

# Beaver *Castor fiber* (Linnaeus, 1758) recovery and monitoring in France

Gestión de una población introducida de castor  
*Castor fiber* (Linnaeus, 1758) en Francia

Frantziar sartutako *Castor fiber* (Linnaeus, 1758)  
izeneko kastorearen populazioaren kudeaketa

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## ABSTRACT

Due to hunting, the distribution of Eurasian beaver *Castor fiber* Linnaeus, 1758 has declined in the whole of Europe until the end of the XIX<sup>th</sup> century. In France, legal protection since 1909 had led to a natural increase of population on the Rhone water system (south-east France). Since the 1960's, a program of about 20 translocations involving more than 300 individuals have favoured the still ongoing recovery of the species. Currently the beavers occur in five out of the six main water systems of France, on more than 8000 km of waterways. Population monitoring and management is ensured by a special network, led by the national game and wildlife agency, and including NGOs and other national or local institutions. This network monitors the evolution of beaver distribution by recording its signs of presence. Owing to its diet, the beaver can create damage to trees and crops near the riverbanks. Nonetheless damage is still quite rare. The beaver network works with local communities to prevent damage by different types of effective measures. Thanks to the work of several institutions the beaver has recovered its place in most French aquatic ecosystems.

**KEY WORDS:** Beaver, *Castor fiber*, reintroduction, damage, monitoring, managing network.

## RESUMEN

Debido a la caza, la distribución del castor euroasiático *Castor fiber* Linnaeus, 1758 se ha reducido en el conjunto de Europa hasta finales del siglo XIX. En Francia, su protección legal desde 1909 ha dado lugar a un aumento natural de la población en el complejo acuático del Ródano (sureste de Francia). Desde la década de 1960, un programa de cerca de 20 traslocaciones que involucraron a más de 300 ejemplares han favorecido la recuperación aún en curso de la especie. Actualmente los castores se distribuyen por cinco de los seis sistemas de agua principales de Francia, en más de 8.000 km de cauces. El seguimiento y la gestión de la población está asegurada por una red de trabajo dirigida por la Agencia Nacional de Caza y Vida silvestre, con la ONG y otras instituciones nacionales o locales. Esta red de trabajo realiza un seguimiento de la evolución de la distribución del castor registrando sus signos de la presencia. Debido a su dieta, el castor puede crear daños a los árboles y los cultivos cerca de las riberas del río, sin embargo, los daños registrados son bastante raros. La red de trabajo sobre el castor trabaja conjuntamente con las comunidades locales para prevenir daños, utilizando diversas medidas de probada eficacia. Gracias a la labor de varias instituciones el castor ha recuperado su lugar en la mayoría de los ecosistemas acuáticos franceses.

**PALABRAS CLAVE:** Castor, *Castor fiber*, reintroducción, daños, seguimiento, red de gestión.

## LABURPENA

Ehiza dela eta, *Castor fiber* Linnaeus, 1758 kastore euroasiarraren banaketa gutxitu egin zen Europa osoan XIX. mendearen amaierara arte. Frantziar, 1909tik lege mailako babesa du eta horrek populazioa modu naturalean areagotzea ahalbidetu du Rodanoko ur-komplexuan (Frantziako hego-ekialdea). 60ko hamarkadatik, 300 kastore-ale baino gehiago biltzen zituen 20 traslokalizazio inguruko programak espezieari berreskuratzen lagundu dio nahiz eta oraindik programa abian dagoen. Gaur egun, kastoreak Frantziako sei ur-sistema nagusitatik bostetan banatuta daude, ubideen 8.000 km baino gehiagotan. Populazioaren jarraipena eta kudeaketa Ehiza eta Bizitza Basatiaren Agentzia Nazionalak zuzendutako lan-sareak bermatzen du GKEarekin eta Estatuko zein tokiko beste erakunde batzuen laguntzarekin. Lan-sare horrek kastorearen banaketaren bilakaeraren jarraipena egiten du presentzia-zantzuak erregistratuta. Haien dieta dela eta, kastoreak kalteak eragin ditzake ibaiertzetatik gertu dauden zuhaitz eta laboreetan. Dena den, kalteak ez dira oso ohikoak izaten. Kastorearen inguruko lan-sareak tokiko komunitateekin batera egiten du lan kalteak prebenitzeko eta eragingarritasun handiko hainbat neurri erabiltzen du. Erakunde ugariaren lanari esker, kastoreak bere tokia berreskuratatu du Frantziako ekosistema urtar gehienetan.

**GAKO-HITZAK:** Kastorea, *Castor fiber*, berriro sartzeta, kalteak, jarraipena, kudeaketa-sarea.

## INTRODUCTION

Originally spread over a wide and continuous area from Spain to eastern Siberia, the European beaver *Castor fiber* Linnaeus, 1758 included 9 subspecies (Gabryś & Wazna, 2003), among which *Castor fiber galliae* (Geoffroy, 1803) in the Rhone valley.

Hunted for its fur, flesh and the *castoreum*, beaver populations have started to decline since the Middle Ages, and progressively disappeared from many countries, including Spain, in the 18<sup>th</sup> century. Only eight small and isolated populations still occurred across Eu-

rope in the early 20<sup>th</sup> century (Nolet & Rosell, 1998), when people became aware of the necessity to protect this species.

In Europe, two main methods have been followed: either the creation of protected areas where beaver hunting was prohibited (e.g. in Russia and Poland), or the complete protection of the species on the whole territory (e.g. in Germany, Norway and Sweden) (Richard, 1980). In France, just a few individuals still occurred in the lower valley of the River Rhone when, in 1909, it was established to protect them. Following the slow recovery of that population, protection was extended to the whole country in 1968.

As a result of conservation programmes, the beaver has recovered across much of its former range, particularly within Europe. Also thanks to reintroductions and translocations that have been carried out throughout Europe since the 1920s, the overall Eurasian beaver population raised from 1200 individuals at the beginning of the 20<sup>th</sup> century, to at least 593000 in 2002 (Halley & Rosell, 2002).

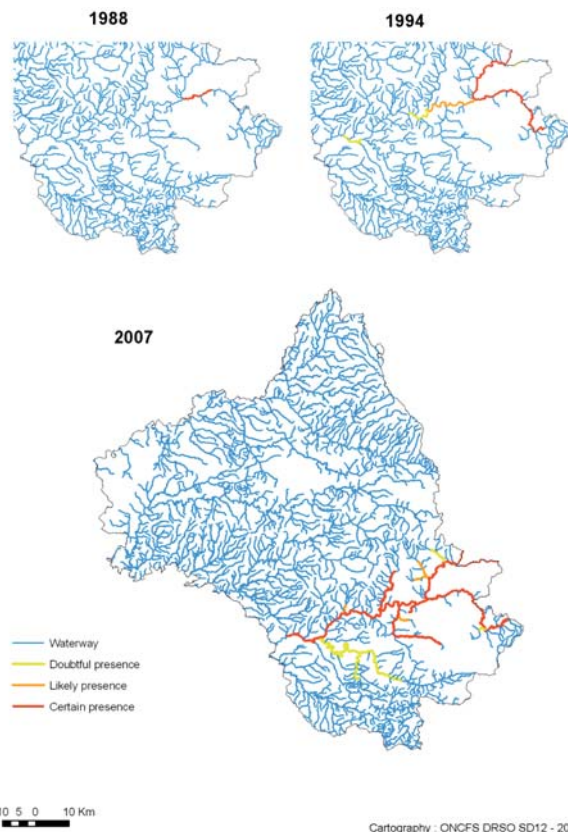
As a consequence, since 2008 its status in the IUCN red list has been changed from “Near threatened” to “Least concern”. Moreover, the European beaver is now listed in the appendix II and IV of the “Habitats Directive”.

**BEAVER RECOVERY IN FRANCE**

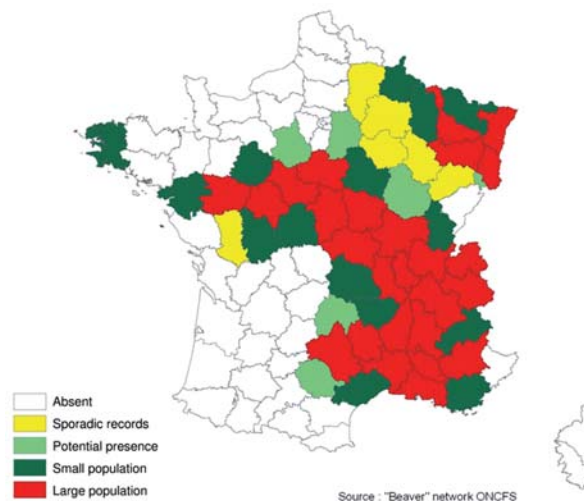
In France, since 1957 more than 20 translocations have been conducted in 15 different departments with beavers coming from the residual population of the Rhone valley. Beavers were captured at sites where they caused conflicts. To create new viable populations, each time, a minimum of 3 or 4 couples were released in areas at least 5 km far from each other, as to avoid contacts in the first post-release period. In the department of Aveyron, located on the edges of the Massif Central (SW France), the current population originated from the reintroduction of 13 beavers in 1977-1980 in the Cévennes National Park and 12 more individuals in 1988-1989 next to Millau in the valley of the River Dourbie. From this last reintroduction area, the beaver has colonised 289 km of waterway, among which 201 km filed as “certain presence” (Fig. 1). In 2009 the beaver was recorded in a neighbour department (Tarn), 30 km downstream the last known beaver territory.

In 2008, about 8000 km of waterway were occupied by the species (Fig. 2), with a population close to 10000 individuals in 1997 (ONCFS, 1997). Five out of the six largest water systems are now occupied by growing populations of *Castor fiber galliae*.

Family groups include a pair of adults and 1 to 3 generations of sub-adults and cubs. Single individuals are also fairly common. Home range size ranges from 1,5 to 3,5 kilometres of waterway (Rouland, 1992). Lairs consist of holes or huts made of branches, depending on the soil structure of river banks. In south-eastern France, some lairs have also been observed in caves. Beaver dams are not widespread.



**Fig. 1.** - Beaver colonization of the Aveyron Department.  
**Fig. 1.** - Colonización del castor en el Departamento de Aveyron.



**Fig. 2.** - Beaver distribution in French departments in 2008.  
**Fig. 2.** - Distribución del castor en Francia por Departamentos en 2008.

In France, the abiotic factors limiting beaver settlement are the slope of the waterway, that has to be less than 1% (Erome, 1982 in Rouland, 1992), and the depth of the stream that has to be greater than 50 cm. Habitat attractiveness depends on food availability in winter.

High human density and organic water pollution seem not to have negative effects on beaver occurrence. Although they cannot be considered as absolute barriers, dams may slow beaver dispersal and the colonization of new territories.

Road collisions are the main cause of man-induced known mortality (38 cases out of 55 deaths recorded in 2008; ONCFS, 2008).

**PREVENTION OF DAMAGE**

The beaver mainly feeds in a 20 to 30 metres wide strip from the riverbanks. Its diet is constituted of vegetal plants, bark, buds, leaves and fruits, depending on seasonal availability. Salicaceae trees (poplars and willows) with a diameter from 3 to 8 cm are preferentially consumed. Locally, beavers can cause damage to crops, especially to ligneous plantations (85% in France according to Rouland, 1992). In France, damage includes (Fig. 3): barking up to 1,20 m above the ground, cutting of the lower branches of fruit trees and, rarely corn eating. Beavers can also damage dykes by digging, while their dams can modify the flow of watercourses in industrial contexts such as nuclear power stations or water supplied factories.

Damage is quite rare. Less than 50 statements are made in France each year mainly for damage on poplar trees (ONCFS, 2008). The challenge for the monitoring network is to anticipate damage as much as possible. Among prevention methods, mechanical protections are mainly used. Depending on the context, 4 major types of protection are advised. Individual protections with fences or wire netting are recommended for a few tree species of economic interest. If the length of the area to protect is less than 100 m, wire fences with a 20 cm flap at the basis

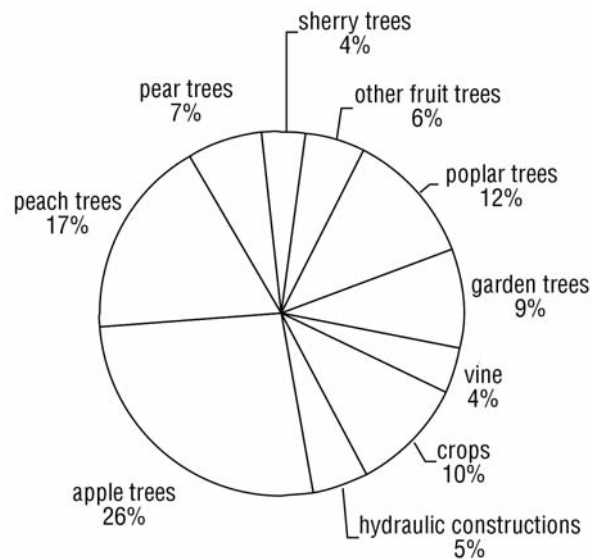


Fig. 3. - Percent distribution of damage types from 1982 to 1989 (N = 110; in Rouland, 1992).

Fig. 3. - Distribución porcentual de tipos de daños desde 1982 a 1989 (N = 110; en Rouland, 1992).

on the water side are recommended (Fig. 4). For larger areas, electrical fence placed 20 cm above the ground can be used. Finally, a so-called “Anti up-streaming system” has been developed to prevent access to little streams and then protect large areas at a very low cost (Fig. 5; Rouland & Pedot, 1990). Chemical compounds are rarely used because of their low persistence in the environment and high cost. Removal of individuals or dam destruction are exceptional events. Predators odours (Rossell & Czech, 2000) are not used in France.

**CONCLUSIONS AND FUTURE PERSPECTIVES**

In France as so as in the whole western Europe, beaver populations are above or will soon reach the mini-

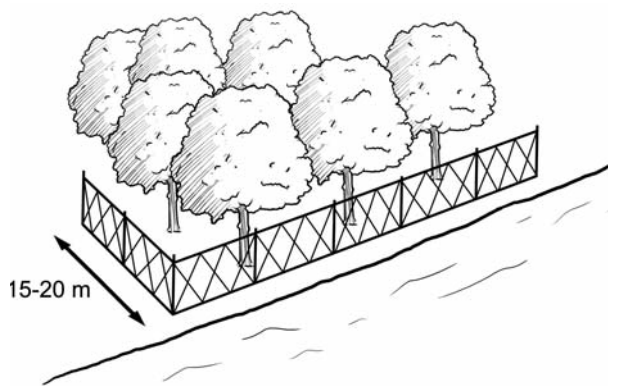


Fig. 4. - Wire fence.

Fig. 4. - Cercado de alambre.

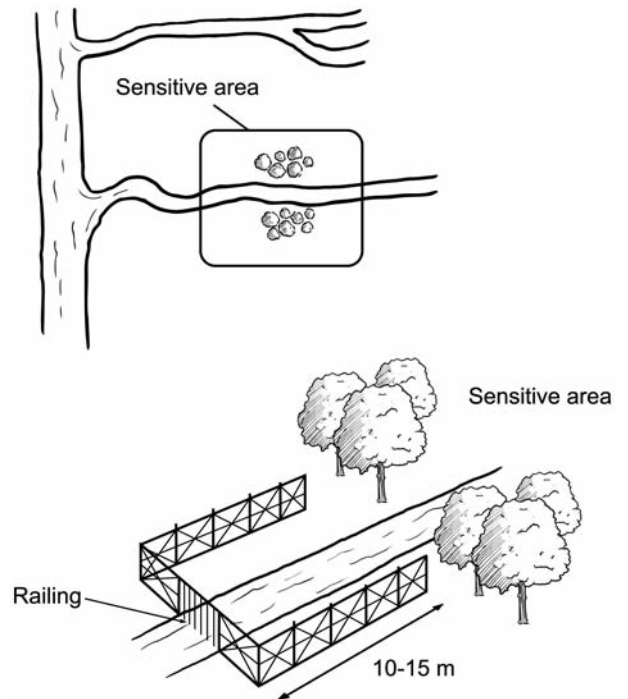


Fig. 5. - Anti up-streaming system (Rouland & Pedot, 1990).

Fig. 5. - Sistema anti-remontada (Rouland & Pedot, 1990).

mum viable population size. Beaver populations are still growing in France and have a wide potential for development, especially in the south-west, where all the Garonne water system could be naturally colonized.

Direct persecution by humans is probably underestimated, but it is not a major concern for beaver conservation. The main conservation issue is thus related with introduction of Canadian beaver *Castor canadensis* Kuhl (1820) as shown by the problems they caused to the Finnish population of European beaver. Populations of Canadian beaver have been identified in Belgium, Luxembourg and Germany. The expansion of these populations or the accidental introduction of individuals could threaten French beavers. Therefore, improved overseeing is being led on Beaver near the borders in North of France.

As long as damage statements are so few, there is no need for specific management policies into the beaver's range. All considered, the work done by the "beaver network" seems to be sufficient to support the ongoing beaver expansion in France.

The European beaver recovery is currently a flagship for conservation programmes. Many private and public organisations have been working so that this species could recover its place in the aquatic ecosystem.

<b>Signs of presence</b>	<b>Presence</b>
Floating cut wood Beaver carcass Visual observation by a not-expert	Doubtful
Cut standing wood Barking on standing wood Barking on cut wood Barking on roots Refectory Banks access or run Tracks Secondary lairs Visual observation by a network representative	Likely
Castoreum Well kept dam Main lairs Pantry (food reserve)	Certain

**Table 1.** - Signs of presence monitored by the beaver network in France.

**Tabla 1.** Red de trabajo de seguimiento de indicios de presencia de castor

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