategy if conditions are favourable enough

Action description	**Sub-action n°2.2.1: Choose the translocation strategy**	**Priority 1**
	Work will have to be carried out to update the first collection of worldwide translocation experiments (ONCFS and DREAL, 2014) in order to take into account the most recent experiments on the releasing of European Mink. In addition to the questions already contained in this collection, others may be added, notably on the involvement of the local population in the operations implemented. This feedback will be combined and therefore simultaneous with that provided for in sub-action n°2.1.1. Once this feedback has been collected, it will be a matter of refining the translocation methods. In particular, the following points will need to be specified: reintroductions or reinforcements, periods, number of individuals, aptitudes for translocation (health assessment …), age, sex, monitoring methods for sites (quality of habitats, competing species…) and individuals (radio-tracking, direct or indirect Capture-Mark-Recapture). At the very least, monitoring should make it possible to estimate the animals' post -translocation survival rate. After validation of the French European Mink translocation strategy, on the basis of the criteria provided by the Gaiadomo study (Agence Gaiadomo, 2012) and data of presence of the European Mink (see actions n°1.1 et n°1.2), the translocation area(s) will be selected. For this purpose, a detailed comparison of the various possible translocation areas will be carried out in function of the different criteria important for European Mink. This/these area(s) must be able to present viable alternatives in the event of unexpected for events affecting the translocation in the site or sites initially chosen.	
	Sub-action n°2.2.2: Prepare the translocation area(s)	**Priority 2**
	Once the translocation (reintroduction or reinforcement) strategy and the choice of the associated site(s) have been decided, the following steps will be taken (see sub-action n°2.2.1), the sustainable management of the sites will be reinforced: maintenance of dens and of areas for feeding, breeding and movement, and combatting the potential factors threatening the European Mink. All these actions for preparing the translocation area(s) can be inspired by translocations that have already been carried out in other countries (see sub-action n°2.2.1). At the same time, all administrative steps will be anticipated and carried out, in order to guarantee the legality, conformity and responsiveness of the translocation process. Finally, as soon as the French European Mink breeding centres are able to supply individuals for translocation (see sub-action n°2.2.1), discussions with the EEP will determine the individuals to be released (see paragraph II.6). If the French European Mink translocation strategy provides for it (see sub-action n°2.2.1), facilities (shelters, feeding areas, pre-release enclosures, etc.) will have to be built on the translocation area(s). Acceptability studies could be carried out beforehand if necessary. In addition, awareness-raising activities for the general public and local stakeholders will be implemented to ensure that the	

translocation project is well perceived locally. As far as possible, these people will be involved in the translocation project in order to obtain their full support.

Sub-action n°2.2.3: Implement translocations, monitor released individuals and their translocation sites — **Priority 2**

Once the French translocation strategy has been defined (see sub-action 2.2.1) and the translocation area(s) are ready (see sub-action 2.2.2), the concrete phase of translocating the animals into wild will be implemented.

In a second phase, the methods provided for in the French translocation strategy will be implemented in order to monitor the released individuals and translocation site(s).

Finally, a "stage" assessment of each of the phases of the translocation of European Mink (preparation of the translocation site(s), translocation(s), monitoring of the translocation areas and released animals) will be carried out. At the end of these three phases, an overall assessment will need to identify the success and failure factors in the global translocation process (population established? size and viability of the population?). This document will be translated into English in order to ensure the availability of French feedback for international partners.

Leader(s) and potential partners

Action leaders:

- Coordinating DREAL of the PNA
- PNA facilitator
- EEP
- GREGE

Action partners:

Zoodyssée Animal Park, Calviac Zoological Reserve, European breeding centres for European Mink, organisations that have already carried out translocation operations, nature protection associations, environmental consultancies, departmental trappers' associations, local authorities, Centres of Initiatives for the Environment, Natural Area Conservancies, Natura 2000 facilitators, for fishing and protection of the aquatic environment, Departmental Hunters' Federations, Departmental Pest Control Federations, managing authorities of natural areas, French Biodiversity Agency (OFB), veterinary schools, genetics laboratories…

Implementation schedule

Sub-action	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
N°2.2.1										
N°2.2.2										
N°2.2.3										

Action scale

- Sub-action 2.2.1: European for feedback, national for the choice of translocation area(s)

	• Sub-action 2.2.2: the translocation area(s) • Sub-action 2.2.3: the translocation area(s)
Other species may benefit	All species living in wetlands and using the same habitats as the European Mink
Monitoring and achievement indicator(s)	• Number of translocation areas studied and then selected • Number of areas where releases have been implemented • Number of releases per area • Number of individuals released • Number of individuals monitored • Survival rate • Number of awareness-raising actions carried out
Deliverable(s)	• International summary of feedback on translocations • Strategy(ies) selected (with list of potential/selected sites) • Implementation reviews (which include site preparation measures, release operations, monitoring of individuals, etc.)
Financial assessment	• Facilitator time: 31 000 €/year • Minimum cost of implementation: 100 000 €/year
Reference document(s) (non-exhaustive)	• Agence Gaiadomo. Mars 2012. Etudes nécessaires pour identifier les aires de réimplantation du Vison d'Europe. 60p. • DIrection Régionale de l'ENvironnement (DIREN) Aquitaine et Mission Vison d'Europe. Décembre 2003. Plan National de Restauration du Vison d'Europe 1999-2003 Bilan [en ligne]. 114p. Disponible sur : http://www.nouvelle-aquitaine.developpement-durable.gouv.fr/le-vison-d-europe-a10771.html. [Consulté le 22.09.2020]. • Direction Régionale de l'Environnement, de l'Aménagement et du Logement (DREAL) et Office National de la Chasse et de la Faune Sauvage (ONCFS). 2019. Évaluation du Plan National d'Actions intermédiaire 2015-2018 en faveur du Vison d'Europe (*Mustela lutreola*). • DIrection Régionale de l'ENvironnement (DIREN) et GEREA. Juin 2007. Deuxième Plan National de Restauration du Vison d'Europe 2007-2011 [en ligne]. 199p. Disponible sur : http://www.nouvelle-aquitaine.developpement-durable.gouv.fr/le-vison-d-europe-a10771.html. [Consulté le 22.09.2020]. • International Union for Conservation of Nature (IUCN). Soorae, P.S. 2013. Global Re-Introduction Perspectives: 2013. Further case studies from around the globe. Gland, Switzerland: IUCN/SSC Re-introduction Specialist Group and Abu Dhabi, UAE: Environment Agency-Abu Dhabi. XIV + 282p. • Office National de la Chasse et de la Faune Sauvage (ONCFS) et Directions Régionales de l'Environnement, de l'Aménagement et du Logement (DREAL). Octobre 2014. Scénarii de stratégie de conservation pour le futur élevage de Visons d'Europe au parc animalier Zoodyssée à Chizé, France. 22p.

4. Axis 3: Limit the impact of the American Mink and other non-native species on the European Mink

a. Action 3.1: Fight against the sources of the introduction of American Mink into the wild

Action n° 3.1	Fight against the sources of the introduction of American Mink into the wild
Work axis	Limit the impact of the American Mink and other non-native species on the European Mink
Context and issue(s)	**Context:** The American Mink is an introduced species in France (MNHN, 2020). It is listed in Annexe I of the 14 February 2018 ministerial decree (Ministry for Ecological and Inclusive Transition, 2018) regarding the prevention of the introduction and propagation of invasive alien animal species in Metropolitan France. This decree forbids "*over the whole metropolitan territory and at all times the introduction into the natural environment, whether voluntarily, through negligence, or through imprudence, of living specimens*" of this species. However, the American Mink is not listed in Annexe II and "*introduction into the metropolitan territory, ownership, transportation, utilisation and exchange of living specimens of the species mentioned […] can be authorised by the administrative authority*". In fact, ownership is only authorised in establishments for their public display and in licensed farms with prefectural authorisation, even if there is only one individual concerned (Ministry of Ecology and Sustainable Development, ministerial decree, 8 October 2018). In addition, individual tagging of the American Mink is obligatory in these establishments (Ministry of Ecology and Sustainable Development, ministerial decree, 14 February 2018) even if it is not always done. Finally, on 29 September 2020 the Ministry stated that all American Mink fur farms in France would be closed by 2025 (Government, 2021). The feral populations of American Mink in Europe, including France, derive from individuals that escaped from fur farms, whether accidentally (escaped from pens or during transportation) or intentionally (vandalism by animal rights activists) (Heptner *and al.,* 1967; Dunstone, 1993; Kauhala, 1996; Ruiz-Olmo *and al.,* 1997; Hammershoj, 2005; Zuberogoitia *and al.,* 2012; Léger *and al.*, 2018; ONCFS-DRE, 2018). Other accidental or voluntary sources of American Mink have also been identified, in particular individuals that escaped from other types of owners (zoos, private owners that keep them as pets, wildlife health centres). Moreover, illegal networks for the sale and transportation of wildlife, including the American Mink, have been identified. In France, the first American Mink fur farm opened in December 1926 in Haute-Savoie and the number of farms reached a peak in 1959 with more than 600 declared farms. In the 2000s, (the four farms still present in the 1st PNA's area received recommendations for making them more escape-proof (DIREN Aquitaine et Mission Vison d'Europe, 2003). Subsequently,

	the desire to avoid new fur farms being set up in the area where European Mink are present was affirmed, particularly after the vandalism of a farm in the Dordogne department in 2009. Emergency actions were enacted to recover the animals and an intervention plan in the event of an escape was drawn up in 2011 (LPO and DREAL, 2011). In 2015, there were 3 remaining active farms in the PNAi area. In 2018, the farms were controlled to determine whether they were compliant and escape-proof (DREAL and ONCFS, 2019). These 3 farms have now definitively closed. There is therefore no remaining American Mink fur farm in the area of application of the 3rd PNA. The last remaining French farms are situated in the Doubs (unproductive) and Orne departments. **Issues:** To fight against the decline of European Mink in France, it is essential to take action against the threat factors impacting its populations. However, the American Mink is known to be one of the principal threats. It is therefore important that this 3rd PNA provides for actions to fight against the American Mink, both in the wild (see action n°3.2) and the sources of its introduction (whether voluntary or not) into the wild. The regulations concerning the ownership of wildlife species includes invasive alien species. They need to be broadly disseminated, explained and enforced. These regulations correspond to an EU regulation (European Parliament and Council of the European Union, Regulation 1143/2014) which is regularly assessed and amended. To achieve this, the Environment Ministry regularly seeks feedback from the managers of areas or species. The lessons learned from the PNA, in association with the other European programmes on the European Mink, should therefore contribute to further development of regulations, particularly concerning the status of American Mink in France.
Objective(s)	• Limit the risks of accidental or voluntary escape of American Mink under professional or private ownership • Contribute to ministerial policy concerning the status of American Mink in France
Action description	**Sub-action n°3.1.1: Verify the state of American Mink fur farms** — **Priority 3** **Update the technical guidelines on security and escape prevention for French American Mink farms:** This will involve establishing a list of all the points of vigilance and technical adjustments recommended within the farms to avoid vandalism or the involuntary escaping of animals. Technical assistance will be provided to fur farms ceasing their activity. These guidelines will be broadly disseminated among the farms present and the State services of the regions and departments concerned.

	Set up an emergency procedure in the event of escape from the farms still present in France: On the basis of the document drawn up in 2011 (LPO and DREAL, 2011) and the technical guidelines cited above, an emergency procedure (methods of action in the event of mass escapes, methods of monitoring…) for French American Mink farms will be drawn up, validated and disseminated in concertation with the State services concerned.
	Sub-action n°3.1.2: Verify keeping conditions for owners other than fur farms — **Priority 2** In a first step, all the DDCSPP in the area of action of the 3rd PNA will be consulted in order to produce and have available a list of the persons currently licensed to keep American Mink. Information concerning the risks of release into the wild will be transmitted to these owners together with a *modus operandi* to follow for those wishing to no longer keep their individuals. These owners will be monitored by the environment police services. A note concerning these owners will also be sent to each DDCSPP in order that they contact the DREAL about any new request for a licence to keep American Mink. This request will be made using the note produced by the DREAL and transmitted by the Environment Ministry (see sub-action n°3.1.1). Concerning wildlife health centres, it regularly happens that individuals found in the wild are brought to them. A management procedure for these individuals needs to be discussed and implemented. To achieve this, a meeting with the existing health centres in the area of action of the 3rd PNA, the DDCSPP and the DREAL concerned will be organised under the aegis of the coordinating DREAL in order to define common management methods. Particular attention will be paid to respecting animal welfare recommendations and avoiding as much as possible the dispensation of health care inappropriate to the animal's welfare. This common procedure could be subject to a charter of commitments with the health centres.
	Sub-action n°3.1.3: Provide the expertise required for changing the reglementary status of the American Mink in France — **Priority 1** The PNA will provide the Environment Ministry the technical elements required to justify tightening the reglementary conditions for keeping American Mink.
Leader(s) and potential partners	**Action leaders**: • Coordinating DREAL of the PNA • PNA facilitator **Action partners**: Wildlife health centres, DDSCPP, French Biodiversity Agency (OFB), Environment Ministry, DREAL

<table>
<tr><td>Implementation schedule</td><td>
<table>
<tr><th>Sub-action</th><th>2022</th><th>2023</th><th>2024</th><th>2025</th><th>2026</th><th>2027</th><th>2028</th><th>2029</th><th>2030</th><th>2031</th></tr>
<tr><td>N°3.1.1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>N°3.1.2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>N°3.1.3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>Action scale</td><td>

Sub-action n°3.1.1: France
Sub-action n°3.1.2: primarily the area of action of the 3rd PNA
Sub-action n°3.1.3: France

</td></tr>
<tr><td>Other species that may benefit</td><td>All species impacted by the American Mink</td></tr>
<tr><td>Monitoring and achievement indicator(s)</td><td>

Changes in the number of American Mink owners known to the authorities present in the area of the 3rd PNA
Number of expert consultancy missions provided at the request of local or national administrative bodies concerning the status of American Mink

</td></tr>
<tr><td>Deliverable(s)</td><td>

Maps of the presence of American Mink owners in the PNA area
Memorandum sent to the DDCSPPs concerning the keeping of American Mink
Template of a “Prevention and Emergency Plan” for American Mink fur farms
Management procedure for American Mink in wildlife health centres

</td></tr>
<tr><td>Financial assessment</td><td>

Facilitator time: 7 500 €/year
Minimum cost of implementation: 1 000 €/year

</td></tr>
<tr><td>Reference document(s) (non-exhaustive)</td><td>

DIrection Régionale de l’ENvironnement (DIREN) Aquitaine et Mission Vison d’Europe. Décembre 2003. Plan National de Restauration du Vison d’Europe 1999-2003 Bilan [en ligne]. 114p. Disponible sur : http://www.nouvelle-aquitaine.developpement-durable.gouv.fr/le-vison-d-europe-a10771.html. [Consulté le 22.09.2020].
Direction Régionale de l’Environnement, de l’Aménagement et du Logement (DREAL) et Office National de la Chasse et de la Faune Sauvage (ONCFS). 2019. Évaluation du Plan National d’Actions intermédiaire 2015-2018 en faveur du Vison d’Europe (Mustela lutreola).
Dunstone, N. 1993. The Mink. T & AD Pyeser Natural History, London. 232p.
Genovesi, P., Carnevali, L., Alonzi, A. and Scalera, R. 2012. Alien mammals in Europe: updated numbers and trends, and assessment of the effects on biodiversity. Integrative Zoology, 7: 247–253.
Gouvernement. 1er Février 2021. Proposition de loi visant à renforcer la lutte contre la maltraitance animale [en ligne].

</td></tr>
</table>

Disponible sur : https://www.legifrance.gouv.fr/dossierlegislatif/JORFDOLE000043084132/. Consulté le 31.03.2021].

- Hammershøj, M., Pertoldi, C., Asferga, T., Møller, T.B., Kristensen, N.B. 2005. Danish free-ranging mink populations consist mainly of farm animals: Evidence from microsatellite and stable isotope analyses. Journal for Nature Conservation, 13: 267-274.
- Heptner, V.G., Naumov, N.P., Yurgenson P.B., Sludskiy, A.A., Chirkova, A.F., Bannikov, A.G. 1967. Mlekopitayushchie Sovetskogo Soyuza [Mammals of Soviet Union], Vol.2 (1) Sea cows and carnivora. 1004 p. Moscow. (In Russian).
- Kauhala, K. 1996 Distributional history of the American mink (*Mustela Vison*) in Finland with special reference to the trends in otter (*Lutra lutra*) populations. Annales Zoologici Fennici, 33, 283–291.
- Leger, F., Steinmetz, J., Laoué, E., Maillard, JF., Ruette, S. Mars 2018. L'expansion du Vison d'Amérique en France – Période 2000-2015. Faune Sauvage, 1er trimestre 2018, n°318, p. 23-31.
- Ligue pour la Protection des Oiseaux (LPO) et Direction Régionale de l'Environnement, de l'Aménagement et du Logement (DREAL). Octobre 2011. Plans de prévention et d'urgence autour des élevages de Vison d'Amérique. 110p.
- Ministère de l'écologie et de développement durable. 8 octobre 2018. Arrêté du 8 octobre 2018 fixant les règles générales de de détention d'animaux d'espèces non domestiques [en ligne]. Journal officiel, n°237 du 13 octobre 2018, texte n° 12. Disponible sur : https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000037491137/. [Consulté le 22.09.2020].
- Ministère de la Transition Ecologique et Solidaire (MTES). 13 Avril 2018. Plans nationaux d'actions en faveur des espèces menacées [en ligne]. Disponible sur : https://www.ecologique-solidaire.gouv.fr/plans-nationaux-dactions-en-faveur-des-especes-menacees [Consulté le 22.09.2020].
- Muséum National d'Histoire Naturelle (MNHN). 2003-2020. 2020a. Inventaire National du Patrimoine Naturel [en ligne]. Disponible sur : https://inpn.mnhn.fr/espece/cd_nom/60704/tab/statut. [Consulté le 22.09.2020].
- Office National de la Chasse et de la Faune Sauvage - Direction de la Recherche et de l'Expertise (ONCFS-DRE). Janvier 2018. Quelques éléments sur l'apparition d'un foyer de présence du Vison d'Amérique dans le département de la Vendée. NT/2018/DRE/UPAD/02. 6p.
- Parlement européen et Conseil de l'Union Européenne. 4 novembre 2014. Règlement (UE) N°1143/2014 du Parlement Européen et du Conseil du 22 octobre 2014 relatif à la prévention et à la gestion de l'introduction et de la propagation des espèces exotiques envahissantes [en ligne]. Journal officiel de l'Union Européenne, L317/35.
- Disponible sur : https://eurlex.europa.eu/legalcontent/FR/TXT/PDF/?uri=CELEX:320

	14R1143&from=FI. [Consulté le 22.09.2020]. • Ruiz-Olmo, J., Palazon, S., Bueno, F., Bravo, C., Munilla, I., Romero, R. 1997. Distribution, status and colonization of the American mink *Mustela Vison* in Spain. J. Wildl. Res., 2(1):30-36. • Zuberogoitia, I., Zalewska, H., Zabala, J., Zalewski, A. 2012. The impact of river fragmentation on the population persistence of native and alien mink: an ecological trap for the endangered European mink. Biodiversity Conservation, 22:169-186.

b. Action 3.2: Fight against the American Mink in the wild

Action n° 3.2	Fight against the American Mink in the wild
Work axis	Limit the impact of the American Mink and other non-native species on the European Mink
Context and issue(s)	**Context:** Native to North America, the American Mink is present in the wild in at least 19 European Union countries, where it is highly invasive. It is the species that has the greatest impacts on native wildlife because it seems to affect no less than 47 species (Genovesi *and al.,* 2012). Through ecological competition, it has a particularly negative impact on numerous carnivores including the European Mink, European Polecat and Stoat (Maran *and al.,* 1998; Sidorovich and Macdonald, 2001; Sidorovich and Solovej, 2007; Sidorovich *and al.,* 2010; Zuberogoitia *and al.,* 2012). Preventing the American Mink from colonising new areas after it has become established is a difficult task. The utilisation of effective detection and control methods (Reynolds *and al.,* 2004, 2013) helps to keep specific areas free of American Mink (Bryce *and al.,* 2011). Trapping by means of rafts, developed in the UK (Reynolds *and al.,* 2004, 2013), enables effective control, even local eradication of the species. This method is used in several regions of Europe and gives better results than traditional trapping with baited cage-traps (Harrington *and al.,* 2009; Tragsatec, 2015; Gomez, 2018) and also enables effective monitoring of the colonisation of new areas by the species (LPO *and al.*, 2017). In the framework of PNAi, a strategy to fight against the American Mink was drawn up in order to organise operations and define appropriate methods with regard to the recent bibliography (Sidorovich *and al.,* 2010; Santulli *and al.,* 2014; Podra and Gomez, 2018) and the results of the distribution survey on American Mink in France (Léger *and al.*, 2018). This strategy has several objectives (DREAL and ONCFS, 2019): • Avoid the propagation of the American Mink on the edges of its range towards areas where recent data on European Mink have been gathered (southern Vendée department, northern Gironde department and western Dordogne department); • Eliminate the feral population established in eastern Dordogne

department resulting from the vandalism of a fur farm in 2009;
- Fight against the northward progression of the southern Gironde department population;
- Prevent the propagation of American Mink towards known European Mink areas in Spain (southern Pyrénées-Atlantiques department).

The selected method is based on the monitoring of footprint rafts, which are fitted with cage-traps when prints are regularly detected. The rafts started to be deployed in late 2016, then more fully in late 2017 / early 2018 and their monitoring is being continued. Raft trapping is being actively carried out in Pyrénées-Atlantiques department, southern Gironde department and eastern Dordogne department. The results of the other areas monitored have not led to trapping being deployed. Acceptation in early 2020 of Natura 2000 contracts will also enable the setting up and monitoring of rafts to be continued on the lower Nive and Nivelle rivers (Pyrénées-Atlantiques department) to complete the operation implemented between France and Spain.

Moreover, in the framework of the LIFE VISON programme, a network of rafts is also set up and monitored throughout the Charente-Maritime and Charente departments. To date, there is no suspicion of the presence of American Mink in this area (LPO *and al.*, 2020).

In addition, studied carried out by means of the gathering and autopsies of American Mink corpses from control programmes (PNA, compensatory measures, LIFE VISON and mammalogical monitoring) provide information concerning the age and breeding status of individuals. This information enables the efficiency of the control actions implemented to be assessed. Ways should be sought to coordinate this subject.

It is also important to specify that since 2013, by ministerial decree, it is obligatory in areas where the European Mink is present that all cage-traps situated less than 200m from a watercourse should be fitted from April to July with a "hatch" (also called "escape kit" or "trap door") to enable female European Mink to escape during the gestation and suckling season. The hatch consists of a five-centimetre by five-centimetre opening that is sealed for the other months of the year. The trapping period for American Mink is therefore limited between August and the end of March.

Finally, in July 2020, Denmark proposed a LIFE programme on the management of the American Mink to the member states of the European Union (Ministry of Environment and Food of Denmark, 2020). The detection of SARS-CoV-2-positive American Mink having led to the closure of many Danish fur farms, this LIFE programme seems to have been put on hold.

Issues:

To fight against the decline of European Mink in France, it is essential to counter its threat factors. Indeed, the American Mink is recognised as one of the principal threats. The 3rd PNA therefore includes actions to control the American Mink, by countering sources of introduction into the

	natural environment (see action n°3.1) and also directly within the natural environment. The latter is very time-consuming and gives results that can vary in function of the population densities present. It is therefore important to fix objectives to be achieved, and to make strategic and methodological choices. These choices will be made in function of the latest data concerning the known presence of American Mink (see action n°1.4), feedback on the experience of other European countries and/or the development of complementary studies to improve control techniques.	
Objective(s)	• Abort the establishment of any new population of American Mink in the area of the 3rd PNA • Prevent the propagation of feral American Mink populations towards areas where the European Mink is known to be present in France and Spain • Monitor the potential arrival of American Mink in areas where the European Mink is known to be present • Continually adapt the control strategy in function of the results obtained	
Action description	**Sub-action n°3.2.1: Refine and implement the control strategy**	**Priority 1**
	Continue the strategy of monitoring and control against the American Mink: The protocol implemented in the framework of PNAi will remain valid, with some adaptations (faster triggering of trapping mode, repositioning of rafts in certain fringe areas …). The surveillance and control actions set up need to be prolonged in southern Vendée, Gironde, eastern Dordogne and southwest Pyrénées-Atlantiques or to be repositioned if necessary (in the event of an absence of data for one year) in order to set up a complete and reactive surveillance system within and around the last remaining population nuclei of European Mink. Therefore, as soon as possible, the American Mink control area in Pyrénées-Atlantiques department will be extended as far as the Atlantic coast. Particular attention will be paid to maintaining regular exchanges with the Spanish teams in order to ensure that the various trans-frontier programmes remain coherent. In addition, after the closure of the LIFE VISON programme on 30/11/2022, the American Mink surveillance actions carried out in the Charente and Charente-Maritime departments need to be continued. In the event of the discovery of American Mink (data gathered in the framework of action n°1.4) within or close to a known population of European Mink, a surveillance operation must rapidly be set up in the river basin concerned for at least one year and be combined, if necessary, with control operations. Moreover, in the event of the discovery of a new nucleus of European Mink (see sub-action n°1.1.1) a network of surveillance rafts will be set up as soon as possible in the river basin concerned to verify the absence or presence of American Mink and implement control operations if necessary.	

	The facilitation of the network of local partners implementing the control strategy in the field is crucial for achieving sufficient mobilisation and finding propitious locations for control actions.	
	Sub-action n°3.2.2: Improve the efficacy of American Mink control	**Priority 2**
	Have an even more effective control protocol: In order always to be at the cutting edge regarding the efficacy of American Mink control, it is essential to keep up to date about American Mink control techniques and strategies. Therefore, as for the European Mink (see sub-action n°1.1.1), throughout the course of 3rd PNA, particular attention will be paid, at national and international level, to any experiments carried out. The new alternative techniques potentially utilisable to control American Mink will be tested and/or implemented: optimisation of the placing of rafts in sectors favourable to the species (Melero *and al.,* 2018) etc. In function of these new advances published in the bibliography or tested in the field, the control protocol could be modified (see sub-action n°3.2.1). In parallel, broad-ranging facilitation by the PNA facilitator should raise awareness and involve all people likely to trap American Mink. A reward system could also be envisaged. In addition, it would be interesting to coordinate the work on collecting and analysing the corpses of American Mink (age and breeding status) in order to improve the control strategy. To achieve this, a common American Mink biopsy protocol will be set up. It will be coherent the protocol presented in the action concerning the implementation of a health monitoring programme for European Mink (see sub-action n°1.3.1). **Have an operational control protocol even more respectful of animal welfare:** The American Mink control protocol, including the killing of animals, needs to be respectful of animal welfare. Currently, it is specified that "*euthanasia of American Mink must be performed as rapidly as possible and without useless suffering for the animal. Shooting is recommended*" (see annexe n°9). In order to further improve the consideration of animal welfare, the obligatory use of two methods could be envisaged, resulting in instantaneous death: shooting or lethal injection when this solution is technically and financially possible (an expensive method because it requires the use of veterinarians - Lonch Obiols 2017). Moreover, recommendations for limiting stress for the animal when captured could be added to the control protocol.	
	Sub-action n°3.2.3: Study possible regulatory adaptations in the framework of American Mink control	**Priority 2**
	Regulation concerning the utilisation of a European Mink "hatch": The obligation to use the European Mink "hatch" during the period of raising young (4 months out of 12) can slow some trappers in the implementation of American Mink control actions. This reglementary	

<table>
<tr><td></td><td>obligation will therefore be reconsidered in certain areas. The shape of the hatch, currently square, could also be reconsidered (e.g., rounded) in order to reduce the risks of injuring other animals. Finally, the pertinence of the European Mink "hatch" is frequently debated. Reminders about its usefulness need to be regularly planned and included in the training sections (see action n°5.2).

Regulation concerning the implementation of the American Mink control organised by 3rd PNA:
The implementation of trapping in a given area requires the administrative procedures for authorising proprietors and delegating the right to kill. These procedures lead to significant inertia in the launching of American Mink control operations. It could therefore be expedient to carry out a legal analysis concerning the possibility of simplifying the procedures for issuing these authorisations in the specific framework of the 3rd PNA.</td></tr>
<tr><td>Leader(s) and potential partners</td><td>Action leader:
Coordinating DREAL of the PNA
PNA facilitator
LIFE VISON
Action partners:
Nature protection associations, environmental consultancies, departmental trappers' associations, local authorities, Centres of Initiatives for the Environment, Natural Area Conservancies, Natura 2000 facilitators, French Biodiversity Agency (OFB), federations for fishing and protection of the aquatic environment, Departmental Hunters' Federations, Departmental Pest Control' Federations, managing authorities of natural areas, zoos, Wildlife health centres, LIFE Lutreola Spain …</td></tr>
<tr><td>Implementation schedule</td><td>
<table>
<tr><th>Sub-action</th><th>2022</th><th>2023</th><th>2024</th><th>2025</th><th>2026</th><th>2027</th><th>2028</th><th>2029</th><th>2030</th><th>2031</th></tr>
<tr><td>N°3.2.1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>N°3.2.2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>N°3.2.3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>Action scale</td><td>Sub-action n°3.2.1: area of action of the 3rd PNA
Sub-action n°3.2.2: area of action of the 3rd PNA
Sub-action n°3.2.3: area of action of the 3rd PNA</td></tr>
<tr><td>Other species that may benefit</td><td>All species impacted by the American Mink</td></tr>
<tr><td>Monitoring and achievement indicator(s)</td><td>Percentage of river basins equipped per area
Number of rafts giving positive results per area</td></tr>
</table>

	• Number of trapping nights per area • Number of American Mink captured per area • Number of American Mink corpse autopsied
Deliverable(s)	• Maps summarising the locations and results of the rafts • Publications of results of studies on American Mink
Financial assessment	• Facilitator time: 33 000 €/year • Minimum cost of implementation: 210 000 €/year
Reference document(s) (non-exhaustive)	• Bryce, R., Oliver, M.K., Davies, L., Gray, H., Urquhart, J., Lambin, X. 2011. Turning back the tide of American mink invasion at an unprecedented scale through community participation and adaptive management. Biological Conservation 144(1): 575–583. • Direction Régionale de l'Environnement, de l'Aménagement et du Logement (DREAL) et Office National de la Chasse et de la Faune Sauvage (ONCFS). 2019. Évaluation du Plan National d'Actions intermédiaire 2015-2018 en faveur du Vison d'Europe (*Mustela lutreola*). • Genovesi, P., Carnevali, L., Alonzi, A. and Scalera, R. 2012. Alien mammals in Europe: updated numbers and trends, and assessment of the effects on biodiversity. Integrative Zoology, 7: 247–253. • Gomez, A. 2018. Cuatro años del proyecto LIFE Lutreola Spain [en ligne]. 42p. Disponible sur : http://lifelutreolaspain.com/fr/projet-life-lutreola-spain/documents. [Consulté le 22.09.2020]. • Harrington, L.A., Moorhouse, T., Gelling, M., Bonesi, L., MacDonald, D.W. 2009. American mink control on inland rivers in southern England: an experimental test of a model strategy. Biological Conservation, 142: 839-849. • Leger, F., Steinmetz, J., Laoué, E., Maillard, JF., Ruette, S. Mars 2018. L'expansion du Vison d'Amérique en France – Période 2000-2015. Faune Sauvage, 1er trimestre 2018, n°318, p. 23-31. • Ligue pour la Protection des Oiseaux (LPO), Conseil Départemental de la Charente-Maritime, Groupe de Recherche et d'Etude pour la Gestion de l'Environnement (GREGE). 26 Avril 2017. LIFE16 NAT/FR/000872-Conservation of the European Mink and associated community interest species and habitats of the Charente River Basin. • Ligue pour la Protection des Oiseaux (LPO), Conseil Départemental de la Charente-Maritime, Groupe de Recherche et d'Etude pour la Gestion de l'Environnement (GREGE). Septembre 2020. Rapport d'avancement LIFE Vison du 01/01/2019 au 31/12/2019. 194p. • Lonch Obiols, P. Decembre 2017. Assesment protocol to the welfare during capture, transport and euthanasia of wild American mink. LIFE Lutreola Spain - LIFE 13 NAT/ES/001171. 29p. • Maran, T., Kruuk, H., Macdonald, D., Polma, M. 1998. Diet of two species of mink in Estonia: displacement of *Mustela lutreola* by *M. vison*. *Journal of Zoology London,* 245:218-222. • Melero, Y., Cornulier, T., Oliver, M., Lambin, X. 22 juillet 2017. Ecological traps for large-scale invasive species control: predicting settling rules by recolonising American mink post-culling. Journal

of Applied Ecology, 2018;1-11.
- Ministry of Environment and Food of Denmark. 2 Juillet 2020. LIFE Project on management of American Mink. 3p.
- Podra, M., Gomez, A. 2018. Rapid expansion of the American mink poses a serious threat to the European mink in Spain. Mammalia, 2018 ; 82(6) : 580-588.
- Reynolds, J.C., Richardson, S.M., Rodgers, B.J.E., Rodgers, O.R.K. 2013. Effective control of non-native American mink by strategic trapping in a river catchment in mainland Britain. The Journal of Wildlife Management, 77: 545–554.
- Reynolds, J.C., Short, M.J., Leigh, R.J. 2004. Development of population control strategies for mink *Mustela Vison*, using floating rafts as monitors and trap sites. Biological Conservation, 120 (4): 533–543.
- Santulli, G., Palazon, S., Melero, Y., Gosalbez, J., Lambin, X. 2014. Multi-season occupancy analysis reveals large scale competitive exclusion of the critically endangered European mink by the invasive non-native American mink in Spain. Biological Conservation, 176(2014)21-29.
- Sidorovich, V.E., Macdonald, D.W. 2001. Density dynamics and changes in habitat use by the European mink and other native mustelids in connection with the American mink expansion in Belarus. Netherlands Journal of Zoology, 51(1):107-126.
- Sidorovich, V.E., Polozov, A.G., Zalewski, A. 2010. Food niche variation of European and American mink during the American mink invasion in north-eastern Belarus. Biological invasions, 12, 7: 2207-2217.
- Sidorovich, V.E., Solovej, I. 2007. The stoat *Mustela erminea* population decline in northern Belarus and its consequences for weasels *Mustela nivalis*. New Zealand Journal of Zoology, 34:9-23.
- Tragsatec. 2015. Report of the project LIFE 13 NAT/ES/001171 LIFE LUTREOLA « Nuevos enfoques en la conservación del visón europeo en España » Acción A1: Comprobación de la efectividad de las metodologías de detección y de captura del visón europeo y del visón americano. 36p.
- Zuberogoitia, I., Zalewska, H., Zabala, J., Zalewski, A. 2012. The impact of river fragmentation on the population persistence of native and alien mink: an ecological trap for the endangered European mink. Biodiversity Conservation, 22:169-186.

c. Action 3.3: Study the potential impact of other non-native species on the European Mink

Action n° 3.3	Study the potential impact of other non-native species on the European Mink
Work axis	Limit the impact of the American Mink and other non-native species on the European Mink
Context and issue(s)	**Context**: In France, there are two major, relatively old population nuclei of Raccoon (Leger, 2003) in the Aisne department and the Grand Est region. New population sites have now been confirmed in the Auvergne and Gironde departments. Data are also starting to be recorded in the Charente (Source FDC16 and GREGE) and Charente-Maritime departments (Source ONCFS) and suggest the appearance of a new population nucleus or expansion from the Gironde department. A surveillance system was set up in the framework of LIFE VISON in the Charente and Charente-Maritime departments. These two population sites are situated close to the European Mink population nuclei identified in the framework of LIFE VISON and the PNA. To date, the Raccoon and its impacts have been very little studied in Europe. The rare recent studies carried out in Germany (Michler and Hohmann, 2004), Poland (Bartoszewicz *and al.*, 2008), Spain (Fischer *and al.*, 2017) and Austria (Duscher *and al.,* 2018) investigated the population densities, home range and diet of the individuals in function of the habitat they occupy. These studies all agree on the need for supplementary data to assess the ecological, economic and health consequences of a population expansion. It would seem necessary to assess the potential consequences of the Raccoon on the conservation of European Mink because it consumes a significant proportion of aquatic prey (amphibians, crayfish…), can be a vector of diseases and frequents the same habitats, while remaining more opportunistic and less restricted to valley bottoms (LPO *and al.,* 2017; LPO *and al.,* 2020; thesis in progress CERFE-GREGE). For the time being, there do not seem to be any other non-native species present in the wild likely to impact the European Mink populations in France. Nonetheless, occasional data are sometimes received (observation of an Egyptian mongoose (*Herpestes ichneumon*) in 2021 in Charente-Maritime department) and require monitoring. **Issues:** The Raccoon is a non-native species originating from North America. There are knowledge gaps concerning the interactions between European Mink and this species. Yet they partly share the same habitats and the same diet, the European Mink being less widespread. In addition, the Raccoon can be a vector of diseases. For these reasons, it appears necessary to study this potentially competitor species. It is also necessary to continue to keep watch over all other existing non-native species.

<table>
<tr><td>Objective(s)</td><td colspan="2">Determine whether the Raccoon directly or indirectly impacts the European Mink, and to what extent
Monitor the potential arrival of other non-native species that may compete with the European Mink</td></tr>
<tr><td rowspan="2">Action description</td><td>Action n°3.3: Study the potential impact of other non-native species on the European Mink</td><td>Priority 3</td></tr>
<tr><td colspan="2">Study and determine the possible impact of the Raccoon on the European Mink and propose a control strategy, if necessary, in the framework of 3rd PNA. A realistic study protocol should be defined that responds to the targeted questions (food and territory competition, propagation of diseases). To achieve this, a bibliographical study of available knowledge concerning the species will be carried out. The results will be published in summary reports and disseminated as broadly as possible. Any gaps in knowledge that would be useful for setting up a control strategy, if one is needed, could thus be identified and lead to the carrying out of complementary studies.

Monitoring operations will be implemented concerning the arrival of other non-native species in the natural environment and their possible impacts on European Mink populations in order to be able to set up of reactive measures.</td></tr>
<tr><td>Leader(s) and potential partners</td><td colspan="2">Action leaders:
Coordinating DREAL of the PNA
PNA facilitator
LIFE VISON
Action partners:
Nature protection associations, environmental consultancies, departmental trappers' associations, local authorities, Centres of Initiatives for the Environment, Natural Area Conservancies, Natura 2000 facilitators, French Biodiversity Agency (OFB), federations for fishing and protection of the aquatic environment, Departmental Hunters' Federations, Departmental Pest Control' Federations, Managing authorities of natural areas, zoos, LIFE Lutreola Spain, genetics laboratories …</td></tr>
<tr><td>Implementation schedule</td><td colspan="2"><table><tr><td>Action</td><td>2022</td><td>2023</td><td>2024</td><td>2025</td><td>2026</td><td>2027</td><td>2028</td><td>2029</td><td>2030</td><td>2031</td></tr><tr><td>N°3.3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table></td></tr>
<tr><td>Action scale</td><td colspan="2">Action n°3.3 area of action of 3rd PNA</td></tr>
<tr><td>Other species that may benefit</td><td colspan="2">All species impacted by the Raccoon.</td></tr>
<tr><td>Monitoring and achievement indicator(s)</td><td colspan="2">Number of studies initiated</td></tr>
</table>

Deliverable(s)	• Publication of the results of studies on the Raccoon
Financial assessment	• Facilitator time: 11 000 €/year • Minimum cost of implementation: 10 000 €/year
Reference document(s) (non-exhaustive)	• Bartoszewicz, M., Okarma, H., Zalewski, A., Szczesna, J. 2008. Ecology of the raccoon (*Procyon lotor*) from Western Poland. Annales Zoologici Fennici, 45(4), 291-298. • Duscher, T., Zeveloff, S., Michler, F.U., Nopp-Mayr, U. 2018. Environmental drivers of raccoon (*Procyon lotor* L.) occurrences in Austria - established versus newly invaded regions. Archives of Biological Sciences, 70(1), 41–53. • Fischer, M.L., Salgado, I., Beninde, J., Klein, R., Frantz, AC., Heddergott, M., Cullingham, C., Kyle, JC., Hochkirch, A. 2017. Multiple founder effects are followed by range expansion and asmixture during the invasion process of the racoon (*Procyon lotor*) in Europe. Diversity and distributions, 23(4), 409-420. • Leger, F. 2003. Le Raton laveur : *Procyon lotor* (Linné, 1758). In : Pascal. M., Lorvelec, O., Vigne J.D., Keith P., Clergeau, P. Évolution holocène de la faune de Vertébrés de France : invasions et extinctions. Rapport INRA/CNRS/MNHN: 286-288. • Ligue pour la Protection des Oiseaux (LPO), Conseil Départemental de la Charente-Maritime, Groupe de Recherche et d'Etude pour la Gestion de l'Environnement (GREGE). 26 Avril 2017. LIFE16 NAT/FR/000872-Conservation of the European Mink and associated community interest species and habitats of the Charente River Basin. • Ligue pour la Protection des Oiseaux (LPO), Conseil Départemental de la Charente-Maritime, Groupe de Recherche et d'Etude pour la Gestion de l'Environnement (GREGE). Septembre 2020. Rapport d'avancement LIFE Vison du 01/01/2019 au 31/12/2019. 194p. • Michler, D.F., Hohmann, U. 2005. Investigations on the ethological adaptations of the raccoon (*Procyon lotor* L. 1758) in the urban habitat using the example of the city of Kassel, North Hessen (Germany), and the resulting conclusions for conflict management. North, 1758. Abstract – Poster. 4p.

5. Axis 4: Contribute to the good status of European Mink habitats and fight against other threats in the wild

a. Action 4.1: Fight against the loss of habitats favourable to the European Mink

Action n° 4.1	Fight against the loss of habitats favourable to the European Mink
Work axis	Contribute to the good status of European Mink habitats and fight against other threats in the wild
Context and issue(s)	**Context:** The European Mink frequents all types of continental surface water wetlands provided there is dense vegetation at water-land interfaces. It only leaves these wetlands to move from one river basin to another. Almost all its daytime dens seem to be situated a few metres from water (GEREA and DIREN, 2007). Given than more than half of wetlands were lost during the course of the 20th century, it is undeniable that natural habitats have undergone a global decline in their holding capacity for European Mink. Moreover, the remaining wetlands are also subject to degradation factors (fragmentation, loss of ecological passageways, physico-chemical quality of water …) (see paragraph I.5.a). As a protected species, the European Mink must benefit from special care on the behalf of urban and rural planners, particularly in the framework of the "*Avoid, Reduce, Compensate*" doctrine. In order to help planners and administrative services to take the species into account, a booklet entitled "*The management of European Mink Habitats – Technical Recommendations*" was drawn up during the 1st PNA (DIREN Aquitaine and Mission Vison d'Europe, 2003). This document can also be used as a resource for drawing up management plans for compensation sites. In addition, the construction of the Natura 2000 network has led to the designation of 71 sites with regard to the conservation of European Mink in the 3rd PNA area of application. Each site needs to have a management plan called the DOCument d'OBjectifs (DOCOB), and a "*Methodological guide for taking the European Mink into account in the Natura 2000 DOCOB*" was drawn up during the 1st PNA (Mission European Mink and CREN Aquitaine, 2004). The PNA's work of assisting Natura 2000 facilitators was only partially continued during the 2nd PNA. However, during PNAi (DREAL and ONCFS, 2019), these actions were progressively relaunched, not only with Natura 2000 facilitators but also the planners or managers of compensation areas. A memorandum addressed to planners (DREAL and ONCFS, 2015b) was drawn up in 2015 and is regularly updated. At their request, support is provided to Natura 2000 facilitators for revising their DOCOB and also to managers of protected areas in the process of revising their management plans (Vallon du Brousseau, Grand Moura de Montrol etc.)

	Moreover, the current LIFE VISON programme in the Charente river basin (LPO *and al.*, 2019) initiated numerous actions to rehabilitate habitats favourable to European Mink: acquisition (30 ha planned including 12 ha already acquired by 31/12/2020), restoration (7.1ha as of 31/12/2020, 10 ponds and 5 spawning grounds planned), refuge zones (40 created as of 31/12/2020), simplified management plans etc. It is also intended to update the technical recommendations on the management of European Mink habitats and how to integrate it into urban and rural planning policies. The LIFE VISON and PNA teams work in close collaboration to successfully carry out these projects. **Issues:** One of the principal threats identified as impacting the European Mink is the loss of its habitats: the degradation and fragmentation of wetlands (DIREN and GEREA, 2007). This loss of wetlands leads to a reduction in the resting, breeding and hunting habitats of the European Mink, together with decreased availability of prey (Zabala *and al.,* 2006). In addition, its dens, which are very often on the ground, can become a vulnerability factor by exposing the animal to a greater risk of predation when they are located in less flooded areas, or to risks of being destroyed when heavy works are carried out on these types of habitats (DIREN et GEREA, 2007). To conserve the European Mink, it is therefore indispensable to implement measures to preserve and restore its habitat.
Objective(s)	• Strengthen the taking into consideration of the European Mink in all existing and future urban and rural planning programmes and nature management and protection tools • Propose tools for preserving and restoring habitats favourable to European Mink • Provide expert advice to all managers and stakeholders of areas specifically managed for the European Mink
Action description	**Sub-action n°4.1.1: Strengthen the taking into consideration of the European Mink in management plans, programmes and documents** — **Priority 1** **Draw up and disseminate a guide to good management practices favourable for the European Mink:** In order to help with setting up a land management system compatible with the ecological requirements of the European Mink, it is important to continue the work of updating the guide to good management practices at the scale of the PNA area of action, in collaboration with the LIFE VISON programme. This work is also the opportunity to review the existing measures or practices that appear unfavourable to European Mink. Depending on the protected species targeted, there may be clashes between different issues that need to be identified in order to propose the best possible compromises (alternative measures). It is also important to disseminate this guide very broadly to all natural area managers and planners in order to ensure that the species is taken into consideration (see action n°5.1).

	Set up tools for taking the European Mink into consideration addressed to administrators processing authorisation requests: The processing of authorisation requests varies in function of the department, the region, the administrative service and the person responsible for processing the request (depending on his/her knowledge of the bio-ecological requirements of the European Mink). For this reason, to improve the taking into consideration of European Mink conservation during the processing of authorisation requests, European Mink awareness tools will be developed (for example: technical memoranda, specific training - see action n°5.1).
	Sub-action n°4.1.2: Assist the implementation of DOCOB offset or compensation measures for the European Mink — **Priority 2**
	The aim is to compile feedback from experience concerning the efficacy of the measures set up and to provide expert advice to administrative services, managers and Natura 2000 facilitators. Therefore, in order to benefit from the experience acquired, an inventory of current measures will be carried out with the administrative services and the implementation assessments compiled and analysed, for example the national wildlife corridor database being compiled at the Centre for Studies and Expertise on Risks, the Environment, Mobility and Planning (CEREMA). The data gathered from monitoring carried out will be compiled in the framework of the PNA in order to assist and promote the plan's various actions and disseminate the data. Recommendations could be formulated in the framework of revising DOCOB or other management plans. If necessary, the PNA facilitator or coordinator could take part in the Steering Committees and Monitoring Committees of the areas concerned. Finally, at the request of the administrative services, expert advice could be provided to help define the avoid, reduce, compensate or offset measures to be implemented during the exemption process together with the monitoring operations to be set up during the operating phase.
	Sub-action n°4.1.3: Improve and/or create specific management tools for European Mink — **Priority 3**
	In function of the results obtained after implementation of sub-actions n°4.1.1 et n°4.1.2, ways could be sought to improve the management measures favourable to European Mink, or even to create new tools to be tested, drawing upon examples set up for other species (technical guides for consultancies, types of compensation ratios, voluntary refuge zones…).
Leader(s) and potential partners	**Action leaders**: • Coordinating DREAL of the PNA • PNA facilitator • LIFE VISON

<table>
<tr><td></td><td>Action partners:
Contracting authorities and project managers responsible for an exemption linked to European Mink, environmental consultancies, Regional Directorates for the Environment, Planning and Housing (DREAL), Departmental Directorates for Territories (and the Sea) (DDTM), local authorities, Chambers of Agriculture, Natura 2000 facilitators, National Forests Agency (ONF), Environmental and Forestry Technical Study Centre (CETEF), Regional Forest Ownership Centre (CRPF), river basin committees, local water commissions, river committees, river syndicates, fishing and aquatic environment protection federations, water agencies, licensed fishing and aquatic environment protection associations, Regional Biodiversity Committee, Coastal Conservancy (Conservatoire du Littoral), natural area managers, Forum des marais atlantiques, Ramsar sites, French Biodiversity Agency (OFB), Centre for Studies and Expertise on Risks, the Environment, Mobility and Planning (CEREMA), National Action Plan for the Otter (PNA Loutre) …</td></tr>
<tr><td>Implementation schedule</td><td>
<table>
<tr><th>Sub-action</th><th>2022</th><th>2023</th><th>2024</th><th>2025</th><th>2026</th><th>2027</th><th>2028</th><th>2029</th><th>2030</th><th>2031</th></tr>
<tr><td>N°4.1.1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>N°4.1.2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>N°4.1.3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>Action scale</td><td>• Sub-action n°4.1.1: area of action of the 3rd PNA
• Sub-action n°4.1.2: area of action of the 3rd PNA
• Sub-action n°4.1.3: area of action of the 3rd PNA</td></tr>
<tr><td>Other species that may benefit</td><td>All animal or plant species living in wetlands or near watercourses.</td></tr>
<tr><td>Monitoring and achievement indicator(s)</td><td>• Number of organisations that receive the guide and other tools
• Number of expert consultancy assignments carried out by 3rd PNA</td></tr>
<tr><td>Deliverable(s)</td><td>• Guide to good management practices favourable for European Mink
• Tools for taking the European Mink into consideration addressed to administrators processing authorisation requests</td></tr>
<tr><td>Financial assessment</td><td>• Facilitator time: 24 500 €/year
• Minimum cost of implementation: 20 000 €/year</td></tr>
<tr><td>Reference document(s) (non-exhaustive)</td><td>• DIrection Régionale de l'ENvironnement (DIREN) Aquitaine et Mission Vison d'Europe. Décembre 2003. Plan National de Restauration du Vison d'Europe 1999-2003 Bilan [en ligne]. 114p. Disponible sur : http://www.nouvelle-aquitaine.developpement-durable.gouv.fr/le-vison-d-europe-a10771.html. [Consulté le 22.09.2020].
• DIrection Régionale de l'ENvironnement (DIREN) et GEREA. Juin</td></tr>
</table>

	2007. Deuxième Plan National de Restauration du Vison d'Europe 2007-2011 [en ligne]. 199p. Disponible sur : http://www.nouvelle-aquitaine.developpement-durable.gouv.fr/le-vison-d-europe-a10771.html. [Consulté le 22.09.2020]. • Direction Régionale de l'Environnement, de l'Aménagement et du Logement (DREAL) et Office National de la Chasse et de la Faune Sauvage (ONCFS). 2019. Évaluation du Plan National d'Actions intermédiaire 2015-2018 en faveur du Vison d'Europe (*Mustela lutreola*). • Directions régionales de l'Environnement, de l'Aménagement et du Logement (DREAL) et Office National de la Chasse et de la Faune Sauvage (ONCFS). 2015. Programme intermédiaire en faveur du Vison d'Europe (2015-2017) [en ligne]. 24p. Disponible sur : http://www.nouvelle-aquitaine.developpement-durable.gouv.fr/le-vison-d-europe-a10771.html. [Consulté le 22.09.2020]. • Ligue pour la Protection des Oiseaux (LPO), Conseil Départemental de la Charente-Maritime, Groupe de Recherche et d'Etude pour la Gestion de l'Environnement (GREGE). Septembre 2020. Rapport d'avancement LIFE Vison du 01/01/2019 au 31/12/2019. 194p. • Mission Vison d'Europe et Conservatoire Régional des Espaces Naturels (CREN) Aquitaine. 2004. Guide méthodologique pour la prise en compte du Vison d'Europe dans les documents d'objectifs Natura 2000. Direction Régionale de l'Environnement (DIREN) Aquitaine. Rapport d'étude. 37p. • Zabala, J., Zuberogoitia, I., Martinez-Climent, J.A. 2006. Factors affecting occupancy by the European mink in south-western Europe. Mammalia, (2006):193-201.

b. Action 4.2: Fight against accidental destruction of European Mink

Action n° 4.2	Fight against accidental destruction of European Mink
Work axis	Contribute to the good status of European Mink habitats and fight against other threats in the wild
Context and issue(s)	**Context:** Currently, in France, the principal threats (DREAL and ONCFS, 2019) to the European Mink are the loss of wetlands (see action n°4.1), competition with an invasive alien species, the American Mink (see action n°3.2) and road casualties. If it can, the European Mink will avoid entering the water to cross water management infrastructures. When it moves along a watercourse, it does so along the banks and if the bank is interrupted by a bridge, it climbs the embankment and crosses by the road, where it is exposed to the risk of being hit (LPO *and al.*, 2017). Moreover, the current low density of European Mink populations obliges individuals seeking a breeding partner

	to travel long distances, which increases road casualty risks. The two periods when there are most casualties are early spring (males moving during the mating season) and high summer (dispersion of young) (DIREN and GEREA, 2007). Various works have been carried out in order to reduce road casualty risks during the course of the various PNAs (DREAL and ONCFS, 2019) and the LIFE VISON programme (LPO *and al.*, 2019) in function of opportunities. These recommendations have been included in the technical guidelines of the Transport and Road Planning Study Service (SETRA) aimed at contracting authorities: "*Planning and measures for small fauna*" (DIREN and GEREA, 2007) and the memorandum "*Otter and European Mink*" (SETRA, 2007). The participation of the various PNAs in defining exemption conditions and planning monitoring committees has improved the taking into consideration of the species. However, even if initial work was carried out in 2016 by the Southwest Centre for Studies and Expertise on Risks, Environment, Mobility and Planning (CEREMA) (DREAL and ONCFS, 2019) et by the LIFE VISON (LPO *and al.*, 2020), a complete inventory still needs to be made of all the infrastructures not yet equipped with ecological passageway systems in the area of application of the PNA. A national database is currently being compiled by the CEREMA to list the new infrastructures equipped for the passage of wildlife. Consultation of this database will be useful for the PNA. In parallel, monitoring of the efficiency of these developments (LIFE VISON - LPO *and al.*, 2020) needs to be continued along with awareness-raising and informing the road services of the departmental councils. Moreover, some maintenance operations (e.g., rotary slashing) can also be a mortality risk factor for European Mink. The technical recommendations guide drawn up during the 1st PNA (DIREN Aquitaine and Mission Vison d'Europe, 2003) and its planned update in action n°4.1, in collaboration with the LIFE VISON programme, should once again provide solutions on land maintenance practices unfavourable to the species. Historically trapped for its fur, the European Mink is now a protected species and is no longer intentionally trapped. However, it can be accidentally captured in traps targeting mustelids (American Mink …) or other semi-aquatic species like the Coypu or Muskrat, and be killed through confusion with them. It is therefore probable that the control campaigns carried out against the American Mink or European Polecat also affected European Mink populations due to identification errors (cases highlighted in the framework of the 1st PNA – DIREN Aquitaine and Mission Vison d'Europe, 2003). Nonetheless, the progressive building of a network of contact persons in the course of the various PNAs reduced the risks of confusion between these species and established a network of local contacts that facilitated the gathering of observation data. This network requires facilitation, regular training and annual updating of the prefectural decrees designating the contact persons. With the exception of the Gers, Lot-et-Garonne and Hautes-Pyrénées departments, all the decrees were updated in the framework of PNAi (DREAL and ONCFS, 2019). In addition, training sessions and awareness-raising operations were carried out during the various PNAs (DIREN Aquitaine and Mission Vison d'Europe, 2003; DREAL and ONCFS, 2019) and are planned in the framework of the LIFE VISON programme (LPO *and al.*, 2017) with

	trappers' associations and pest control federations (see action n°5.2) and during the training of licensed trappers. However, not all trappers are necessarily licensed or members of associations. There is therefore regular local awareness-raising work to be continued or set up. In addition, European Mink populations have probably been impacted by non-selective rodent control techniques through secondary intoxication by anticoagulants (Fournier-Chambrillon *and al.,* 2004) and the large-scale utilisation of lethal traps. Since then and thanks to the first PNAs (DIREN Aquitaine and Mission Vison d'Europe, 2003; DREAL and ONCFS, 2019), changes in regulations have reduced the effects of these control methods on European Mink: regulations on the utilisation of rodenticides (Ministry of Ecology and Sustainable Development, 29 January 2007 Decree), and on types of traps and the European Mink "hatch" in 2013 (Ministry of Ecology, Sustainable Development and Energy, 8 July 2013 Decree). **Issues:** On the European scale, the fragmentation and destruction of European Mink habitats together with overhunting were the principal factors in the historical decline of the species. It seems that the greatest current impacts are mainly due to damage to European Mink habitat and the impact of American Mink (Maran, 2007; Marinov *and al.,* 2013; Haage, 2016). However, the more fragmented the population, the more its decline is influenced by combined causes (Lode *and al.*, 2011). It is therefore also pertinent to combat the secondary causes of European Mink: road casualties, potentially unfavourable or destructive habitat management measures, species confusion in the framework of trapping activities and secondary poisoning.
Objective(s)	• Reduce the risk of destruction due to confusion with European Polecat and American Mink • Reduce the risks of road casualties for European Mink • Reduce the use of management measures that may kill European Mink • Reduce the risks of European Mink mortality by secondary poisoning • Provide expert advice on any regulations that may endanger European Mink
Action description	Reminder: the mortality risks linked to poor management or maintenance practices are covered in action file n°4.1 about combatting the loss of habitats favourable to European Mink. Training sessions on good practices will also be organised (see sub-action n°5.2.1)
	Sub-action n°4.2.1: Fight against accidental destruction linked to trapping — Priority 1
	Organise regular training sessions for Mink contact persons (see action n°5.2): Whenever necessary during 3rd PNA, training sessions should be organised

	in the various departments in its area of action. Particular attention will be paid to the Charente-Maritime and Charente departments in order that the training actions for trappers carried out in the framework of LIFE VISON and the PNA remain coherent. Particular attention will also be paid to the Gers, Lot-et-Garonne and Hautes-Pyrénées departments where no training has yet been dispensed. **Ensure the validity of the prefectural decrees listing the Mink contact persons:** The network of departmental contact persons currently in place needs to be optimised and facilitated to maintain high skill levels and effective coverage of the whole area. For this reason, all the Mink contact persons will be summoned to an annual meeting. This will also be an opportunity to remind them of the regulations in force on trapping (see sub-action n°3.2.3), review the various actions currently underway in the framework of the 3rd PNA, update the list and identify any local, geographical or availability problems. **Ensure the inclusion of a specific European Mink module in trapper training:** See action n°5.1. **Raise awareness among unlicensed trappers about European Mink issues:** In the framework of Coypu control, cage-traps can be laid by any landowner without training, being licensed or even being aware of the presence of European Mink, American Mink or European Polecat. It is essential to include in action n°5.1 the need to raise awareness among these people, who could be mobilised in control actions (see action n°3.2) and ensure observation data are transmitted (see sub-action n°1.4.2).
	Sub-action n°4.2.2: Fight against mortalities due to infrastructure — **Priority 1** Concerning the infrastructures modified for European Mink, the results of the monitoring operations carried out need to be compiled (departmental councils, LIFE VISON…) in order to assess the efficacy of the measures (effective passageways for small fauna, reduction in casualties). The summary of these results needs to be exploited for communicating with planners (see action n°5.1). It is also important to list all infrastructures for which ecological passageways have not been ensured for European Mink, based on the work of the Southwest Centre for Studies and Expertise on Risks, Environment, Mobility and Planning (CEREMA) and LIFE VISON. A prioritisation process should then be established in order to define the sectors urgently requiring modifications. Awareness-raising will then be carried out with the owners of these infrastructures in order to encourage them to intervene then do post-modification monitoring. In addition, for other lower-priority infrastructures that nevertheless present a risk, the

	chosen strategy will be to take advantage of works on the road network to modify them. To achieve this, close contact will be maintained with departmental and regional councils, and also with motorway or railway concessionaries and the interdepartmental roads directorate. This contact could especially be in the form of workshop days to present the issues and the priority sectors for modifications. Some of the tools about taking the European Mink into consideration intended for the administrative services (see sub-action n°4.1.1), will cover infrastructure modifications in order to present the essential aspects of infrastructure that can be crossed by the European Mink in all seasons.	
	Sub-action n°4.2.3: Keep watch concerning the taking into consideration of European Mink conservation in the regulatory texts	**Priority 2**
	The coordinator and the facilitator of the 3rd PNA will keep watch over the regulatory texts and respond to any requests from a legislative organisation (national or local) in order to ensure that the European Mink is correctly taken into consideration in all updated or new regulatory texts. Increased attention will be paid to measures regarding the elimination of organisms listed as likely to cause damage (pests). In addition, the 3rd PNA should identify and communicate to legislative organisations any limiting or incoherent measure in order for it to be corrected. For example, it seems illogical at present that the American Mink is allowed to be shot by hunters whereas in the framework of control operations it cannot be killed by shooting (to avoid the risk of confusion with European Mink).	
Leader(s) and potential partners	**Action leaders**: • Coordinating DREAL of the PNA • PNA facilitator • LIFE VISON • Departmental councils **Action partners**: Contracting authorities and project managers responsible for an exemption linked to European Mink, environmental consultancies, Regional Directorates for the Environment, Planning and Housing (DREAL), Departmental Directorates for Territories (and the Sea) (DDTM), local authorities, Natura 2000 facilitators, departmental trappers' associations, departmental hunters' federations, departmental pest control federations, members of the "Vison" contact person networks, owners of infrastructure, Interdepartmental Atlantic and Centre-West Roads Directorate, French Biodiversity Agency (OFB), Centre for Studies and Expertise on Risks, the Environment, Mobility and Planning (CEREMA)…	

<table>
<tr><td>Implementation schedule</td><td>
<table>
<tr><th>Sub-action</th><th>2022</th><th>2023</th><th>2024</th><th>2025</th><th>2026</th><th>2027</th><th>2028</th><th>2029</th><th>2030</th><th>2031</th></tr>
<tr><td>N°4.2.1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>N°4.2.2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>N°4.2.3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>Action scale</td><td>

Sub-action n°4.2.1: area of action of the 3rd PNA
Sub-action n°4.2.2: area of action of the 3rd PNA
Sub-action n°4.2.3: area of action of the 3rd PNA

</td></tr>
<tr><td>Other species that may benefit</td><td>All species that cannot fly, particularly those living on the edges of flooded areas.</td></tr>
<tr><td>Monitoring and achievement indicator(s)</td><td>

Number of meetings for the Mink contact persons
Number of valid and updated Mink contact person decrees
Number of accidental mortalities recorded (by type)
Number of infrastructures evaluated and modified
Number of expert consultancy assignments on current or future legislation

</td></tr>
<tr><td>Deliverable(s)</td><td>

Tools used for Mink contact person training sessions
Specific European Mink module to be incorporated into trapper training
Awareness-raising booklet for trappers created in the framework of the LIFE VISON programme (revised if necessary)
Summary of the comparison between different ways of modifying infrastructure
Tools on taking the European Mink into account for administrative personnel responsible for processing authorisation requests

</td></tr>
<tr><td>Financial assessment</td><td>

Facilitator time: 21 500 €/year
Minimum cost of implementation: 80 000 €/year

</td></tr>
<tr><td>Reference document(s) (non-exhaustive)</td><td>

DIrection Régionale de l'ENvironnement (DIREN) Aquitaine et Mission Vison d'Europe. Décembre 2003. Plan National de Restauration du Vison d'Europe 1999-2003 Bilan [en ligne]. 114p. Disponible sur : http://www.nouvelle-aquitaine.developpement-durable.gouv.fr/le-vison-d-europe-a10771.html. [Consulté le 22.09.2020].
DIrection Régionale de l'ENvironnement (DIREN) et GEREA. Juin 2007. Deuxième Plan National de Restauration du Vison d'Europe 2007-2011 [en ligne]. 199p. Disponible sur : http://www.nouvelle-aquitaine.developpement-durable.gouv.fr/le-vison-d-europe-a10771.html. [Consulté le 22.09.2020].
Direction Régionale de l'Environnement, de l'Aménagement et du Logement (DREAL) et Office National de la Chasse et de la Faune Sauvage (ONCFS). 2019. Évaluation du Plan National d'Actions intermédiaire 2015-2018 en faveur du Vison d'Europe (Mustela lutreola).

</td></tr>
</table>

- Fournier-Chambrillon, C., Berny, P.J., Coiffier, O., Baebedienne, P., Dasse, B., Delas, G., Galineau, H., Mazet, A., Pouzenc, P., Rosoux, R., Fournier, P. 2004b. Evidence of secondary poisoning of free-ranging riparian mustelids by anticoagulants rodenticides in France: implications for conservation of European mink (*Mustela lutreola*). Journal of Wildilife Deseases, 40 (4) : 688-695.
- Haage, M. 2016. Conservation, personality and ecology of the European mink (*Mustela lutreola*). Sotckholm University. ISBN 978-91-7679-420-2. 40p.
- Ligue pour la Protection des Oiseaux (LPO), Conseil Départemental de la Charente-Maritime, Groupe de Recherche et d'Etude pour la Gestion de l'Environnement (GREGE). 26 Avril 2017. LIFE16 NAT/FR/000872-Conservation of the European Mink and associated community interest species and habitats of the Charente River Basin.
- Ligue pour la Protection des Oiseaux (LPO), Conseil Départemental de la Charente-Maritime, Groupe de Recherche et d'Etude pour la Gestion de l'Environnement (GREGE). Septembre 2020. Rapport d'avancement LIFE Vison du 01/01/2019 au 31/12/2019. 194p.
- Lode T., Cornier J.P., Le Jacques D. 2011. Decline in endangered species as an indication of anthropic pressures: the case of European mink *Mustela lutreola* Western population. Environ Manage, 28(6), 727-735.
- Maran, T. 2007. Conservation biology of the European mink, *Mustela lutreola* (Linnaeus 1761): Decline and causes of extinction. Chair of Geo-Ecology. Faculty of Mathematics and Natural Sciences of Tallinn University. 38p.
- Marinov, M., Kiss, J., Toman, A., Polednik, L., Alexe, V., Doroftei, M., Dorosencu, A., Kranz, A. 2013. Monitoring of the European Mink (*Mustela lutreola*) in the Danube Delta Biosphere Reserve – Romania, 2003-2011. Current status and setting of goals for the European Mink conservation. Scientific Annals of the Danube Delta Institute. Vol 18, 69-74.
- Ministère de l'écologie et de développement durable et de l'énergie. 14 juillet 2013. Arrêté du 8 juillet 2013 pris pour l'application de l'article R. 427-6 du code de l'environnement et fixant la liste, les périodes et les modalités de destruction des espèces non indigènes d'animaux classés nuisibles sur l'ensemble du territoire métropolitain [en ligne]. Journal officiel, n°0162 du 14 juillet 2013 page 11788 texte n°9. Disponible sur : https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000027697981&categorieLien=id. [Consulté le 22.09.2020].
- Ministère de l'écologie et de développement durable. 29 janvier 2007. Arrêté du 29 janvier 2007 fixant les dispositions relatives au piégeage des animaux classés nuisibles en application de l'article L. 427-8 du code de l'environnement [en ligne]. Journal officiel, n°91 du 18 avril 2007 page 6961 texte n°31, version consolidée au 4 septembre 2020. Disponible sur : https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000000648027&dateTexte=20200904. [Consulté le 22.09.2020].

6. Axis 5: Communication and training on the European Mink and the actions of 3rd PNA

a. Action 5.1: Develop and implement a communication strategy

Action n° 5.1	Develop and implement a communication strategy
Work axis	Communication and training on the European Mink and the actions of 3rd PNA
Context and issue(s)	**Context:** In France, the first large scale knowledge dissemination actions were carried out in the early 1990's by means of encyclopaedias, conferences and a public awareness-raising programme with leaflets and posters (Camby, 1990; DIREN Aquitaine and GREGE, 1999). Subsequently, during the 1st PNA, various media were created: bi-annual newsletter, leaflets, press pack, website (although now offline), films (including the one by Robert Luques), books, press articles, television appearances, and scientific communications. Despite all the efforts made, the media impact for the general public was low at national level (DIREN Aquitaine and Mission Vison d'Europe, 2003). The launching of the 2nd PNA was marked by the dissemination of the PNA, a public meeting and the publishing of a leaflet. Awareness-raising actions were also carried out with the administrative services, managers of natural areas, planners, hunters, trappers and the general public, and documents were made available on the DREAL and ONCFS websites. Finally, a PNA logo was created (DREAL, 2012). During PNAi, various communication and awareness-raising actions were also carried out: making of a film, publishing of a poster and a leaflet, numerous articles in the specialised and general-public press and presentations during national and international colloquia. A page dedicated to the European Mink was recreated on the DREAL Nouvelle-Aquitaine and OFB websites. They disseminate all documents useful (DREAL and ONCFS, 2019). At this same period, the LIFE VISON programme organised and participated in several communication actions: national and international colloquia, meetings on the differentiated management of habitats in Charente river basin: website, information boards, articles, videos, leaflets, newsletters, training kit … (LPO *and al.*, 2020). **Issues:** Since 2011, the European Mink has been listed as "critically endangered" worldwide, since 2012 in Europe and since 2017 in France (MNHN, 2020a). Despite this alarming classification and various conservation programmes set up, the European Mink remains a species quite unknown to the general public. When we speak of Mink, the general public first thinks about fur production rather than the existence of a protected heritage

	species facing the threat of extinction. As for local stakeholders, the species is generally known but prejudices and gaps in knowledge need to be addressed. The European Mink is discreet, furtive and crepuscular, and often goes unnoticed making it difficult to take it into account. It is well known that it is difficult to protect something that people do not see. It is for these reasons, to protect the species more actively, that the 3rd PNA includes awareness-raising actions for the general public and local stakeholders on the species and all actions: favourable management measures, protection of habitats and fighting against the American Mink… Finally, this communication section must be designed in a way that is complementary to the training section (see action n°5.2).
Objective(s)	• Communicate about the actions implemented during the 3rd PNA • Communicate and raise awareness of the European Mink, its ecology and causes of its declining populations • Reach target audiences
Action description	**Sub-action n°5.1.1: Develop and implement a communication plan** — **Priority 1** The first step consists in identifying all the audiences targeted in the 3rd PNA (local, national and international) and the associated communication objectives. For the various target audiences and objectives identified, the communication media will be defined according to relevance. Great care will be paid to the reuse and/or recovery of already existing communication media (film, leaflet, poster…) or those being developed in the context of LIFE VISON programme (habitat guide, Kakemono displays…). New tools can be developed, if needed, in the framework of the 3rd PNA. In function of the target audience (funder, partners, general public…) and planned resources, mailing lists (postal, email…) will be drawn up to ensure rapid and exhaustive dissemination of information. This awareness-raising information will focus in particular on the ecology of the European Mink, its habitat and food resource requirements, conditions for carrying out work on watercourses and wetlands, the characteristics of infrastructure to allow semi-aquatic mammals to move freely, trapping etc. Finally, once stabilised, the communication plan will be implemented over the 10 years of the 3rd PNA. Relays with local organisations will be sought to guarantee the proper dissemination of information while emphasising the network of partners contributing to the action plan. One priority is communication actions for the launch and closure of the 3rd PNA. The pages dedicated to Mink on the DREAL and OFB websites will be kept up to date.

<table>
<tr><td></td><td colspan="2">Sub-action n°5.1.2: Respond to communication requests</td><td>Priority 2</td></tr>
<tr><td></td><td colspan="3">As far as possible and according to relevance, the PNA coordinator and facilitator will seek to respond to requests (international, national or local) about PNA-related subjects.</td></tr>
<tr><td>Leader(s) and potential partners</td><td colspan="3">Action leaders:
Coordinating DREAL of the PNA
PNA facilitator
LIFE VISON
Action partners:
Local authorities, Ministry of the Environment, Ministry for Higher Education, EEP Vison, French Institute of Animal Cinema training at Ménigoute (IFCAM), road concession holders, environmental consultancies, nature protection associations, Permanent Centres of Initiatives for the Environment, Chamber of Agriculture, cooperatives, National Forests Agency (ONF), DREAL, DDT(M), DD(CS)PP, prefectures, departmental trappers' associations, natural area management authorities, Natura 2000 facilitators, fishing and aquatic environment protection federations, departmental hunters' federations, departmental pest control federations, zoos, LIFE Lutreola Spain, French Biodiversity Agency (OFB) …</td></tr>
<tr><td>Implementation schedule</td><td colspan="3"><table><tr><th>Sub-action</th><th>2022</th><th>2023</th><th>2024</th><th>2025</th><th>2026</th><th>2027</th><th>2028</th><th>2029</th><th>2030</th><th>2031</th></tr><tr><td>N°5.1.1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>N°5.2.2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table></td></tr>
<tr><td>Action scale</td><td colspan="3">Sub-action n°5.1.1: local, national and international
Sub-action n°5.1.2: local, national and international</td></tr>
<tr><td>Other species that may benefit</td><td colspan="3">Any species living in the same habitats as the European Mink using the same ecological corridors</td></tr>
<tr><td>Monitoring and achievement indicator(s)</td><td colspan="3">Number and types of communication operations carried out
Number of people reached via Internet</td></tr>
<tr><td>Deliverable(s)</td><td colspan="3">Communication plan
Mailing list(s)
Communication materials</td></tr>
<tr><td>Financial assessment</td><td colspan="3">Facilitator time: 13 000 €/year
Minimum cost of implementation: 30 000 €/year</td></tr>
<tr><td>Reference document(s) (non-exhaustive)</td><td colspan="3">Camby, A. 1990. Le Vison d'Europe (Mustela lutreola) (Linnaeus, 1761). Encyclopédie des carnivores de France n° 13. Société française pour l'étude et la protection des mammifères. 19p.</td></tr>
</table>

	• DIrection Régionale de l'ENvironnement (DIREN) Aquitaine et Mission Vison d'Europe. Décembre 2003. Plan National de Restauration du Vison d'Europe 1999-2003 Bilan [en ligne]. 114p. • Disponible sur : http://www.nouvelle-aquitaine.developpement-durable.gouv.fr/le-vison-d-europe-a10771.html. [Consulté le 22.09.2020]. • DIrection Régionale de l'ENvironnement (DIREN) Aquitaine, Groupe de Recherche et d'Etude pour la Gestion de l'Environnement (GREGE) et Agence de Recherche pour la Protection des Espaces Naturels (ARPEN). 1999. Plan de restauration national du Vison d'Europe 1999-2003 [en ligne]. 66p. • Disponible sur : http://www.nouvelle-aquitaine.developpement-durable.gouv.fr/le-Vison-d-europe-a10771.html. [Consulté le 22.09.2020]. • Direction Régionale de l'Environnement, de l'Aménagement et du Logement (DREAL) Aquitaine. Aout 2012. Deuxième Plan national d'actions du Vison d'Europe (2007-2011) - Bilan technique et financier (tome 1).127p. • Direction Régionale de l'Environnement, de l'Aménagement et du Logement (DREAL) et Office National de la Chasse et de la Faune Sauvage (ONCFS). 2019. Évaluation du Plan National d'Actions intermédiaire 2015-2018 en faveur du Vison d'Europe (*Mustela lutreola*). • Ligue pour la Protection des Oiseaux (LPO), Conseil Départemental de la Charente-Maritime, Groupe de Recherche et d'Etude pour la Gestion de l'Environnement (GREGE). Septembre 2020. Rapport d'avancement LIFE Vison du 01/01/2019 au 31/12/2019. 194p. • Muséum National d'Histoire Naturelle (MNHN). 2003-2020. 2020a. Inventaire National du Patrimoine Naturel [en ligne]. • Disponible sur : https://inpn.mnhn.fr/espece/cd_nom/60704/tab/statut. [Consulté le 22.09.2020].

b. Action 5.2: Organise training courses to raise awareness about the European Mink and its conservation issues

Action n° 5.2	Organise training courses to raise awareness about the European Mink and its conservation issues
Work axis	Communication and training on the European Mink and the actions of 3rd PNA
Context and issue(s)	**Context:** In the framework of the 1st PNA, "technical days" for personnel responsible for territorial planning and management of national habitats were organised along with meetings and workgroups for watercourse professionals (DIREN Aquitaine and Mission Vison d'Europe, 2003).

	Trappers were also made aware and trained differently depending on the department. Specific content on the European Mink was included in training courses for trapping monitors in the Gironde department. Training sessions specifically dedicated to the European Mink were organised in all departments except Lot-et-Garonne, Gers and Hautes-Pyrénées. This awareness-raising for trappers was essential to highlight the very real risk of confusion (DIREN Aquitaine and Mission Vison d'Europe, 2003). Finally, awareness-raising for pest control federations was carried out at the time when regulations on the use of chemical control and lethal traps were changed to alternative methods (DIREN Aquitaine et Mission Vison d'Europe, 2003). During the 2nd PNA, thematic meetings informed and raised awareness among stakeholders in the field and wetland professionals, while however not being able to reach out to everyone (DREAL, 2012). At the same time, approximately Mink contact persons were trained on how to avoid risks of confusion between species (about 200 people) and some twenty training courses were provided to trappers to strengthen the existing network (DREAL, 2012). In the framework of PNAi, this network of Mink contact persons was reactivated (still being set up in departments Lot-et-Garonne, Gers and Hautes-Pyrénées) with the organisation of 6 departmental training courses. Furthermore, the launching of a new survey campaign required training all the participants (DREAL and ONCFS, 2019). During this period, the ONCFS also added a focus on these issues in training courses on invasive alien species for its external partners. In addition, other training course actions for trappers are planned in the LIFE VISON programme and must be implemented shortly in close coordination with the PNA. Finally, training courses for water and aquatic habitat stakeholders are being organised in the context of the LIFE VISON programme, and other courses for forestry workers and infrastructure developers are planned (LPO *and al.,* 2017). **Issues:** Although training courses were included in the context of 1st PNA, 2nd PNA, intermediary PNA and LIFE VISON programme, deficiencies and misunderstandings persist concerning all the action axes of 3rd PNA. In addition, knowledge of species and habitats is evolving continuously along with the personnel in charge of the issues. It is important for newcomers to attend the training courses and/or updates. For these training courses to be as relevant and efficient as possible, they must be adapted to target audiences and provide concrete applications and actions.
Objective(s)	• Train as many stakeholders as possible to raise awareness and implement favourable actions for the European Mink

<table>
<tr><td rowspan="4">Action description</td><td>Sub-action n°5.2.1: Design training modules that can be adapted to the audiences concerned</td><td>Priority 1</td></tr>
<tr><td colspan="2">Along with developing a communication plan (see action n°5.1), a training plan will be drawn up. After identifying the target audiences (trappers, managers, administrative services, Natura 2000 facilitators…), various adapted training courses will be offered.

This involves having regularly updated training material. For example, a training module may be offered to existing training institutions (Centre of Human Resource Development, OFB, training courses for trappers, hunting licenses…). A simplified training course adapted to being used by a third party other than the PNA facilitator could be useful (transferable version). Conversely, a more detailed and precise module could be produced for partners in charge of PNA actions.

There are many topics that could be addressed: the ecology of European Mink, its needs in terms of habitat and food resources, criteria for species recognition, conditions to carry out work on watercourses and wetlands respectful of European Mink, characteristics of equipment used to enable European Mink to move freely and safely either side of linear utility infrastructures…

This training plan will include training courses for Mink contact persons (see sub-action n°4.2.1) and road owners see sub-action n°4.2.2). It will also be indispensable to have mandatory training for partners responsible for PNA actions.</td></tr>
<tr><td>Sub-action n°5.2.2: Respond to training requests</td><td>Priority 2</td></tr>
<tr><td colspan="2">Depending on a volume to be assessed yearly, the purpose is to respond as fully as possible to requests for training courses made to the coordinator and facilitator of the 3rd PNA. Within this context, the simplified transferable training course (see sub-action n°5.2.1) could be made available to those who make the requests.</td></tr>
<tr><td>Leader(s) and potential partners</td><td colspan="2">Action leaders:
• Coordinating DREAL of the PNA
• PNA facilitator
• LIFE VISON

Action partners:
Local authorities, Ministry of the Environment, Ministry for Higher Education, EEP Vison, French Institute of Animal Cinema training at Ménigoute (IFCAM), road concession holders, environmental consultancies, nature protection associations, Permanent Centres of Initiatives for the Environment, Chambers of Agriculture, cooperatives, National Forests Agency (ONF), DREALs, DDT(M)s, DD(CS)PPs, Prefectures, departmental trappers' associations, natural area management authorities, Natura 2000 facilitators, fishing and aquatic environment protection federations, departmental hunters' federations, departmental pest control federations, zoos, LIFE Lutreola Spain, OFB…</td></tr>
</table>

<table>
<tr><td>Implementation schedule</td><td>
<table>
<tr><th>Sub-action</th><th>2022</th><th>2023</th><th>2024</th><th>2025</th><th>2026</th><th>2027</th><th>2028</th><th>2029</th><th>2030</th><th>2031</th></tr>
<tr><td>N°5.2.1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>N°5.2.2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>Action scale</td><td>• Sub-action n°5.2.1: area of action of the 3rd PNA
• Sub-action n°5.2.2: area of action of the 3rd PNA</td></tr>
<tr><td>Other species that may benefit</td><td>Any species living in the same habitats as the European Mink using the same ecological corridors</td></tr>
<tr><td>Monitoring and achievement indicator(s)</td><td>• Number of training courses dispensed
• Number of people trained</td></tr>
<tr><td>Deliverable(s)</td><td>• Training programme with its target audiences
• Training materials</td></tr>
<tr><td>Financial assessment</td><td>• Facilitator time: 8 000 €/year
• Minimum cost of implementation: 10 000 €/year</td></tr>
<tr><td>Reference document(s) (non-exhaustive)</td><td>• DIrection Régionale de l'ENvironnement (DIREN) Aquitaine et Mission Vison d'Europe. Décembre 2003. Plan National de Restauration du Vison d'Europe 1999-2003 Bilan [en ligne]. 114p. Disponible sur : http://www.nouvelle-aquitaine.developpement-durable.gouv.fr/le-vison-d-europe-a10771.html. [Consulté le 22.09.2020].
• Direction Régionale de l'Environnement, de l'Aménagement et du Logement (DREAL) Aquitaine. Aout 2012. Deuxième Plan national d'actions du Vison d'Europe (2007-2011) - Bilan technique et financier (tome 1).127p.
• Direction Régionale de l'Environnement, de l'Aménagement et du Logement (DREAL) et Office National de la Chasse et de la Faune Sauvage (ONCFS). 2019. Évaluation du Plan National d'Actions intermédiaire 2015-2018 en faveur du Vison d'Europe (Mustela lutreola).
• Ligue pour la Protection des Oiseaux (LPO), Conseil Départemental de la Charente-Maritime, Groupe de Recherche et d'Etude pour la Gestion de l'Environnement (GREGE). 26 Avril 2017. LIFE16 NAT/FR/000872-Conservation of the European Mink and associated community interest species and habitats of the Charente River Basin.</td></tr>
</table>

V. Provisional budget and intended sources of funding

1. Financial estimation of the 3rd PNA

The costing of each of the 13 actions is given in each action file. The total of all these cost estimates (see details in annexe n°10) result in the table below presenting the annual cost of implementing 3rd PNA:

	Action 1	Action 2	Action 3	Action 4	Annual total
Axis 1	171 500 €	172 000 €	34 500 €	18 500 €	396 500 €
Axis 2	70 500 €	131 000 €	-	-	201 500 €
Axis 3	8 500 €	243 000 €	21 000 €	-	272 500 €
Axis 4	44 500 €	101 500 €	-	-	146 000 €
Axis 5	43 000 €	18 000 €	-	-	61 000 €
					1 077 500 €

Table 4: Annual financial estimation of the 3rd PNA for the European Mink

To the cost for carrying out actions must be added the coordination time of the coordinating DREAL and facilitator for the cross-functional management of 3rd PNA, drafting assessments, organisation/facilitation of COPIL/CS/workgroups, financial management, and coordination with other French programmes. This cost is estimated at 0.5 FTE per organisation, i.e., 1 FTE in total, or approximately 74 000 €/year.

In total, the carrying out of PNA3 is therefore estimated at 1 151 500 €/year, i.e., a total of 11 515 000 € for the 10 years it will take.

2. Sources of funding for 3rd PNA

Financial engineering (seeking and mobilisation of funding) will be carried out throughout the 3rd PNA by the coordinating DREAL and the facilitator of the PNA (see paragraph III.3). As far as possible, financial needs will be anticipated. Sources will be varied and adapted to actions: public action instruments (European Interreg programme, European LIFE+ programme, European Regional Development Fund, European Agricultural Fund for Rural Development, Natura 2000, State, regions, water agencies, OFB, departmental councils, support measures…), university projects, calls for research projects, private individuals, foundations, environmental sponsorships, etc.

VI. Implementation schedule of the 3rd PNA

N° of action	Name of action	Priority	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Axis 1: Enhance knowledge about the European Mink												
Action 1.1: Monitor trends in the range of the European Mink												
Sub-action n°1.1.1: Update the European Mink distribution map with validated data		1										
Sub-action n°1.1.2: Assess and compare alternative methods to capture survey campaigns		2										
Action 1.2: Characterise European Mink populations												
Sub-action n°1.2.1: Characterise European Mink population nuclei		1										
Sub-action n°1.2.2: Improve knowledge about the utilisation of habitats and occupation of territory		2										
Action 1.3: Monitor the health status of European Mink populations												
Sub-action n°1.3.1: Draw up and implement a health monitoring programme for the European Mink		2										
Sub-action n°1.3.2: Develop and implement a protocol for the management of individuals in distress		1										
Action 1.4: Organise the gathering and use of data with their producers												
Sub-action n°1.4.1: Manage and feed the databases relating to the implementation of the PNA		1										
Sub-action n°1.4.2: Gather data produced by partners and define a common framework for their use		2										
Sub-action n°1.4.3: Produce and update a bibliographical summary on the European Mink		3										

N° of action	Name of action	Priority	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Axis 2: Conservation breeding of European Mink and strategy for translocation into the wild												
Action 2.1: Perpetuate/strengthen European Mink conservation breeding in France and strengthen its integration within the European Endangered species Programme (EEP)												
Sub-action n°2.1.1: Feedback on European Mink breeding practices and updating of reference documents		1										
Sub-action n°2.1.2: Draw up guidelines together with the EEP of appropriate management for French breeding centres		2										
Sub-action n°2.1.3: Contribute to the EEP, in particular by carrying out studies		3										
Action 2.2: Define and implement a strategy for translocation into the wild												
Sub-action n°2.2.1: Choose the translocation strategy		1										
Sub-action n°2.2.2: Prepare the translocation area(s)		2										
Sub-action n°2.2.3: Implement translocations, monitor released individuals and their translocation sites		2										
Axis 3: Limit the impact of the American Mink and other non-native species on the European Mink												
Action 3.1: Fight against the sources of the introduction of American Mink into the wild												
Sub-action n°3.1.1: Verify the state of American Mink fur farms		3										
Sub-action n°3.1.2: Verify keeping conditions for owners other than fur farms		2										
Sub-action n°3.1.3: Provide the expertise required for changing the reglementary status of the American Mink in France		1										

N° of action	Name of action	Priority	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Action 3.2: Fight against the American Mink in the wild												
Sub-action n°3.2.1: Refine and implement the control strategy		1										
Sub-action n°3.2.2: Improve the efficacy of American Mink control		2										
Sub-action n°3.2.3: Study possible regulatory adaptations in the framework of American Mink control		2										
Action 3.3: Study the potential impact of other non-native species on the European Mink												
		3										
Axis 4: Contribute to the good status of European Mink habitats and fight against other threats in the wild												
Action 4.1: Fight against the loss of habitats favourable to the European Mink												
Sub-action n°4.1.1: Strengthen the taking into consideration of the European Mink in management plans, programmes and documents		1										
Sub-action n°4.1.2: Assist the implementation of DOCOB offset or compensation measures for the European Mink		2										
Sub-action n°4.1.3: Improve and/or create specific management tools for European Mink		3										
Action 4.2: Fight against accidental destruction of European Mink												
Sub-action n°4.2.1: Fight against accidental destruction linked to trapping		1										
Sub-action n°4.2.2: Fight against mortalities due to infrastructure		1										
Sub-action n°4.2.3: Keep watch concerning the taking into consideration of European Mink conservation in the regulatory texts		2										

N° of action	Name of action	Priority	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Axis 5: Communication and training on the European Mink and the actions of 3rd PNA												
Action 5.1: Develop and implement a communication strategy												
Sub-action n°5.1.1: Develop and implement a communication plan		1										
Sub-action n°5.1.2: Respond to communication requests		2										
Action 5.2: Organise training courses to raise awareness about the European Mink and its conservation issues												
Sub-action n°5.2.1: Design training modules that can be adapted to the audiences concerned		1										
Sub-action n°5.2.2: Respond to training requests		2										

Table 5: Implementation schedule of 3rd PNA

VII. Bibliography

Acloque, A. 1900. Faune de France contenant la description des espèces indigènes. Mammifères, oiseaux, poissons, reptiles, batraciens, protochordés. Librairie J.B Baillère et fils. Paris. 548p.

Agence Gaiadomo. Mars 2012. Etudes nécessaires pour identifier les aires de réimplantation du Vison d'Europe. 60p.

Amblard O. 2013. Étude comparative des causes de mortalité de visons d'Europe (*Mustela lutreola*) en France et en Navarre. Rapport de stage Mini-Projet. École Nationale Vétérinaire de Toulouse. 40p.

Amstislavsky, S., Kizilova, E., Ternovskaya, Y., Zudova, G., Lindeberg, H., Aalto, J., Valtonen, M. 2006. Embryo development and embryo transfer in the European mink (*Mustela lutreola*), an endangered mustelid species. Reproduction, Fertility and Development, 2006, 18, 459-467.

Amstislavsky, S., Ternovskaya, Y. 2000. Reproduction in mustelids. Animal Reproduction Science, 60-61, 571-581.

Anisimova, E.I. 2004. Study on the European mink *Mustela lutreola* helminthocenoses in connection with the American mink *M. vison* expansion in Belarus: story of the study and review of the results. Helminthologia, 41(4):193-196.

Arambarri, R., Rodriguez, A.F., Belamendia, G. 1997. Selección de habitat, mortalidad y nueva aportacion a la distribucion del Vison Europeo (*Mustela lutreola*) en Alava. Est. Mus. Cienc. Nat. De Alava, 12:217-225.

Baillie, J.E.M., Hilton-Taylor, C., Stuart S.N. 2004. IUCN Red List of Threatened Species. A Global Species Assessment. IUCN, Gland, Switzerland and Cambridge, UK. Xxiv. 191p.

Bartoszewicz, M., Okarma, H., Zalewski, A., Szczesna, J. 2008. Ecology of the raccoon (*Procyon lotor*) from Western Poland. Annales Zoologici Fennici, 45(4), 291-298.

Bernard, P. 1994. Les zones humides. Rapport d'évaluation. La documentation Française. 396p.

Bevanger, K., Henriksen, G. 1995. The distributional history and present status of the American mink (*Mustela Vison* Schreber, 1777) in Norway. Ann. Zool. Fenn., 32:11–14.

Brunstrom, B., Lund, B.O., Bergman, A., Asplund, L., Athanassiadis, I., Athanasiadou, M., Jensen, S., Orberg J. 2001. Reproductive toxicity in mink (*Mustela vison*) chronically exposed to environmentally relevant polychlorinated biphenyl concentrations. Environmental Toxicology and Chemistry, Vol. 20, No. 10, pp. 2318-2327, 2001.

Bryce, R., Oliver, M.K., Davies, L., Gray, H., Urquhart, J., Lambin, X. 2011. Turning back the tide of American mink invasion at an unprecedented scale through community participation and adaptive management. Biological Conservation 144(1): 575–583.

Cabria, M.T, Michaux, J., Gomez-Moliner, B.J., Skumatov, D., Maran, T., Fournier, P., Lopez De Luzuriaga, J., Zardoya. 2011. Bayesian analysis of hybridization and introgression between the endangered European mink (*Mustela lutreola*) and the polecat (*Mustela putorius*). Molecular Ecology, 20: 1176-1190.

Cabria, M.T., Gonzalez, E.G., Gomez-Moilner, B.J, Michaux, J.R, Skumatov, D., Kranz, A., Fournier, P., Palazon, S., Zardoya, R. 2015. Patterns of genetic variation in the endangered European Mink (*Mustela lutreola* L., 1761). BMC Evolutionary Biology, 15-141.

Camby, A. 1990. Le Vison d'Europe (*Mustela lutreola*) (Linnaeus, 1761). Encyclopédie des carnivores de France n° 13. Société française pour l'étude et la protection des mammifères. 19p.

Cena, J.C., Cena, A., Gomez, A., Luzuriaga, J. 2003. Aspectos de la ecologia y de la composicion de la poblacion de Vison europeo *Mustela lutreola* (Linnaeus, 1761) en la cuenca alta del rio Ebro. Proceedings book of the International Conference on the Conservation of European Mink (*Mustela lutreola*), 5-8 november 2003. Gobierno de la Rioja, Logrono: 63-84.

Chanudet, F., Saint Girons, M.C. 1981. La répartition du Vison européen (*Mustela lutreola* L.) dans le sud-ouest de la France. Ann. Soc. Sc. Nat. Ch. Mar., 6 (8):851-858.

Claudius, F. 1866. Bemerkungen. Zool. Garten, 7:315.

Code de l'Environnement, article L411-2 de la section 1 « conservation de sites d'intérêt géologique, d'habitats naturels, d'espèces animales ou végétales et de leurs habitats [en ligne]. Disponible sur : https://www.legifrance.gouv.fr/codes/article_lc/LEGIARTI000033034252/2016-08-10. [Consulté le 07.12.2020].

Collectif. 2003. La Gestion des Habitats du Vison d'Europe - Recommandations techniques. Conseil général des Landes, Groupe de Recherche et d'Etude pour la Gestion de l'Environnement (GREGE), Centre d'Etudes Techniques de l'Equipement (CETE) du Sud-Ouest, Service d'Etudes sur les Transports, les Routes et leurs Aménagements (SETRA), Société Française pour l'Etude et la Protection des Mammifères (SFEPM). 63p.

Conseil de l'Europe. 1979. Convention relative à la conservation de la vie sauvage et du milieu naturel de l'Europe [en ligne]. Série des traités européens – n°104. Disponible sur : https://obv-na.fr/ofsa/ressources/3_ref_regle/ConventiondeBerne-EUROPE-1979.pdf. [Consulté le 14.12.2020].

Danilov, P.I., Tumanov, I.L. 1976. The ecology of the European and American mink in the Northwest of the USSR. Ecology of birds and mammals in the Northwest of the USSR. Akad. Nauk. Karelski filial, Inst. Biol., 118-143.

Davison, A., Birks, J.D.S, Griffiths, H.I., Kitchener, C., Biggins, D., Butlin, R.K. 1999. Hybridization and the phylogenetic relationship between polecat an domestic ferrets in Britain. Biol. Conderv., 87:155-161.

Davison, A., Birks, J.D.S, Maran, T., Macdonald, D.W., Sidorovich, V.E, Griffiths, H.I. 2000. Conservation implications of hybridization between polecats, ferrets and European mink (*Mustela spp.*). In Mustelids in a modern world : 153-162. GRIFFITHS H.I. (Ed.). Leiden:Backhuys.

Davison, A., Griffiths, H.I., Brookes, R., Maran, T., Macdonald, D.W., Sidorovich, V.E., Kitchener, A.C., Irizar, I., Villate, I., Gonzalez-Esteban, J., Cena, J.C., Moya, I., Palazon, S. 2000. Mitochondrial DNA and paleontological evidence for the origins of the endangered European mink, *Mustela lutreola*. Animal Conservation, 3:345-355.

De Bellefroid, M.N, Rosoux, R. 2000. Le Vison d'Europe dans le Centre-Ouest atlantique. Evolution et devenir. SFEPM / Museum d'Histoire Naturelle de La Rochelle, DIREN Poitou-Charentes. Rapport d'étude. 53p.

De Bellefroid, M.N. 1997. Le Vison d'Europe, statut, répartition et devenir en Poitou-Charentes et dans les zones limitrophes. Rapport pour le compte du Parc Interrégional du Marais Poitevin. Association Pro Lutra et Muséum d'Histoire Naturelle de La Rochelle. 65p.

De Bellefroid, M.N. 1999. Etude biogéographique de l'évolution de la population de Vison européen, *Mustela lutreola*, en France. Statut, répartition, écologie, facteurs de déclin et stratégie de conservation pour l'espèce. Diplôme doctoral de recherche. Université de Rennes I. 93p.

De Bellefroid, M.N., Rosoux, R. 2005. Le Vison d'Europe. Belin Eveil nature, collection « Approche ». Paris. 96p.

De Bellefroid, M.N., Rosoux, R. 1998. Le « Vison du Poitou », un hôte des zones humides menacés dans le Centre Ouest atlantique. Annales de la société des sciences naturelles de Charente-Maritime, 8(7):865-879.

De Montlezun, M. 1905. Note sur le vison, *Mustela lutreola* L. Soc. Hist. Nat. de Toulouse, 39(1):1-4.

DIrection Régionale de l'ENvironnement (DIREN) Aquitaine et Mission Vison d'Europe. Décembre 2003. Plan National de Restauration du Vison d'Europe 1999-2003 Bilan [en ligne]. 114p. Disponible sur : http://www.nouvelle-aquitaine.developpement-durable.gouv.fr/le-vison-d-europe-a10771.html. [Consulté le 22.09.2020].

DIrection Régionale de l'ENvironnement (DIREN) Aquitaine, Groupe de Recherche et d'Etude pour la Gestion de l'Environnement (GREGE) et Agence de Recherche pour la Protection des Espaces Naturels (ARPEN). 1999. Plan de restauration national du Vison d'Europe 1999-2003 [en ligne]. 66p. Disponible sur : http://www.nouvelle-aquitaine.developpement-durable.gouv.fr/le-Vison-d-europe-a10771.html. [Consulté le 22.09.2020].

DIrection Régionale de l'ENvironnement (DIREN) et GEREA. Juin 2007. Deuxième Plan National de Restauration du Vison d'Europe 2007-2011 [en ligne]. 199p. Disponible sur : http://www.nouvelle-aquitaine.developpement-durable.gouv.fr/le-vison-d-europe-a10771.html. [Consulté le 22.09.2020].

Direction Régionale de l'Environnement de l'Aménagement et du Logement (DREAL) et Office National de Chasse et de Faune Sauvage (ONCFS). 2015b. Note relative à la répartition du Vison d'Europe. 2p.

Direction Régionale de l'Environnement, de l'Aménagement et du Logement (DREAL) Aquitaine. Aout 2012. Deuxième Plan national d'actions du Vison d'Europe (2007-2011) - Bilan technique et financier (tome 1).127p.

Direction Régionale de l'Environnement, de l'Aménagement et du Logement (DREAL) et Office National de la Chasse et de la Faune Sauvage (ONCFS). 2019. Évaluation du Plan National d'Actions intermédiaire 2015-2018 en faveur du Vison d'Europe (*Mustela lutreola*).

Directions régionales de l'Environnement, de l'Aménagement et du Logement (DREAL) et Office National de la Chasse et de la Faune Sauvage (ONCFS). 2015a. Programme intermédiaire en faveur du Vison d'Europe (2015-2017) [en ligne]. 24p. Disponible sur : http://www.nouvelle-aquitaine.developpement-durable.gouv.fr/le-vison-d-europea10771.html. [Consulté le 22.09.2020].

Dunstone, N. 1993. The Mink. T & AD Pyeser Natural History, London. 232p.

Dupuy, M. 2020. Evaluation de l'efficacité de deux méthodes de détection du Vison d'Europe (*Mustela lutreola* (Linnaeus, 1760)). GREGE / LIFE VISON. Rapport de stage Master 2 - Biodiversité et Suivis Environnementaux 2019-2020 - Université de Bordeaux. 40p.

Duscher, T., Zeveloff, S., Michler, F.U., Nopp-Mayr, U. 2018. Environmental drivers of raccoon (*Procyon lotor* L.) occurrences in Austria - established versus newly invaded regions. Archives of Biological Sciences, 70(1), 41–53.

European Food Safety Authority, 2021. EFSA Journal published by John Wile y and Sons Ltd on behalf of European Food Safety Authority. 85p.

FGBU. 2018. Kurilsky State Nature Reserve. Annal of Nature, 34, 190-192 (in Russian).

Fischer, M.L., Salgado, I., Beninde, J., Klein, R., Frantz, AC., Heddergott, M., Cullingham, C., Kyle, JC., Hochkirch, A. 2017. Multiple founder effects are followed by range expansion and

asmixture during the invasion process of the racoon (*Procyon lotor*) in Europe. Diversity and distributions, 23(4), 409-420.

Foundation Lutreola. 2006. European Mink (*Mustela Lutreola*, Linnaeus 1761), Captive breeding and husbandry protocol. 74p.

Fournier, P., Maizeret, C. 2003. Status and conservation of the European Mink (*Mustela lutreola*) in France. International conference of the Conservation of the European Mink, Logrognio (La Rioja, Spain), 5-8 November 2003. 95-102p.

Fournier, P., Maizeret, C., Fournier-Chambrillon, C., Ilbert, N, Aulagnier, S., Spitz, F. 2008. Spatial behaviour of European mink *Mustela lutreola* and polecat *Mustela putorius* in southwestern France. Acta Theriol., 53, 4:343-354.Fournier, P., Maizeret, C., Jimenez, D., Chusseau, J.P., Aulagnier, S., Spitz, F. 2007. Habitat utilization by sympatric European mink *Mustela lutreola* and polecats *Mustela putorius* in south-western France. Acta Theriologica, 52:1-12.

Fournier, P., Maizeret, C., Jimenez, D., Chusseau, J.P., Aulagnier, S., Spitz, F. 2007. Habitat utilization by sympatric European mink *Mustela lutreola* and polecats *Mustela putorius* in south-western France. Acta Theriologica, 52:1-12.

Fournier-Chambrillon, C., Bifolchi A., Mazzola-Rossi E., Sourice S., Albaret M., Bray Y., Ceña J.-C., Urra Maya F., Agraffel T., Fournier P. 2010. — Reliability of stained placental scar counts in farmed American mink and application to free-ranging mustelids. Journal of Mammalogy, 91 (4): 818–826.

Fournier-Chambrillon, C., Aaster, B., Perrot, A., Pontier, D., Sauvage, F., Artois, M., Cassiede, J.M., Chauby, X., Dal Molin, Simon, C., Fournier, P. 2004a. Antibodies to Aleutian mink disease parvovirus in free-ranging European mink (*Mustela lutreola*) and other small carnivores from southwestern France. Journal of Wildlife Diseases, 40(3), 394-402.

Fournier-Chambrillon, C., Berny, P.J., Coiffier, O., Baebedienne, P., Dasse, B., Delas, G., Galineau, H., Mazet, A., Pouzenc, P., Rosoux, R., Fournier, P. 2004b. Evidence of secondary poisoning of free-ranging riparian mustelids by anticoagulants rodenticides in France: implications for conservation of European mink (*Mustela lutreola*). Journal of Wildilife Deseases, 40 (4) : 688-695.

Fournier-Chambrillon, C., Cena, J.C., Urra Maya, F., Amblard, O., Giralda-Carrera, G., Fournier, P. 2013. Causas directas de mortalidad del Vison europeo (*Mustela* lutreola) en Francia y Navarra, y factores de vulnerabilidad. In: XI congreso de la SECEM, Aviles, España. SECEM. Recueil de résumés p.53.

Fournier-Chambrillon, C., Cena, J.C., Urra Maya, F., Van De Bildt, M., Ferreras, M.C., Giralda-Carrera, G., Kuiken, T., Buisson, L., Palomares, F., Fournier, P. 2020. A 9-year demographic and health survey of an European mink population in Navarre (Spain): role of the canine distemper virus. Small Carnivores in Space and Time: Evolution, Ecology, Behaviour and Conservation, E. Do Linh San, J. J. Sato, J. L. Belant and M. J. Somers (eds). Wiley, Chichester, United Kingdom, pp. In print.

Fournier-Chambrillon, C., Pigneur, L.M., Michaux, J., Giralda-Carrera, G., Urra-Maya F., Fournier, P. 2017. Hybridization between the critically endangered European mink and the Polecat in Navarre, Spain: two recent cases with different phenotypes. 32nd European Mustelid Colloquium, LBBE, ONCFS, The Vincent Wildlife Trust, Villeurbanne, Lyon, France, 15-17 November 2017. 55p.

Franc, C. 1838. Histoire naturelle des animaux les plus remarquables de la classe des mammifères (Quadrupèdes et Cétacés). Alfred Mame et Fils. Tours. 232p.

Fraser, E.J., Macdonald, D.W., Oliver, M.K., Piertney, S.B., Lambin, X. 2013. Using population genetic structure of an invasive mammal to target control efforts - an example of the American mink in Scotland. Biological conservation, 167:35-42.

Fur Europe. September 2015. Annual report 2014 of Fur Europe. 33p.

Galy-Fajou, C. 2020. Etude de l'utilisation de l'espace et de l'habitat par le Vison d'Europe (*Mustela lutreola*) en zone de marais et en plaine agricole alluviale de Charente. GREGE / LIFE VISON. Rapport de stage Master 2 Gestion de la Biodiversité (GBI) 2019-2020 - Université Toulouse III Paul Sabatier. 73p.

Garin, I., Aihartza, J., Zuberogoitia, I., Zabala, J. 2002. Activity pattern of European mink (*Mustela lutreola*) in Southwestern Europe. Z. Jagdwiss. 48:102-106.

Garin, I., Zuberogoitia, I., Zabala, J., Aihartza, J., Clevenger, A., Rallo, A. 2002. Home ranges of European mink (*Mustela lutreola* L.) in Southwestern Europe. Acta Theriologica, 47:55-62.

Genovesi, P., Carnevali, L., Alonzi, A. and Scalera, R. 2012. Alien mammals in Europe: updated numbers and trends, and assessment of the effects on biodiversity. Integrative Zoology, 7: 247–253.

Gomez, A. 2018. Cuatro años del proyecto LIFE Lutreola Spain [en ligne]. 42p. Disponible sur : http://lifelutreolaspain.com/fr/projet-life-lutreola-spain/documents. [Consulté le 22.09.2020].

Gouvernement d'Espagne. 2006. Programa de conservación ex situ del Visón Europeo en España [en ligne]. 59p. Disponible sur : http://lifelutreolaspain.com/fr/projet-life-lutreola-spain/documents. [Consulté le 22.09.2020].

Gouvernement. 1er Février 2021. Proposition de loi visant à renforcer la lutte contre la maltraitance animale [en ligne]. Disponible sur : https://www.legifrance.gouv.fr/dossierlegislatif/JORFDOLE000043084132/. Consulté le 31.03.2021].

Gouvernement. 22 novembre 2020. Communiqué de presse : surveillance du SARS-COV-2 dans les élevages de visons : un élevage contaminé. 1p.

Groupe d'Experts Intergouvernemental sur l'Evolution du Climat (GIEC). 2014. Changements climatiques 2014: Rapport de synthèse. Contribution des Groupes de travail I, II et III au cinquième Rapport d'évaluation du Groupe d'experts intergouvernemental sur l'évolution du climat [Sous la direction de l'équipe de rédaction principale, R.K. Pachauri et L.A. Meyer]. GIEC, Genève, Suisse. 161p.

Groupe de Recherche et d'Etude pour la Gestion de l'Environnement (GREGE). 2014. Suivi et contrôle du Vison d'Amérique en Charente et Dordogne – Rapport final – Bilan du suivi mené en 2013-2014. DREAL Poitou-Charentes. 16p.

Groupe de Recherche et d'Etude pour la Gestion de l'Environnement (GREGE) et Agence de Recherche pour la Protection des Espaces Naturels (ARPEN). 2004. Recherche de facteurs toxicologiques susceptibles de contribuer à la régression du Vison d'Europe. Rapport final. Conseil Régional d'Aquitaine. 13p.

Haage, M. 2016. Conservation, personality and ecology of the European mink (*Mustela lutreola*). Sotckholm University. ISBN 978-91-7679-420-2. 40p.

Haage, M., Angerbjorn, A., Almhagen, B., Maran, T. 2017. An experimental approach to the formation of diet preferences and individual specialisation in European mink. European Journal of Wildlife Research, (2017)63:34.

Hammershøj, M., Pertoldi, C., Asferga, T., Møller, T.B., Kristensen, N.B. 2005. Danish free-ranging mink populations consist mainly of farm animals: Evidence from microsatellite and stable isotope analyses. Journal for Nature Conservation, 13: 267-274.

Harrington, L.A., Moorhouse, T., Gelling, M., Bonesi, L., MacDonald, D.W. 2009. American mink control on inland rivers in southern England: an experimental test of a model strategy. Biological Conservation, 142: 839-849.

Henttonen, H. 1992. Vesikko (*Mustela lutreola*). In Elo, U. (ed.), Maailman uhanalaiset elaimet : 46-48.

Henttonen, H., Tolonen, H. 1983. Minkkki ja vesikko. Koivisto, I. (ed.), Suomen claimet. L. Nisakkaat : 228-233

Heptner, V.G., Naumov, N.P., Jurgenson, P.B., Sludsky, A.A., Chirkova, A.F., Bannikov, A.G. 1974. Die Saugetiere der Sowjetunion. II – Seekuhe und Raubtiere *Mustela lutreola*. Gustav Fisher Verlag, Jena: 701-720.

Heptner, V.G., Naumov, N.P., Yurgenson P.B., Sludskiy, A.A., Chirkova, A.F., Bannikov, A.G. 1967. Mlekopitayushchie Sovetskogo Soyuza [Mammals of Soviet Union], Vol.2 (1) Sea cows and carnivora. 1004 p. Moscow. (In Russian).

Heptner, V.G., Naumov, N.P., Yurgenson, P.B., Sludskii, A.A, Chirkova, A.F., Bannikov, A.G. 2001. Mammals of the society Union. Volume II, part 1b, Carnivora (weasels ; additional species). 816p.

Institut Français de l'Environnement (IFEN). 2002. L'Environnement en France. Institut Français de l'Environnement, Paris : 1-608.

International Union for Conservation of Nature (IUCN). Soorae, P.S. 2013. Global Re-Introduction Perspectives: 2013. Further case studies from around the globe. Gland, Switzerland: IUCN/SSC Re-introduction Specialist Group and Abu Dhabi, UAE: Environment Agency-Abu Dhabi. XIV + 282p.

Jensen, S., Kihlstrom, J.E., Olsson, M., Lundberg, C., Orberg, J. 1977. Effects of PCB and DDT on mink (*Mustela vison*) during the reproductive season. Ambio 6:239.

Kauhala, K. 1996 Distributional history of the American mink (*Mustela Vison*) in Finland with special reference to the trends in otter (*Lutra lutra*) populations. Annales Zoologici Fennici, 33, 283– 291.

Kiik, K, Maran, T., Nemvalts, K., Sandre, S.L., Tammaru, T. 2017. Reproductive parameters of critically endangered European mink (*Mustela lutreola*) in captivity. Animal reproduction science, 181 (2017) 86-92.

Kiik, K., Maran, T., Nagl, A., Ashford, K., Tammarut, T. 2013. The causes of the low breeding success of European mink (*Mustela lutreola*) in captivity. Zoo Biol. 32(4), 387-393.

Klaumann, I., Peters, E., Seebass, C. 2013. Wiederansiedlung des Europaischen Nerzes *Mustela lutreola* (Linné 1761) im FFH-Gebiet „Taler der ILL und ihre Nebenbache" im Saarland, Deutchland. Abschlussbericht 2006 bis 2013. Technical report, 48pp (in German).

Kneidinger, N., Nagl, A., Kiik, K., Shwarzenberger, F., Maran, T. 2018. The individual courtship behaviour of male European mink (*Mustela lutreola*) is a good indicator for their breeding success. Applied Animal Behaviour Science 205, 98-106.

Korpimaki, E., Norrdahl, K., Rinta-Jaskari, T., URL, S. 1991. International Association for Ecology Responses of Stoats and Least Weasels to Fluctuating Food Abundances : Is the Low Phase of the Vole Cycle Due to Mustelid Predation ? Oecologia, 88(4), 552-561.

Lambin, X., Atkinson, S., Bryce, R., Davies, L., Gray, H., Oliver, M.K., Urquhart, J. 2011. Turning back the tide of American mink invasion at unprecedented scales in partnership with communities. 8th European Vertebrate Pest Management Conference, Book of abstracts. Julius-Kühn-Archiv 432:24-25.

Leger, F. 2003. Le Raton laveur : *Procyon lotor* (Linné, 1758). In : Pascal. M., Lorvelec, O., Vigne J.D., Keith P., Clergeau, P. Évolution holocène de la faune de Vertébrés de France : invasions et extinctions. Rapport INRA/CNRS/MNHN: 286-288.

Leger, F., Ruette, S. 2005. Le vison d'Amérique, une espèce qui se développe en France. Faune Sauvage, n◦ 266 (2005):29-36.

Leger, F., Ruette, S. 2014. Raton laveur et chien viverrin : le point sur leur répartition en France. Faune Sauvage 302:9-16.

Leger, F., Steinmetz, J., Laoué, E., Maillard, JF., Ruette, S. Mars 2018. L'expansion du Vison d'Amérique en France – Période 2000-2015. Faune Sauvage, 1er trimestre 2018, n°318, p. 23-31.

Letacq, A.L. 1922. Notes zoologiques recueillies à Couterne (Orne). Bull. Soc. Amis Sc. Nat. De Rouen, 56:48.

Libois, R., Michaux, J., Rosoux, R., De Beaulieu, Y., Fournier, P., De Bellefroid, M.N. 2002. Diversité génétique : du diagnostic à la conservation. Le cas du Vison d'Europe. Annales de la sociétés des sciences naturelles de la Charente-Maritime. Volume IX. Fascicule 2. 6p.

Libois, R. 2001. Etude préliminaire du régime alimentaire du Vison d'Europe (*Mustela lutreola*) dans le Sud-Ouest de la France – Rapport préliminaire de la seconde phrase. Groupe Vison d'Europe – Plan de restauration Vison d'Europe. 15p.

Libois, R., Fellous, A., Rosoux, R., Fournier, P., Siberchicot, O. 1998. The diet of the European mink, *Mustela lutreola*, in south-western France : preliminary results in S. Reg (Ed.) Euro-American Mammal Congress. Santiago de Compostela, 19-24th July 1998. 172p.

LIFE GERVE. LIFE 05 NAT/E/000073 [en ligne]. 2007. Disponible sur https://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=2925. [Consulté le 19.03.2021].

LIFE Lutreola Spain. LIFE 13 NAT/ES/001171 [en ligne]. 20 février 2020. Disponible sur : http://lifelutreolaspain.com/fr. [Consulté le 22.09.2020].

LIFE Territorio Vison. LIFE 09 NAT/ES/531 [en ligne]. Janvier 2020. Disponible sur : https://territoriovison.eu/en/. [Consulté le 19.03.2021].

Ligue pour la Protection des Oiseaux (LPO) et Direction Régionale de l'Environnement, de l'Aménagement et du Logement (DREAL). Octobre 2011. Plans de prévention et d'urgence autour des élevages de Vison d'Amérique. 110p.

Ligue pour la Protection des Oiseaux (LPO), Conseil Départemental de la Charente-Maritime, Groupe de Recherche et d'Etude pour la Gestion de l'Environnement (GREGE). 26 Avril 2017. LIFE16 NAT/FR/000872-Conservation of the European Mink and associated community interest species and habitats of the Charente River Basin. 299p.

Ligue pour la Protection des Oiseaux (LPO), Conseil Départemental de la Charente-Maritime, Groupe de Recherche et d'Etude pour la Gestion de l'Environnement (GREGE). Septembre 2020. Rapport d'avancement LIFE Vison du 01/01/2019 au 31/12/2019. 194p.

Lode T., Cornier J.P., Le Jacques D. 2011. Decline in endangered species as an indication of anthropic pressures: the case of European mink *Mustela lutreola* Western population. Environ Manage, 28(6), 727-735.

Lode, T. 1999. Genetic bottleneck in the threatened western population of European mink *Mustela lutreola*. J. Zool., 66:351-353.

Lode, T. 2002. An endangered species as indicator of freshwater quality: fractal diagnosis of fragmentation within a European mink, *Mustela lutreola*, population. Arch. Hydrobiol., 155-1, 163-176.

Lode, T., Cormier, J.P., Le Jacques, D. 2001. Decline in endangered species as an indication of anthropic pressures: the case of European mink *Mustela lutreola* western population. Env. Manage. 28:221-227.

Lode, T., Guiral, G., Peltier, D. 2005. European mink-polecat hybridization events: hazards from natural process? Journal of Heredity, 96:1-8.

Lonch Obiols, P. Decembre 2017. Assesment protocol to the welfare during capture, transport and euthanasia of wild American mink. LIFE Lutreola Spain - LIFE 13 NAT/ES/001171. 29p.

Lopez-Martin, J.M., Ruiz-Olmo, J., Palazon, S. 1994. Organochlorine residue levels in the European mink (*Mustela lutreola*) in Northern Spain. Ambio, 23:294-295.

Lowis, O. 1899. Jagdbilden aus Livland. Zool. Garten 40:24-26.

Lucques, R., réal. Le Vison, trésor des marais [film]. Décembre 2004. Documentaire animalier, 52min.

Lüers, E., Brandt, T. 2014. Ein Versuch zur Wiederansiedlung des Europaischen Nerzes (*Mustela lutreola*) am Steinhuder Meer, Niedersachsen. Saugetierkundliche Informationen. 9, 249-264 (in German).

Macdonald, D.W, Sidorovich, V.E., Maran, T., Kruuk, H. 2002. The Darwin Initiative : European mink, Mustela lutreola : analyses for Conservation. Oxford Univ. Wildlife Conservation Research Unit. 130p.

Maillard, J.F., Berger, J., Chevret, P., Ruette, S., Adiraens, T., Schockert, V., Leger, F., Veron, G., Queney, G., Devillards, S. 2020. L'apport de la génétique dans la compréhension de l'évolution des populations de ratons laveurs. Faune Sauvage, 326:10-17.

Maizeret, C., Migot, P, Galineau, H., Grisser, P., Lode, T. 1998. Répartition et habitats du Vison d'Europe (*Mustela lutreola*) en France. Arvicola, Actes « Amiens 97 »: 67:72.

Maizeret, C., Migot, P., Rosoux, R, Chusseau J.P., Gatelier, T., Maurin, H., Fournier-Chambrillon, C. 2002. The distribution of the European Mink (*Mustela lutreola*) in France: towards a short-term extinction? Mammalia T66 n°4 p525-532.

Maizeret, M. 1990. Le Vison d'Amérique (*Mustela vison*) (Schreber, 1777). Encyclopédie des carnivores de France n° 13. Société Française pour l'Etude et la Protection des Mammifères (SFEPM). 19p.

Manas, S., Gómez, A., Asensio, V., Palazón, S., Podra, M., Alarcia O.E., Ruiz-Olmo, J., Casal, J. 2016. Prevalence of antibody to Aleutian Mink disease virus in European mink (*Mustela lutreola*) and American mink (*Neovison vison*) in Spain. Journal of Wildlife Disease Association, 52(1):22-32.

Maran, T. 2007. Conservation biology of the European mink, *Mustela lutreola* (Linnaeus 1761): Decline and causes of extinction. Chair of Geo-Ecology. Faculty of Mathematics and Natural Sciences of Tallinn University. 38p.

Maran, T., Fienieg, E., Schad, K. 2017a. Long-term management plan for the European mink (*Mustela lutreola*) European Endangered Species Programme (EEP). Tallinn Zoological gardens. 49p.

Maran, T., Henttonen, H. 1995. Why is the European mink (*Mustela lutreola*) disappearing? A review of the process and hypotheses. Acta Zoologica Fennica, 32 : 47-54.

Maran, T., Kruuk, H., Macdonald, D., Polma, M. 1998. Diet of two species of mink in Estonia: displacement of *Mustela lutreola* by M. vison. Journal of Zoology London, 245:218-222.

Maran, T., Podra, M, Harrington, L.A., Macdonald, D.W. 2017b. European mink: restoration attempts for a spices on the brink of extinction. Biology and Conservation of Mustelids. Edited by David W. Macdonald, Chris Newman, and Lauren A. Harrington: Oxford University Press. 19p.

Maran, T., Podra, M., Polma, M, Macdonald, D.W. 2009. The survival of captive-born animals in restoration programmes – case study of the endangered European mink *Mustela lutreola*. Biological Conservation, 142(2009)1685-1692.

Maran, T., Robinson, P. 1996. European mink, *Mustela lutreola* (Linnaeus, 1761), captive breeding and husbandry protocol. Vol 1. EMCC et Tallinn Zoo. 33p.

Maran, T., Skumatov, D., Gomez, A., Põdra, M., Abramov, A.V., Dinets, V. 2016. *Mustela lutreola*. *The IUCN Red List of Threatened Species* 2016: e.T14018A45199861 [en ligne]. Disponible sur : https://www.iucnredlist.org/fr/species/14018/45199861. [Consulté le 10.02.2021].

Marinov, M., Kiss, J., Toman, A., Polednik, L., Alexe, V., Doroftei, M., Dorosencu, A., Kranz, A. 2013. Monitoring of the European Mink (*Mustela lutreola*) in the Danube Delta Biosphere Reserve – Romania, 2003-2011. Current status and setting of goals for the European Mink conservation. Scientific Annals of the Danube Delta Institute. Vol 18, 69-74.

Masuda, R., Yoshida, M.C. 1994. A molecular phylogeny of the family Mustelidae (Mammalia, Carnivora), based on comparison of mitochondrial cytochrome b nucleotide sequences. Zoological Science, 11:605-612.

Matthews, G.V.T., Luthi, E. 1993. The Ramsar Convention on Wetlands: its History and Development Re-issued Ramsar Convention Secretariat, 2013. ISBN No. 2-940073-00-7. 90p.

Mazzola-Rossi, E. 2006. Thèse. Etude comparative des paramètres reproducteurs du Vison d'Europe (*Mustela lutreola*), du Vison d'Amérique (*Mustela vison*) et du Putois (*Mustela putorius*) dans le sud-ouest de la France. Ecole nationale vétérinaire d'Alfort. 135p.

Mead, R.A. 1989. Reproduction in Mustelids. In: Conservation biology and the blackfooted ferret. Seal US, Thorne ET, Bogan MA, Anderson SH (eds). New Haven (CT), Yale University Press, 124-137.

Melero, Y., Cornulier, T., Oliver, M., Lambin, X. 22 juillet 2017. Ecological traps for large-scale invasive species control: predicting settling rules by recolonising American mink post-culling. Journal of Applied Ecology, 2018;1-11.

Melero, Y., Robinson, E., Lambin, X. 2015. Density and age - dependent reproduction partially compensates culling efforts of invasive non - native American mink. Biological invasions, 7(9) : 2645-2657.

Michaux, J.R., Hardy, O.J, Justy, F., Fournier, P., Kranz, A., Cabria, M., Davison, A., Rosoux, R., Libois, R. 2005. Conservation genetics and population history of the threatened European mink *Mustela lutreola*, with an emphasis on the west European population. Molecular Ecology, 14:2373-2388.

Michaux, J.R., Libois, R., Davinson, A., Chevret, P., Rosoux, R. 2004. Is the western population of the European mink (*Mustela lutreola*) a distinct Management Unit for conservation? Biological Conservation, 115:357-367.

Michler, D.F., Hohmann, U. 2005. Investigations on the ethological adaptations of the raccoon (*Procyon lotor* L. 1758) in the urban habitat using the example of the city of Kassel, North

Hessen (Germany), and the resulting conclusions for conflict management. North, 1758. Abstract – Poster. 4p.

Ministère de l'aménagement du territoire et de l'environnement. 9 juillet 1999. Arrêté du 9 juillet 1999 fixant la liste des espèces de vertébrés protégées menacées d'extinction en France et dont l'aire de répartition excède le territoire d'un département [en ligne]. Journal officiel, n°199 du 28 aout 1993. Disponible sur : https://www.legifrance.gouv.fr/loda/id/JORFTEXT000000396986/2020-12-07/. [Consulté le 07.12.2020].

Ministère de l'écologie et de développement durable. 29 janvier 2007. Arrêté du 29 janvier 2007 fixant les dispositions relatives au piégeage des animaux classés nuisibles en application de l'article L. 427-8 du code de l'environnement [en ligne]. Journal officiel, n°91 du 18 avril 2007 page 6961 texte n°31, version consolidée au 4 septembre 2020. Disponible sur : https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000000648027&dateTexte=20200904. [Consulté le 22.09.2020].

Ministère de l'écologie et de développement durable. 8 octobre 2018. Arrêté du 8 octobre 2018 fixant les règles générales de de détention d'animaux d'espèces non domestiques [en ligne]. Journal officiel, n°237 du 13 octobre 2018, texte n° 12. Disponible sur : https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000037491137/. [Consulté le 22.09.2020].

Ministère de l'écologie et du développement durable et de l'énergie. 14 juillet 2013. Arrêté du 8 juillet 2013 pris pour l'application de l'article R. 427-6 du code de l'environnement et fixant la liste, les périodes et les modalités de destruction des espèces non indigènes d'animaux classés nuisibles sur l'ensemble du territoire métropolitain [en ligne]. Journal officiel, n°0162 du 14 juillet 2013 page 11788 texte n°9. Disponible sur : https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000027697981&categorieLien=id. [Consulté le 22.09.2020].

Ministère de l'Ecologie et du Développement durable. 10 août 2004. Arrêté du 10 aout 2004 fixant les conditions d'autorisation de détention d'animaux de certaines espèces non domestiques dans les établissements d'élevage, de vente, de location, de transit ou de présentation au public d'animaux d'espèces non domestiques [en ligne]. Journal officiel, n°228 du 30 septembre 2004. Disponible sur : https://www.legifrance.gouv.fr/loda/id/LEGITEXT000018810562/. [Consulté le 22.09.2020].

Ministère de l'environnement. 19 décembre 1994. Arrêté du 16 décembre 1994 relatif au retrait d'homologation de certains pièges [en ligne]. Journal officiel, n°2 du 3 janvier 1995. Disponible sur : https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000000714757. [Consulté le 09/04/2021].

Ministère de l'environnement. 4 mars 1986. Arrêté ministériel du 4 mars 1986 [en ligne]. Chapitre IV. Disponible sur : https://www.legifrance.gouv.fr/loda/id/LEGITEXT000006074744/1986-03-03. [Consulté le 22.09.2020].

Ministère de la Transition Ecologique et Solidaire (MTES). 13 Avril 2018. Plans nationaux d'actions en faveur des espèces menacées [en ligne]. Disponible sur : https://www.ecologique-solidaire.gouv.fr/plans-nationaux-dactions-en-faveur-des-especes-menacees [Consulté le 22.09.2020].

Ministry of Environment and Food of Denmark. 2 Juillet 2020. LIFE Project on management of American Mink. 3p.

Mission Etalab, Direction interministérielle du numérique et du système d'information et de communication de l'Etat (DINSIC). 2021. Sous-secteurs hydrographiques – Métropole 2016 –

Bd Carthage [en ligne]. Disponible sur : https://www.data.gouv.fr/fr/datasets/sous-secteurs-hydrographiques-metropole-2016-bd-carthage/ [Consulté le 05.05.2021].

Mission Vison d'Europe et Conservatoire Régional des Espaces Naturels (CREN) Aquitaine. 2004. Guide méthodologique pour la prise en compte du Vison d'Europe dans les documents d'objectifs Natura 2000. Direction Régionale de l'Environnement (DIREN) Aquitaine. Rapport d'étude. 37p.

Moinet, M. 2008. Etude comparative de la leptospirose chez le vison d'Europe (*Mustela lutreola*) et les autres petits carnivores sauvages du sud-ouest de la France. Ecole Nationale Vétérinaire de Nantes. 108p.

Moinet, M., Fournier-Chambrillon, C., André-Fontaine, G., Aulagnier, S., Mesplède, A., Blanchard, M., Descarsin, V., Dumas, P., Dumas, Y., Coic, C., Couzi, L., Fournier, P. 2010. Leptospirosis in free-ranging endangered European mink (*Mustela lutreola*) and other small carnivores (Mustelidae, Viverridae) from southwestern France. Journal of Wildlife Diseases. 1141-1151p.

Moshonkin, N.N. 1983. Reproduktivnii cikl samok evropeiskoi norki (Lutreola). Zool. Zh., 60 :1731-34.

Muséum National d'Histoire Naturelle (MNHN). 2003-2020. 2020a. Inventaire National du Patrimoine Naturel [en ligne]. Disponible sur : https://inpn.mnhn.fr/espece/cd_nom/60704/tab/statut. [Consulté le 22.09.2020].

Muséum National d'Histoire Naturelle (MNHN). 2020b. Coronavirus : quels risques pour les autres animaux ? [en ligne]. Disponible sur : https://www.mnhn.fr/fr/explorez/actualites/coronavirus-quels-risques-autres-animaux. [Consulté le 23.11.2020].

National Aeronautics and Space Administration (NASA). Retrieved December 16, 2020. Global Temperature - Vital Signs - Climate Change: Vital Signs of the Planet [en ligne]. Disponible sur : https://climate.nasa.gov/vital-signs/global-temperature/. [Consulté le 15/10/2020].

Novikov, G.A. 1939. The European mink. Izd. Leningradskogo Gos. Univ. Leningrad.

Office National de la Chasse et de la Faune Sauvage - Direction de la Recherche et de l'Expertise (ONCFS-DRE). Janvier 2018. Quelques éléments sur l'apparition d'un foyer de présence du Vison d'Amérique dans le département de la Vendée. NT/2018/DRE/UPAD/02. 6p.

Office National de la Chasse et de la Faune Sauvage (ONCFS) et Directions Régionales de l'Environnement, de l'Aménagement et du Logement (DREAL). Octobre 2014. Scénarii de stratégie de conservation pour le futur élevage de Visons d'Europe au parc animalier Zoodyssée à Chizé, France. 22p.

Office National de la Chasse et de la Faune Sauvage (ONCFS). Juin 2016. Eléments sur la dynamique des populations et la biologie de la reproduction chez le Vison d'Europe *Mustela lutreola.* Note à l'intention du Ministère en charge de l'environnement. 7p.

Ognev, S.I. 1962. Mammals of USSR and adjacent countries. VIII Carnivora (Fissipeda and Pinnipeda). 1935. Translated from Russian. 541p.

Ökologische Schutzstation Steinhuder Meer (OSSM). 2011. Wiederansiedlung des Europäischen Nerzes (*Mustela lutreola*) am Steinhuder Meer. 43p (in German).

Organisation Mondiale de la Santé Animale (OIE), Union International pour la Conservation de la Nature (UICN), Species Survival Commission (SSC), Willdlife Health Specialist Group

(WHSG). 2021. Guidelines for Working with Free-Ranging Wild Mammals in the Era of the COVID-19 Pandemic. 6p.

Organisation Mondiale de la Santé Animale (OIE). 16 novembre 2020. Guidance on working with farmed animals of species susceptible to infection with SARS-CoV-2. 11p.

Organisation mondiale de la santé animale (OIE). 23 mars 2021. Portail COVID-19 [en ligne]. Disponible sur : https://www.oie.int/fr/expertise-scientifique/informations-specifiques-et-recommandations/questions-et-reponses-sur-le-nouveau-coronavirus2019/. [Consulté le 23.11.2020].

Palazon, S., Melero, Y., Gomez, A., Lopez de Luzuriaga, J., Podra, M., Gosalbez, J. 2012. Causes and patterns of human-induced mortality in the critically endangered European mink *Mustela lutreola* in Spain. Oryx, 46:614-616.

Palazon, S., Ruiz-Olmo, J. 1998. A preliminary study of behaviour of the European mink (*Mustela lutreola*) by means of radiotracking. Behaviour and ecology of riparian mammals, N.Dunstone and Gorman M.L eds., Cambridge University Press, Cambridge : 93-105.

Palazon, S., Ruiz-Olmo, J., Gosalbez, J. 2004. Diet of the European mink (*Mustela lutreola*) in Northen Spain. Mammalia, 68(2-3):159-165.

Palomares, F., Lopez-bao, J.V., Telletxea, G., Cena, J.C., Fournier, P., Giralda, G., Urra, F. 2017. Activity and home range in a recently widespread European mink population in Western Europe. Eur J Wildl Res, (2017) 63:78.

Parlement européen et Conseil de l'Union Européenne. 4 novembre 2014. Règlement (UE) N°1143/2014 du Parlement Européen et du Conseil du 22 octobre 2014 relatif à la prévention et à la gestion de l'introduction et de la propagation des espèces exotiques envahissantes [en ligne]. Journal officiel de l'Union Européenne, L317/35. Disponible sur : https://eur-lex.europa.eu/legal-content/FR/TXT/PDF/?uri=CELEX:32014R1143&from=FI. [Consulté le 22.09.2020].

Peters, E., Brinkmann, I., Kruger, F., Zwirlein, S., Klaumann, I. 2009. Reintroduction of the European mink *Mustela lutreola* in Saarland, Germany. Preliminary data on the use of space and activity as revealed by radio-tracking and live-trapping. Endangered Species Research, 10, 305-320.

Philippa, K., Fournier-Chambrillon, C., Fournier, P., Schaftenaar, W., Van De Bildt, M., Van Herweijnen, R., Kuiken, T., Liabeuf. A, Ditcharry, S., Joubert, L., Begnier, M., Osterhaux, A. 2008. Serologic survey for selected viral pathogens in free-ranging endangered European mink (*Mustela lutreola*) and other Mustelids from South-Western France. Journal of Wildlife Diseases, 44: 791-801.

Podra, M. 2021. Expansion of alien American Mink, *Neovison Vison*, and translocation of captive-bred European Mink, *Mustela lutreola*: assessing impact on the native species conservation. School of Natural Science and Health, Tallinn University, Estonia. 124p.

Podra, M., Gomez, A. 2018. Rapid expansion of the American mink poses a serious threat to the European mink in Spain. Mammalia, 2018 ; 82(6) : 580-588.

Podra, M., Maran, T., Sidorovich, V., Jonhson, P., Macdonald, D. 2012. Restoration programmes and the development of a natural diet: a case study of captive-bred European mink. European Journal of Wildlife Research, 59(1):93-104.

Powell, R.A., Clarck, T.W., Richardson, L., Forrest, S.C. 1985. Black-footed ferret *Mustela nigripes* energy expenditure and prey requirements. Biological Conservation, 34(1), 1-15.

Reid, F., Schiaffini, M., Schipper, J. 2016. *Neovision vison*. *The IUCN Red List of Threatened Species* 2016 [en ligne]. Disponible sur https://www.iucnredlist.org/species/41661/45214988. [Consulté le 11.12.2020].

Reynolds, J.C., Richardson, S.M., Rodgers, B.J.E., Rodgers, O.R.K. 2013. Effective control of non-native American mink by strategic trapping in a river catchment in mainland Britain. The Journal of Wildlife Management, 77: 545–554.

Reynolds, J.C., Short, M.J., Leigh, R.J. 2004. Development of population control strategies for mink *Mustela Vison*, using floating rafts as monitors and trap sites. Biological Conservation, 120 (4): 533–543.

Rodriguez de Ondarra, P. 1955. Hallazgo en Guipuzcoa de un mamifero no citado en la "Fauna Ibérica" de Cabrera. El "Putorius lutreola". *MUI/ib e.*7:201-207.

Ruiz-Olmo, J., Jimenez, J., Palazon, S., Lopez-Martin, J.M. 2002. Ecologie et conservation de la loutre (*Lutra*) et du vison d'Europe (*Mustela lutreola*) en milieu méditerranéen. Chapron G. et Moutou, F., 2002. L'étude et la conservation des carnivores. Société Française pour l'Etude et la Protection des Mammifères. Paris. 167p. 104:112.

Ruiz-Olmo, J., Palazon, S., Bueno, F., Bravo, C., Munilla, I., Romero, R. 1997. Distribution, status and colonization of the American mink *Mustela Vison* in Spain. J. Wildl. Res., 2(1):30-36.

Salgado, I. (2018). Is the raccoon (*Procyon lotor*) out of control in Europe? *Biodiversity and Conservation*, *27*(9), 2243–2256.

Santucci S. 11 Juillet 2019. Thèse vétérinaire : Développement de l'insémination artificielle chez le Vison d'Europe (*Mustela lutreola*) : étude expérimentale. Ecole vétérinaire d'Alfort. 196p.

Santulli, G., Palazon, S., Melero, Y., Gosalbez, J., Lambin, X. 2014. Multi-season occupancy analysis reveals large scale competitive exclusion of the critically endangered European mink by the invasive non-native American mink in Spain. Biological Conservation, 176(2014)21-29.

Sato, J.J., Hosoda, T., Wolsan, M, Tsuchiya, K., Yamamoto, M., Susuki, H. 2003. Phylogenetic relationships and divergence time among Mustelids (Mammalia, Carnivora) based on nucleotide sequences of the nuclear interphotoreceptor retinoid binding protein and mitochondrial cytochrome b genes. Zoolog. Sci., 20: 243-264.

Saudskj, E.P. 1989. The European mink (*Lutreola lutreola*) on the Mountain Rivers of Kuril and Tadzikhistan. All-Union conference on problems of ecology in mountain regions. 9-13p (in Russian).

Savouré-Soubelet A., Haffner P., Moutou F., Richard-Hansen C., Ruette S., Veron G. (coord.). In print. Atlas des mammifères sauvages de France. Volume 3 : Carnivores et Primates. Muséum national d'Histoire naturelle, Paris, XXXp. (Patrimoines naturels, XX).

Schropfer, R., Paliocha, E. 1989. Zur historischen und rezenten Bestanderung der Nerze *Mustela lutreola* (L. 1761) und *Mustela vison* Schreber 177Fd7 in Europa – Eine Hypothesendiskussion. Wiss. Beitr. Univ. Halle 37 (p39):303-321.

Secrétariat de la convention Ramsar. 2021. Ramsar [en ligne]. Disponible sur : https://www.ramsar.org/fr. [Consulté le 09/04/2021].

Sentilles J., Bellanger C., Fayet M., Steinmetz J., Guinot-Ghestem M. 2018. Un chien de détection pour le suivi des espèces invasives ? Faune Sauvage N° 321, p26-27.

Service public – zones humides. 2021. Les Zones Humides [en ligne]. Disponible sur : http://www.zones-humides.org/. [Consulté le 09/04/2021]. http://www.trameverteetbleue.fr/sites/default/files/noted_information_no76.pdf. [Consulté le 09/04/2021].

Shuai, L., Zhong, G., Yuan, Q., Wen, Z., Wang, C., He, X., Liu, R., Wang, J., Zhao, Q., Liu, Y., Huo, N., Deng, J., Bai, J., Wu, H., Guan, Y., Shi, J., Tian, K., Xia, N., Chen, H., Bu, Z. 2020. Replication, pathologenicity, and transmission of SARS-CoV-2 in minks. National Science Review, nwaa291.

Shvarts, E.A., Vaisfeld, MA. 1993. Problem of saving vanishing species and the island (discussion of the European mink *Mustela lutreola* on Kunashir Island). Usp. Sov. Biol., 113, 46-59 (in Russian).

Shvarts, E.A., Vaisfeld, MA. 1995. Politics and unpredictable consequences of island transfers for the protection of the endangered species : an example from Russia (the European mink *Mustela lutreola*, on Kunashir Island). Journal of the Royal Society of New Zealan, 25(3), 313-325.

Sidorovich, V.E. 1992. Comparative analysis or the diets of European mink *(Mustela lutreola),* American mink *(Mustela vison)* and Polecat *(Mustela putorius)* in Byelorussia. Small Carnivore Conservation, 6:2-4.

Sidorovich, V.E. 1993. Reproductive plasticity of the American mink *Mustela vison* in Belarus. Acta Theriologica, 38(2), 175-183.

Sidorovich, V.E. 2000. Seasonal variation in the feeding habits of riparian mustelids in river valleys of NE Belarus. Acta Theriologica, 45 (2):233-242.

Sidorovich, V.E. 2000. The on-going decline of riparian mustelids (European mink, *Mustela lutreola*, polecat, *Mustela putorius*, and stoat, *Mustela erminea*) in eastern Europe: a review of the results to date and an hypothesis: 295-319 in: Griffiths, H.I. (ed.): Mustelids in a modern world. Management and conservation aspects of small carnivore - human intercations. Backhuys Publishers, Leiden.

Sidorovich, V.E. 2001. Findings on the ecology of hybrids between the European mink *Mustela lutreola* and the polecat *M. putorius* at the Lovat upper reaches, NE Belarus. Small Carnivore Conservation, 24:1-5.

Sidorovich, V.E., Kruuk, H., Macdonald, D.W. 1999. Body size and interactions between European and American mink (*Mustela lutreola* and *M. vison*) in Eastern Europe. *Journal of Zoology London,* 248:521-527.

Sidorovich, V.E., Kruuk, H., Macdonald, D.W. 1999. Body size and interactions between European and American mink (*Mustela lutreola* and *M. vison*) in Eastern Europe. *Journal of Zoology London,* 248:521-527.

Sidorovich, V.E., Kruuk, H., Macdonald, D.W., Maran, T. 1998. Diets of semi-aquatic carnivores in northern Belarus, with implications for populations changes, in Dunstone, N. and Gorman, M. L. (eds), Behaviour and ecology of riparian mammals. Symposia of the Zoological Society of London, 71:177-189.

Sidorovich, V.E., Macdonald, D.W. 2001. Density dynamics and changes in habitat use by the European mink and other native mustelids in connection with the American mink expansion in Belarus. Netherlands Journal of Zoology, 51(1):107-126.

Sidorovich, V.E., Polozov, A.G., Zalewski, A. 2010. Food niche variation of European and American mink during the American mink invasion in north-eastern Belarus. Biological invasions, 12, 7: 2207-2217.

Sidorovich, V.E., Solovej, I. 2007. The stoat *Mustela erminea* population decline in northern Belarus and its consequences for weasels *Mustela nivalis*. New Zealand Journal of Zoology, 34:9-23.

Skorupski, J. 2020. Fifty years of research on European mink *Mustela lutreola* L., 1761 genetics: where are we now in studies on one of the most endangered mammals? Genes, 27p.

Steinmetz, J., Ruette, S., Ruys, T., Jean, P, Dejean, T. 2018. Vers une nouvelle méthode de détection des espèces de mammifères semi-aquatiques : étude pilote et approche « Metabarcoding ADNe ». Faune Sauvage, 2ème trimestre 2018, n°319, p.11-17.

Stubbe, M. 1993. *Mustela lutreola* (Linné, 1761) - Europaischer Nerz in Niethammer. J. und F. Krapp, 1993. Handbuch der Saugetiere Europas, Band 5 ; Raubsauger - Carnivora (Fissipedia), Teil II : Mustelidae 2, Viverridae, Herpestidae, Felidae. Aula - Verlag Wiesaden. 684p.

Ternovskaya, Y.G., Zudova, G., Amstislavsky, S. 2006. Strategies for European Mink preservation. Proceedings book, International Conference on the Conservation of European Mink (*Mustela lutreola*). Logrono, Spain, Gobierno de La Rioja. 267-279p.

Ternovsky, D.V., Ternovskaya, Y. 1994. Ecology of Mustelids. Scientific Siberian Press Novosibirsk, Nauka. 22p (in Russian).

Ternovsky, D.V. 1977. Biology of mustelids (Mustelidae). Naua Pibl., Novosibirsk.

Torres, J., Miquel, J., Fournier, P., Fournier-Chambrillon, C. Liberge, M., Fons, R., Felu, C. 2008. Helminth communities of the autochtonous mustelids *Mustela lutreola* and *M. putorius* and the introduced *Mustela vison* in south-western France. Journal of Helminthology, 82:349-355.

Tragsatec. 2015. Report of the project LIFE 13 NAT/ES/001171 LIFE LUTREOLA « Nuevos enfoques en la conservación del visón europeo en España » Acción A1: Comprobación de la efectividad de las metodologías de detección y de captura del visón europeo y del visón americano. 36p.

Trouessart, E.L.. 1884. Histoire naturelle de la France, 2e partie, Mammifères. Emilie Deyrolle. Paris. 359p.

Tumanov, I.L., Abramov, A. 2002. A study of the hybrids between the European mink *Mustela lutreola* and the Polecat *Mustela putorius*. Small Carnivore Conservation, 27:29-31.

Tumanov, I.L., Rozhnov, MV.V. 1993. Tentative results of release of the European mink into Valaam Island. Lutreola, 2, 25-27 (in Russian).

Union Internationale pour la Conservation de la Nature en France (UICN), Muséum National d'Histoire Naturelle (MNHN), Société Française pour l'Etude et la Protection des Mammifères (SFEPM) et Office National de la Chasse et de la Faune Sauvage (ONCFS). 2017. La Liste rouge des espèces menacées en France – Chapitre Mammifères de France métropolitaine. 16p.

Unité Mixte de Service (UMS) Patrinat. 2019. Résultats synthétiques de l'état de conservation des habitats et des espèces, période 2013-2018. Rapportage article 17 envoyé à la Commission européenne, avril 2019. 28p.

Van Bree, P.J.H. 1961. On the remains of one Carnivora found in a prehistoric site at Vlaardingen, the Netherlands. Beaufortia - Series of Miscellaneous publications. Zoological museum, Amsterdam n91, vol. 8:109-118.

Vogt, C. 1884. Les Mammifères. Edition G. Masson, 548p.

Youngman, P.M. 1982. Distribution and systematics of the European Mink *Mustela lutreola* Linnaeus 1761. Acta Zoologica Fennica, 166:1:48.

Youngman, P.M. 1990. *Mustela lutreola*. The American Society of Mammologists? Mammalian Species, 362, 1-3.

Zabala, J., Zuberogoitia, I. 2002. Habitat use of male European Mink (*Mustela lutreola*) during the activity period in south western Europe. Mitteilungen – short communications. Z. Jagdwiss, 49 (2003), 77-81, Blackwell Verlag, Berlin, ISSN 0044-2887.

Zabala, J., Zuberogoitia, I., Garin, I., Aihartza, J. 2003. Landscape features in the habitat selection of European mink (*Mustela lutreola*) in south-western Europe. Journal of Zoology London, 260:415-421.

Zabala, J., Zuberogoitia, I., Martinez-Climent, J.A. 2006. Factors affecting occupancy by the European mink in south-western Europe. Mammalia, (2006):193-201.

Zuberogoitia, I., Podra, M., Palazon, S., Gomez, A., Zabala, N., Zabala, J. 2016. Misleading interpretation of shifting baseline syndrome in the conservation of European mink. Biodiversity Conservation. DOI 10.1007/s10531-016-1156-0. 8p.

Zuberogoitia, I., Podra, M., Palazon, S., Gomez, A., Zabala, N., Zabala, J. 2018. Facing Extinction, Last Call for the European Mink. Annals of reviews and research. Short communication. Volume 2 Issue 2 – May 2018. 18-20.

Zuberogoitia, I., Zabala, J. 2003. Do European mink use only rivers or do they also use other habitats? Small Carnivore Conservation, 28:7-8.

Zuberogoitia, I., Zalewska, H., Zabala, J., Zalewski, A. 2012. The impact of river fragmentation on the population persistence of native and alien mink: an ecological trap for the endangered European mink. Biodiversity Conservation, 22:169-186.

VIII. Annexes

1. Summary of decisions of the Scientific Council meeting of 3rd May 2021
2. Report on the Steering Committee meeting of 1st June 2021
3. Statement of the National Nature Protection Council meeting of 17th June 2021
4. List of members of the 3rd PNA Steering Committee
5. List of members of the 3rd PNA Scientific Council
6. Reports of the Workgroups of 28th and 29th May 2020: drawing up PNA3
7. Maps of European Mink surveys carried out as of 31/12/2020
8. Targeted European Mink survey protocol
9. Methodology for monitoring and combatting American Mink
10. Summary table of the 3rd PNA for the European Mink

Annexe n°1

PRÉFÈTE
DE LA RÉGION
NOUVELLE-AQUITAINE
Liberté
Égalité
Fraternité

OFB
OFFICE FRANÇAIS DE LA BIODIVERSITÉ

Plan National d'Actions en faveur du Vison d'Europe
Conseil Scientifique du 3 mai 2021
Relevé de décisions

Animateurs :
Aurore PERRAULT - DREAL Nouvelle-Aquitaine
Maylis FAYET - OFB

Rapporteurs :
Christelle BELLANGER - OFB
Yoann BRESSAN - OFB

Membres permanents du Conseil Scientifique :
Sébastien DEVILLARD – Université de Lyon
Christine FOURNIER – GREGE
Tiit MARAN - Zoo de Tallin
Johan MICHAUX - Université de Liège
Madis PODRA - Fondation Lutreola
Audrey SAVOURE-SOUBELET - SFEPM
Julien STEINMETZ - OFB

Expert ponctuel :
Sandrine RUETTE – OFB

Excusé :
Philippe BERNY - VetAgro Sup

Après une brève présentation du bilan de la consultation du projet de 3e PNA et de la façon dont les commentaires ont été pris en compte, il est fait remarquer qu'il est dommage de ne pas actualiser la carte de répartition du paragraphe I.3.b avec les derniers contacts de Vison d'Europe. Etant donné que les prospections standardisées ne sont pas terminées, il est fait le choix de conserver la carte telle quelle et de mentionner les captures récentes dans le texte.

Les membres du Conseil Scientifique (CS) ont ensuite été consultés sur les points suivants :

1. Quel nom latin pour le Vison d'Amérique ?

Dans l'Atlas national des mammifères de France, il a été décidé de mettre *Mustela vison* pour des raisons de cohérence avec les autres mustélidés proches. Dans d'autres publications scientifiques, c'est plutôt *Neovison vison* qui est utilisé.

➔ Dans le PNA, figureront les deux noms (*Mustela vison* et *Neovison vison*)

2. Validation de l'action 1.2 « Caractériser les populations de Vison d'Europe »

Suite aux nombreuses remarques émises sur cette fiche action lors de la consultation (COPIL et CS), celle-ci a été complètement réécrite et est donc soumise à l'avis du CS.

➔ Cette nouvelle rédaction est validée, mais il faut toutefois y ajouter la notion d'occupation de l'espace pour comprendre la structure des populations, en plus de l'utilisation de l'habitat.

La question de la priorité de la sous-action 1.2.2 « affiner les connaissances sur l'utilisation des habitats » est débattue.

➔ Finalement, le choix est fait de la conserver en priorité 2 car il est jugé plus important de conduire des actions de gestion que d'améliorer les connaissances. De fait, il sera vérifié que l'importance des habitats est bien mise en avant dans les fiches actions traitant de leur amélioration et/ou de leur préservation.

3. Niveau de priorité de la sous-action 1.1.2 « Tester et comparer des méthodes alternatives aux campagnes de prospection par capture »

Tous les membres du CS s'accordent à dire que la mise à jour de la carte de répartition est d'une importance majeure, quelle que soit la méthode utilisée. Il est également signalé qu'il est important de disposer de méthodes alternatives (ou d'une combinaison de méthodes) moins chronophages que la détection directe et que la répétition de ces méthodes est importante, vu la faible détectabilité de l'espèce. L'utilisation de méthodes alternatives de détection est testée dans le cadre du LIFE VISON, elle n'est donc pas prioritaire en termes de besoins de financement.

➔ La sous-action est conservée en priorité 2.

4. Niveau de priorité de la sous-action 3.1.1 « Veiller sur l'état des élevages pelletiers de Vison d'Amérique »

Le ministère a annoncé le 29 septembre 2021 que les élevages pelletiers de Vison d'Amérique seraient tous fermés d'ici à 2025. C'est pourquoi cette action a initialement reçu un niveau de priorité 3.

➔ Ce choix est acté par le CS, en précisant que le PNA aura un rôle d'accompagnement à jouer lors de la fermeture des derniers élevages, en particulier concernant le devenir des animaux.

5. La faible diversité génétique du Vison d'Europe est-elle à considérer comme une menace ?

Il est confirmé que la population de Visons d'Europe doit être considérée comme une entité unique, il n'existe pas de différences génétiques significatives entre les populations occidentales et orientales justifiant de les gérer séparément.

La faible diversité génétique n'est pas un facteur de menace en tant que tel mais fragilise les populations et les rend plus sensibles, par exemple lors d'arrivée de nouvelles maladies. De plus, vu le faible nombre d'individus de la population française de Vison d'Europe (l'estimation de 200-250 individus est probablement optimiste), la diminution peut être rapide (vortex d'extinction), la réintroduction d'individus en nature est donc une priorité urgente. Le choix des sites de réintroduction est capital et devra se faire dans des habitats de bonne qualité et exempts de la présence de Vison d'Amérique. Cette fragilité des petites populations sera réaffirmée dans l'introduction du PNA.

➔ Le CS conclut que la faible diversité génétique est à citer comme un facteur de menace mais qu'elle n'entraîne pas d'action spécifique. Cette question ainsi que celle concernant l'hybridation avec le Putois d'Europe seront réunies dans un paragraphe unique traitant de la génétique des populations.

Il est également proposé de changer l'ordre des menaces dans le chapitre dédié.

➔ Bien que secondaires, la « prédation par les carnivores », peut être très impactante localement et est donc à remonter.

6. Le Raton laveur est-il une menace pour le Vison d'Europe ?

Certains membres du CS doutent que le Raton laveur soit un compétiteur potentiel du Vison d'Europe. En fortes densités, le Raton laveur pourrait poser des problèmes de compétition alimentaire ou d'occupation des habitats du Vison d'Europe, mais ce n'est pas démontré.

➔ En l'absence de preuves concrètes, il est acté de conserver le Raton laveur dans les menaces potentielles et l'action associée (sous-action 3.3.2 « Etudier l'impact potentiel d'autres espèces allochtones sur le Vison d'Europe ») en priorité 3. La population de Raton laveur fera l'objet d'une surveillance.

Le bilan à mi-parcours du 3^{e} PNA sera l'occasion de réviser cette action et d'y inclure de la lutte si un impact est démontré d'ici là. Le CS alerte néanmoins sur la nécessité de conduire une lutte appropriée afin de ne pas générer une explosion démographique.

7. Action 3.3.1 « Etudier le Vison d'Amérique pour améliorer la stratégie de lutte »

Les études n'apparaissent pas comme une action pertinente, la lutte reste prioritaire et peut apporter suffisamment de données pour l'améliorer en continu. L'utilisation des radeaux reste à ce jour le meilleur moyen de lutte. L'analyse des données issues des radeaux et des cadavres peut permettre d'étudier la structure de la population et ainsi d'adapter la lutte.

➔ Il est décidé de supprimer cette sous-action et d'inclure la valorisation des données dans l'action 3.2 « Lutter contre le Vison d'Amérique en nature ».

8. Indicateurs

Les indicateurs actuellement prévus dans le PNA sont des indicateurs de réalisation, et la question est posée sur la nécessité de disposer d'indicateurs d'efficacité. Leur choix est important car certains résultats peuvent poser des difficultés d'interprétation.

➔ Les membres du CS ont une semaine (jusqu'au 10/05/2021) pour faire des propositions d'indicateurs supplémentaires.

Annexe n°2

PRÉFÈTE
DE LA RÉGION
NOUVELLE-AQUITAINE
Liberté
Égalité
Fraternité

OFB
OFFICE FRANÇAIS
DE LA BIODIVERSITÉ

Plan National d'Actions en faveur du Vison d'Europe
Comité de pilotage du 1er juin 2021

Animateurs
Capucine CROSNIER – DREAL Nouvelle-Aquitaine
Maylis FAYET – Office Français de la Biodiversité
Aurore PERRAULT – DREAL Nouvelle-Aquitaine

Rapporteurs
Christelle BELLANGER – Office Français de la Biodiversité
Yoann BRESSAN – Office Français de la Biodiversité
Thomas RUYS – Groupe de Recherche et d'Investigation sur la Faune Sauvage (GRIFS)
Nolwenn PONS – Cistude Nature

Participants
Christian ARTHUR – Société Française pour l'Etude et la Protection des Mammifères
Géraldine AUDIE-LIEBERT – CEREMA Sud-Ouest
Xavier BARON – Parc Naturel Régional du Marais Poitevin
Véronique BARTHELEMY – DREAL Nouvelle-Aquitaine
Romain BEAUBERT – Ligue pour la Protection des Oiseaux
Yann de BEAULIEU – Office Français de la Biodiversité
Nicolas BERNADICOU – Conseil départemental du Gers
Laurie BERTHOMIEU – ZOODYSSÉE
Sylvain BROGNIEZ – Conseil départemental de la Gironde
Pascale CAZIN – DRAAF Nouvelle-Aquitaine
Pierre CHAMBON – CEREMA Sud-Ouest
Matthieu DORFIAC – Charente nature
Nathalie DUPRIEZ – DDT des Hautes-Pyrénées
Fabien EGAL – Association Départementale des Piégeurs Agréés de Gironde
Christine FOURNIER – GREGE
Paul GARCIA – Union Nationale des Associations de Piégeurs Agréés de France
Thierry GATELIER – Conseil départemental des Landes
Estelle LAOUE – GREGE
Marine LAVAL – Conseil régional Nouvelle-Aquitaine
Ingrid MARCHAND – Ligue pour la Protection des Oiseaux
Alain MESPLEDE – DDPP des Pyrénées-Atlantiques
Mickaël MIMAUD – Fédération Régionale des Chasseurs Pays de la Loire
Olivier PATRIMONIO – Ministère de la Transition Ecologique
Mathilde PICARD – ZOODYSSÉE
Guillaume ROMANO – ZOODYSSÉE
René ROSOUX – Rapporteur du CNPN
Fabrice SAGOT – DDT des Deux-Sèvres

Etaient excusés
John BERGERON – Conseil départemental de la Charente
Nicolas BOURDET – Conseil départemental de la Charente

Eric FEDRIGO – DDT de la Dordogne
Pascal FOURNIER – GREGE
Patrick HAFFNER – Muséum National d'Histoire Naturelle
Hélène GINESTE – DREAL Occitanie
Catherine LABAT – Conseil départemental des Hautes-Pyrénées
Marie-Christine LACOSTE – Conseil départemental de la Charente-Maritime
Isaël LARVOR – DREAL Pays de la Loire
Guillaume MALFAIT – DDTM de la Charente-Maritime
Sylvain WAGNER – Conseil départemental de la Dordogne

Le diaporama présenté en séance est disponible sur la page Vison d'Europe du site Internet de la DREAL Nouvelle-Aquitaine :
http://www.nouvelle-aquitaine.developpement-durable.gouv.fr/le-vison-d-europe-a10771.html

1. Introduction (Capucine CROSNIER et Aurore PERRAULT)

Depuis 1999, deux Plans Nationaux d'Actions et un Plan National d'Actions intermédiaire se sont succédé. Un LIFE VISON est en cours et se terminera en 2022.
Remerciement de tous les participants, des animateurs, du ministère et du CNPN pour leur soutien.
La DREAL Nouvelle-Aquitaine réaffirme l'importance de ce PNA pour la région.

Depuis le précédent COPIL du 2 avril 2019, des groupes de travail techniques ont permis de lister les actions du futur 3e PNA. Un projet de PNA a été soumis à la consultation de tous les partenaires du 7 janvier au 25 février 2021. Après la prise en compte de tous ces commentaires, le projet de plan a été soumis au Conseil Scientifique le 3 mai et est présenté ce jour au COPIL avant le passage en CNPN, le 17 juin prochain.

2. Elaboration du 3e PNA (Maylis FAYET et Aurore PERRAULT)

Présentation des remarques émises lors de la consultation et des points spécifiques soumis à l'avis du Conseil Scientifique.
Présentation du PNA finalisé : sommaire, fiches actions, estimation financière.

3. Eléments saillants des discussions

Le dialogue et le travail menés par l'équipe du PNA sont salués ainsi que le caractère opérationnel et explicite du document. Quelques propositions de regroupement de sous actions sont émises, à évaluer au regard de la compréhension globale du document.

Une animation soutenue et continue dans le temps du PNA doit être confortée pour assurer une bonne mise en œuvre et un suivi des actions. La DREAL Nouvelle-Aquitaine souhaite poursuivre en ce sens avec le binôme d'animateurs OFB/GRIFS. De grands chantiers sont à mener pour la sauvegarde du Vison d'Europe : si des partenaires souhaitent participer au pilotage de certaines actions, ils sont les bienvenus.

La coopération internationale doit être poursuivie tout au long du 3e PNA, en particulier au niveau franco-espagnol. La conduite d'actions en commun est importante. Le MTE assurera le lien avec le ministère espagnol.

Concernant le calendrier de validation et lancement « officiel » du 3e PNA :

- L'avis du CNPN est rendu dans les 15 jours suivant la commission.
- Les consultations interministérielle et publique (1 mois) seront lancées en parallèle pour une validation courant septembre.

Le démarrage effectif du 3e PNA sera alors possible ainsi que l'organisation des prochaines réunions de travail pour les actions prioritaires.

La mise en œuvre des opérations de translocation est attendue de manière prioritaire de la part des partenaires et la réflexion sur le sujet devra trouver place dès le démarrage du 3e PNA. Elle devra notamment s'appuyer sur les ressources bibliographiques disponibles et sur les retours d'expériences déjà menées par d'autres équipes à l'international (notamment en Espagne, en Estonie et en Allemagne). Il faudra bien veiller à l'acclimatation des individus avant lâcher, à anticiper la préparation du terrain et la sensibilisation des acteurs locaux.

Les dernières informations concernant le développement des élevages ex-situ en France ont été annoncées : l'élevage de Zoodyssée compte actuellement 17 mâles et 14 femelles. En 2021, 6 femelles ont été mises en reproduction, 4 accouplements ont été observés. Une première mise-bas a eu lieu le 8 mai, une seconde le 21 mai. Une femelle est encore gestante et devrait mettre bas début juin. Une femelle n'est pas gestante.
Il est également possible qu'il y ait des premières naissances à la réserve zoologique de Calviac cette année car un accouplement a été observé.

Concernant le Vison d'Europe, des précisions concernant son occupation et son utilisation de l'espace sont attendues. Les résultats des suivis engagés par le LIFE Vison devront être valorisés en ce sens dans le 3e PNA. Pour les suivis et notamment les prospections, la démultiplication des méthodes est bien prévue, notamment pour permettre la participation du plus grand nombre de partenaires.

La vigilance du PNA sur les risques et voies d'introduction de Vison d'Amérique en nature ne doit pas oublier les particuliers détenteurs d'agrément. Un appui du 3e PNA est attendu pour aider à limiter autant que possible la détention de cette espèce en France.

Le budget prévisionnel présenté, environ 1M € par an, ne semble pas excessif pour 10 ans de mise en œuvre compte-tenu des enjeux et de l'aire d'action du 3e PNA.

Pour clore le COPIL, des vidéos des individus suivis par le LIFE Vison sont diffusées. Des vidéos seront également présentées en CNPN à la demande de M. ROSOUX.
Remerciements à l'ensemble des participants et des contributeurs au 3e PNA. Le résultat du passage en CNPN sera transmis aux membres du COPIL par email.

Annexe n°3

COMMISSION ECB du CNPN du 17 juin 2021

Avis du CNPN sur le PNA² 2021-2030 en faveur du Vison d'Europe *(Mustela lutreola)*

La commission ECB a entendu les porteurs de projet (DREAL Nouvelle-Aquitaine et Direction régionale de l'OFB) à propos du nouveau PNA en faveur du Vison d'Europe. De l'avis général, le projet de ce PNA² est apparu pertinent, clair, bien argumenté et relativement complet au regard des remarques critiques et des suggestions qui avaient été formulées, par la commission ECB, sur le bilan du PNAi (2015-2020) en faveur du Vison d'Europe, le 11/07/2019.

Pour mémoire, la commission avait insisté pour que les actions du futur PNA se concentrent sur :

- l'évolution de la répartition, en privilégiant les méthodes préconisées,
- la protection durable et la gestion appropriée des habitats occupés par l'espèce,
- la gestion efficace des centres de reproduction en captivité,
- la mise en œuvre des campagnes de translocation conservatoire ; un effort tout particulier devant être apporté à la mise au point de méthodes et techniques efficaces et au choix des lieux de lâcher des individus, issus des élevages conservatoires.

À l'issue de la présentation du projet de PNA² et à la suite des remarques critiques du rapporteur, la commission « Espèces et communautés biologiques » a débattu et a émis l'avis suivant :

- malgré un bilan mitigé et une réussite modérée des actions du PNAi, notamment en ce qui concerne la protection effective de la population française et la maîtrise des facteurs de régression,

- en considérant le statut de conservation de cette espèce en danger (EN / Réf : UICN-F), les menaces qui pèsent toujours sur elle et la nécessité de poursuivre les efforts d'études et de protection, à travers un programme d'actions concerté, tant sur la population relictuelle que sur ses habitats spécifiques,

- en prenant en compte les avancées scientifiques obtenues lors du PNAi et du programme LIFE associé et, par ailleurs, l'amélioration notable des connaissances en matière d'élevage et le succès de reproduction en captivité, ainsi que la bonne collaboration entre les partenaires scientifiques et les acteurs de terrain,

Après délibération, la Commission **a émis un avis favorable à l'unanimité** (12 voix pour), à la mise en place du nouveau Plan National d'Action 2021-2030 en faveur du Vison d'Europe. Toutefois, s'agissant du contenu et de la présentation du document, au regard de l'importante diffusion internationale prévue (version anglaise) et de la responsabilité de la France à l'égard de cette espèce endémique européenne, la commission recommande vivement à la DREAL coordinatrice de veiller, d'une part, à apporter les corrections et les compléments scientifiques proposés par le référent « Vison d'Europe » du CNPN et, d'autre part, de mieux anticiper les sources de financement, accordées ou pressenties (plan de financement), au moins sur les cinq premières années, pour permettre d'apprécier l'importance relative et les enjeux des actions.

L'avis est toutefois assorti des recommandations suivantes :

- poursuivre l'étude de l'évolution de la répartition, en privilégiant les méthodes non invasives ne mettant pas en danger la vie des individus, compte-tenu du faible effectif de la population relictuelle française ;
- renforcer les actions de conservation et de restauration des zones humides et des cours d'eau favorables dans l'aire de répartition actuelle ;
- concentrer les efforts sur l'éradication du Vison d'Amérique (espèce déclarée EEE), en particulier dans les zones où les deux espèces de vison cohabitent, avec les précautions d'usage (formations à l'identification) et, concomitamment, intervenir auprès du Ministère de la Transition Écologique (argumentaire détaillé), pour que ne soient plus autorisées la vente et la détention du Vison d'Amérique, en tant que NAC, pour les particuliers ;
- poursuivre la veille sanitaire en surveillant les causes de mortalité liées à certaines pathologies ;
- dynamiser les efforts de reproduction en captivité dans les centres agréés et veiller à mettre les individus à relâcher dans les conditions optimales, pour qu'ils puissent être autonomes et aguerris face aux contraintes de la vie en pleine nature ;
- mettre en œuvre une étude comparative sur les potentialités des futurs sites de translocation conservatoire, afin de ne pas perturber les populations relictuelles établies. Mettre en place des indicateurs de suivis, pour pouvoir apprécier le taux de survie des individus lâchés et le succès de reproduction des animaux issus de captivité.
- démontrer que ce nouveau PNA n'est pas un *bis repetita* du précédent et montrer sa pertinence et ses enjeux ; la responsabilité partagée de la France et de l'Espagne étant devenue capitale pour la sauvegarde de cette espèce européenne, au bord de l'extinction ;
- veiller à la compatibilité et à la complémentarité des actions avec le programme « LIFE Vison » en cours, coordonné par la LPO (LIFE 16NAT/FR/00872) ;
- collaborer étroitement avec les autres pays d'Europe engagés dans la conservation de l'espèce et obtenir un retour d'expérience sur les opérations de réintroductions récentes en Allemagne, pour pouvoir apprécier la probabilité d'une reconquête de la région Grand Est, par la SARRE, toute proche ;
- prévoir impérativement un bilan du PNA², y compris financier, à mi-parcours en distinguant bien les actions spécifiques du PNA² et celles du programme **LIFE** en cours ;
- prévoir les moyens en personnel suffisants pour assurer la coordination et l'animation du PNA, afin d'éviter les difficultés de fonctionnement des PNA antérieurs et assurer la continuité et la bonne gestion des programmes d'actions ;
- inviter et prévoir l'accueil du référent du CNPN aux réunions du comité de pilotage du PNA, pendant toute sa durée.

Rédacteur de l'avis : René ROSOUX, référent CNPN du Vison d'Europe.

Michel METAIS
Président de la Commission ECB

Annexe n°4

Liste des membres du Comité de Pilotage du 3e PNA

- Ministère de la Transition Écologique
- Conseil National de Protection de la Nature
- Muséum National d'Histoire Naturelle
- Agence de l'Eau Adour-Garonne
- Agence de l'Eau Loire-Bretagne
- Office Français pour la Biodiversité - Direction Régionale Nouvelle-Aquitaine
- Centre d'Études et d'Expertise sur les Risques, l'Environnement, la Mobilité et l'Aménagement Sud-Ouest
- Direction Régionale de l'Alimentation, de l'Agriculture et de la Forêt Nouvelle-Aquitaine
- Direction Régionale de l'Environnement, de l'Aménagement et du Logement des Pays de la Loire
- Direction Régionale de l'Environnement, de l'Aménagement et du Logement Occitanie
- Direction Départementale des Territoires de la Charente
- Direction Départementale des Territoires et de la Mer de la Charente-Maritime
- Direction Départementale des Territoires de la Dordogne
- Direction Départementale des Territoires du Gers
- Direction Départementale des Territoires et de la Mer de la Gironde
- Direction Départementale des Territoires et de la Mer des Landes
- Direction Départementale des Territoires du Lot-et-Garonne
- Direction Départementale des Territoires et de la Mer des Pyrénées-Atlantiques
- Direction Départementale des Territoires des Hautes-Pyrénées
- Direction Départementale des Territoires des Deux-Sèvres
- Direction Départementale des Territoires et de la Mer de la Vendée
- Direction Départementale de la Protection des Populations des Pyrénées-Atlantiques
- Direction Départementale de la Cohésion Sociale et de la Protection des Populations des Deux-Sèvres
- Conseil Régional Nouvelle-Aquitaine
- Conseil Régional Occitanie
- Conseil Régional des Pays de la Loire
- Conseil Départemental de la Charente
- Conseil Départemental de la Charente-Maritime
- Conseil Départemental de la Dordogne
- Conseil Départemental du Gers
- Conseil Départemental de la Gironde
- Conseil Départemental des Landes
- Conseil Départemental du Lot-et-Garonne
- Conseil Départemental des Pyrénées-Atlantiques
- Conseil Départemental des Hautes-Pyrénées
- Conseil Départemental des Deux-Sèvres
- Conseil Départemental de la Vendée
- Chambre Régionale d'Agriculture Nouvelle-Aquitaine
- Zoodyssée
- Réserve zoologique de Calviac
- Fédération départementale des chasseurs de la Charente
- Fédération départementale des chasseurs de la Vendée
- Union Régionale des Associations des Piégeurs Agréés d'Aquitaine
- Association des Piégeurs Agréés des Hautes-Pyrénées

- Fédération Nationale de Pêche
- Fédération Régionale de Défense contre les Organismes Nuisibles Nouvelle-Aquitaine
- Fédération Régionale de Défense contre les Organismes Nuisibles Pays de La Loire
- Fédération Régionale de Défense contre les Organismes Nuisibles Occitanie
- Parc Naturel Régional des Landes de Gascogne
- Parc Naturel Régional Périgord Limousin
- Parc Naturel Régional du Marais poitevin
- Réserves Naturelles de France
- Ligue pour la Protection des Oiseaux
- Société Française pour l'Étude et la Protection des Mammifères
- Confédération France Nature Environnement Nouvelle-Aquitaine
- Groupe de Recherche et d'Étude pour la Gestion de l'Environnement
- Groupe de Recherche et d'Investigation sur la Faune Sauvage
- Conservatoire des Espaces Naturels Nouvelle-Aquitaine
- Conservatoire des Espaces Naturels des Pays de la Loire

Annexe n°5

Liste des membres du Conseil Scientifique du 3e PNA

(membres nommés intuitu personnae)

- M. Philippe BERNY	VetAgro Sup
- M. Sébastien DEVILLARD	Université de Lyon
- Mme Christine FOURNIER	GREGE
- M. Tiit MARAN	Zoo de Tallin
- M. Johan MICHAUX	Université de Liège
- M. Madis PODRA	Fondation Lutreola
- Mme Audrey SAVOURE-SOUBELET	SFEPM
- M. Julien STEINMETZ	OFB

Annexe n°6

Plan National d'Actions en faveur du Vison d'Europe
Groupes de travail des 28 et 29 mai 2019

Participants

28 mai 2019 – 10h-12h : « Amélioration des connaissances sur le Vison d'Europe »

Romain BEAUBERT - Ligue pour la protection des oiseaux
Christelle BELLANGER – ONCFS
John BERGERON - Conseil départemental de la Charente
Laurie BERTHOMIEU - ZOODYSSÉE
Yoann BRESSAN - ONCFS
Pierre DEXET - Conseil départemental de la Charente
Maylis FAYET - ONCFS
Pascal FOURNIER - GREGE
Estelle LAOUE - GREGE
Ingrid MARCHAND - Ligue pour la protection des oiseaux
Aurore PERRAULT - DREAL Nouvelle-Aquitaine
Jean-Baptiste PONS - Cistude Nature
Nolwenn PONS - Cistude Nature

28 mai 2019 – 14h-16h : « Elevage du Vison d'Europe et stratégie de renforcement »

Romain BEAUBERT - Ligue pour la protection des oiseaux
Christelle BELLANGER - ONCFS
Laurie BERTHOMIEU - ZOODYSSÉE
Yoann BRESSAN - ONCFS
Maylis FAYET - ONCFS
Pascal FOURNIER - GREGE
Ingrid MARCHAND - Ligue pour la protection des oiseaux
Aurore PERRAULT - DREAL Nouvelle-Aquitaine
Jean-Baptiste PONS - Cistude Nature
Nolwenn PONS - Cistude Nature

28 mai 2019 – 16h30-18h30 : « Communication et financements »

Romain BEAUBERT - Ligue pour la protection des oiseaux
Christelle BELLANGER - ONCFS
Laurie BERTHOMIEU - ZOODYSSÉE
Yoann BRESSAN - ONCFS
Maylis FAYET - ONCFS
Pascal FOURNIER - GREGE

Ingrid MARCHAND - Ligue pour la protection des oiseaux
Aurore PERRAULT - DREAL Nouvelle-Aquitaine
Jean-Baptiste PONS - Cistude Nature
Nolwenn PONS - Cistude Nature

29 mai 2019 – 10h-12h : « Lutte contre le Vison d'Amérique »

Xavier BARON - Parc naturel régional Marais Poitevin
Romain BEAUBERT - Ligue pour la protection des oiseaux
Christelle BELLANGER - ONCFS
Matthieu DORFIAC - Charente nature
Fabien EGAL - Association départementale des piégeurs agréés de Gironde
Maylis FAYET - ONCFS
Pascal FOURNIER - GREGE
Paul GARCIA – UNAPAF
Théo LABEYRIE – FDGDON 40
Estelle LAOUE - GREGE
Ingrid MARCHAND - Ligue pour la protection des oiseaux
Mickaël MIMAUD – Fédération des chasseurs de Vendée
Aurore PERRAULT - DREAL Nouvelle-Aquitaine
Jean-Baptiste PONS - Cistude Nature
Nolwenn PONS - Cistude Nature
Vincent ROHRHURST – FDGDON 40

29 mai 2019 – 14h-16h : « Lutte contre les autres facteurs de menace et amélioration des habitats favorables au Vison d'Europe »

Géraldine AUDIE-LIEBERT - CEREMA SO
Xavier BARON - Parc naturel régional Marais Poitevin
Romain BEAUBERT - Ligue pour la protection des oiseaux
Christelle BELLANGER - ONCFS
Matthieu DORFIAC - Charente nature
Maylis FAYET - ONCFS
Pascal FOURNIER - GREGE
Théo LABEYRIE – FDGDON 40
Estelle LAOUE - GREGE
Ingrid MARCHAND - Ligue pour la protection des oiseaux
Mickaël MIMAUD – Fédération des chasseurs de Vendée
Aurore PERRAULT - DREAL Nouvelle-Aquitaine
Jean-Baptiste PONS - Cistude Nature
Nolwenn PONS - Cistude Nature
Vincent ROHRHURST – FDGDON 40

L'objectif de ces groupes de travail était de proposer les thèmes qui devraient être abordés dans les fiches actions du 3e Plan National d'Actions en faveur du Vison d'Europe, rédigé par l'ONCFS.

L'ensemble des propositions a permis de construire un programme prévisionnel de 13 actions et 29 sous actions présenté dans le tableau 1. À noter que toutes les actions de communication ont été regroupées dans l'item 5.1.1. « Construire un plan de communication et le mettre en œuvre » et sont détaillées dans le tableau 2.

Tableau 1 : Programme prévisionnel d'actions du PNA 3 en faveur du Vison d'Europe

AXES	ACTIONS	SOUS-ACTIONS
1. Amélioration des connaissances sur le Vison d'Europe	**1.1. Suivre l'évolution de l'aire de répartition du Vison d'Europe**	**1.1.1. Mettre à jour la carte de répartition du Vison d'Europe.** Cette connaissance est la base à partir de laquelle de nombreuses actions du PNA vont dépendre, cette actualisation doit être fondée sur une base d'informations/données validées scientifiquement. Par conséquent, au vu des données récoltées grâce au protocole de prospection démarré pendant le PNAi mais également par le biais d'autres sources (plateformes naturalistes participatives…), il convient d'apporter les ajustements nécessaires au protocole, i) répétition/adaptation du protocole sur certains secteurs prioritaires, ii) couplage avec différentes méthodes en cours de test (pièges photos…), iii) passage sur les secteurs de présence ancienne. pour être en mesure de produire une actualisation de l'aire de répartition de l'espèce rapidement et sur la base de données validées scientifiquement. Une coordination avec les programmes de prospections espagnols sera à rechercher.
		1.1.2. Tester et comparer des méthodes alternatives aux campagnes de prospection Comparer l'analyse des résultats des campagnes de prospections (taux de détection, variables environnementales, périodes), avec ceux obtenus par d'autres méthodes alternatives et/ou innovantes (Pièges à poils, tunnels à empreintes, chien de détection, pièges photos appâtés, ADNe…) afin de poursuivre l'amélioration des différentes techniques et méthodes, qui pourront par la suite faire l'objet de protocoles de déploiement adaptés afin de continuer à capitaliser des données de répartition de l'espèce pendant toute la durée du PNA.
	1.2. Caractériser les populations de Vison d'Europe	**1.2.1. Définir des protocoles de suivis individuels et mise en place d'une coopération scientifique** Afin de mieux appréhender l'état des populations, il convient de mettre à jour les connaissances sur les noyaux de populations : effectif (individualisation), sexe ratio, structures d'âges (filiation), fertilité, périodes de reproduction, survie des jeunes, capacités de dispersion, taille des domaines vitaux, régime alimentaire, habitats utilisés, taux d'hybridation avec le putois… Pour répondre à toutes ces questions, des partenariats scientifiques durables au niveau national et international vont être nécessaires pour mutualiser les efforts et notamment dans le domaine de la génétique.
	1.3. Étudier l'état sanitaire des populations de Vison d'Europe.	**1.3.1. Élaborer et mettre en œuvre un programme de suivi sanitaire du Vison d'Europe** Afin de mieux comprendre les facteurs de mortalité touchant les populations naturelles, il est important d'identifier et de suivre les pathologies présentes ou émergeantes dans celles-ci, mais également au sein des différentes espèces vectrices de pathologies pouvant atteindre le Vison d'Europe (Vison d'Amérique, Putois…autres espèces). Pour ce faire, il convient de définir des protocoles de collecte (sur animaux vivants ou morts) et de gestion (stockage, tenue d'un registre en lien avec l'action 1.4.1) d'échantillons de matériels biologiques (sang, crottes, cadavres, organes…) et de définir les champs d'analyses à mener (toxicologie, bactériologie, virologie…). Pour mener à bien ces études, il faudra construire des liens étroits avec des laboratoires habilités à réaliser des analyses, des biologistes, des partenaires scientifiques, tant au niveau national (SAGIR…) qu'international afin de mobiliser les compétences adéquates.
		1.3.2. Elaborer et mettre en œuvre un protocole de gestion des individus en détresse. Que ce soit de manière inopinée ou pendant les études mises en œuvre dans le cadre du PNA, il est possible d'être confronté à la découverte d'un individu dont l'état de santé est préoccupant. Dans ce cas, il convient de mener une réflexion sur le devenir de celui-ci en fonction d'examens vétérinaires ciblés (remise en état et relâché ou examens sublétaux contribuant à l'amélioration des connaissances). Par ailleurs, la découverte d'un tel individu à proximité d'une population frontalière (Espagne), devra faire l'objet d'un transfert rapide d'informations.
	1.4. Collecter et valoriser les données et leurs producteurs	**1.4.1. Gérer et alimenter les bases de données relatives à la mise en œuvre du PNA** Les différentes actions du PNA contribuant à l'amélioration des connaissances (Axe1) sont sources de productions de données qu'il convient de capitaliser, d'ordonner et d'actualiser. Il peut s'agir à la fois de données opportunistes ou de données issues de protocoles sur les espèces (prospections Vison d'Europe, opérations de lutte Vison d'Amérique), mais aussi de données d'échantillons, de résultats d'analyses, de photos, de vidéos…etc. Ces données sont souvent le fruit de la participation de divers partenaires qu'il conviendra de bien identifier afin de valoriser ensemble les résultats selon la charte qui sera définie (Cf action 1.4.2)
		1.4.2. Collecter les données produites par des partenaires et assurer une valorisation commune dans le cadre du PNA. Dans le cadre de leurs programmes propres, différentes structures peuvent être productrices de données sur les visons. Il convient d'identifier ces producteurs et détenteurs de données (service des routes, faune aquitaine, OAFS, LPO, DDT(M)…) et d'établir avec eux des modalités de transfert vers le PNA afin d'en assurer une valorisation collective. Pour ce faire, il est nécessaire d'établir une charte d'utilisation et de valorisation des données des partenaires pour garantir une transparence et la reconnaissance de tous les partenaires. Afin d'associer davantage le grand public à la connaissance du Vison d'Europe, la possibilité de la création d'une plateforme collaborative de saisie de données pourrait être étudiée.
		1.4.3. Réaliser et tenir à jour une synthèse bibliographique sur le Vison d'Europe. Afin d'être efficient, il est important de profiter des avancées des études réalisées, de bénéficier des expériences acquises pour éviter de relancer des sujets déjà traités et analysés. Aussi, une veille sur l'ensemble des travaux nationaux et internationaux relatifs aux diverses actions du PNA est nécessaire.
2. Stratégie de conservation et	**2.1. Disposer d'un centre d'élevage de Vison d'Europe durable et intégré au sein de l'EEP**	**2.1.1. Actualiser et compléter le guide de bonnes pratiques « breeding guidelines »** Sur la base d'une consultation de l'ensemble des centres d'élevages européens de Vison d'Europe, faire un retour d'expérience des pratiques d'élevage et des taux de réussite ou facteurs d'échec :

d'élevage du Vison d'Europe.		origine des individus, descriptifs des installations, matériels utilisés pour les suivis individuels (pesées, frottis, échographies...), suivis sanitaires pratiqués, maladies déclarées, gestion des individus (suivi du poids, type d'alimentation…), type de reproduction (naturelle, semi-naturelle et/ou artificielle), pratiques en période de reproduction (déplacement des individus, gestion des enclos, journée vs nuit, durée accouplement…), taux de mâles inaptes, résultats des croisements en souches Est et Ouest (reproduction des F1, impacts génétiques…), difficultés rencontrées…
		2.1.2. Rédiger en lien avec l'EEP un guide de gestion adapté aux élevages français Sur la base des retours apportés par la sous-action 2.1.1, il s'agit de compiler les paramètres les plus probants pour améliorer l'efficacité des élevages français. Ce guide fera notamment le descriptif précis des protocoles de suivi à mettre en place selon le cycle de reproduction (avant, pendant, élevage des jeunes, après). Il définira également comment les élevages français s'intègrent au sein de l'EEP (besoins d'individus complémentaires – nombre, source, sexe…, gestion des individus inaptes, définition des appariements, devenir des individus nés en France…)
		2.1.3. Réaliser des études complémentaires contributives pour l'EEP La France peut aussi apporter au sein de l'EEP des éléments pour améliorer l'efficacité globale de la gestion ex situ du Vison d'Europe. Il s'agit d'étudier les comportements stéréotypés vus en France et de poursuivre les recherches sur l'insémination artificielle et la constitution d'une banque de sperme. Suivant les premiers résultats, la question du transfert embryonnaire (mère porteuse Putois) pourrait aussi être explorée. Un autre volet d'étude pourrait être constitué par une réflexion autour de l'élevage en semi-captivité. L'ensemble de ces réflexions pourrait notamment trouver place lors d'un workshop proposé en marge du colloque européen sur les mustélidés qui a lieu tous les 2/3 ans.
	2.2. Définir la stratégie de réintroduction dans le milieu naturel et la mettre en œuvre	**2.2.1. Définir la stratégie de réintroduction** Sur la base de l'actualisation des retours d'expériences analogues menées en Europe (où, quand, comment, quels individus, suivis engagés, taux et facteurs d'échecs…), affiner les différents scénarii possibles (à proximité d'une population existante ou non, sites potentiels, quand, comment, combien d'individus, âges, sexes, source, modalités de suivi des sites et des individus – radiopistage ou CMR directe ou indirecte...) et faire un choix
		2.2.2. Préparer la ou les zones de réintroduction Assurer une bonne perception locale du projet, gérer des habitats de qualité (gîtes, alimentation, reproduction, déplacements), veiller à lutter contre les facteurs de menaces en nature, réaliser les démarches administratives nécessaires…
		2.2.3. Mettre en œuvre les réintroductions et suivre les sites et les individus réintroduits Organiser un suivi partenarial des sites (qualité des habitats, espèces concurrentes…) et des individus lâchés. Faire un bilan des facteurs de réussite ou d'échec.
3. Limitation des impacts du Vison d'Amérique sur le Vison d'Europe	**3.1. Lutter contre les sources d'introduction de Vison d'Amérique dans le milieu naturel**	**3.1.1. Veiller sur l'état des élevages de Vison d'Amérique** Sur le périmètre d'action du PNA, il reste un seul élevage actif. Il convient de s'assurer régulièrement que les installations de ce dernier garantissent des conditions d'étanchéité optimales. Par ailleurs, étant donné les risques d'actes de vandalisme qui touchent régulièrement ce type de structure, il parait opportun d'éviter toute nouvelle installation d'élevage de Vison d'Amérique sur le périmètre d'action du PNA. Il est donc nécessaire que les services instructeurs garants des réglementations concernant les espèces exotiques envahissantes, la détention de faune sauvage captive ou encore les installations classées pour l'environnement se coordonnent pour formuler leurs avis. Une procédure d'urgence en cas d'échappée doit être actualisée et mise en œuvre autour de l'élevage présent en zone PNA et hors zone PNA. Une veille par radeau en continu pourrait être de mise. Concernant les élevages situés en dehors du périmètre du PNA, dont certains ne sont pas si loin, il convient de transférer les acquis du PNA pour éviter autant que possible toute fuite d'individus dans le milieu naturel et indiquer comment réagir en cas d'échappée.
		3.1.2. Veiller sur les conditions de détention en dehors des élevages. Il existe d'autres détenteurs de vison d'Amérique, temporaires ou durables, que sont les parcs zoologiques, des individus détenteurs d'un certificat de capacité ou encore les centres de soin de la faune sauvage. Pour ces derniers, il arrive régulièrement que des individus trouvés en nature leur soient apportés. Il existe aussi des réseaux illégaux de vente et de transfert de faune sauvage et quelques cas de visons d'Amérique ont déjà été rencontrés. Les effectifs d'animaux sont bien moins conséquents qu'en cas d'échappée d'un élevage. Néanmoins, dans le périmètre du PNA, pour protéger les derniers noyaux restants de Vison d'Europe, il est impératif que ces individus soient limités et contraint dans des conditions de détention hermétiques vis-à-vis des espaces naturels. Une procédure de gestion des individus arrivant en centre de soin doit être discutée et mise en œuvre.
		3.1.3 Apporter l'expertise nécessaire à l'évolution du statut réglementaire du Vison d'Amérique en France. La réglementation récente, et encore en cours d'évolution, sur la détention des espèces exotiques envahissantes doit être largement diffusée, expliquée et contrôlée. Cette réglementation répond à un règlement européen régulièrement évalué. Des modifications sont parfois apportées sur la base des remontées des gestionnaires d'espaces ou d'espèces en lien avec des difficultés de gestion d'espèces exotiques envahissantes. Aussi, il parait important que les acquis du PNA, en lien avec les autres programmes européens sur le Vison d'Europe, puissent apporter matière aux évolutions réglementaires, notamment concernant le statut du Vison d'Amérique en France.
	3.2. Lutter contre le Vison d'Amérique en nature en zone PNA	**3.2.1. Affiner et mettre en œuvre la stratégie de lutte.** La lutte contre les espèces exotiques envahissantes et notamment le Vison d'Amérique, est très chronophage et pour des résultats pas toujours à la hauteur des espérances. Il convient donc de faire des choix et de fixer des objectifs à atteindre ainsi que des moyens de lutte adaptés à ces derniers. Une surveillance sur la zone de présence de Vison d'Europe est à poursuivre (après LIFE) ainsi qu'une lutte prioritaire sur les fronts de colonisation et aux frontières du périmètre du PNA. Une cohérence et une coordination avec les équipes espagnoles est à mettre en place pour gagner en efficience en zone transfrontalière.

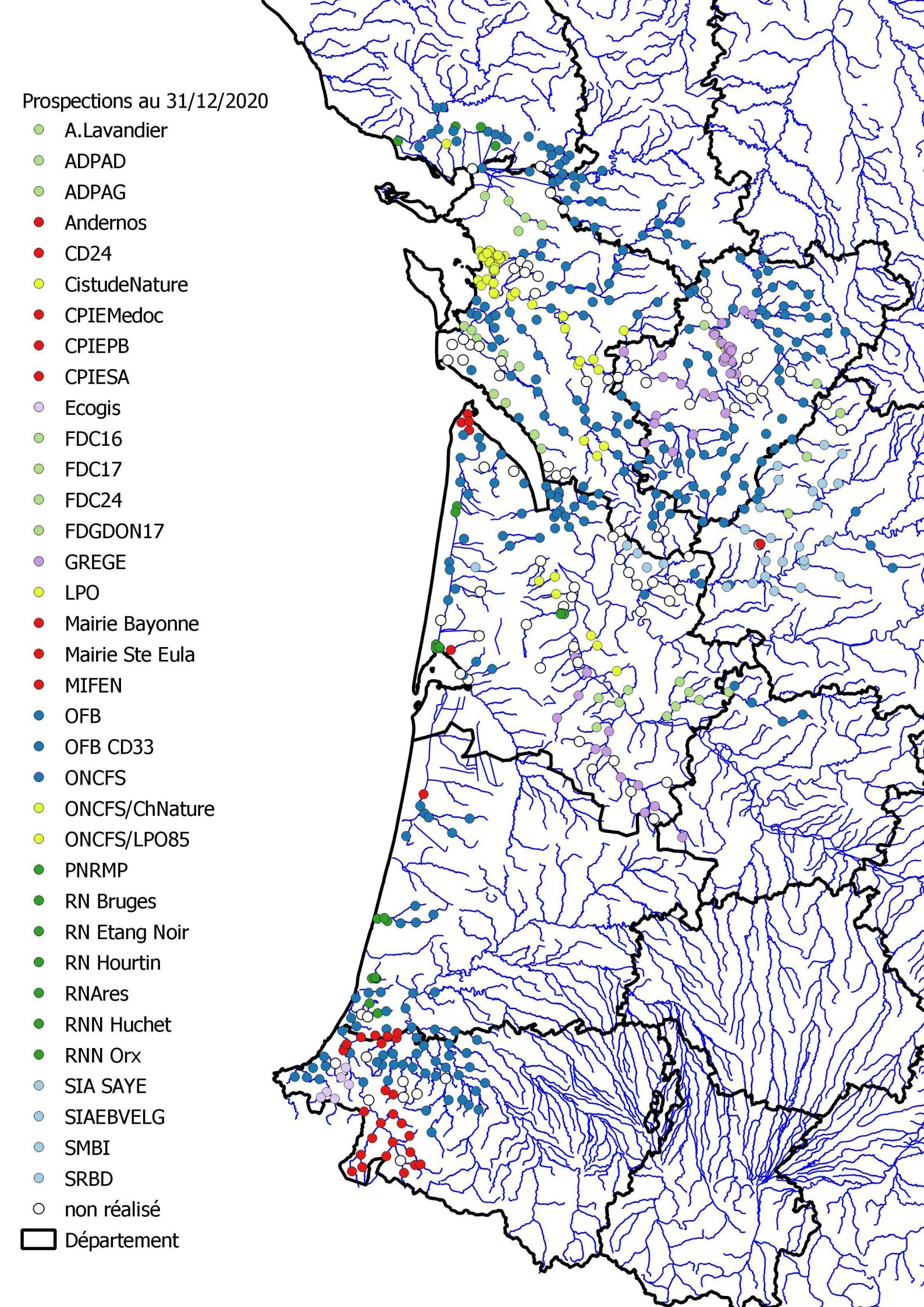
		3.2.2. Améliorer l'efficacité de la lutte Afin d'être toujours en pointe en matière d'efficacité de lutte, il est opportun de mettre en œuvre une veille internationale sur les techniques et stratégies de lutte contre le Vison d'Amérique. Le retour des données de capture ou d'observation de Vison d'Amérique doit être rapide afin que la lutte puisse être adaptée en conséquence. Par exemple, une réactivité rapide doit être prévue en cas de découverte de Vison d'Amérique sur le secteur Charente / Charente-Maritime. Les départements situés en périphérie des zones cœur de Vison d'Europe connues sont, comme les autres, soumis à l'obligation de l'utilisation de la trappe à vison en zone PNA. Cette trappe vise à garantir la sortie des visons et notamment des femelles allaitantes de Vison d'Europe pendant la période d'élevage des jeunes. L'obligation de cette dernière semble freiner fortement les piégeurs dans la mise en œuvre d'action de lutte contre le Vison d'Amérique. Une réflexion doit être menée sur cette obligation après vérification de l'absence du Vison d'Europe de ces secteurs. Par ailleurs, durant cette période de 4 mois d'utilisation de la trappe à vison, il est possible qu'une donnée de présence de Vison d'Amérique dans un secteur de lutte prioritaire apparaisse. Dans ce cas, une surveillance via la pose de radeaux sera mise en place rapidement afin de cibler où démarrer le piégeage dès levée de la période de restriction. Enfin, concernant la trappe à vison, qui peut être de forme carrée, une adaptation devra impérativement être apportée pour l'arrondir afin de diminuer les risques de blessures pour les autres animaux. La trappe à vison suscite régulièrement des interrogations. Des rappels sur son utilité doivent être prévus régulièrement et repris dans les volets de formation prévus à l'action 5.2 La mise en œuvre du piégeage sur un territoire nécessite des procédures administratives d'autorisation des propriétaires et de délégation de droit de destruction. Celles-ci amènent de l'inertie dans le lancement des opérations de lutte. Il pourrait être opportun de mener une analyse juridique sur la possibilité de simplifier les procédures de délivrance de ces autorisations. L'animation du réseau des piégeurs est capitale pour avoir une mobilisation suffisante et pour la recherche des emplacements favorables aux actions de lutte.
	3.3. Acquérir de meilleures connaissances sur le Vison d'Amérique et d'autres espèces allochtones pour améliorer la lutte	**3.3.1. Étudier le Vison d'Amérique pour améliorer la stratégie de lutte** Il s'agit ici d'étudier la dynamique des populations (fertilité, sexe ratio, âge, dispersion..) selon la zone (cœur ou front de dispersion) par différentes méthodes (prélèvements génétiques, GPS, autopsies…) afin de lutter plus efficacement. Par ailleurs, il serait intéressant d'identifier comment le Vison d'Amérique impacte le Vison d'Europe et d'autres espèces, par exemple par l'analyse de son régime alimentaire.
		3.3.2. Étudier l'impact potentiel d'autres espèces allochtones sur le Vison d'Europe Étudier notamment l'impact éventuel du Raton Laveur et proposer une stratégie de lutte si nécessaire Rechercher d'éventuelles autres sources d'impacts (animaux domestiques par exemple).
4. Lutte contre les autres menaces en nature pesant sur le Vison d'Europe	**4.1. Lutter contre la disparition des habitats favorables au Vison d'Europe**	**4.1.1. S'assurer de la prise en compte du Vison d'Europe dans les plans, programmes et documents de gestion** Afin d'aider à la mise en place d'une gestion du territoire compatible avec les exigences écologiques du Vison d'Europe, il convient de poursuivre les travaux de mise à jour du guide des bonnes pratiques de gestion en collaboration avec le programme LIFE et d'en assurer une large diffusion auprès de tous les gestionnaires d'espaces naturels et aménageurs. Ce travail est aussi l'occasion de faire le point sur les mesures ou pratiques existantes qui seraient défavorables au Vison d'Europe. En effet, selon les espèces protégées visées, il peut exister des confrontations d'enjeux qu'il convient d'identifier pour proposer les meilleurs compromis possibles (mesures alternatives). La prise en compte du Vison d'Europe dans les politiques de continuité écologique (TVB, SRADDET) est également à inciter le plus possible.
		4.1.2. Créer des mesures de gestion spécifiques pour le Vison d'Europe Identifier les outils possibles (MAEC, contrats territorial milieux aquatiques, contrat de gestion de cours d'eau, contrats de bassin, zones protégées réglementaires, mesures compensatoires, zones « Havre de paix »…) en fonction de leur portée (règlementaire, contractuelle…) et proposer, inciter à la mise en place de mesures ou d'acquisitions spécifiques pour le Vison d'Europe (berges, zones humides, ilots forestiers…etc.)
		4.1.3. Identifier et suivre la mise en œuvre des mesures compensatoires favorables au Vison d'Europe S'assurer de la prise en compte du Vison d'Europe dans les projets d'aménagements Lister les mesures compensatoires existantes et s'assurer de leur mise en œuvre et de leur efficacité et de leurs suivis (exemple de la base nationale passages faune en cours de constitution au CEREMA). Prévoir le référencement des mesures compensatoires à venir (lien avec outil national GeoMCE)
	4.2. Lutter contre les destructions accidentelles de Vison d'Europe	**4.3.1. Lutter contre les destructions accidentelles liées au piégeage** Le réseau de référents départementaux actuellement en place nécessite d'être optimisé et animé pour maintenir un niveau de compétence (formations) et une couverture du territoire (localisation des référents, disponibilité) performants. En lien avec la stratégie de communication et de formation (action 5.1), il est important de poursuivre et développer la sensibilisation des piégeurs aux critères de distinction entre le Vison d'Europe, le Vison d'Amérique et le Putois. Dans le cadre de la lutte contre le ragondin, des cages peuvent être posées par tout propriétaire sans pour autant être formé, avoir passé un agrément ou encore être au fait de la présence des trois espèces citées ci-avant. Il est nécessaire d'inclure dans l'action 5.1 la prise en compte d'actions de sensibilisation auprès de ces personnes qui peuvent également être mobilisées dans les actions de lutte et faire remonter des données d'observations.

		4.3.2. Lutter contre les mortalités liées aux infrastructures Identifier les ouvrages déjà perméabilisés en zone PNA à partir de bases de données existantes (CEREMA) et évaluer l'efficacité des mesures déjà mises en place (perméabilisations et protections, baisse des collisions ?). Identifier les ouvrages devant être perméabilisés (identification des points noirs de collisions, hiérarchisation des ouvrages…), inciter les aménageurs à intervenir et à organiser le suivi post-aménagement.
5. Communication et formations sur le Vison d'Europe et les actions du PNA 3	**5.1. Élaborer et mettre en œuvre une stratégie de communication**	**5.1.1. Construire un plan de communication et le mettre en œuvre** Identifier tous les publics cibles (français et internationaux) et définir pour chaque les moyens de communication à utiliser ainsi que les supports pertinents. Identifier les supports devant bénéficier d'une traduction. Inclure dans ce plan la valorisation des supports déjà créés (film, plaquette, poster) ou en cours de développement (guide habitat, Kakémono…) dans le cadre du PNAi, du LIFE Vison… Mettre en place une liste de diffusion permettant de faire passer rapidement des informations aux partenaires, financeurs…divers publics.
	5.2. Organiser des formations pour faire connaitre le Vison d'Europe et ses enjeux de conservation	**5.2.1. Construire des modules de formations adaptables selon les publics** Il s'agit de disposer de supports de formation, mis à jour régulièrement permettant de proposer une offre de formation vers un large public. Un module de formation pourrait être proposé au sein des différents instituts de formation existants (CVRH, OFB, formations piégeurs, permis de chasser, …). Prévoir une version du module de formation simplifiée et adaptée pour une prise en main par un tiers autre que les animateurs du PNA (version transférable). Prévoir à l'inverse une version fine et précise à destination des partenaires prenant en charge des actions du PNA.
		5.2.2. Répondre aux demandes de formation Selon une volumétrie à calibrer annuellement, il s'agit de répondre le plus possible positivement aux demandes de formations formulées auprès des animateurs du PNA. En cas d'impossibilité, mettre à disposition le module de formation simplifié transférable. Mettre en œuvre de façon obligatoire une formation pour les partenaires prenant en charge des actions du PNA

Tableau 2 : Projet de plan de communication du PNA3 en faveur du Vison d'Europe

Public cible	Moyens, supports	Commentaires
Tout public	Personnalité publique comme parrain et ambassadeur de l'espèce en France	
	Site Internet avec diffusion des mises à jour via mailing liste et réseaux sociaux en continu	Mise à disposition de tous les supports de communication du PNA. Inclure une cartographie dynamique permettant de visualiser les mises en œuvre des actions du PNA et leurs résultats. Invitations aux journées à thème…
	Bulletins municipaux (association des maires de France)	Informations sur la présence du VE sur commune concernées et sur les dispositifs en place sur ou à proximité des cours d'eau. Rappel sur la réglementation divagation des chiens
	Journées à thème (journée mondiale des ZH, journée de la biodiversité, journée internationale du VE, fête de la nature…)	En choisir 1 ou 2 par an, pas plus
	Film Fifo 1 et quid d'un film Fifo 2 ?	
	Goodies/ parrainage visons Zoodyssée	Mise à disposition de goodies à Zoodyssée avec achat possible via leur site Internet ? Création d'une association pour recevoir les dons de parrainage. Rétribution d'un pourcentage pour contribuer à la mise en œuvre des actions du PNA
	Panneaux à proximité des ouvrages aménagés ou des sites gérés en faveur du VE	
Élus	Bulletins municipaux (association des maires de France) et intercommunaux (en début de PNA puis à mi-parcours)	Informations sur la présence du VE sur communes concernées et sur les dispositifs en place sur ou à proximité des cours d'eau.
	Commissions environnement des conseils départementaux (tous les 2 ans) via diaporama	Présentation de l'ensemble des actions du PNA et des avancées
Scolaires (élémentaire et niveaux supérieurs)	Insertion dans le programme Ecorce, exposition itinérante/mallette pédagogique/film Fifo/accueil d'étudiants en stage sur différents projets d'étude du PNA. Formations en Master.	
Aménageurs d'ouvrages	Interview filmées de retours d'expériences et construction d'un film, conception d'un livret spécifique aux aménageurs avec des préconisations techniques. Guide habitats et pratiques à risque. Sensibiliser aussi sur les mesures de suivi à mettre en œuvre. Formations à proposer à l'association des aménageurs	
Partenaires européens	Via EEP et Newsletter	
Propriétaires fonciers/Agriculteurs	Bulletins municipaux (association des maires de France), bulletins des chambres d'agriculture, coopératives agricoles. Formations en Lycée agricole	Informations sur la présence du VE sur communes concernées et sur les dispositifs en place sur ou à proximité des cours d'eau.
Partenaires des actions du PNA	Réunions annuelles interdépartementales, séminaires mi-parcours et fin de PNA, COPIL annuels via diaporamas et rapports annuels, formations pour les gestionnaires d'espaces naturels. Formations spécifiques pour les partenaires prenant en charge des actions du PNA (protocole de prospection VE, protocole Lutte VA)	
Chasseurs, pêcheurs, piégeurs	Articles revues des FDC et FDP, animaux naturalisés, messages dans les bulletins municipaux, flyer distribué par les référents départementaux avec leurs coordonnées.	Rôles et utilité de la trappe à vison, info sur les dispositifs en place sur les cours d'eau. Valoriser les remontées d'information afin de réduire les craintes concernant la remontée d'observations VE/VA des piégeurs et des propriétaires (peur de « l'uniforme », des contraintes réglementaires, etc.)
Services de l'Etat (DREAL, DDT, DDCSPP)	Fiche de prise en compte du VE dans les projets d'aménagements	
Animateurs N2000, ENS, CEN, techniciens de rivière, syndicats de bassins, forestiers	Guide habitats avec propositions d'alternatives de gestion, réunion annuelle des animateurs Natura 2000	Mobilisation des agences de l'eau, inscription d'objectifs dans les contrats territoriaux (agences de l'eau).
Eleveurs VA, centres de soin, détenteurs de faune sauvage captive	Formation du personnel et sensibilisation sur les risques de fuite dans le milieu naturel	Communiquer sur les impacts du VA sur espèces protégées, sur les poulaillers, risques de pathologies…

Annexe n°7


Prospections au 31/12/2020
A.Lavandier
ADPAD
ADPAG
Andernos
CD24
CistudeNature
CPIEMedoc
CPIEPB
CPIESA
Ecogis
FDC16
FDC17
FDC24
FDGDON17
GREGE
LPO
Mairie Bayonne
Mairie Ste Eula
MIFEN
OFB
OFB CD33
ONCFS
ONCFS/ChNature
ONCFS/LPO85
PNRMP
RN Bruges
RN Etang Noir
RN Hourtin
RNAres
RNN Huchet
RNN Orx
SIA SAYE
SIAEBVELG
SMBI
SRBD
non réalisé
Département

Annexe n°8

Prospections ciblées Vison d'Europe

Rédacteurs: Maylis Fayet (maylis.fayet@ofb.gouv.fr), Christelle Bellanger christelle.bellanger@ofb.gouv.fr) et Julien Steinmetz,
En collaboration avec : Cistude Nature, GREGE, OFB
Opérateurs du plan : DREAL Nouvelle-Aquitaine et OFB
Version mars 2020

Objectifs des prospections

Pour caractériser les noyaux de population de Vison d'Europe, l'approche par bassin versant semble la plus appropriée.
La base de données BD Carthage (IGN-Agence de l'eau) définit des Sous-Secteurs Hydrographiques (SSH), eux-mêmes divisés en Zones Hydrographiques (ZH) connectées. En moyenne, sur la zone concernée par le PNA Vison d'Europe, leur surface est de 350 km² pour les SSH et 60 km² pour les ZH.

Outre l'apport d'informations nécessaires à l'évaluation de l'état de conservation générale de l'espèce en France, les connaissances issues des prospections Vison d'Europe, doivent permettre de mieux cibler les actions de conservation pour les rendre plus efficaces. Pour cela, il est suffisant d'identifier les noyaux de population à l'échelle des Sous-Secteurs Hydrographiques (SSH). **Les zones hydrographiques (ZH) constitueront quant à elles le niveau le plus fin d'information sur la présence de l'espèce.**

L'objectif général des prospections ciblées est donc d'identifier les noyaux de population qui peuvent être définis à l'échelle des Sous-Secteurs Hydrographiques. Dans la mesure du possible, il conviendra alors de caractériser l'état des noyaux de population : utilisation plus précise du territoire (ZH occupées), caractéristiques de la population (distinguer un individu isolé d'une population installée avec des femelles).

Le principe général de mise en œuvre des prospections est donc le suivant :

- **A la première donnée de présence, le SSH devient une zone d'action prioritaire pour la conservation du Vison d'Europe. Les prospections sur les autres ZH de ce SSH ne sont alors plus prioritaires. Elles pourront éventuellement être mises en œuvre dans un second temps pour caractériser l'état des noyaux de population.**
- **En l'absence de données, toutes les ZH d'un SSH sont prospectées avec un nombre minimum de campagnes de prospections tel que défini dans ce document.**

Objectifs quantitatifs :

Si la mise en œuvre d'une campagne de prospections sur l'ensemble de l'aire de répartition n'est pas envisageable sur l'échéance d'un programme transitoire, des campagnes ciblées doivent être organisées, dans un cadre coordonné, sur des secteurs cibles. Ces campagnes constitueront une première phase de mise en œuvre qui, dans un second temps, devront être étendues à l'ensemble de l'aire d'application du PNA 3 Vison d'Europe.

L'objectif final est d'avoir pu prospecter tout le secteur d'étude (zone de mise en œuvre du Plan National d'Actions 3) dans un pas de temps de 5 ans. Si l'on considère que l'ensemble des ZH n'aura pas à être prospectée, il serait nécessaire de prospecter un minimum d'environ 100 ZH par an.

La présente proposition correspond à la mise en œuvre de prospections sur dans les SSH définis comme prioritaires. Les résultats obtenus lors des premières années, permettront une réévaluation des priorités pour les années suivantes.

Choix des zones de prospection

Critères d'identification des sous-secteurs prioritaires :

Sur la base des données de présence transmises au PNA2 (carte 1), les sous-secteurs prioritaires (carte 2) sont définis selon les critères suivants :

- Sous-Secteurs Hydrographiques avec présence avérée de l'espèce postérieure à 2010. L'objectif est de vérifier que l'espèce est encore présente, et éventuellement de caractériser le noyau de population
- Sous-Secteurs Hydrographiques avec donnée douteuse (Vison sp.), Marais Poitevin
- Sous-Secteurs Hydrographiques avec présence avérée de l'espèce entre 2004 et 2009. L'objectif est dans un premier temps de confirmer la présence de l'espèce sur ces secteurs
- Sous-Secteurs Hydrographiques traités comme des cas particuliers (voir ci-dessous) : Marais Poitevin, Canal de la Daurade, Boutonne Amont et Seudre
- Sous-Secteurs prospectés en complément dans les Pyrénées-Atlantiques

Cas particuliers :

- Marais poitevin

Deux données douteuses ont été collectées sur le secteur du Marais poitevin en 2013 et 2014, l'une (deux jeunes individus Vison ou Putois) sur la commune de Nalliers (85), l'autre (Vison sp.) sur la partie amont du Mignon, en limite Charente-Maritime / Deux-Sèvres.
Ces données posent la question de la présence du Vison d'Europe sur l'entité territoriale « Marais poitevin ». Une recherche ciblée de l'espèce doit donc être menée à l'échelle de ce territoire.

- Marais de Brouage et Marais de Rochefort

Dans le référentiel BD Carthage, ces marais sont divisés en plusieurs Sous-Secteur Hydrographiques de petite taille, dont certains disposent de données récentes (marais de Rochefort, marais d'Yves), d'autres de données plus anciennes (marais de Brouage, Charente en aval de Tonnay) et dont un SSH ne présente aucune donnée de Vison d'Europe (canal de la Daurade). Dans une logique d'homogénéité territoriale, le Sous-Secteur Hydrographique du canal de la Daurade sera donc intégré comme prioritaire.

- Boutonne Amont

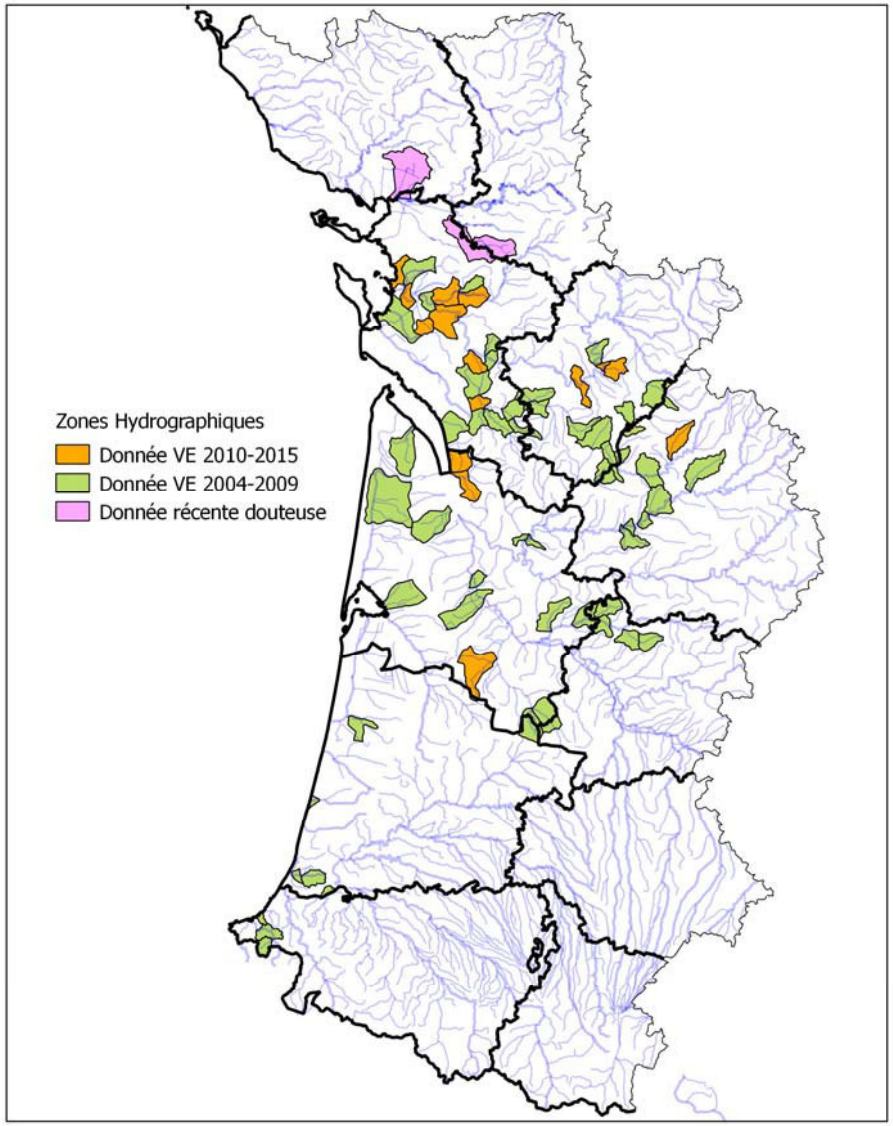
Dans le cadre d'une mission d'appui technique auprès de la DREAL Poitou-Charentes, le GREGE a identifié la partie amont de la Boutonne comme zone à prospecter en priorité car l'espèce semble bien présente sur la zone aval, et que des témoignages non vérifiables en ont fait mention sur l'amont. Ce SSH est donc intégré en priorité.

- Seudre

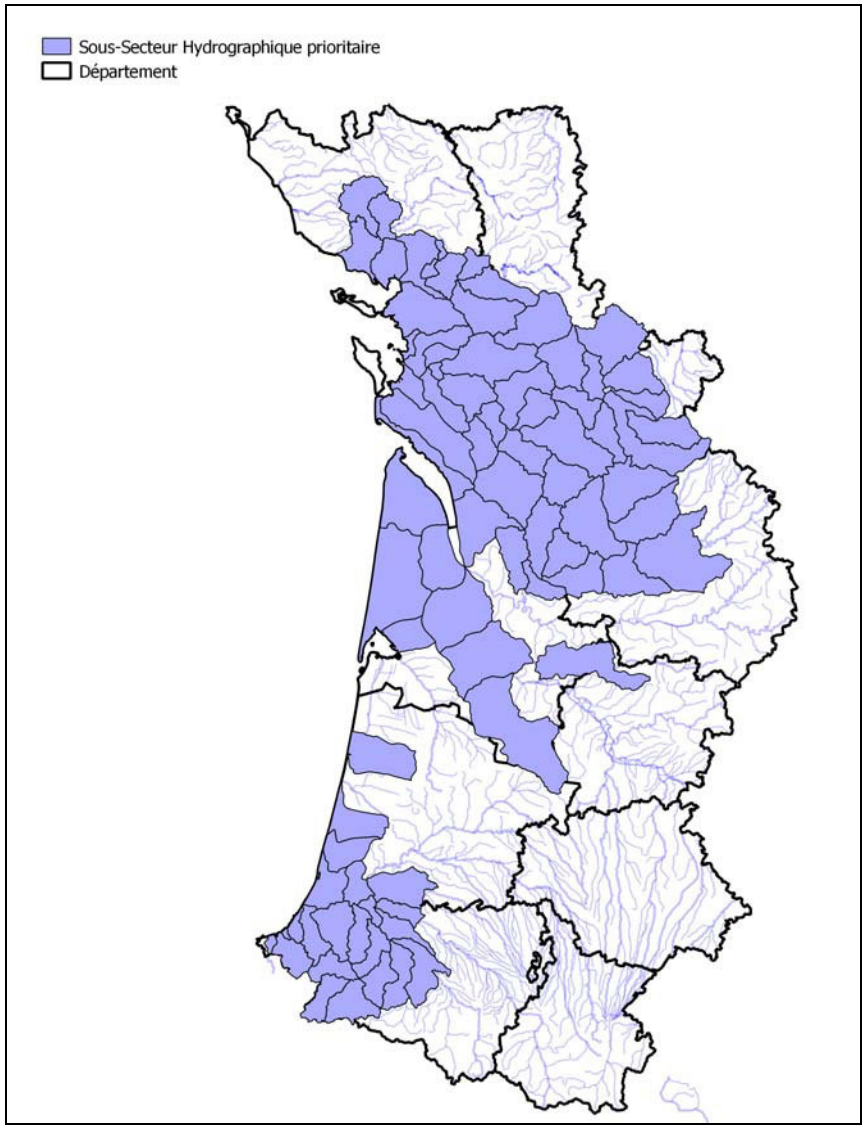
Dans le cadre des suivis Vison d'Amérique réalisés par le GREGE sur la Seudre en 2015, une empreinte attribuée « Vison sp. » a été trouvé sur ce cours d'eau, situé par ailleurs entre des secteurs de présence récente de l'espèce. Il est donc important d'infirmer / confirmer la présence de l'une ou l'autre des espèces de vison sur ce secteur.

- Pyrénées-Atlantiques et sud Landes

Grâce à des financements complémentaires, de nombreuses prospections (N=59) ont pu être prévues dans ce secteur dans le but d'être le plus exhaustif possible quand à la présence du Vison d'Europe.



Carte 1 : Données de présence de Vison d'Europe entre 2004 et 2015.



Carte 2 : Sous-secteurs hydrographiques (SSH) prioritaires

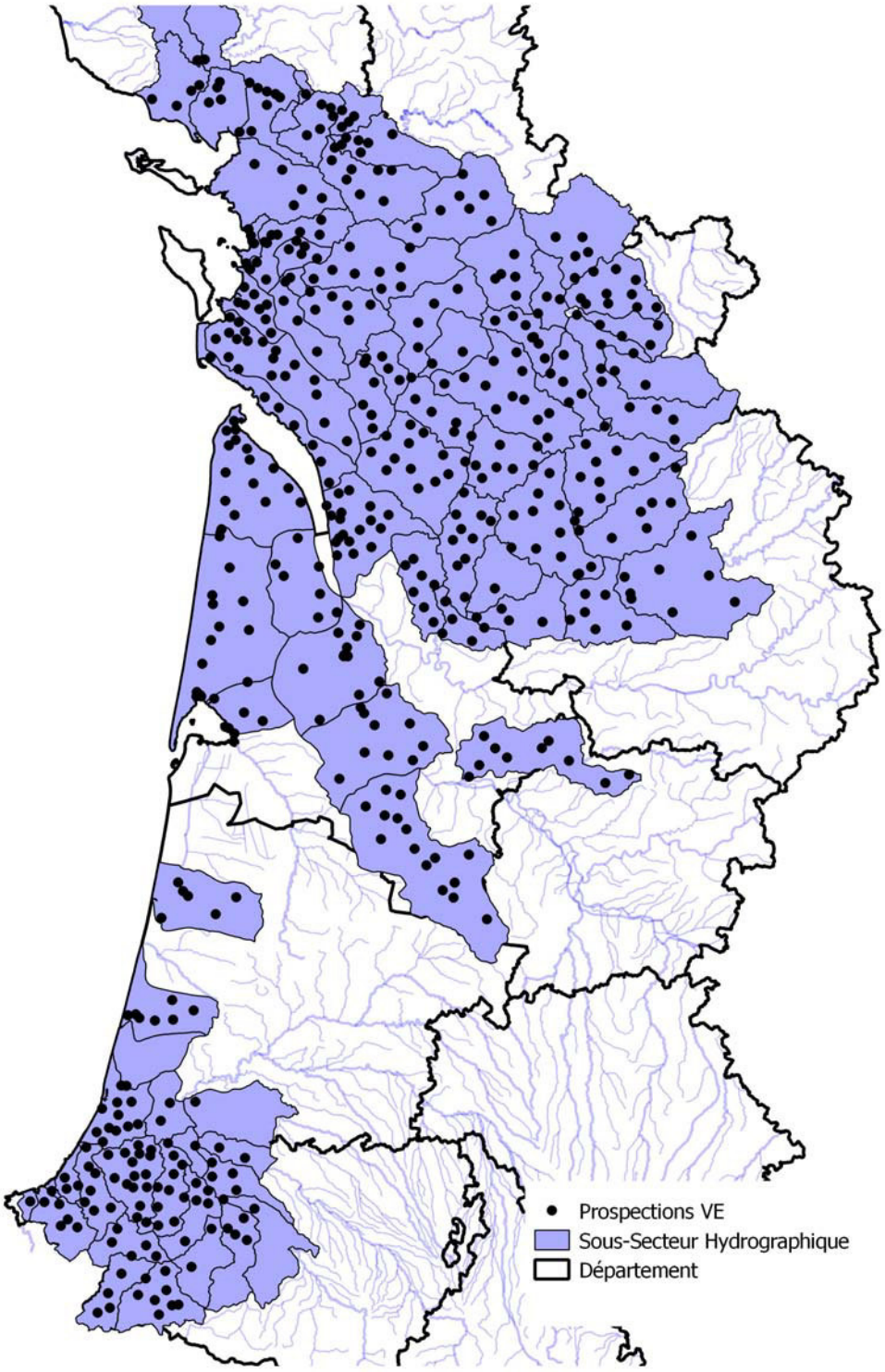
Répartition spatiale des campagnes de prospection prioritaires

Sur chaque SSH, un nombre minimal de campagnes de prospections à mettre à œuvre a été défini en simulant leur implantation selon les critères suivants :

- la règle générale est de mettre en œuvre une campagne de prospection par Zone Hydrographique ;
- sur les grandes Zones Hydrographiques, proposition d'une campagne minimum tous les 10 km de cours d'eau principal ;
- en zone de marais, densification du nombre de campagnes de prospections, une campagne minimum pour 10 km².

Tableau 1 : Nombre de campagnes de prospections Vison d'Europe par département

Département	Nombre de campagnes à réaliser
16	97
17	132
24	38
33	116
40	37
47	5
64	75
79	18
85	25
Total	**543**



Carte 3 : Proposition de répartition des campagnes de prospection Vison d'Europe

Cette répartition des points est une proposition réalisée sur la base d'analyses cartographiques. Selon la réalité du terrain (problèmes d'accès ou d'autorisation des propriétaires), les points de prospections pourront être déplacés de quelques kilomètres (3-4 km maximum).

Quelle priorisation pour les campagnes de prospection ?

L'objectif est de réaliser cette série de campagnes de prospection au cours des trois hivers entre 2016 et 2019.

Le niveau de mise en œuvre dépendra des moyens mobilisables pour cette action et des compléments apportés annuellement en fonction des premiers résultats.

Si toute la zone ne peut être couverte, la logique globale est d'essayer de prospecter de manière assez homogène la plus large aire possible plutôt que de concentrer les prospections sur quelques secteurs couverts de manière exhaustive.

Les efforts pourront être mis en priorité sur les sous-secteurs hydrographiques avec des données postérieures à 2010 dans un premier temps et ceux avec des données plus anciennes (2004-2009) dans un second temps. L'objectif étant de vérifier la présence de l'espèce pour pouvoir d'ores et déjà focaliser les actions de conservation sur ces territoires.

En fonction des opportunités, et des premiers résultats obtenus sur les zones prioritaires, il pourra être envisagé dans un second temps de recourir à des campagnes de prospection sur des secteurs complémentaires, avec un effort semblable à celui proposé sur les zones prioritaires.

Méthodes de prospection

Une « campagne de prospection » est définie par la mise en œuvre de techniques de prospections de manière standardisée (c'est-à-dire en assurant un effort de prospection connu : nombre de dispositifs mis en œuvre pendant une durée déterminée) sur un territoire cible.

Cette première phase de prospections propose de mettre en œuvre en parallèle différentes méthodes. En effet, le recours à une variété de méthodes pourra permettre de s'adapter aux contextes locaux (personnels mobilisables localement) et de travailler à différentes périodes de l'année (y compris lorsque les captures sont impossibles), dans l'objectif d'optimiser la collecte d'informations.

Cela permettra également de comparer par la suite les avantages et inconvénients respectifs de chacune d'entre elles et d'en évaluer l'efficience. Une mise en place croisée de différentes techniques sur le même territoire pourra dans ce cadre être envisagée. Toutes les informations détaillées relatives à ces opérations devront être systématiquement transmises aux opérateurs du PNA dans un délai de 1 mois après la fin des opérations.

Cinq méthodes sont retenues pour cette première phase de prospections (voir ci-dessous).

La méthode utilisée traditionnellement de manière standardisée pour le suivi de l'espèce est celle des campagnes de capture.

Pendant les différentes phases de prospections ciblées des méthodes complémentaires seront testées et calibrées dans l'objectif de pouvoir proposer des protocoles standardisés pour les prospections ultérieures. Si cette phase de test est achevée pour l'une ou l'autre des méthodes au cours des différentes phases de prospections, il pourra être envisagé de la mettre en œuvre en routine.

1. Capture :

C'est actuellement la seule méthode standardisée déployable en routine à large échelle.

Outre le fait qu'il s'agit d'une méthode invasive potentiellement perturbatrice pour l'espèce, son utilisation est soumise à des contraintes techniques et administratives : **impossibilité réglementaire entre les mois d'avril et juillet compris ; mise en œuvre impérative par des piégeurs agréés, demande d'autorisation préalable (capture d'espèce protégée) et formation spécifique à la reconnaissance Vison d'Europe/Vison d'Amérique/ Putois d'Europe et au protocole de prospection.**

A contrario, cette méthode permet d'apporter des informations sur le nombre d'individus et leur sexe. Elle pourra être utilisée pour confirmer l'identification du Vison d'Europe, notamment en complément d'autres méthodes, et apporter des éléments de caractérisation des noyaux de population.

Elle pourra donc être utilisée soit directement comme méthode de prospection, soit en complément d'une autre méthode ayant apporté des informations partielles, ou pour aider à calibrer d'autres méthodes (comparaison de l'efficacité de chaque méthode).

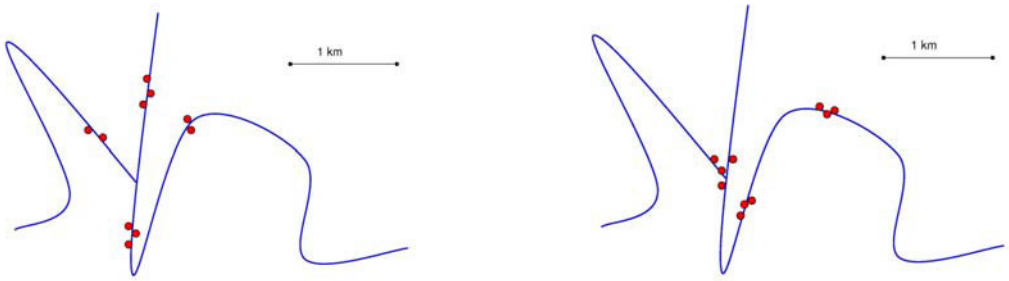
- **Disposition des cages**

Une campagne de prospection consiste en une pose de 10 cages de type mustélidés (à une ou deux entrées) réparties sur les habitats les plus favorables pour la capture de l'espèce (en bordure de zone humide, zones de passage lors des déplacements, etc.), selon les modalités suivantes :

- sur les cours d'eau : 10 cages réparties en 3-4 groupes de 2-3 cages sur environ 3 km de cours d'eau principal ;
- en zone de marais : 10 cages réparties en 3-4 groupes de 2-3 cages sur environ 3 km² de marais, en essayant de diversifier les milieux (essayer de poser les cages sur différents types de canaux par exemple).

Ces modalités de disposition des cages permettent d'échantillonner une part plus importante du réseau, tout en facilitant la gestion des autorisations des propriétaires (possibilité de grouper plusieurs cages sur une même parcelle).

Figure 1 : Exemples de positionnement des 10 cages sur un réseau hydrographique



- **Durée des opérations**

Nous proposons deux modalités d'organisation.

Le calcul du coût humain se fait selon les modalités suivantes : une personne seule peut relever l'équivalent de 4 campagnes (40 cages) en une matinée (4-5 heures) si la distance entre ces points de prospection est de moins de 20 km, ou l'équivalent de 3 campagnes si celles-ci sont distantes de plus de 20 km. La pose et le ramassage des cages de 4 campagnes se fait en une demi-journée à 2 personnes, la totalité des cages devant être relevées avant 12h.

Cages tendues 10 nuits consécutives

Pour des raisons réglementaires, une personne salariée ne peut pas travailler 7 jours de suite. Il est donc nécessaire d'organiser un relais au 5ème jour de campagne, avec un relevé des cages à deux personnes pour que l'emplacement de chaque cage soit connu précisément par la seconde personne. L'organisation sera alors la suivante :

Nb de personnels pour 3 ou 4 campagnes	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11
Matin	2	1	1	1	1	1/2	1	1	1	1	1/2

La mise en œuvre de 3 ou 4 campagnes simultanées nécessitera 7 jours agents.

Cages tendues deux fois 4 nuits consécutives

Afin de limiter les surcoûts et faciliter la gestion du personnel, il sera possible de détendre les cages pendant 2 ou 3 nuits consécutives (correspondant par exemple à un week-end) au cours de cette période de 10 nuits consécutives. Les cages ne seront alors tendues que durant 8 nuits. Il conviendra de bien le préciser dans le bilan de prospection.

Lorsque les cages seront laissées détendues, elles devront être sécurisées de manière fiable par exemple en bloquant le mécanisme de fermeture avec un fil de fer.

Attention même si une seule personne peut en théorie s'occuper d'une campagne dans ce cas de 2x4 nuits, nous préconisons l'intervention d'une seconde personne qui devra connaître l'ensemble des emplacements de cages sur le terrain. Ceci est une précaution en cas d'imprévu qui empêcherait la première personne de réaliser le relevé des cages.

L'organisation sera la suivante :

Nb de personnels pour 4 campagnes	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11	J12
Matin	2	1	1	1	1	0	0	1	1	1	1	1/2

La mise en œuvre de 3 ou 4 campagnes simultanées nécessitera 6 jours agents.

Test de modalités d'organisation alternatives

La figure 2 ci-dessous indique l'évolution des premières captures (ces données ne prennent pas en compte les recaptures d'individus) au fil des jours lors des campagnes précédentes. Sur la base de ces résultats, nous proposons de tester sur certaines campagnes la possibilité de décomposer une campagne de prospection en deux sessions de 4 nuits distantes de plusieurs semaines, sur le même secteur. Cette organisation ne sera mise en œuvre qu'en phase de test opérationnel durant ces 3 ans.

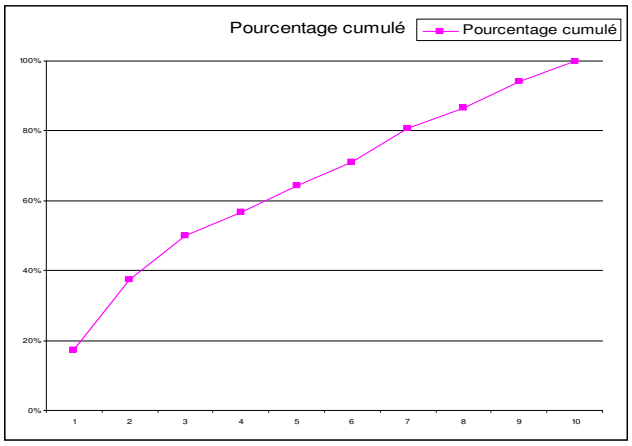


Figure 2 : Pourcentage cumulé des primo-captures sur les campagnes menées entre 1991 et 2005 au fil des nuits de capture (sources GREGE)

- **Modalités de capture**

Les cages sont appâtées avec de la sardine à l'huile ou du poisson frais.

Les opérations de capture peuvent être menées des **mois de septembre à mars inclus** (le mois d'août est exclu car les plus jeunes individus sont encore fragiles, et qu'à cette période, les risques de très fortes chaleurs sont importants).

Sur la période de prospection proposée, il ne semble pas y avoir de période plus efficace qu'une autre pour la capture du Vison d'Europe.

Les cages devront être protégées au maximum avec de la végétation afin d'éviter que les individus pris ne soient trop exposés aux éléments climatiques. Dans la mesure du possible, il est également conseillé de disposer un peu de végétation dans la cage pour permettre aux animaux de se protéger. En cas de conditions météorologiques défavorables (alertes oranges froid, vent, pluie, crues), les campagnes doivent être interrompues.

A partir de la saison 2018/2019, la capture d'un Vison d'Europe lors d'une campagne de prospection entraine obligatoirement l'arrêt de celle-ci. Ainsi, la campagne sera stoppée, même si les 10 jours ou 2 x 4 jours de prospections ne sont pas atteints. La totalité des 10 cages correspondant à ce point de prospection seront enlevées ou, à minima, détendues dès la journée de capture du vison d'Europe.

Cette interruption de la prospection lors d'une capture d'un Vison d'Europe a été actée, dans le cadre du PNA intermédiaire, suite à la découverte de deux Visons d'Europe morts (en mars 2018) dans les cages de prospection installées dans le cadre du LIFE-MAMMAQ (coordonnée par la Ligue de Protection des Oiseaux). Pour ces deux individus, il s'agissait d'une recapture lors de la même session de 10 jours de prospection. Compte tenu de l'état critique dans lequel est la population française de Vison d'Europe, et dans l'attente des conclusions définitives des analyses vétérinaires de ces 2 animaux, il a été décidé de mettre en place ces mesures de précaution.

- **Manipulation des animaux**

En cas de capture, un référent local sera contacté pour identifier formellement l'animal. Si aucun référent ne peut se déplacer dans un délai de quelques heures (4 maximum à compter de la capture, midi au plus tard), l'animal sera relâché sur place. En aucun cas, l'animal ne sera déplacé.

Lors de chaque capture de Vison d'Europe ou de Putois, l'animal sera :

- sexé si possible,
- pesé,
- photographié (si possible tête face, tête profil droit et profil gauche, ensemble du corps avec queue (flanc droit et flanc gauche), sous la tête + poitrine).

L'individualisation des animaux capturés sera effectuée au travers d'une identification génétique qui permettra par ailleurs de confirmer l'espèce et d'alimenter la banque de données sur l'espèce.
En vu d'analyses génétiques, un prélèvement avec port de gants à usage unique sera effectué sous la forme :

- d'une touffe de poils : poils vivants arrachés sur l'animal (avec bulbes), puis stockés dans une enveloppe fermée conservée à l'abri de la lumière et des températures extrêmes et transmise aux opérateurs du PNA dans les plus brefs délais ;
- de la récolte des fèces fraîches dans la cage (conservation au congélateur ou dans de l'alcool), si possible en complément

Tout vison d'Amérique capturé sera détruit, le cadavre conservé au congélateur et transmis aux opérateurs du PNA.

- **Précautions sanitaires**

Afin d'éviter la transmission de pathogènes et notamment de la COVID 19 vers la faune sauvage, les cages seront nettoyées et désinfectées entre chaque campagne de prospection, et après chaque capture d'un carnivore sauvage ou domestique.
Nous préconisons par exemple la pulvérisation du matériel à l'aide d'une solution bactéricide et virucide de type Virkon à 1%. L'ensemble des prospections doivent être réalisées avec le port de gants de protection et de masques. L'utilisation de gel hydro alcoolique avant et après les visites de cages est préconisée. En cas de symptômes du manipulateur, remettre la campagne à plus tard (2 semaines).

2. ADN environnemental : méthode à tester et calibrer

Cette méthode pourrait permettre, à termes, de caractériser la présence de Vison d'Europe à l'échelle d'une entité territoriale définie. Dans l'état actuel des connaissances, elle semble plus appropriée sur les secteurs d'eau calme (marais notamment).

Les opérateurs du PNA ont conduit des opérations-tests de calibrage en partenariat avec un laboratoire de génétique.

Les premiers résultats ont montré qu'il restait encore à apporter des améliorations sur le protocole et la détection des espèces de mammifères amphibies. Cette méthode n'est donc pas utilisable en routine à l'heure actuelle.

3. Tunnel à empreintes : méthode à tester et à calibrer

Cette méthode est en cours de développement, et n'est donc pas utilisable en routine à l'heure actuelle.

Des tunnels en bois de petite taille permettent de collecter des empreintes de l'ensemble de la petite faune terrestre, y compris les petits mustélidés semi-aquatiques. Les premiers tests effectués avec cette méthode montrent que l'identification de l'espèce est possible dans environ 95% des cas, avec des possibilités d'erreur réduites. La distinction des deux espèces de Vison reste néanmoins difficile.
Cette méthode doit donc dans un premier temps être couplée à des campagnes de capture pour confirmation de l'espèce avec certitude. Elle pourra à terme permettre de mieux cibler les secteurs où mettre en œuvre des opérations de capture.

En fonction des résultats des opérations de test menées sur le Vison d'Europe, la méthode fera l'objet d'une diffusion et de formations à son usage.

4. Piège à poils : méthode à tester et à calibrer

A l'aide de tubes équipés de pastilles collantes ou bien avec d'autres dispositifs de collecte, cette méthode consiste à prélever des poils qui, une fois triés, sont soumis à une analyse génétique permettant d'identifier l'espèce, ainsi que le sexe.
Si l'ADN n'est pas trop dégradé et si les poils sont suffisamment nombreux, l'analyse génétique permet d'avoir une certitude sur l'espèce, sans qu'il y ait recours à des captures.

En fonction des résultats des opérations de test menées sur le Vison d'Europe, la méthode fera l'objet d'une diffusion et de formations à son usage.

5. Méthodes complémentaires

En complément de ces méthodes, d'autres techniques peuvent permettre de venir compléter les connaissances sur le Vison d'Europe :

- Les suivis sur radeaux à traces, utilisés pour le suivi et la lutte contre le Vison d'Amérique, peuvent permettre de récolter des informations sur le Vison d'Europe, qui peut lui aussi être capturé sur ces radeaux. Néanmoins, contrairement au Vison d'Amérique, le Vison d'Europe ne présente pas de meilleurs taux de capture sur radeaux que sur berge. Cette technique n'est donc pas plus appropriée que la méthode de capture standardisée.

- La récolte et l'analyse génétique des fèces peuvent être utilisées dans certains cas particuliers (marais avec platelage par exemple) pour mettre en évidence la présence de Vison d'Europe. Pour autant cette méthode n'a pour l'instant pas vocation à être utilisée à large échelle.

- Le piégeage photographique : l'utilisation de pièges photographiques peut permettre d'inventorier certaines espèces avec un minimum de manipulations. La grande diversité des modèles et de leurs caractéristiques techniques, la diversité des réglages, et les modalités d'installation des appareils (sur secteurs appâtés, en coulée…) influencent fortement l'efficacité de cette technique pour détecter et identifier avec certitude du Vison d'Europe. En absence de protocole standardisé à ce jour, l'utilisation de pièges photographiques peut être testée en complément d'autres méthodes.

Modalités de mise en œuvre de ces opérations

Coordination

OFB (Animation Scientifique et Technique) :
Maylis FAYET : maylis.fayet@ofb.gouv.fr
Christelle BELLANGER: christelle.bellanger@ofb.gouv.fr

Cistude Nature (Animation des Réseaux) :
Jean-Baptiste PONS: jean-baptiste.pons@cistude.org

DREAL Nouvelle-Aquitaine (Coordination PNA) :
Aurore PERRAULT : aurore.perrault@developpement-durable.gouv.fr

Sur chaque Sous-Secteur Hydrographique, un responsable du suivi sera identifié. Plusieurs SSH pourront être regroupés sous la responsabilité d'une seule structure. Cela pourra par exemple être le cas pour les zones concernées par le projet de Life porté par la LPO.

Autorisations de capture et de transport d'espèce protégée

Le Vison d'Europe étant une espèce protégée, toute opération de capture et de transport de tout ou partie de l'animal (poils inclus) doit faire l'objet d'une autorisation spécifique et nominative.

Ainsi, toute personne désirant mettre en œuvre une opération de capture ou de collecte de poils devra disposer des autorisations nécessaires.

Une formation spécifique (identification des espèces, rappels réglementaires…) sera préalablement dispensée à toute personne recevant une de ces autorisations.
Les autorisations sont à demander auprès de l'OFB (christelle.bellanger@ofb.gouv.fr).

Centralisation des données par le PNA Vison d'Europe

Ces opérations s'inscrivant dans un programme coordonné par les opérateurs du Plan National d'Actions Vison d'Europe, chaque opérateur devra remettre à l'issue de chacune des campagnes un fichier SIG (ou une cartographie détaillée) avec les éléments suivants :

- emplacements des dispositifs mis en œuvres (cages, appareils photographiques, tunnels à empreintes, dispositifs de récolte de poils) dans l'optique de recenser des Visons d'Europe, avec numéro unique pour chaque dispositif,
- dates de mise en œuvre de chacun des dispositifs (en précisant si neutralisé X jours),
- types d'appâts utilisés le cas échéant,
- résultats détaillés des opérations menées (date et lieu de chaque capture d'espèce cible ou non cible avec mention de l'espèce),
- données et poils récoltés dans le cadre des opérations de capture.

Des fiches standardisées seront fournies aux opérateurs.

Gestion / Utilisation / Propriété des données

Les données récoltées seront administrées par l'animateur scientifique du PNA et ne seront utilisées que dans le cadre du PNA Vison d'Europe, pour répondre aux demandes nationales de conservation de l'espèce. La structure ayant récolté sera toujours associée à la donnée. Les animateurs du PNA ne pourront céder les données à des tiers.

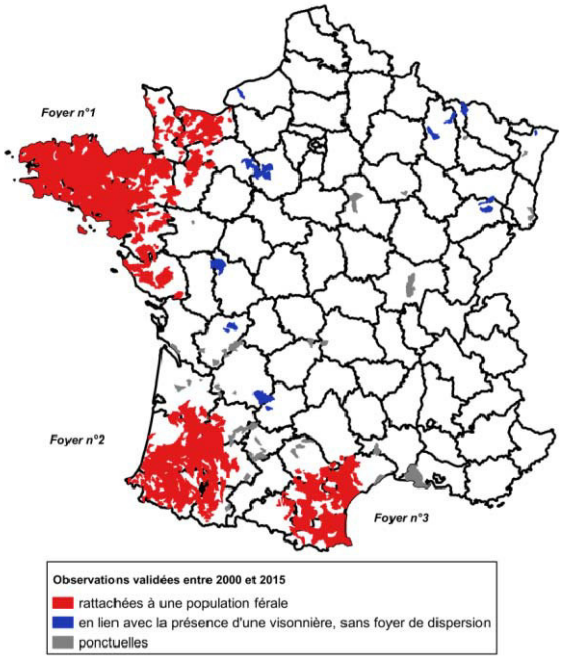
Annexe n°9

Méthodologie de Surveillance et de Lutte contre le Vison d'Amérique
Plan National d'Actions transitoire sur le Vison d'Europe
Rédaction : Coordination PNA (ONCFS – Cistude Nature) en partenariat avec GREGE.

1. Contexte et Objectif :

Le Vison d'Amérique *Neovison vison* est une espèce en voie de progression dans le Sud-Ouest de la France. Il est notamment bien présent à l'ouest de l'Occitanie et dans le sud de la Nouvelle-Aquitaine, trouvant sa limite nord dans le tiers-sud du département de la Gironde.

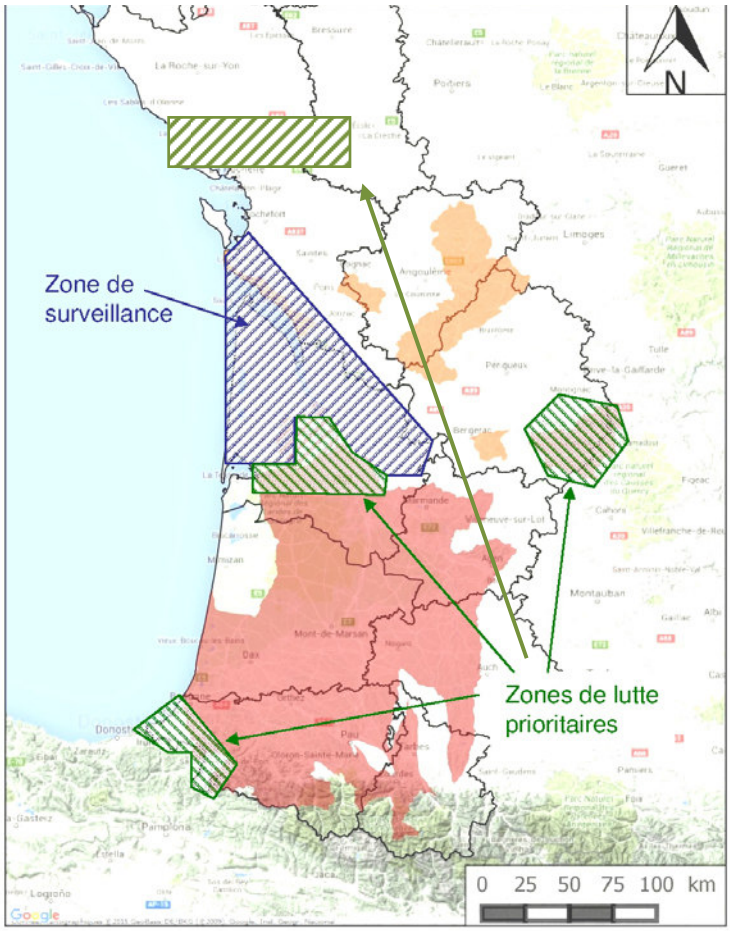
Par ailleurs, le Vison d'Amérique est également en expansion dans le Nord-Ouest de la France.



© ONCFS : Répartition du Vison d'Amérique en France 2018

Ce plan de surveillance et de lutte a été défini afin de stopper la progression de l'espèce.
Il vise à bloquer la colonisation du Vison d'Amérique :
- vers les derniers secteurs connus de présence certaine du Vison d'Europe en France (Gironde, Charente, Charente -Maritime) ;
- vers les populations espagnoles de Vison d'Europe, notamment en Pays basque.

La stratégie retenue repose sur deux types de zone d'action : une zone de Surveillance et une zone de Lutte comme indiquées sur la carte ci-après.



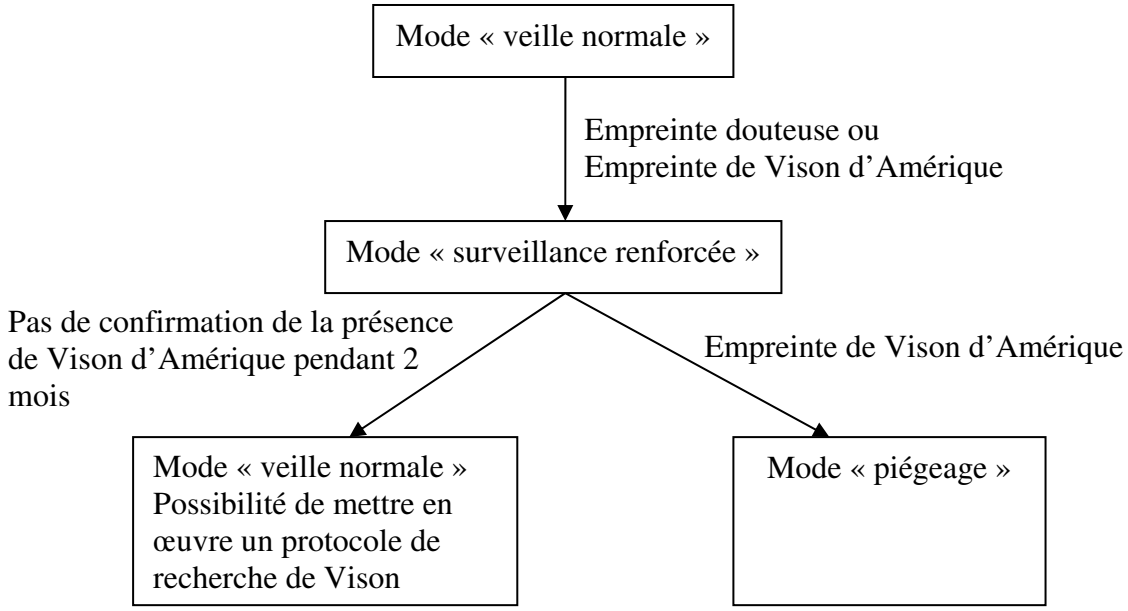
Pour chacune de ces zones, les opérations sont basées sur la mise en place d'un réseau de radeaux à empreintes pour détecter la présence de Vison d'Amérique, avec mise en œuvre d'opérations de piégeage ciblées en cas de détection. Chaque radeau est identifié et comporte une étiquette d'information permettant, à toute personne s'approchant du dispositif, de contacter un référent.

2. Protocole détaillé

a. Zones de surveillance

Gironde : Blayais – Entre Deux Mers – Marais Estuariens – Médoc
Dordogne : secteur de Saint-Rémy

Cette stratégie s'applique dans les secteurs où le Vison d'Amérique n'est pas réputé comme étant déjà implanté. L'objectif est d'en empêcher l'implantation. Chaque vison détecté doit être éliminé. La surveillance est organisée de manière évolutive en fonction des indices de présence de l'espèce. Elle comporte trois modalités de mise en œuvre :



Mode « veille normale »

En mode veille normale, les radeaux positionnés tous les 5 ou 10 km de cours d'eau, selon les secteurs, sont contrôlés 1 fois par mois.

Mode « surveillance renforcée »

Pour mieux connaitre la fréquentation spatiale du secteur et mieux cibler les opérations de piégeage, le mode surveillance renforcée est activé :
- En cas de découverte d'une empreinte douteuse attribuée au complexe Vison sp / Putois afin de déterminer s'il s'agit de Vison d'Amérique ;
- En cas de découverte d'une empreinte attribuée au Vison d'Amérique.

Dans ce cas, les radeaux déjà disposés sont densifiés et le nombre de contrôle est augmenté :

- ⇨ Densification des radeaux : positionnement d'une dizaine de radeaux supplémentaires autour du radeau positif (radeau où l'empreinte a été détectée), distants d'environ 2 km sur le cours d'eau ou à raison d'un radeau par km² en zone de marais.

- ⇨ Densification des contrôles : contrôle de ces radeaux toutes les deux semaines.
  - Si d'autres empreintes possiblement attribuables au Vison d'Amérique sont observées, le mode piégeage est activé ;
  - Si aucune autre empreinte n'est détectée au bout de 2 mois, le mode surveillance renforcée est désactivé, la zone repasse en mode veille normale. La fréquence des contrôlés redevient mensuelle et les radeaux surnuméraires sont alors retirés ou installés, si besoin, sur un autre secteur (ils peuvent être maintenus sur place dans le cas contraire) ;

En complément, si le doute persiste sur l'espèce qui a pu fréquenter le radeau, alors le secteur peut faire l'objet de prospections dans le cadre de l'enquête coordonnée sur la répartition du Vison d'Europe, qui inclut d'intégrer aux secteurs prioritaires ceux sur lesquels des données douteuses permettent de suspecter la présence de Vison d'Europe.

Mode « piégeage »

Il s'agit de campagnes de 2x4 nuits (ou 10 nuits consécutives) de piégeage.
Environ 10 pièges sont posés sur les radeaux fréquentés par l'animal et ceux qui les entourent, complétés par une campagne de piégeage sur berge (une quarantaine de pièges appâtés posés sur berge). L'objectif est de maximiser l'efficacité du piégeur en maximisant le nombre de pièges vérifiables en une matinée.
En l'absence de capture, trois campagnes de capture par an peuvent être envisagées sur un même secteur.
Le déclenchement du mode piégeage implique l'autorisation des propriétaires pour la pose de cages ainsi que pour la destruction des espèces susceptibles d'occasionner des dégâts. La capture d'un mustélidé donne lieu au remplissage d'une fiche de capture. Les individus prélevés sont conservés et transmis dès que possible aux animateurs du PNA accompagnés de leur fiche de capture. L'euthanasie des Visons d'Amérique doit être réalisée de la manière la plus rapide possible et sans souffrance inutile à l'animal. Le tir à balle est préconisé.

b. Zones de lutte

Gironde : Sud-Gironde
Dordogne : secteur de Saint-Cybranet
Vendée : sud du département
Pyrénées-Atlantiques : Nive, Nivelle

Cette stratégie s'applique sur les secteurs où l'espèce est implantée avec certitude. L'objectif est de casser la dynamique positive (et donc d'éviter la colonisation des bassins les plus proches), voire d'éliminer l'espèce sur ces secteurs. L'efficacité est privilégiée dans le but de maximiser le nombre d'individus prélevés, plutôt que de concentrer les moyens pour capturer un seul individu.

Mode « veille normale »

En fonctionnement normal, les radeaux sont positionnés à hauteur d'un tous les 5 km. Ils sont contrôlés tous les mois.

Mode « surveillance renforcée »

En cas d'activation du mode surveillance renforcée, 4 radeaux complémentaires sont placés : en amont et 2 autres en aval du radeau présentant des indices de présence. Ces radeaux sont visités toutes les deux semaines, pendant 2 mois maximum.

Mode « piégeage »

Une campagne de piégeage sera activée (2 fois 4 nuits ou 10 nuits consécutives) en disposant 5 pièges sur les radeaux entourant celui sur lequel les empreintes sont les plus régulières.
Le déclenchement du mode piégeage implique l'autorisation des propriétaires pour la pose de cages ainsi que pour la destruction des espèces susceptibles d'occasionner des dégâts. La capture d'un mustélidé donne lieu au remplissage d'une fiche de capture. Les individus prélevés sont conservés et transmis dès que possible aux animateurs du PNA accompagnés de leur fiche de capture. L'euthanasie des Visons d'Amérique doit être réalisée de la manière la plus rapide possible et sans souffrance inutile à l'animal. Le tir à balle est préconisé.

c. *Cas particulier du Sud Gironde : définition d'une stratégie de lutte sectorisée*

Dans un premier temps, sur la zone de lutte du Sud-Gironde, il n'est pas envisageable financièrement ni forcément pertinent, de couvrir l'ensemble du secteur avec un maillage de radeaux aussi dense (200 km de cours d'eau favorables à couvrir soit 100 radeaux à 200 radeaux selon la densité retenue) qu'en zone de lutte classique. L'objectif est donc, en disposant d'un stock de 50 radeaux supplémentaires, de placer ces 50 radeaux stratégiquement sur les cours d'eau abritant une population de Vison d'Amérique la plus au nord ou le plus en aval, c'est-à-dire la plus susceptible de coloniser de nouveaux bassins versants.

- Dans un premier temps (par exemple 2 mois soit 4 relevés de traces), l'opérateur cherchera à identifier les cours d'eau où l'espèce est présente de manière importante ;
- Sur la base de cette connaissance, les cours d'eau sur lesquels la lutte doit s'opérer seront identifiés. La densité de radeaux sera alors renforcée à hauteur d'un radeau minimum tous les deux kilomètres, en disposant les 50 radeaux surnuméraires prévus à cet effet ;
- Sur ces zones, en cas d'identification de Vison d'Amérique sur un radeau, une campagne de piégeage sera organisée : piégeage sur 5 radeaux (le radeau visité + 2 en amont et 2 en aval), pendant 4 nuits d'affilées.

Que ce soit en zone de surveillance ou en zone de lutte, sur chaque secteur où des radeaux sont ou vont être disposés, une structure animatrice sera définie. Celle-ci validera la stratégie locale à adopter conjointement avec les animateurs du PNA. Elle sera responsable du suivi des radeaux et des contacts avec les partenaires locaux. Les résultats de suivis ainsi que les supports photographiques (traces) seront centralisés par les animateurs du PNA.

3. Actions complémentaires

Réactivité en cas de découverte d'un Vison d'Amérique au nord de la zone considérée
Un dispositif de surveillance et de lutte sensiblement similaire à celui mis en place sur la zone de surveillance, devra être mis en place de manière réactive en fonction du type de donnée (urgence plus importante si l'animal est vivant que s'il est directement capturé et tué).

Mise en place d'une lutte au cœur du noyau de la population de Vison d'Amérique à contenir

Afin de diminuer la pression de colonisation sur le secteur de veille/lutte, il pourrait être pertinent de mettre en place des actions de lutte dans les parties amont du bassin de la Leyre ou sur les cours d'eau en rive gauche de la Garonne en amont de la zone d'étude (entre le Ciron et l'Avance). L'objectif serait d'y diminuer l'effet source vers les secteurs plus au nord ou en aval.
Cette action sera mise en place dans un second temps.

Afin d'éviter la transmission de pathogènes et notamment de la COVID 19 vers la faune sauvage, il est recommandé aux intervenants de bien respecter les gestes barrière : port de gants de protection, de masque, lavage puis désinfection des mains au gel hydro-alcoolique avant et après la pose d'équipements sur le terrain. Les radeaux, les cages ….etc. seront nettoyés et désinfectées. Nous préconisons par exemple la pulvérisation du matériel à l'aide d'une solution bactéricide et virucide de type Virkon à 1%. En cas de symptômes de l'intervenant, remettre à plus tard (2 semaines).

Annexe n°10

Numéro et nom de l'action	Priorité	Livrables	Indicateurs	Evaluation financière
Axe 1 : Amélioration des connaissances sur le Vison d'Europe				**3 965 000**
Action 1.1 : Suivre l'évolution de l'aire de répartition du Vison d'Europe				
Sous-action n°1.1.1 : Mettre à jour la carte de répartition du Vison d'Europe avec des données validées	1	- Bilan détaillé de la 1ère phase du protocole de prospection - Bilan détaillé de la 2e phase du protocole de prospection - Méthodologie d'interprétation des données pour qualifier les zones de présence du Vison d'Europe en France - Cartes de l'aire de répartition du Vison d'Europe en France - Bilans comparatifs des techniques potentiellement utilisables pour détecter le Vison d'Europe	- Nombre de campagnes de prospections réalisées, par type de méthode utilisées - Nombre de sous-secteurs hydrographiques prospectées par an - Nombre de méthodes testées	1 715 000
Sous-actions n°1.1.2 : Tester et comparer des méthodes alternatives aux campagnes de prospection par capture	2			
Action 1.2 : Caractériser les populations de Vison d'Europe				
Action n°1.2.1 : Caractériser les noyaux de populations de Vison d'Europe	1	- Publication(s) des connaissances acquises	- Nombre de noyaux caractérisés et nombre de campagnes de caractérisation associées (par type de méthode) - Nombre d'échantillons passés en analyse génétique - Nombre d'individus suivis - Nombre d'études sur l'utilisation de l'habitat et l'occupation de l'espace	1 720 000
Action n°1.2.2 : Affiner les connaissances sur l'utilisation des habitats et l'occupation de l'espace	2			
Action 1.3 : Assurer une veille sur l'état sanitaire des populations de Vison d'Europe				
Sous-action n°1.3.1 : Elaborer et mettre en œuvre un programme de suivi sanitaire du Vison d'Europe	2	- Synthèse des champs d'analyse à mener - Protocole de collecte et de stockage des échantillons - Bilan des études réalisées - Protocole de prise en charge d'un Vison d'Europe en détresse	- Nombre d'échantillons mis en conformités - Nombre d'échantillons analysées par champs d'étude	345 000
Sous-action n°1.2.3 : Elaborer et mettre en œuvre un protocole de gestion des individus en détresse	1			
Action 1.4 : Organiser la collecte et l'utilisation des données avec leurs producteurs				
Sous-actions n°1.4.1 : Gérer et alimenter les bases de données relatives à la mise en œuvre du PNA	1	- Liste des producteurs de données dans la zone d'action du 3ePNA - Charte de mise à disposition et d'utilisation des données - Carte de résultats des mises en œuvre des protocoles du PNA : prospections en faveur du Vison d'Europe et lutte contre le Vison d'Amérique	- Nombre de données intégrées dans la base de données - Nombre d'échantillons collectés - Nombre d'adhésions à la charte de mise à disposition et d'utilisation des données - Nombre de références bibliographiques collectées	185 000
Sous-action n°1.4.2 : Collecter les données produites par des partenaires et définir un cadre commun d'utilisation	2			
Sous-action n°1.4.3 : Réaliser et tenir à jour une synthèse bibliographique sur le Vison d'Europe	3			
Axe 2 : Elevage conservatoire du Vison d'Europe et stratégie de translocation dans le milieu naturel				**2 015 000**
Action 2.1 : Pérenniser/renforcer l'élevage conservatoire de Vison d'Europe en France et conforter son intégration au sein de l'*European Endangered Program* (EEP)				
Sous-action n°2.1.1 : Retour d'expérience sur les pratiques européennes d'élevage du Vison d'Europe et actualiser les documents de référence	1	- Guide français des élevages de Vison d'Europe - Rapport d'études sur les techniques de reproduction assistée	- Capacité d'accueil des élevages français de Visons d'Europe	705 000

Numéro et nom de l'action	Priorité	Livrables	Indicateurs	Evaluation financière
Sous-actions n°2.1.2 : Rédiger en lien avec l'EEP un guide de gestion adapté aux élevages français	2	- Bilan annuel de la saison de reproduction du Vison d'Europe pour chaque établissement français en accueillant	- Nombre de Visons d'Europe présents dans les élevages français - Nombre de couples mis en contact chaque année - Nombre de Visons d'Europe nés en captivité en France chaque année - Nombre d'études réalisées contribuant à l'EEP	
Sous-action n°2.1.3 : Contribuer à l'EEP, notamment en réalisant des études	3			
Action 2.2 : Définir une stratégie de translocation dans le milieu naturel				1 310 000
Sous-action n°2.2.1 : Choisir la stratégie de translocation	1	- Synthèse internationale des retours d'expériences de translocations - Stratégie(s) retenue(s) (avec liste des sites potentiels/retenus) - Bilans de mise en œuvre (qui incluent les mesures de préparation des sites, les opérations de relâchers, les suivis des individus…)	- Nombre de zones de relâchés étudiées, puis retenues - Nombre de secteurs où des relâchés ont été mis en œuvre - Nombre de relâchés par secteur - Nombre d'individus suivis - Taux de survis - Nombre d'actions de sensibilisation réalisées	
Sous-action n°2.2.2 : Préparer la ou les zone(s) de translocation	2			
Sous-action n°2.2.3 : Mettre en œuvre les translocations, suivre les individus relâchés et leurs sites de translocation	2			
Axe 3 : Limitation des impacts du Vison d'Amérique et d'autres espèces allochtones sur le Vison d'Europe				**2 725 000**
Action 3.1 : Lutter contre les sources d'introduction de Vison d'Amérique dans le milieu naturel				85 000
Sous-action n°3.1.1 : Veiller sur l'état des élevages pelletiers de Vison d'Amérique	3	- Cartes de présence des détenteurs de Vison d'Amérique en zone PNA - Note d'information à destination des DDCSPP concernant la détention Vison d'Amérique - Modèle de « Plan de prévention et d'urgence » des élevages de Vison d'Amérique - Procédure de gestion d'un Vison d'Amérique en centre de soin de la faune sauvage	- Évolution du nombre de détenteurs de Visons d'Amérique connus de l'administration, présents dans la zone du 3e PNA - Nombre d'expertises fournies à la demande des administrations locales ou nationales concernant le statut du Vison d'Amérique	
Sous-action n°3.1.2 : Surveiller les conditions de détention en dehors des élevages pelletiers	2			
Sous-action n°3.1.3 : Apporter l'expertise nécessaire à l'évolution du statut réglementaire de Vison d'Amérique en France	1			
Action 3.2 : Lutter contre le Vison d'Amérique en nature				2 430 000
Sous-action n°3.2.1 : Affiner et mettre en œuvre la stratégie de lutte	1	- Cartes de synthèse de localisation et de résultat des radeaux - Publications des résultats des études sur le Vison d'Amérique	- Pourcentage de bassins versants équipés par secteur - Nombre de radeaux positifs par secteur - Nombre de nuits piégées par secteur - Nombre de Vison d'Amérique capturés par secteur - Nombre de dépouilles de Vison d'Amérique autopsiées	
Sous-action n°3.2.2 : Améliorer l'efficacité de la lutte contre le Vison d'Amérique	2			
Sous-action n°3.2.3 : Etudier les adaptations réglementaires possibles dans le cadre de la lutte contre le Vison d'Amérique	2			

Numéro et nom de l'action	Priorité	Livrables	Indicateurs	Evaluation financière
Action 3.3 : Etudier l'impact potentiel d'autres espèces allochtones sur le Vison d'Europe				
	3	- Publication des résultats des études sur le Raton laveur	- Nombre d'études initiées	210 000
Axe 4 : Contribuer au bon été des habitats du Vison d'Europe et lutter contre les autres menaces en nature				**1 460 000**
Action 4.1 : Lutter contre la disparition des habitats favorables au Vison d'Europe				
Sous-action n°4.1.1 : Renforcer la prise en compte du Vison d'Europe dans les plans, programmes et documents de gestion	1	- Guide des bonnes pratiques de gestion favorables au Vison d'Europe - Outils pour la prise en compte du Vison d'Europe à destination des instructeurs de dossier	- Nombre de structures destinataires du guide et autres outils - Nombre d'expertises réalisées par le 3e PNA	445 000
Sous-action n°4.1.2 : Accompagner la mise en œuvre des DOCOB, des mesures compensatoires ou d'accompagnement en faveur du Vison d'Europe	2			
Sous-actions n°4.1.3 : Améliorer et/ou crées des outils de gestion spécifiques pour le Vison d'Europe	3			
Action 4.2 : Lutter contre les destructions accidentelles de Vison d'Europe				
Sous-action n°4.2.1 : Lutter contre les destructions accidentelles liées au piégeage	1	- Supports utilisés lors des formations « référents Vison » - Module spécifique au Vison d'Europe à intégrer aux formations piégeurs - La plaquette de sensibilisation à destination des piégeurs créée dans le cadre du LIFE VISON (ré-amendée si besoin) - Synthèse sur la comparaison des différentes modalités d'aménagement d'ouvrages - Outils sur la prise en compte du Vison d'Europe à destination des instructeurs de dossier	- Nombre de mortalités accidentelles enregistrées (par type) - Nombre de réunion à destination des « référents Vison » - Nombre d'arrêtés « référents Vison » valides et à jour - Nombre d'ouvrages expertisés et aménagés - Nombre d'expertises sur la législation en cours ou à venir	1 015 000
Sous-action n°4.2.2 : Lutter contre les mortalités liées aux infrastructures	1			
Sous-action n°4.2.3 : Assurer une veille sur la prise en compte des enjeux de conservation du Vison d'Europe dans les textes réglementaires	2			
Axe 5 : Communications et formations sur le Vison d'Europe et les actions du 3è PNA				**610 000**
Action 5.1 : Elaborer et mettre en œuvre une stratégie de communication				
Sous-action n°5.1.1 : Construire et mettre en œuvre le plan de communication	1	- Plan de communication - Liste(s) de diffusion - Supports de communication	- Nombre et types d'opérations de communication réalisées - Nombre de personnes touchées via internet	430 000
Sous-action n°5.1.2 : Répondre aux sollicitations de communication	2			
Action 5.2 : Organiser des formations pour faire connaitre le Vison d'Europe et ses enjeux de conservation				
Sous-action n°5.2.1 : Construire des modules de formations adaptables selon les publics	1	- Programme de formations avec publics cibles - Supports de formation	- Nombre de formations réalisées - Nombre de personnes formées	180 000
Sous-action n°5.2.2 : Répondre aux demandes de formation	2			
Actions transversales de gestion du 3e PNA				**740 000**
Total				**11 515 000**

European Mink, © Julien Steinmetz

Document written by:

In collaboration with:

Published in October 2021

15, rue Arthur Ranc
CS 60539 - 86020 Poitiers Cedex
☎ 05 49 55 63 63
@ dreal-na@developpement-durable.gouv.fr
www.nouvelle-aquitaine.developpement-durable.gouv.fr

Direction régionale de l'Environnement,
de l'Aménagement et du Logement
Nouvelle-Aquitaine