Improvement of the ecological transparency of a linear infrastructure: the case of the RCEA (A79)

Katherine Salès

PhD Candidate under the supervision of
Nathalie Frascaria-Lacoste et **Pascal Marty**

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DOCTORAL RESEARCH TOPIC

- Research ongoing
- Provisional title : "*Territorial and ecological dynamics in biodiversity offsetting: a multidisciplinary analysis*"
- Disciplinary focus : geography, ecology, law
- Research axes:
  - ✓ Case study of a linear infrastructure (RCEA A79) : information and data provided by ALIAE (Eiffage group)
  - ✓ Case law analysis
  - ✓ International benchmark : Colombia and Peru

METHODOLOGY FOR THE RCEA CASE STUDY

- Primary focus of case study in its globality : biodiversity offsetting
- Methodology (conventional)
  - ✓ Literature review : legislation, information and data on the case study
  - ✓ Interviews (11) : Concessionaire; State agencies; Consulting firms; Offsetting operators

Objective of today's presentation : analyze how and to what extent, by inheriting an infrastructure built at a time when environmental requirements were limited, the enforcement of a now much more developed environmental legislation can improve the ecological transparency of the infrastructure

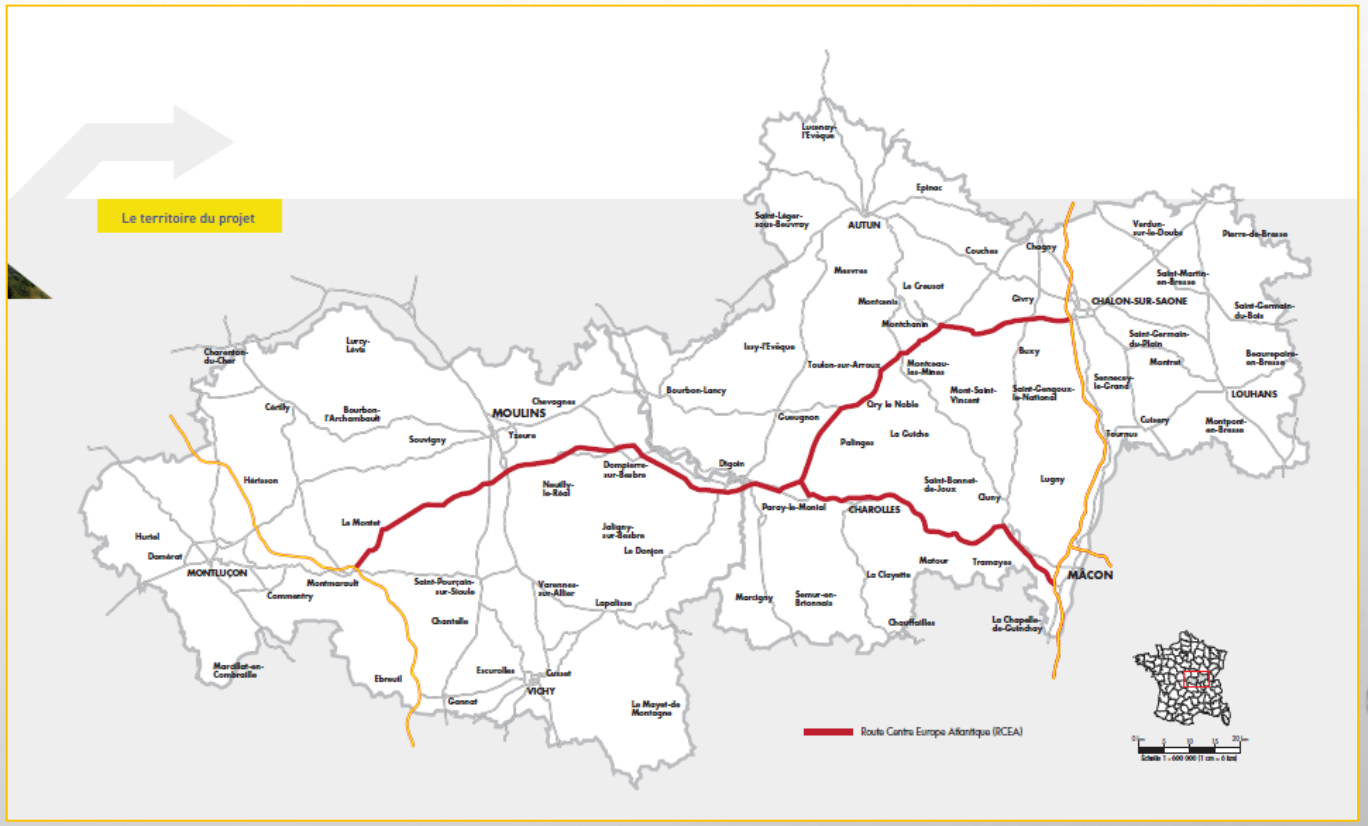
INTRODUCTION : THE RCEA

- RCEA = *Route Centre Europe Atlantique*
- Runs across France from west to east, north of the Massif Central, and links Royan to Chalon-sur-Saône and Mâcon
- Part of the European route E62
- Built in the 1970s

Source: https://www.prefectures-regions.gouv.fr/bourgogne-franche-comte/Grands-dossiers/La-Route-Centre-Europe-Atlantique

PRESENTATION OF THE CASE STUDY: THE A79 HIGHWAY

- The RCEA crosses the Allier and Saône-et-Loire (RN79) departments
- Very accident-prone : 1x1 lane in some places ; many head-on collisions



Source: Project owner's documentation for the public debate, p.3

PRESENTATION OF THE CASE STUDY: THE A79 HIGHWAY

- Mid-1990s : upgrading to 2x2 lanes in the Auvergne and Rhône-Alpes regions declared to be of public utility
- 2010s : public debate + post-public debate consultation → decision to transform the section of the RCEA located in Allier - nearly 90 km - into a highway (A79), by means of a concession.
- Concessionaire: ALIAE (Eiffage Group) ALIAE
- A79 opened in November 2022

- 1990s: Water Act
- 2000s: Decree on environmental competent authority + *Grenelle de l'environnement*
- 2010s: Reform of Environmental Impact Assessment (EIA) + Doctrine on mitigation hierarchy + Biodiversity Act

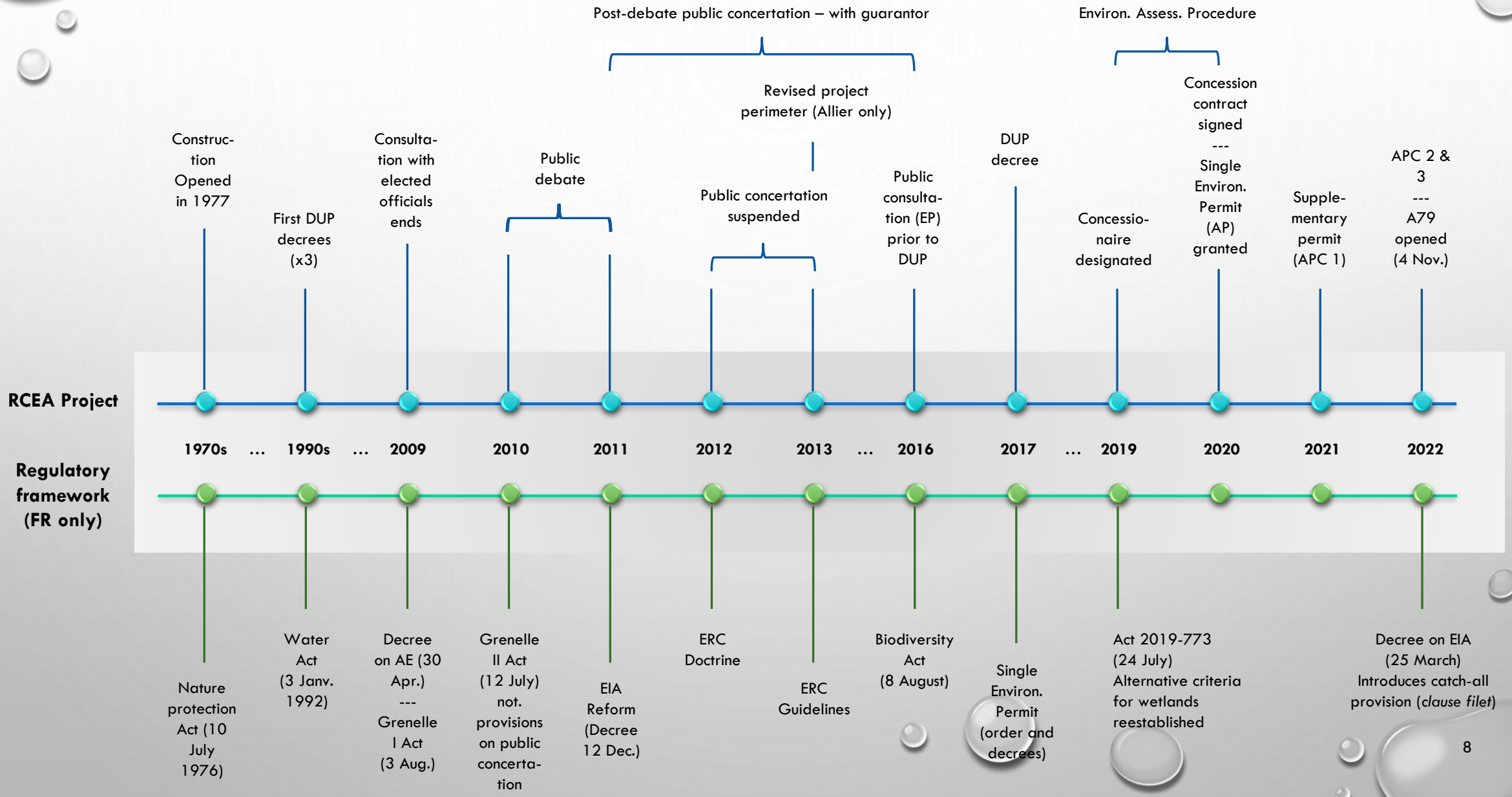
OBJECTIVE OF THE PRESENTATION

- Focus on the portion of the RCEA that is now the A79 highway

Source: ALIAE https://www.aliae.com/files/live/sites/aliae/files/Documents/DossierPresse_AutorouteA79_Mars2020.pdf

ALIAE

MAIN PROJECT AND REGULATORY MILESTONES



APPLICATION OF THE MITIGATION HIERARCHY

- Mandatory application of the mitigation hierarchy known as ERC in France (*Éviter – Réduire – Compenser*)
- ERC application as it results from the EIA:
  - ✓ **Avoidance :** Limited possibilities as widening of an existing road
  - ✓ **Reduction :** Upgrading of the RCEA to environmental standards → Reduction measures that contribute to improve the ecological transparency of the infrastructure
  - ✓ **Offsetting :** Required for the residual significant impacts (protected species and habitats, wetlands)

Note: Ecological transparency = permeability of an infrastructure with regard to wildlife movements

GREEN AND BLUE ECOLOGICAL FRAMEWORK

- Mandatory to take into account the green and blue ecological framework (TVB – *Trame Verte et Bleue*) in the EIA.
- The identification of ecological corridors and reservoirs was based on:
  - ✓ Planning documents : maps of the Regional ecological coherence scheme (SRCE, *Schéma régional de cohérence écologique*) for the Auvergne region
  - ✓ Field observations
  - ✓ Animal mortality observations
  - ✓ Photo-interpretation

CREATION OF A LARGE WILDLIFE OVERPASS

- Creation of one large wildlife overpass (20-meter wide) in the Montbeugny forest
- Design based on allowing the passage of deer, roe deer and wild boar + all other smaller species.

Source: APRR

IMPROVED / NEW UNDERPASSES

- For small terrestrial mammals, semi-aquatic mammals and amphibians (some underpasses can also be used by chiropterans)
- Improvement by creation of structures and by the enlargement of existing hydraulic structures (deconstructed and reconstructed).
  - ✓ Structures with a **larger opening** than at present → Minimize the negative impacts of the extension of the structures (because of RCEA widening)
  - ✓ Creation of **banks** or **corbels** to allow the passage of wildlife (notably Eurasian Beaver, European Otter, Southwestern water Vole -protected species-) → banks within a dozen hydraulic structures
  - ✓ Creation of new structures when enlargement of existing hydraulic structures impossible → small wildlife crossings (**dry culverts** *-buses sèches-*) created parallel existing structures

Single or tiered bank

Corbel

Dry culvert

Source: Cerema
https://www.cerema.fr/fr/actualites/vison-europe-enquete-lutter-contre-mortalite-routiere-espece

FENCES

- Installation of fences adapted (height of the fence, size of the mesh) to the fauna present and to the configuration of the site :
  - ✓ To limit intrusion (and hence risks of collision)
  - ✓ To guide animals towards the ecological transparency structures
- Choice of fences : study by the hunting federation → breakdown every 25 meters of the 90-km infrastructure to determine design of fences (based on federation's data on observed game)

Illustration of fencing (large fauna and amphibians) in front of a mixed hydraulic - small fauna structure
Source: ALIAE – Environmental Permit Application File, Exhibit A

SPECIFIC IMPROVEMENTS FOR CHIROPTERANS

- Installation of wooden screens on overpasses to guide chiropterans
- Installation of "acoustic lighthouses" *(phares acoustiques)* where wooden screens incompatible with overpass
- Installation of wooden palisades on some of the underpass structures (where regular passages of chiropterans identified)
- Installation of six specific gantries for chiropterans at the main bat flight routes
- Hedges planted longitudinally to the road to guide chiropterans towards crossing points

Illustration: acoustic lighthouse
Source: ALIAE – Environmental Permit Application File, Exhibit A

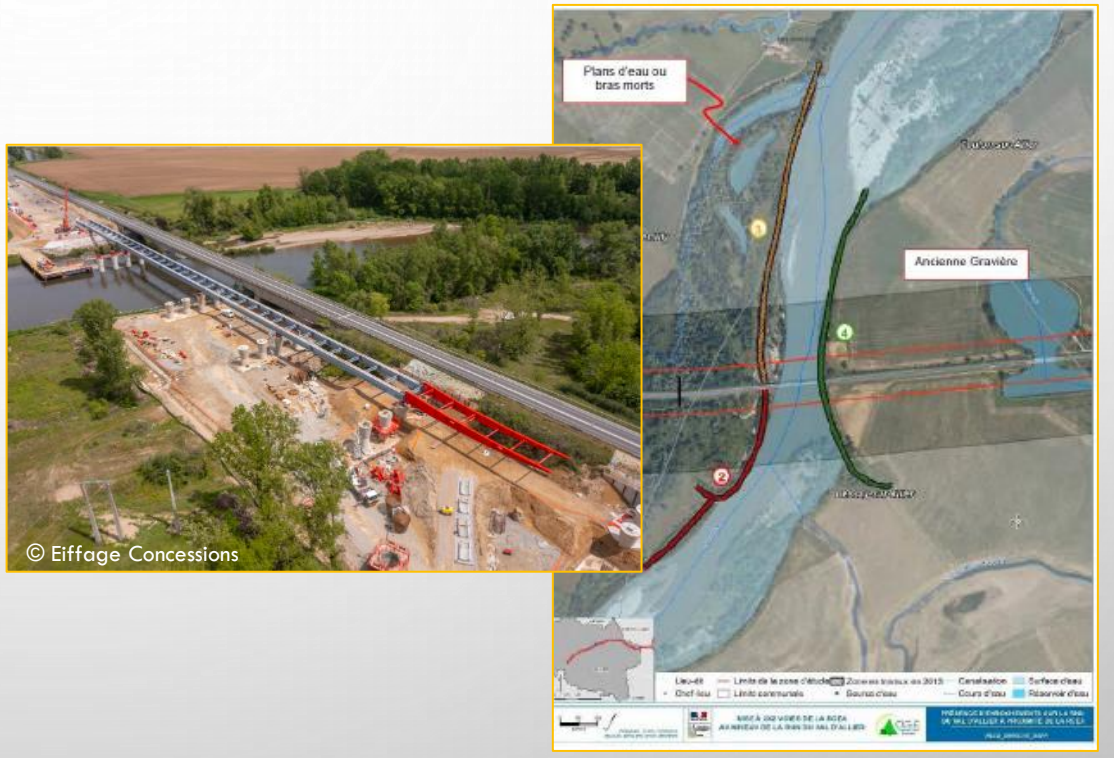
Illustration: wooden palisade at underpass (A63)
Source: ALIAE – Environmental Permit Application File, Exhibit A

VIADUCT ACROSS THE ALLIER RIVER

- Extension of the viaduct over the Allier river by 236 m (total: 416 m) → new viaduct
- Removal of the embankment of the previous viaduct (deconstructed)
- Removal of the riprap on the left bank of the Allier

⇨ Additional opening that can be used by wildlife

⇨ Restoration of the mobility of the Allier river



Source: ALIAE – Environmental Permit Application File, Exhibit F

FINDINGS AND CONCLUSIONS

- Evolution of the legislation led to stronger requirements in terms of ecological transparency of the infrastructure
  - ✓ Improvement of ecological transparency one of the arguments used to justify project (not. at declaration of public utility stage)
- Implementation of reduction measures hence mandatory under the applicable legislation at time of project
- Developments implemented (wildlife crossings, fences, etc.) are not new → they do not depart from those currently applied when building an infrastructure *ad nihilo*

FINDINGS AND CONCLUSIONS

- Significant improvement over the previous situation, although increased risk of collisions → Creation of ecological transparency infrastructures that did not exist before (clear improvement for small fauna, aquatic environments, amphibians, etc.).
  - ✓ BUT not necessarily improved for all species impacted, especially flying species, due to the doubling of the road and the increase in traffic
  - ✓ Improvement does not mean no impact → e.g., works in the Val d'Allier Natural Reserve (and related biodiversity offsets)

FINDINGS AND CONCLUSIONS

- Are the reduction measures put in place sufficient ? Possible questions:
  - ✓ Is only one large wildlife overpass enough for a 90-km long infrastructure?
  - ✓ Are there enough improved crossings (underpasses + specific improvements for chiropterans) → high enough density?
  - ✓ Could more have been done? Or differently?
- Awaiting results of first monitoring campaigns to determine efficiency

FINDINGS AND CONCLUSIONS

- Improvement of ecological transparency as a response to legislative requirements and developments
- Should we await the modification of an infrastructure (under an environmental regime) to implement reduction measures, where the infrastructure is old and not ecologically transparent?

⇨ Broader question as to whether action on the ground can really improve the overall ecological status of the country/region/landscape

THANK YOU FOR YOUR ATTENTION