



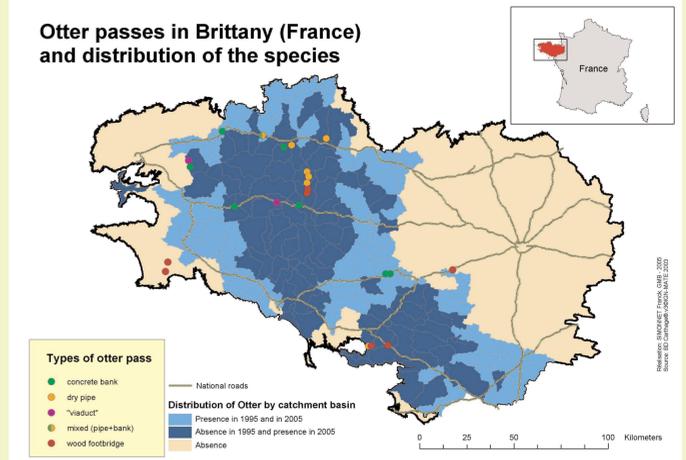
OTTER STATUS IN BRITTANY

- 19th and 20th centuries: **sharp decline** of the population first due to **massive trapping** and then to **slick and habitat damaging**.
- 1972 : **legal protection** of the species. Otter population is confined to central west Brittany, to some small islands, to coasts and to the large coastal wetlands of the south-east.
- 2005 : In the west, the otter has recolonized many catchment basins, from sources to estuaries. In the east half, **recolonization** is much slower.

ROAD NETWORK AND TRAFFIC DEVELOPMENT

- For 30 years now, due to economic development, the breton road network and traffic have been rapidly growing.
- This road network represents a major obstacle that may **threaten the recolonization process**.

Otter passes in Brittany (France) and distribution of the species



18 YEARS OF EXPERIENCE IN BRITTANY

Since its creation in 1988, the **Groupe Mammalogique Breton (GMB)** has been:

- making an inventory of dangerous road bridges
- informing professionals and elected representatives
- recommending specific measures to the relevant authorities
- instigating the installation of many structures designed for aquatic mammals.

However, the GMB is neither the project manager, nor the constructor. It is necessary to assess the efficiency of these structures in order to improve both existing ones and future recommendations.

The durability and the functional aspects of 23 otter passes have been tested.

RESULTS

Type of passes: 8 concrete banks, 6 pipes (diameter: 30 to 80 cm), 6 wood footbridges, 2 "viaducts", 1 mixed: pipe+bank

Type of roads: 10 motorways, 7 roads with high traffic, 6 roads with low traffic

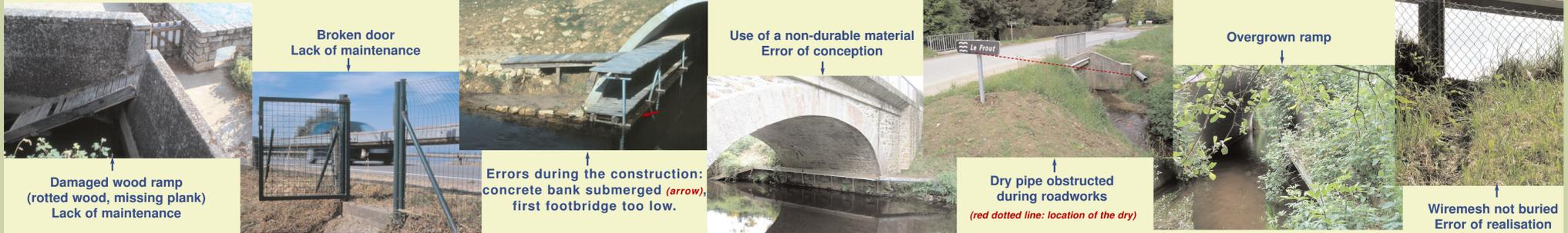
Type of waterways: 8 rivers, 10 streams and 5 rivulets

Efficiency:

- 9 used by otter
- 11 functional, 9 dysfunctional, 3 non-functional



DYSFUNCTION OBSERVED



PASSES ARE EFFICIENT IF THE RECOMMENDATIONS ARE RESPECTED.

IT IS ESSENTIAL THAT THEY BE INTEGRATED IN ALL ROADWORKS, especially in Natura 2000 areas, Natural Parks...



RECOMMENDATIONS



TYPES OF STRUCTURES

- Viaduct across the main river bed : ideal structure ①**
- Dry pipe ②: efficient for small streams if**
 - placed well above the flood level ③
 - adequate ratio diameter/length ④
 - annual maintenance of the ramp ⑤
- Concrete bank = ideal for medium-sized bridges if**
 - the bank will never be submerged due to an error of measurement ⑤ ⑥
 - the bank is wide enough ⑥ ⑦ ⑧
 - and has adequate headroom ⑥
 - the exterior access ramp is protected from becoming overgrown; ⑥ ⑦ ⑧ otherwise, interior ramp.
- Complementary structures (if necessary):**
 - stainless wiremesh**
 - both sides of the road and on all the main river bed width
 - base buried in concrete ②
 - both sides of the wiremesh mowed annually ②
 - water deflectors on the base of the concrete bank**
 - Speed bumps on the road : only solution for roads close to the water level (wetlands...)**

Dry pipe recommended by the GMB for the Society for the Protection of Prespa (Greece)

CONCEPTION

- Initial conception by naturalists (each case is unique)
- Use of durable materials (concrete, rocks)
- Over sized structure (to anticipate changes of water level)

CONSTRUCTION

- Naturalists must control the work

MAINTENANCE

- Annual control by naturalists
- Train the maintenance workers

