

21 ways to protect the Eurasian lynx



Priorities for the conservation of
the Eurasian lynx in France



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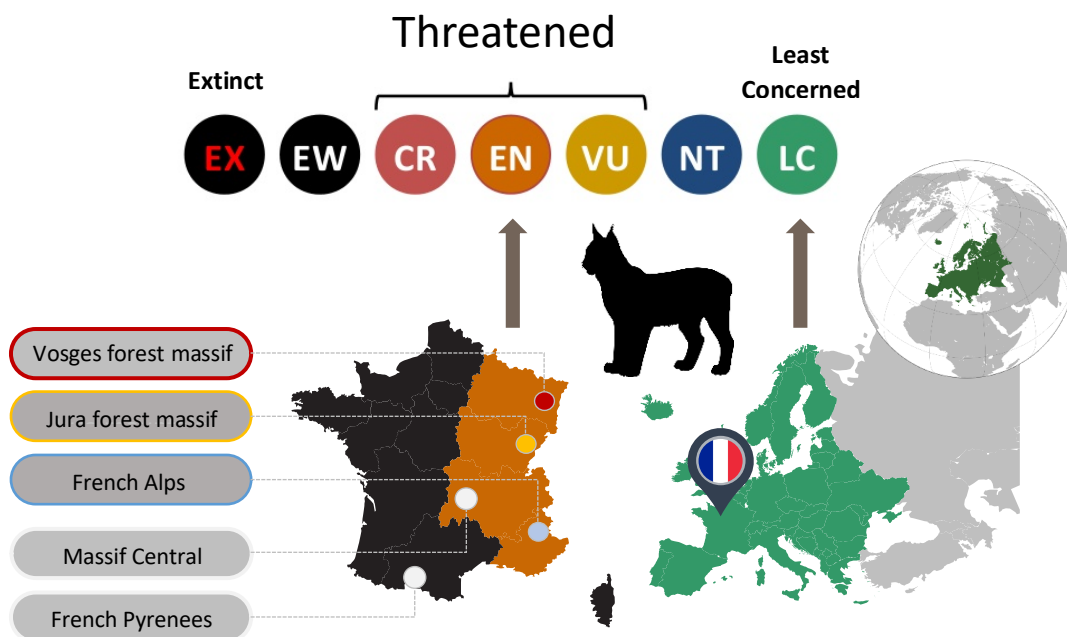
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Why is it important to save the lynx?

The Eurasian lynx (*Lynx lynx*) is one of the three large carnivores occurring in France, alongside the brown bear and the grey wolf. These felids are distributed across three core areas: the Vosges forest massif where they are endangered, the Jura forest massif, representing the heart of the French population, and the Alps where their presence is erratic.

Although lynx are considered to be of “Least Concern” (LC) across Europe, largely due to their vast distribution at this scale, this is not the case in France. In 2017, as in 2009, the Eurasian lynx was listed as “Endangered” (EN) on the national Red List of mammals of mainland France because its conservation status had not improved during this eight-year interval. In 2018, the trend of the French lynx population went from “increasing” along the Jura forest massif, to “decreasing” across the entire French distribution. The conservation of lynx in France is dire, and evidence informing their status is increasingly unfavourable. Therefore, it is a priority to take action toward their protection!



Current data from the field suggest that the Eurasian lynx may already be considered virtually “Extinct” (EX) from the Vosges forest massif, slowly increasing in the Jura forest massif and occurring only occasionally in the Alps, where population monitoring needs to be intensified. It would also appear that this species has disappeared from the Massif Central and the Pyrenees, however, a finer-scale population monitoring would need to be conducted to confirm their status.

- Eurasian lynx distribution in France is severely reduced, with the Vosges population suffering an extreme decline. Already extirpated from a few regions, lynx are on the brink of extinction.

With a total number of individuals estimated to be less than 200 in the entire country, the state of the Eurasian lynx population is predicted to deteriorate in the future. Moreover, the species has a low reproduction rate. Mating occurs only once a year, and on average, females only give birth to two kittens at a time. The mortality rate among young lynx is also very high. These factors prevent any rapid recovery or growth of lynx populations.

- The current geographic range and population dynamics of Eurasian lynx population do not allow for its long-term survival in France.

Lynx depend on forests to survive as they require safe denning sites to birth and raise kittens. In Western Europe, lynx can be found in regions where forest cover represents at least 30% of overall landcover, but also in more open habitats, such as the Jura “pré-bois” (i.e., a mix of woodland and meadows) or enclosed pastures within forests. The presence and distribution of its main prey, the roe deer and chamois, as well as the presence of conspecifics, are particularly important factors in the establishment of their vast home ranges.

- Lynx have particular habitat quality requirements. They favor resting sites undisturbed by human presence with continuous forest cover for protection.

Unlike wolves, lynx are not long-distance travellers. This limited dispersal ability prevents these felids from rapidly colonising new areas. Connectivity between forested patches is therefore crucial to allow for both the dispersal of young lynx and the movements of adults to establish suitable territories, locate mates and ultimately reproduce. Secured connectivity between forested habitats also provides corridors for sufficient geneflow to retain the genetic diversity required to maintain population viability. Without this genetic diversity, diseases and congenital deformity could threaten lynx populations. This threat is a particular concern for the lynx population in France, as it originates from a restricted number of individuals.

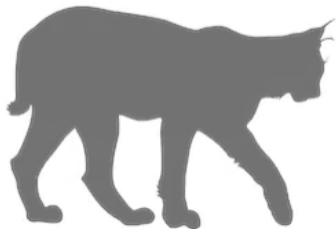
- The lynx dispersal and colonization mechanism, referred to as “step-by-step”, only allows for the very slow colonisation of suitable, unoccupied habitats, making this species even more vulnerable to habitat fragmentation.

In addition to these intrinsic characteristics not facilitating survival in human-dominated landscapes, lynx populations face increased mortality through human interaction. Vehicle (e.g., cars and trains) collisions and illegal killing directly threaten the species. Moreover, as a large carnivore, the lynx sometimes triggers fear and even antipathy among people. Although capable of killing sheep or unguarded tamed ungulates, in France, this type of predation

remains isolated, localised and only accounts for a relatively small number of attacks each year. Predation and the consumption of roe deer and chamois can also result in direct competition with the hunting community who fear that lynx predation diminishes game populations and thereby hunting opportunities. Yet, lynx play a crucial role in the functioning of forested ecosystems and are in this respect, necessary top-down regulators.

- While vehicle collisions represent the primary cause of known mortality for lynx in France, small-livestock or wild game depredation is sometimes the cause of conflict with livestock farmers and hunters, where these land uses overlap with lynx range.

This booklet summarises an in-depth literature review, analysis, interview, and consultation process with various stakeholders involved in the conservation of the Eurasian lynx in France. This study took shape over fourteen months and culminated in the development of the national action plan for the conservation of the Eurasian lynx in France (PNCL). The project was sponsored by WWF France and led by the French society for the study and the protection of mammals (SFEPM)¹. The PNCL consists of a repository of advisory proposals made available to the French Government in August 2019. These directives are to be implemented within the framework of a National Action Plan (NAP) to conserve the Eurasian lynx across its distribution in France. These proposals are herewith summarised.



The objective of the actions summarised in this document is to restore a favourable long-term conservation status to the Eurasian lynx in France, where it is ecologically and socially possible to do so.

¹ Full document available in French at www.sfepm.org/les-carnivores.html

A stakeholder consensus-building process involving more than a hundred attendees

The goal of this consultation was to assemble all motivated stakeholders and consolidate ongoing initiatives regarding Eurasian lynx in France. Creating multi-player engagement dynamics for lynx conservation at a national level allowed for the development of a “priority action” document to guide French government agencies. The proposed actions not only meet the current priorities for the conservation of Eurasian lynx in France but also address its challenges and support coexistence with human activities.

Stakeholders attended consultation meetings voluntarily, and any group, organisation or individual interested in or affected by the presence of the Eurasian lynx and concerned for or by its conservation in France was encouraged to participate. Stakeholders whose position could influence the protection and the conservation management of lynx were also included in the consensus-building process. Attendees were primarily recruited in the Vosges and Jura forest massifs, as well as in the Alps, but stakeholders from other geographical areas could also participate. In the Vosges forest massif, cooperative engagement and strategy sessions were conducted in partnership with the “Centre de recherche et d’observation sur les carnivores” (CROC), which has been working toward the “Plan Lynx Massif des Vosges” (PLMV) since 2016, with the aim of developing a regional action plan.

The consensus-building process followed an open, transparent, empathic, and constructive approach with the stakeholders. These working groups had three operating rules:



➤ **Allocation of speaking time**



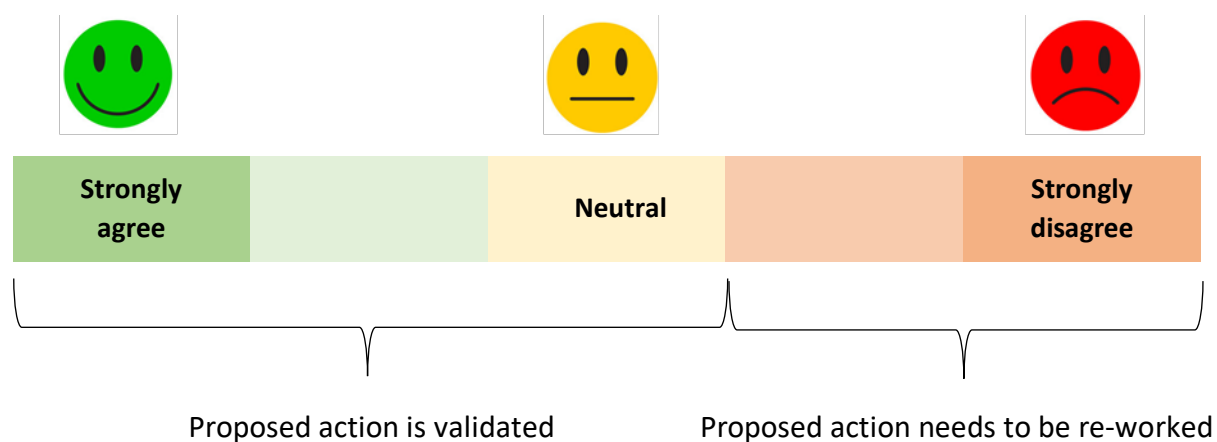
➤ **Attentive listening and respect for individual opinions**



➤ **Benevolence, even in the case of disagreement**

As the final goal was to account for the interests of all parties in developing a holistic and inclusive plan, which favoured an improved conservation status for the Eurasian lynx in France, the validation of each proposed action was based on a Likert consent scale. A Likert scale is a psychometric tool allowing for the measurement of individual attitudes. For any proposed action, stakeholders expressed their degree of agreement (two levels), neutrality

(one level), or disagreement (two levels). A proposed action was only adopted if all the stakeholders were in one of the three levels of agreement or neutrality.



First, we contacted the primary stakeholders (i.e., those who are the most concerned with the topic of lynx conservation) in France. We organised face-to-face or telephonic interviews with these parties. Secondly, we arranged working groups in each forest massif (i.e., the Vosges, Jura and Alps) with all the stakeholders who were interested in the topic, as well as two meetings with the PNCL steering committee. We also maintained constant communication with the CROC, our partner for the Vosges forest massif.

Working group objectives and analysis of the information provided by attendees

The working groups, which focussed on restoring a favourable long-term conservation status for the Eurasian lynx in France through improved coexistence with human activities, had five general objectives:



- ✓ Identify new stakeholders who were previously unknown and were therefore not contacted for their engagement



- ✓ Identify the threats to and challenges of lynx conservation in France



- ✓ Identify the sources of conflict between stakeholders



- ✓ Identify the relationships between stakeholders/organisations and their communication needs



- ✓ Generate a neutral and open framework to discuss the priorities for lynx conservation

Key themes, along with the most cited threats to lynx conservation, and significant challenges to lynx protection emerged following an analysis of these various stakeholder discussions. Prior to the consultation and engagement sessions with stakeholders, a review of existing literature was conducted in French, English, and to a lesser extent German. The review allowed for pre-identification of discussion themes implemented during the working groups and served as a common thread to our approach.

What are the threats to lynx conservation?

Four main threats to lynx conservation in France were identified through the literature review, interviews and consultation with stakeholders:

A low degree of acceptance and lack of knowledge regarding the lynx is at the root of human-lynx conflict within the hunting and farming communities

Of the three species of large carnivores occurring in France, the lynx is the less well-known but also the less feared. This lack of fear has not, however, prevented the complete eradication of lynx from mainland France, nor their historical disappearance across much of Europe. This low degree of acceptance for lynx is very often linked to their real or perceived impacts on game and livestock. These felids are also persecuted as a direct result of conflicting values between various stakeholders regarding their conservation.

Direct human-induced destruction

In France, direct human-induced destruction of lynx includes collisions with transport vehicles and illegal killing. While vehicle-lynx collisions are the primary known cause of modern lynx mortality in France, the unlawful killing of these felids is one of the foremost reasons for their demise from the Vosges forest massif following reintroductions from 1983-1993, with at least three proven and three suspected cases during this period. Since the return of lynx to France, about fifteen known cases of illegal killing have been recorded, however, estimating the actual number of illegally killed individuals is very difficult. Convictions are erratic as the culprits are rarely identified. When they are, current sentences do not bear any deterrent effect. Across Europe, illegal killing is identified as one of the three primary causes of lynx mortality.

Habitat loss and fragmentation

The loss and fragmentation of suitable habitat is a dire threat to remaining lynx populations in France. Fragmentation restricts the movements of this species and limit connectivity between populations, which can lead to their isolation. Lynx, like many large carnivores, are particularly sensitive to habitat fragmentation and destruction as they require vast territories to feed and reproduce effectively. In France, lynx populations are small, isolated and fragmented by an assortment of infrastructure and urban development such as roads, highways, railways and canals that inhibit or restrict their movements and increase the risk of collision with vehicles. While lynx have recolonised parts of eastern France, revealing a remarkable ability to cross numerous obstacles, growing intensification of these obstacles and the loss of forest corridors will prevent the future colonisation of new territories. Lynx populations that have little or no connectivity with other populations suffer an increased risk of extinction at the local level, due to the loss of genetic diversity and therefore, resilience to habitat change or threats.

Diseases

Different diseases carried by parasites or caused by viruses and bacteria can impact lynx health. In addition to other factors, they can increase the risk of mortality or reduce the reproduction rate in lynx populations. Detecting this cause of mortality in wild populations is highly complex, and therefore, its current impact on lynx is likely underestimated.

These four principal threats can accumulate and strongly impact the survival of any given lynx population.



What are the long-term perspectives on lynx conservation?

Though the conservation status of the Eurasian lynx is considered of “Least Concern” (LC), due to its wide distribution across Europe and Asia, this classification should not conceal the fragility of many European lynx populations, including in France.

Any conservation strategy for lynx in France, as in much of Western Europe, must be considered on an international scale, as it would need to account for the transboundary nature of the forest massifs that host these populations. In France, this would mean collaborating closely and aligning with lynx conservation strategies firstly in Germany (i.e., the Black and Palatinate Forests), Switzerland (i.e., the Jura mountain range and Swiss Alps), and then Italy (i.e., western Alps), and Spain (i.e., the Pyrenees).

Three situations are identified, each with their own objective:

- **Regions where lynx are present but rare or almost extinct:**
(Vosges forest massif, northern Alps, southern Alps)
In these areas, the objective will be to restore viable populations by promoting the settlement of dispersing individuals.
- **Regions where the current state of lynx populations allows for a favourable development over the next five years:**
(The Jura forest massif)
In this area, the objective will be to promote the expansion of lynx where the habitat is favourable, by developing and restoring forests and their corridors if necessary, while ensuring that the species coexists as well as possible alongside human activities.
- **Regions of historical presence, from which lynx have disappeared and for which the return of this species can be considered a long-term objective:**
(The Massif Central and Pyrenees)
In these areas, an analysis of the ecological and sociological situation must be carried out before considering the restoration via reinforcement or reintroduction of lynx.

The 21 priority actions for the conservation of the Eurasian lynx in France developed below relate to the first two situations. Additional actions will need to be developed to deal with the third situation.

21 ways to protect the Eurasian lynx

Twenty-one priority actions to protect the Eurasian lynx in France were defined during the consultation process with the stakeholders. These meet five practical objectives:

REDUCING HUMAN-RELATED MORTALITY

- Develop road and rail crossings to reduce collision-related mortalities
- Challenge and combat illegal killing and intentional disturbances
- Form a national alert network to protect and save lynx in distress

IMPROVING AND CONNECTING LYNX HABITAT

- Improve our knowledge of lynx movements
- Protect lynx habitat
- Help lynx cross roads, railway lines and canals
- Raise awareness of lynx habitat needs and vehicle-lynx collision risks

FOSTERING COEXISTENCE WITH HUMAN ACTIVITIES

- Improve the efficacy of livestock protection tools
- Support livestock farmers
- Promote open communication with livestock farmers
- Raise awareness of lynx presence among outdoor sports players and nature enthusiasts
- Account for lynx presence in hunting activities
- Further communication with the hunting community

TURN THE LYNX INTO AN ASSET BY ENHANCING ITS IMAGE

- Improve the lynx image and thereby its preservation
- Inform, raise awareness, and educate for conservation
- Study the perception of lynx and the impact of communicative actions

DEVELOPING SCIENTIFIC STUDIES AND LYNX MONITORING

- Improve lynx population monitoring
- Make better use of lynx mortality and remains
- Study lynx diet
- Implement genetic, disease and pollutant studies impacting lynx health
- Reinforce regional and transboundary cooperation between organisations



REDUCING HUMAN-RELATED MORTALITY

Particular effort must be made to reduce the causes of anthropogenic mortality, whether direct or indirect. The primary known cause of lynx mortality in France, that of collisions with transport vehicles, must be treated as a priority, without neglecting the other causes of mortality. Increasing the social acceptance for the species should make it possible to reduce the number of cases involving illegal destruction. Priority actions must focus on revisiting or establishing new criminal policy, but also and above all on strengthening the means of investigations and fight against the illegal killing of this protected species.

Actions!

➤ **Develop road and rail crossings to reduce collision-related mortalities**

High mortality rates, especially among young dispersing lynx, are often associated with transportation infrastructure (e.g., highways, roads, railways) and play a major role in lynx population dynamics.

Did you know? More than 150 cases of lynx collisions have been recorded since 1983 in France, mainly within the Jura forest massif. Even if these were not all fatal, this incidence represents the equivalent of the entire remaining French lynx population today.

➤ **Challenge and combat illegal killing and intentional disturbances**

The illegal destruction of lynx strongly impacts the annual growth rate of regional populations (a 15% drop was demonstrated across Europe). Moreover, even if lynx seem to adapt relatively well to human presence, any disturbances can have a particularly negative impact at certain times of the year, such as when females birth and raise their kittens.

Did you know? Cases of illegal lynx destruction could represent between 30 and 50% of overall mortality rate for the species according to several European studies, which have followed lynx equipped with GPS collars.

➤ **Form a national alert network to protect and save lynx in distress**

In France between 1974 and 2012, 146 lynx were found dead due to various reasons. Of these, 59% were victims of collisions with transport vehicles (e.g., car, train). However, not all road collisions prove fatal, and some lynx survive but present significant traumas requiring veterinary intervention. If possible, lynx that recover are released back into their natural environment and monitored post-release. Similarly, orphaned-kittens of (illegally) killed females are condemned if they are not swiftly found and rehabilitated. Each year in the Jura forest massif, and recently in the northern Alps, distressed lynx are found in close proximity to human settlements, which may pose a public safety concern. The management of

distressed lynx is therefore crucial in reducing anthropogenic mortality and contributing to lynx conservation in France.

Did you know? Since its creation in 1989, the “Centre Athénas” located in the Jura has received 56 injured or orphan lynx for rehabilitative care. Those that could be treated were released back into the wild and equipped with GPS collars to learn more about their ecology.



IMPROVING AND CONNECTING LYNX HABITAT

Lynx should be taken into account in land-use planning, and it will be necessary to facilitate connectivity between forest patches, including at the transboundary level (e.g., with the Palatinate and Black Forests as well as with both the Swiss Jura forest massif and Alps). Limiting disturbances caused by forestry activities (e.g., logging and forestry work during the breeding season) should be prioritised as well as improving the quality of forests through abundance of prey and appropriate refuge (e.g., management of forest stands and the establishment of undisturbed, “quiet” zones).

Actions!

➤ Improve our knowledge of lynx movements

The continuity of forest cover inside and between forest patches is fragmented by infrastructure (e.g., roads, highways, railway lines, canals and city sprawl), such as that of the Saverne pass in the Vosges forest massif. Currently, very little is known regarding the ecological corridors used by lynx and the barriers to the species movements, thus making it challenging to prioritise any conservation actions.

Did you know? Less than ten forest corridors have been identified between France, Germany and Switzerland. Whether lynx actively make use of these corridors has yet to be verified in the field.

➤ Protect lynx habitat

The growth of lynx populations in France, their natural recolonization and their connection with the forest patches of neighbouring countries require to protect but also to restore suitable habitats. Restoring functional connectivity between the Vosges, Jura and alpine mountain ranges is also crucial to ensuring geneflow between these populations. Furthermore, habitat quality should account for lynx behaviour, especially females and their young, who are vulnerable and require minimal human disturbance while denning.

Did you know? Lynx home range size varies by population and across regions. These are generally estimated to be between 50 and 450 km², but could range from 10 to 2 200 km² in Europe

➤ **Help lynx cross roads, railway lines and canals**

Transport infrastructures and canals may constitute obstacles and even barriers to lynx movements, particularly for young dispersing individuals. The high mortality risks associated with these obstacles hamper lynx conservation efforts in numerous European countries. Thus, the implementation of tangible measures, which facilitate the crossing of such infrastructure prove to be necessary to re-establish ecological corridors.

Did you know? Dispersal to find a new territory is often the most critical period in the life of a young lynx. Dispersing generally takes place between the end of March and mid-April, when individuals are between 9 and 11 months old. Dispersal distances range from 5 to 130 kilometres on average and often leads to the crossing of many roads.

➤ **Raise awareness of lynx habitat needs and vehicle-lynx collision risks**

Currently in France, information and awareness-raising actions regarding lynx requirements in terms of habitat and ecological corridors, intended for forestry managers and users, are either inadequate or non-existent. This results in insufficient consideration of lynx habitat needs in land-use planning projects. Therefore, the objective of this action is to develop communication and awareness tools based on field experience and adapted to land planners, decision-makers, managers and motorists.

Did you know? Despite the lynx being endangered, its needs are often not taken into account in regional land planning. This is primarily due to the lack of information and communication with the stakeholders concerned.



FOSTERING COEXISTENCE WITH HUMAN ACTIVITIES

The successful work that has been conducted by several organisations so far to mitigate the conflicts with the farming and hunting communities requires reinforcement and support. Actions to reduce unintentional lynx disturbances (e.g., outdoors sports, wildlife photography) must also be integrated into this objective, in conjunction with that of ensuring habitat quality.

Actions!

➤ **Improve the efficacy of livestock protection tools**

Lynx depredation on livestock is usually low in Western Europe. Sheep grazing in unguarded plots are the most at risk, yet acceptance of lynx by livestock farmers is highly variable. Although livestock guarding dogs have been shown to be effective at protecting livestock against lynx, they are not always the ideal solution for each farm. Therefore, testing other methods for those farms is crucial for the coexistence between lynx and livestock farming.

Did you know? Livestock guarding dogs are successfully used in various countries around the world. In France, an 86 % drop in damage was recorded following their introduction into sheep flocks in the Jura forest massif.

➤ **Support livestock farmers**

Livestock farmers have to face an increasingly harsh socio-economic context and each depredation case can have substantial financial and psychological impacts, besides representing additional workloads for farmers. Even though several tools have already been developed to support sheep farming in the face of livestock depredation, additional efforts still need to be made to mitigate existing conflicts and to maintain coexistence where it is already established. Due to the limited extent of lynx depredation on livestock and the effectiveness of protective measures (such as livestock guarding dogs), few resources should suffice to improve coexistence. Recognition of the social and psychological aspects of depredation is particularly important, as well as support for voluntary farmers wishing to implement new coexistence practices.

Did you know? Around the world, voluntary certification programs for farming products that promote biodiversity and coexistence with large carnivores have been developed. These products benefit from alternative retail channels through better publicity.

➤ **Promote open communication with livestock farmers**

Livestock farmers generally have a negative perception of lynx and are somewhat intolerant to its presence. A lot of false information is still conveyed about lynx in the farming sector and often stems from a misunderstanding of the species. Misinformation exacerbates the fear already triggered by the potential risk of lynx depredation on domestic flocks. Thus, the development of information and awareness campaigns is essential to improving coexistence between farmers and lynx. In addition, the lack of recognition felt by the agricultural sector about their work, efforts and struggles strongly curbs farmers acceptance of the lynx.

Did you know? The current number of lynx attacks on livestock in France varies between 50 and 100 each year across the entire lynx distribution range, which is very low compared to other causes of mortality suffered by livestock.

➤ **Raise awareness of lynx presence among outdoor sports players and nature enthusiasts**

Lynx can coexist with people and seem relatively tolerant of human disturbance, as long as quiet areas and safe dens are available for birthing and rearing of young. However, some practices may cause severe disturbance, especially at particular times of the year (e.g., mating and breeding seasons) or when they impact feeding sites (i.e., carcasses of prey killed by lynx). Often, a lack of communication and/or general public awareness explain behaviours that cause unintentional disturbance of lynx and could, therefore, be easily resolved.

Did you know? Disturbances, even when unintentional, can severely disrupt the feeding sites of lynx, forcing individuals to abandon their prey. Lynx are thus compelled to kill more prey, which might increase conflicts with livestock farmers and/or hunters.

➤ **Account for lynx presence in hunting activities**

Lynx predate and feed on wild ungulates and are therefore perceived as competitors by many hunters. In addition, hunters may feel powerless regarding the management and conservation issues of this protected species occurring at low density and that they are not permitted to control. Yet, in many countries, hunters and large carnivores coexist and hunters are directly involved in the conservation of lynx. For this to be possible, official hunting documentation must clearly present the lynx as a protected species to be conserved. Presidents of hunting associations and leaders of invested organisations play an important role in the acceptance of the lynx locally. Their support is crucial to managing illicit hunting activities and reducing lynx disturbances in France.

Did you know? In France, the lynx is protected all year round but in Norway and in Estonia where its numbers are higher, a lynx hunting season with quotas is open each year. Yet, the existence of a hunting season does not prevent the illegal killing of the species.

➤ Further communication with the hunting community

Acceptance of the lynx by hunters is a priority for the long-term conservation of the species. This could be achieved through their involvement in lynx conservation projects, at the early stages of their development. Information, inclusion, consultation and negotiations are crucial in the improvement of hunters' perceptions of lynx and of the people who defend its conservation. Similar experiences throughout Europe show that active participation of hunters in lynx conservation programs reduces their feeling of exclusion. Cooperation between groups of stakeholders encourages the appropriation and defense of these programs and the species by hunters. Those aspects significantly increase the likelihood of successful conservation programs and prevent opposition to lynx protection measures.

Did you know? In the Palatinate forest of Germany, hunters are an integral part of lynx conservation. They committed to respect its conservation status, to report any acts of illegal destruction of lynx, and to help with the monitoring of the species.





TURN THE LYNX INTO AN ASSET BY ENHANCING ITS IMAGE

Lynx conservation requires the consideration of socio-economic issues related to the territorial development of the forest massifs impacted by its presence. A strategy aiming at improving the acceptance of the species while highlighting the ecological but also economic, aesthetic and cultural benefits of lynx presence, is essential. To do so, awareness and information efforts targeting the general public and other key stakeholders (elected representatives, hunters, livestock farmers, foresters, tourism professionals, outdoors sports players and managers, land planners, etc.) need to be pursued and intensified.

Actions!

➤ **Improve the lynx image and thereby its preservation**

As a large carnivore and a wild cat species, lynx are emblematic and able to arouse public interest and sympathy. Its presence in a given area can generate economic benefits and allow the development of new opportunities for local businesses (e.g., tourist accommodations, catering, transport, crafts, gastronomic products, and guided tours). Thus, the development of activities related to the species (e.g., “lynx” hiking trails, holiday cottages, regional products, souvenirs and lynx memorabilia) should be promoted since this would benefit both the local economies and the conservation of the species.

Did you know? The Harz and Bavarian Forest National Parks in Germany have developed lynx-related tourist attractions that benefit the local economy and the conservation of the species.

➤ **Inform, raise awareness and educate**

Lynx have a low media profile and remain relatively unknown in France, particularly when compared to the two other large carnivores occurring in the country (i.e. the brown bear and the grey wolf). In addition to targeted communication for specific stakeholders, liaising with the general public and school groups is essential to publicize the lynx and to raise awareness of the threats it is facing. It is also necessary for sustaining the development of a strong conservation movement for the species.

Did you know? June 11th marks the celebration of the International Lynx Day. Germany, the Czech Republic, Austria, and Slovenia all participate in the event by organising different activities for the general public.

➤ Study the perception of lynx and the impact of communication actions

Studying the relationships between humans and wildlife along the land-use interface in the field of conservation is crucial to a better understanding of the socio-cultural, psychological and economic aspects of coexistence with a particular species. Although public support is a necessary condition for the successful conservation of lynx, it is not sufficient. Historical reintroduction of lynx to the Vosges forest massif represents an excellent example of this, where despite public support, this population has been decreasing and is now on the brink of extinction. To improve our understanding of lynx perception and acceptance at the regional scale, additional stakeholders will need to be considered (e.g., livestock farmers, hunters, foresters and tourism professionals). Simultaneously, the relative impacts of communication actions aimed at conserving the lynx must be quantified to allow for adaptive management, which uses this information to modify these actions, if necessary, to improve their efficacy.

Did you know? A survey carried out in 2004 by the GEPMA² and Alsace Nature showed that, when interviewed, 79 % of the public was in favour of lynx returning to the Vosges forest massif.



DEVELOPING SCIENTIFIC STUDIES AND LYNX MONITORING

Priority research actions should include analyses of lynx diet and an assessment of the genetic diversity remaining in these populations. Health and eco-toxicological monitoring should also be implemented as these small populations are at severe risk of disease and poisoning. The development or strengthening of collaborations with various European research networks should be promoted. The French “Réseau Lynx” should be reinforced through an increased participation of multiple stakeholders in the population and ecological monitoring of the species.

Lynx reinforcement programs in the Vosges forest massif and the Alps would meet population demographic needs and could be implemented in the long term if the conditions are met (e.g., elimination of primary threats). However, such programs must be subject to broad consensus and include the support of all stakeholders. Where these programs failed in the past, a lack of transparency or inclusion resulted in conflicting stalemates and likely drove retaliation through the illegal destruction of released individuals and of other lynx. Thus, improving the conservation status of lynx in France will require continued and further in-depth collaboration to strengthen the multi-stakeholder dynamics currently underway. Capitalizing on the rescued individuals (e.g., young orphans, injured animals) that have been rehabilitated by the “Centre Athénas”, should already be under discussion with the intent to support the expansion of existing populations.

² Groupe d’Étude et de Protection des Mammifères d’Alsace (group for the study and the protection of Alsatian mammals)

Actions!

➤ **Improve lynx population monitoring**

Due to their secretive habits and relatively low density, lynx need accurate and constant monitoring to detect any changes in the trends of their populations. The lack of standardised, intensive and coordinated monitoring throughout their French range does not currently allow population size to be estimated in a timely way nor its management to be sufficiently reactive. Slow monitoring and response rates could have serious implications, such as in the Vosges forest massif where the lynx distribution range has continuously been decreasing since 2006, but this range contraction was officially recognised too late by the State. Lynx are still settling in the Alps but their range expansion progresses very slowly and population trend remains difficult to assess without sufficient survey effort across the massif. It is therefore necessary to increase these efforts in areas where currently little to no data are collected, such as the recolonization fronts of some mountain ranges (e.g., Massif Central, Alps), to accurately update the lynx distribution map for France.

Did you know? A recent study, conducted between January 2011 and April 2016 in the French departments of Ain, Doubs, Jura, Vosges, Haut-Rhin, Bas-Rhin and Moselle, only identified 92 lynx, all of which occurred in the Jura forest massif.

➤ **Make better use of lynx mortality and remains**

Lynx found dead in France are typically collected by the French Agency for Biodiversity (OFB), and samples are collected if the condition of the animal allows it. However, the practical biobanking of samples and whole carcasses is often limited by a lack of adequate storage space and/or staff to catalogue and update records on databases. Moreover, there is a lack of information and communication between the organisations that store the samples and those that have the facilities to conduct the scientific research required to improve our knowledge and mitigate the threats faced by lynx. Current protocols do not always include all the necessary sampling and analyses to answer relevant scientific questions. These protocols will need to include these steps to standardize techniques for comparison, not just between regional veterinary laboratories in France, but also for dissemination among neighbouring countries to inform transnational-level monitoring strategies.

Did you know? In France, between 1974 and 2012, 146 lynx were found dead for various reasons, but the carcasses could be used for scientific research to improve the conservation of the species.

➤ **Study lynx diet**

The lynx is an obligate carnivore. Studying its diet is important to better comprehend the potential impact of the species on wild and domestic ungulate populations and on its ability to regulate populations of other species such as the red fox. Some French hunters have

expressed concerns over the impact of lynx on the densities of roe deer and chamois. Yet, studies currently underway in neighboring countries suggest that there is no significant impact of lynx presence on either the density or the behavior of roe deer.

Did you know? Unlike wolves and brown bears, lynx are obligate carnivores that only eat meat. About thirty different prey species have been identified in their diet across Europe.

➤ **Implement genetic, disease and pollutant studies impacting lynx health**

The small size and isolation of lynx populations in France, associated with relatively high mortality rates (e.g., collisions and illegal destruction), exposes these lynx to genetic costs, which threaten the long-term survival of these populations. Only about twenty individuals are at the origin of the Jura and Alps lynx populations in France. These populations are relatively isolated, even if some exchanges between forest massifs occasionally occur. The situation of the Vosges population, however, is critical. In the north-west of the Alps, inbreeding issues have been highlighted and several cases of congenital deformity in wild individuals from the Jura forest massif have been reported, which may be the result of reduced genetic diversity. In addition, individual lynx health status has never been assessed in France, even though the exposure to different chemical and/or biological contaminants could represent an additional threat to the conservation of the species.

Did you know? In Switzerland, congenital malformations affecting the heart and skeleton of several lynx have been discovered, likely due to their compromised genetic diversity.

➤ **Reinforce regional and transboundary cooperation between organisations**

In France, apart from the “Réseau Loup Lynx” coordinated by the OFB, other organisations and individuals are involved in lynx population monitoring, sometimes without communicating with each other. Yet, lynx monitoring would greatly benefit from collaboration between actors at the regional and national levels. That would allow organisations to improve knowledge, distribute the workload and pool resources of available staff and limited equipment, thereby reducing survey costs. Similarly, cooperation between organisations at the transboundary level could be improved, particularly between France and Switzerland.

Did you know? Eurolynx is an open, bottom-up scientific network that was created in November 2018 to promote collaborative science based on knowledge and data sharing to investigate the ecology of the Eurasian lynx.

Your turn to act!

Everyone can take part in lynx conservation and the mitigation of conflicts its presence might cause with some human activities. Some examples are cited below, though this list is certainly not exhaustive:

- **If you are a nature guide**, organise activities around the lynx and share knowledge about its conservation.
- **If you are an artist**, put your talent to good use for lynx conservation, in collaboration with an NGO or out there on your own.
- **If you are an NGO**, collaborate with other NGOs to ensure that the conservation status of the lynx is respected and support highlighting its status as a national priority.
- **If you are a vehicle driver**, keep a sharp eye out! Enquire about accident-prone road stretches for lynx and respect speed regulation measures put in place to limit collisions.
- **If you are a hunter**, ask your hunting association to develop a training course about lynx ecology and to file a civil suit in case of illegal killing of the species.
- **If you are a citizen**, become a member of an NGO that protects the lynx and tell others about it.
- **If you are a researcher**, help design studies which are useful in supporting lynx conservation or the mitigation of conflicts with human activities.
- **If you are a farmer**, join training sessions about livestock protection methods and share your success with fellow farmers.
- **If you are an elected representative**, support farmers who protect their livestock with guarding dogs and raise awareness regarding the importance of livestock guarding dogs in lynx-farmer coexistence.
- **If you are a teacher**, organise a school trip for students to learn about lynx conservation.
- **If you are an outdoor sports federation**, raise your members awareness regarding the importance of being quiet and respectful of wildlife, including lynx, and enquire about the disturbance your activities might cause.
- **If you are a protected area manager**, contribute to data collection on the species in collaboration with existing networks.

- **If you are a forest owner/manager**, limit disturbance during sensitive periods for the lynx (e.g., mating and rearing seasons) and report your observations to existing networks.
- **If you are a journalist**, raise awareness of the threats that the lynx face among your readership, audiences, and viewers. Highlight the benefits that lynx can bring to society.
- **If you are a naturalist**, report your observations to existing monitoring networks.
- **If you are a tourism information centre**, showcase lynx presence as a tourism asset for your region.
- **If you are a zoo or a wildlife park**, support *ex-situ* lynx conservation programs and alert the general public about the threats the species faces.
- **If you are a wildlife photographer**, respect the peace and quiet lynx requires and put your artistic talents to good use for its conservation.
- **If you are a transportation network**, put in place corrective measures on infrastructure used by lynx (e.g., roads and bridges) and get in touch with NGOs that protect the species to help raise awareness among your customers.
- **If you are a holiday-maker**, support local initiatives (e.g., crafts and tourist attractions) that promote the lynx image and campaign for its conservation and improved coexistence with human activities.

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