Dobert C., (2025), Water territories of draining ponds: environment interactions (exchanges / rejects), uses and perceptions, pp. 198-206. In Gastescu, P., Bretcan, P. (edit., 2025), Water resources and wetlands, *7th International Hybrid Conference Water resources and wetlands, 10-14 September 2025, Tulcea (Romania)*.
Available online at http://www.limnology.ro/wrw2025/proceedings.html

7th International Hybrid Conference Water resources and wetlands, 10-14 September 2025, Tulcea (Romania)

WATER TERRITORIES OF DRAINING PONDS: ENVIRONMENT INTERACTIONS (EXCHANGES / REJECTS), USES AND PERCEPTIONS

Chanel DOBERT
Université d'Orléans, UFR Lettres, Langues et Sciences Humaines, laboratoire CEDETE, 10 rue de Tours, BP 46527, 45065 Orléans cedex 2, 0238492525, Email: chanel.dobert@etu.univ-orleans.fr, 1 bis rue de Basmont, 45130 Meung-sur-Loire, France

Abstract. In their conception, ponds are traditionally drainable, and human interventions are often necessary. Their emptying is more or less regularly, depending on the uses and the region of the pond. This process is an important part of their physical functioning and their management, necessary for their life cycle. However, emptying is now the subject of many controversies between institutional actors, owners and managers. Moreover, the emptying is both imposed by regulation and perceived as having exclusively negative impacts. So, there's inside the discourses of authorities a contradictory aspect, perpetuated by a lack of scientific knowledge. This creates some conflictual situations who makes emptying difficult to perform and leads to partial or even absent management of some ponds. The study works on emptying, mostly studied as the prerequisite for pond fishing, to improve knowledge on the subject and provide precise scientific data. It aims to be a complete work on both the physical effects and the social part, with the management that links the two. The first objective is to quantify the physical effects of the emptying downstream of the pond as well as the benefits on his health and biodiversity. The second objective concerns the social and cultural dimensions of the practice, to document its sociocultural roles in ponds territories. This reveals the links between local societies and ponds and helps to reconcile blocking points of view. A third objective is to propose avenues for reflection for a more hybrid management of ponds and their emptying. To successfully complete these objectives, the methodology is divided into three axes. A physical one with field measurements before, during and after emptying, a quantitative method to have data on the real effects. A social one with observation, semi-directive interviews and questionnaire, to analyze with a qualitative method the evolution of pond's perceptions and uses, and relationship between owners, fish farmers, merchants, managers and locals. The third is geomatic, to collect and analyze data of hydrological characteristics. In the aim of making complete and reliable work, the ponds studied must be diversified in uses, location, morphology and emptying system. They're considered like a part of the hydrographic system with no value judgement, taking into account the interrelationships between the pond and its environment, by varying the spatial and temporal scales.
The emptying takes place in the study not only as a technical act, but as a geographical object, whose aim is to understand the role and effects on the territories of pond water.
Keywords: Ponds, Draining, Water territories, Limnosystem, Effects, Water management

1. INTRODUCTION

1.1. Literature review

Artificial ponds play a key ecological and cultural role in many rural landscapes of France, yet the management practices they require, particularly drainage, raise complex environmental and regulatory challenges.

In France, pond-based fish farming is an ancient practice, dating back to the 8th century with the establishment of the first monastic communities (Bachasson, 2012). Still today, ponds remain key features of many rural landscapes in France, where they play important ecological, economic, and cultural roles. Their management is now the subject of growing debate, particularly around the practice of drainage. This operation consists of gradually emptying the pond of its water in order to maintain ecological balance and prevent its degradation or disappearance.

The available literature, whether scientific, academic, regulatory, institutional, or technical, offers only limited information on this topic. While it does highlight potential impacts of drainage operations on aquatic ecosystems, such as physico-chemical disturbances, sediment release, or habitat alteration (Stephens and Farris, 2004; Kestemont, 1995), comprehensive insights remain scarce. A few ethnographic studies (Bédoucha, 2011) exist, and some works also emphasize the ecological benefits of drainage, including its role in biodiversity conservation and its importance for species adapted to alternating wet and dry conditions (Otto-Bruc, 2001; Bouin, 2002; Trintignac et Kerleo, 2004; Prompt et Guillerme, 2011; cited in Trintignac, Le Berre, Haury et Lambert, 2020).

However, there is still a lack of an integrated geographical perspective, one that combines multiple spatial and temporal scales, encompassing both the physical (sediment and hydrological monitoring) and the social (cultural and heritage dimensions) aspects of drainage. Management practices themselves must also be considered as central, forming a link between ecological and social dynamics.

Beyond documenting a topic that has been largely overlooked in geography, focusing on pond drainage through a human geography lens offers several key contributions. First, it enables the analysis of local practices and perceptions of pond drainage, in contrast with institutional approaches. This raises several questions: What does a drainage event mean for local stakeholders? Is it a legacy, a calling, or simply a necessary technical act? Does it influence local practices? Is the perception of drainage shaped by the pond's uses or the category of stakeholder involved?

These inquiries also include a specific reflection on the festive dimension of pond fishing. Does fishing still represent a territorial marker in which social belonging is expressed (Bédoucha, 2011)? The goal is to understand the role of social dynamics in the management of pond drainage.

Moreover, controlling the rate at which water levels drop during drainage is crucial in pond-rich landscapes, particularly for the success of fishing operations in fish-farming ponds (Bédoucha, 2011). This control is also essential for hydrological functioning, especially when ponds are connected in chains. It requires coordination among owners and managers to follow the appropriate drainage sequence, from downstream to upstream.

Local knowledge and skills are essential for proper management, and a fine understanding of each pond is imperative for a successful drainage operation. Ultimately, drainage reveals the relationships between the various stakeholders involved (owners, tenants, managers, etc.) and the aquatic environment. One of the central aims of this research is precisely to document these human–pond interactions.

1.2. Research gaps

Knowledge about freshwater bodies, and specifically ponds, is gradually expanding, yet significant gaps remain in both understanding and managing them effectively.

In French, a wide range of definitions exist for terms such as *mare* and *étang*, which makes these categories ambiguous and often misunderstood. In contrast, English typically uses the single term "pond" to describe both (Oertli, 2013). Existing definitions of *mares* and *étangs* vary widely, often

relying on morphometric and/or functional criteria. Referring to scientific definitions is necessary because in France, there is no legal definition of “plans d’eau” (water bodies). Legally, the term encompasses *mares*, *étangs*, and lakes. While some texts explicitly mention *mares*, *étangs* and lakes are generally not differentiated and fall under the same regulatory framework. Furthermore, scientific knowledge about sediment-related processes in ponds (such as retention, sedimentation, resuspension, and export) and their effects on downstream watercourses remains partial. Most studies on these processes have focused on deep lakes or marine environments (Banas, 2001). While some of that research can be partially transposed to shallow water bodies like ponds, their specific characteristics, of which there are many, require dedicated and context-specific studies.

In France, pond drainage is the subject of considerable controversy, primarily due to its downstream effects, particularly on rivers. Drainage operations are both mandatory, legally regulated, and considered an integral part of the pond's lifecycle. However, they are also widely perceived as having exclusively negative impacts, especially on watercourses, due to excessive sediment release and alterations in key environmental parameters, which can be detrimental to the ecosystem. Indeed, ponds, which are often connected to the hydrographic network, are frequently accused of disrupting its natural functioning. This ecological and nature-centered perspective has led to the removal of many of these water bodies, without adequately considering their societal, cultural, heritage, and economic contributions (Garcia, Choffel, Nasser, 2020). The anthropogenic nature of ponds is also largely overlooked, even though they are spaces created and shaped by human activity (Garcia, Choffel, Nasser, 2020). Although most ponds in France were man-made, most of the population tends to perceive them as natural environments (Bartout, 2006). Banas (2001) echoes this view, noting that ponds “blend into our landscapes as bodies of water with a wild and natural appearance. For this reason, there are few studies assessing the impact of these ponds on river systems. Yet many of them result from the obstruction of a tributary by the construction of a dam. A pond can therefore be considered, by extension, an agroecosystem, similar to any cultivated land; however, it supports a floristic and faunistic diversity that is far greater than that found in other agricultural systems.”
Since the 1980s, regulations surrounding pond drainage in France have become more structured, recognizing these operations as necessary steps that pond owners are legally required to perform. This makes pond drainage a unique case: it is both mandated by law, as part of what is considered proper pond management (as outlined in best practices documents) and simultaneously regarded as a source of environmental degradation. This institutional ambivalence is compounded by a lack of scientific knowledge about the ecological effects of drainage operations.

1.3. Study sites

For this study, it was therefore decided to include all types of ponds, regardless of their use, size, drainage systems, or management approaches, in order to conduct a comprehensive investigation. These ponds are concentrated in three major pond regions, as can be easily seen in *Figure 1. Ponds territories of the study*: Sologne, an emblematic landscape known for its ponds, biodiversity, and associated practices; Brenne, the second most important fish-farming region in France after Dombes, where ponds are a strong component of regional identity; and Limousin, where ponds have existed for centuries, originally used to power mills and support fish farming.

These regions are not only characterized by a high density of ponds, but also by a long-standing social and economic context tied to these water bodies. They are also territories that clearly stand out from neighboring areas, both in terms of landscape and social practices (Bédoucha, 2001). Formerly described as unhealthy and inhospitable, these regions have evolved by making use of their impermeable, water-rich soils, and have developed around their ponds a unique culture, heritage, economy, and biodiversity.

Originally a marshy region, Sologne saw the development of a vast network of ponds as early as the Middle Ages, primarily for fish farming. Ponds have long been a defining feature of Sologne. As recently as 1850, there were an estimated 2,000 to 2,500 ponds covering more than 120,000 hectares (Monmarché, 1970), nearly a quarter of the region’s surface area. Today, more than 3,000

ponds remain, continuing to shape both the landscape and land use. At the heart of the region lies the "Sologne des étangs" (Sologne of the ponds), a humid and clay-rich zone that favors pond installation. The functions of these ponds have diversified over time, now encompassing fish farming, tourism, private hunting, and supporting rich biodiversity (notably within Natura 2000 sites). They contribute significantly to the territorial identity.

Nicknamed "Le pays des milles étangs" (the land of a thousand ponds), Brenne also experienced a surge in pond creation during the medieval period. The presence of water bodies structured human settlement in what was once a poor, uncultivable landscape without watercourses, and ponds still serve as strong territorial markers today. As a designated Regional Natural Park, Brenne promotes the exceptional biodiversity that has largely developed thanks to aquatic environments. Ponds in this region are crucial for bird conservation and, as in Sologne, are also used for fish farming, nature-based tourism, and reinforcing local identity.

In Limousin, where the terrain is more rugged, many ponds were historically created for artisanal (e.g., mill operation), or aquacultural purposes. They also served for watering livestock and irrigation. Although their role is less central today, ponds remain widespread and contribute to biodiversity conservation and to agricultural or recreational uses. Limousin is also affected by water management challenges, particularly as it includes many headwater catchments.

In these three regions, ponds have shaped not only the landscape, but also local practices and social representations. Their historical role as economic tools (for fish farming, land reclamation, or subsistence) has gradually evolved into a range of contemporary functions, including ecological conservation, tourism, and heritage identity. At the same time, they raise pressing issues of environmental and social management, particularly regarding practices such as pond drainage. Deeply embedded in regional identity and cultural traditions, ponds also serve as spaces of encounter and discovery. As such, these regions are especially suitable study areas for addressing this topic. Given the exceptionally high density of ponds, the need to advance both knowledge and management practices is critical. In these territories, more than elsewhere, the absence or poor adaptation of management can lead to social, economic, and ecological tensions. The methodology implemented for this work on pond emptying must therefore take these regional specificities into account.

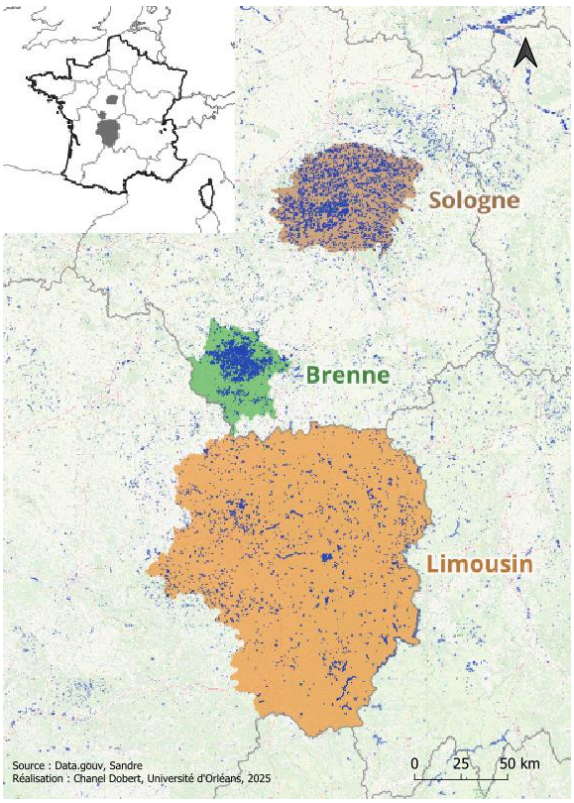

Figure 1. Pond territories of the study

2. METHODS. Data collection and analytical methods

Firstly, the pond, whether isolated or part of a series, is not initially regarded as a disruptor of the hydrographic network, but rather as a link in the chain: both a recipient of the watershed and a driver of the downstream emissary, without value judgment. However, the dichotomy in the perception of ponds is acknowledged, on the one hand as hydrological disruptors at the heart of conflicts, and on the other as valuable landscape, touristic, and recreational resources. Furthermore, the interrelations between the pond and its environment are examined across different spatial and temporal scales. For each site, geographical and historical variables (location, land use in the

catchment area, bedrock, water source, date of creation), morphological characteristics (water surface area, average pond depth, physico-chemical water parameters (pH, temperature, [flow rate, turbidity, dissolved oxygen]), as well as variables related to fish farming practices (fish species raised, inputs such as liming, fertilization, supplementary feeding, frequency of drainage, refilling time, dry-out periods), and other uses (hunting, recreational fishing) are recorded (Trintignac, Le Berre, Haury, Lambert, 2020).

The physical component of this study is conducted through field measurements of several parameters, including temperature, flow rate, pH, turbidity, and dissolved oxygen. These analyses are performed before (to establish a reference state), during (to monitor changes during the water level drawdown), and after the pond drainage (to compare with the initial state), in order to assess changes in water quantity and quality and to build a solid scientific foundation.

Figure 2. Multiparameter logger

These so-called physico-chemical parameters were selected in accordance with existing regulations on pond drainage. A high number of measurements is planned: for each pond studied, the five parameters will be recorded across the three temporal phases and at at least three different spatial points (one upstream and two downstream), resulting in approximately 45 measurements per pond for a single drainage period. As previously outlined, one of the study's goals is to assess the effects of drainage on ponds with varying morphology and functioning, within each of the three regions under investigation. During last fall, some first measurements have been carried out with a multiparameter logger (on Figure 2), in three ponds in Brenne. The next fall, many more measures should complete the latter to arrive at the first results of the study.

The social component of the study focuses on analyzing the evolution of perceptions and uses, as well as characterizing the current situation and its likely trajectories through fieldwork, based on direct observations, note-taking, and interactions with stakeholders. These are qualitative methods aimed at understanding the relationships between various actors (pond owners, fish farmers, traders, processors, managers, etc.), and at identifying practices, perceptions, and opinions. The approach relies on well-established tools in the human and social sciences, such as in-situ observation and semi-structured interviews with a sample of stakeholders involved in pond drainage activities. The in-situ observation is for now characterized by the follow of pond fishing (illustrated in Figure 3), that allow me to observe people, practices and to interrogate.

Additionally, the implementation of a questionnaire allows for the standardized collection of data and serves to complement the interviews and broaden the respondent base. The questionnaire is designed to be as comprehensive as possible, incorporating factual indicators based on observable facts, behaviors, or data; formal indicators referring to socio-demographic information to characterize the sample and compare actor groups; and more subjective indicators reflecting individual thoughts or feelings.

The surveyed stakeholder categories include institutional actors for administrative and regulatory aspects; professional and recreational freshwater fishers who regularly carry out pond drainage, such as fish farmers; and local actors such as pond owners, tenants, residents, and other users. A significant part of this work is therefore conducted directly in the field during drainage periods to facilitate exchanges and enable real-time observation.

3. PROJECT INTERESTS

3.1. Objectives

The proposed approach considers drawdown as a key stage in the life cycle and long-term management of a pond, from the opening of the sluice gate for gradual drawdown to the subsequent refilling. It is also a phase with a spatial dimension, as the drawdown transforms the configuration of the pond, alters the landscape, and impacts the downstream watercourse. Thus, pond drainage is approached not only as a technical operation but also as a geographical object, in the sense proposed by Brunet (1993), whose role and effects on pond-related hydrosocial territories (Ardillier-Carras, 2007) must be understood. In the social sciences and humanities literature, pond drainage is often viewed primarily as a preliminary step to pond fishing (Schlumberger, Girard, 2020) which tends to concentrate academic attention, particularly in ethnological and anthropological studies. The aim of this research is to broaden that perspective by considering the entire process, integrating both its physical and social dimensions.

Figure 3. During a pond fishing in Brenne in November 2025.

The physical component of this research aims to provide quantified scientific data to assess the real effects of pond drawdowns on downstream environments, by measuring the physical impacts on the receiving watercourse. Through the analysis of several water parameters, it becomes possible to precisely determine the influence of a pond on its downstream environment throughout the drawdown process. These findings help to better understand the magnitude, duration, and extent of the impact on receiving aquatic ecosystems. By documenting these dynamics, it becomes possible to distinguish between transient and lasting effects, and to identify the environmental conditions or management techniques that promote them. The social dimension of this research aims to characterize the social and cultural aspects of pond drawdowns, by documenting their socio-cultural roles within pondscapes. Focusing on drawdowns helps to shed light on the connections between local communities and pond environments. This intent to both quantify and qualify the social aspects surrounding drawdowns seeks to contribute to a reconciliation of diverging perspectives, which often lead to polarizing and paralyzing debates.

Ultimately, both dimensions are linked by a common objective: the management of ponds. Since drawdowns constitute a major component of this management and are included in water law

regulations, their practice is governed by a number of criteria. However, these regulatory frameworks have tended to drift away from on-the-ground realities, resulting in dysfunctions and contradictions between the texts and their implementation. It is therefore crucial that all stakeholders can refer to a solid knowledge base, allowing for adaptation to the specificities of each pond without compromising its management. The final objective of this research is thus to offer lines of thought for a more nuanced approach to drawdown management, moving beyond the current binary of good versus bad, toward a more fact-based hybrid model. This would help restore a degree of coherence and promote broader acceptance among stakeholders.

This paper presents the initial framework and early developments of a recently launched doctoral research project. As such, it does not aim to deliver final results, but rather to outline the methodological foundations and research directions currently being implemented. It also highlights the expected outcomes of the study, both in terms of environmental impacts and social dynamics.

3.2. Results and discussions

This study aims to produce both environmental and social results by offering an integrated analysis of the physical effects and human dynamics associated with pond drainage practices. It adopts a cross-disciplinary approach, with the objective of providing a robust scientific and empirical foundation to support improvements in pond management practices.

From a physical perspective, water quality parameters (including temperature, pH, turbidity, dissolved oxygen, and flow rate) are measured before, during, and after the drainage process. These data will allow for a detailed documentation of the impacts of drainage on downstream aquatic environments. They will help to characterize the intensity and duration of the disturbances caused, as well as their reversibility. By distinguishing between short-term and long-lasting effects, this study will contribute to a more nuanced assessment of the ecological consequences of pond drainage.

The diversity of the ponds included in the study will also allow for the identification of factors that either amplify or mitigate the impacts of drainage. The goal is to determine the environmental, technical, or territorial conditions that contribute to less disruptive drainage practices, thereby laying the groundwork for a differentiated set of best practice guidelines. In this regard, the study aims to deepen understanding of the functional role of ponds within the hydrological system, whether they are isolated or part of a larger network. The multi-spatial analysis will be particularly useful for capturing longitudinal effects on the downstream watercourse, as well as the interactions between successive ponds.

On the social side, the expected results concern the understanding of perceptions, uses, and tensions surrounding pond drainage. Through field surveys, semi-structured interviews, and questionnaires, it will be possible to construct a typology of perceptions according to stakeholder categories (pond owners, fish farmers, water managers, local residents, institutions). Highlighting areas of convergence and divergence among these perspectives will help identify the root causes of conflicts, as well as the conditions conducive to reconciling views and improving the social acceptability of regulatory practices.

The study is also expected to shed light on the evolution of management practices over time, highlighting how traditional uses and cultural representations are shifting in response to new environmental standards. This diachronic perspective will make it possible to explore the various forms of resistance, adaptation, or innovation in pond management strategies, and to emphasize the central role these water bodies play in the local social and territorial organization. It is also important to underline, as demonstrated by Trintignac, Le Berre, Haury, and Lambert (2020), that “traditional pond aquaculture [and other types] management practices such as drawdowns, drying phases, shoreline maintenance, sloped bank design, and water quality requirements for fish production enable and sustain the presence of specific vegetation. These practices, used for several centuries, must therefore be preserved. Supporting the entire sector is essential if we are to conserve pond biodiversity while also promoting a sustainable economic activity with promising development prospects.”

Finally, this dual perspective, both physical and social, will serve as a foundation for concrete proposals in terms of governance. The aim is to better align regulatory requirements with on-the-ground realities, and to promote more flexible, context-sensitive management approaches that address the complexity of contemporary challenges. In this way, the study aspires to support the development of hybrid drainage governance models, grounded in shared knowledge, measurable data, and a nuanced understanding of human dynamics.

4. CONCLUSIONS

It has already been demonstrated that ponds provide multiple services for humans, whether through fish production, recreational activities (fishing, hunting, wildlife observation), or even drinking water supply. Recognized for their rich and both ordinary and remarkable biodiversity, they often serve as links within ecological corridors. Recent studies (Biggs et al., 2024; Girard, 2024) have emphasized the importance of the ecosystem services provided by ponds, particularly through the rich biodiversity they support. They contribute to water regulation by supplying and recharging aquifers, humidifying soils, and mitigating flood events. They also play a role in the carbon cycle, thereby helping to alleviate the effects of climate change. However, these ecosystems are subject to many anthropogenic pressures, resulting both from global changes (such as nutrient and micropollutant pollution, rising temperatures and altered hydrological régimes) and from local management practices.

A significant number of ponds are undergoing changes in use, reflecting broader societal shifts, including dietary habits, recreational practices, and even the perception of these environments. Their preservation and the maintenance of their ecological functioning are therefore fundamental priorities (Bachasson, 2012).

Pond drainages, often perceived as mere technical operations, emerge from this study as complex events with multiple implications. From a physical standpoint, they generate measurable disturbances in downstream aquatic environments, but the extent and nature of these impacts vary depending on management practices, hydrological context, and the specific characteristics of each pond. On the social level, drainage remains a structuring moment in the life of rural territories, conveying local knowledge, shared rituals, and contrasting perceptions among different stakeholders. These dimensions, often overlooked in public policy, reveal that pond drainage management cannot be reduced to a binary view of good versus bad practices. Instead, it must account for both ecological realities and human dynamics.

This study promotes a more contextualized and hybrid approach to pond management, in which environmental data and social knowledge are used in tandem. Such an approach could lead to greater acceptance of drainage practices that are better suited to the specificities of each territory.

REFERENCES

Ardillier-Carras, F. (2007). *L'étang et son environnement humain : une géographie du rôle social*. In Touchart L., Géographie de l'étang (pp.157-177). Paris, L'Harmattan.

Bachasson, B. (2012). *Mise en valeur des étangs*, Edit. Tec & Doc, France, 168p.

Banas, D. (2001). F*lux de matière en étangs piscicoles extensifs: Rétention, Sédimentation Exportation*, Doctoral thesis in geography, Edit. Université de Metz, France, 231p.

Bartout, P. (2006). *Pour un référentiel des zones humides intérieures en milieu tempéré : l'exemple des étangs en Limousin (France)*, Doctoral thesis in geography. Edit. Université de Limoges, France, 464p.

Bédoucha, G. (2011). *Les liens de l'eau. En Brenne, une société autour de ses étangs*, Edit. Maison des Sciences de l'Homme, 688p.

Biggs, J., Hoyle, S., Matos, I., McDonald, H., Nicolet, P., Oertli, B., Teixeira, J. (2024). *Ponds and pondscapes: a technical guide to the use of ponds and pondscapes as nature-based solutions for climate change mitigation and adaptation*, EU Horizon 2020 Ponderful project, University of Vic – Central University of Catalonia, 133p.

Brunet, R. (1993). *La région selon Brunet, 1992*, EspacesTemps Les Cahiers, 52–53, pp. 70–71.

Garcia, R., Choffel, Q., Nasser, T. (2020). *Les étangs et leurs ressources piscicoles: perceptions, pratiques et consommations des français - Résultats d'une enquête extrapolée au niveau national*, Dynamiques environnementales, 45, 119-130, DOI: https://doi.org/ 10.4000/dynenviron.4215

Girard, L. (2024). *Étangs piscicoles et services écosystémiques : Relations entre pratiques de gestion, maintien de la biodiversité et stockage de carbone*, Doctoral thesis in agroecology. Edit. AgroParisTech, France, 243p.

Kestemont, P., (1995). *Different systems of carp production and their impacts on the environnement*, Aquacult. 129, 347–372.

Monmarché, G. (1970). *Les pays de la Loire, aperçu géographique*. In Monmarché G., Les guides bleus, Val de Loire (pp. 25-27). Paris: Hachette.

Oertli, B., Frossard, P-A. (2013). *Mares et étangs. Ecologie, gestion, aménagement et valorisation*, Edit. Presses polytechniques et universitaires romandes, 473p.

Schlumberger, O., Girard, P. (2020). Mémento de pisciculture d'étangs, Edit. Quae, 224p.

Stephens, W. W., Farris, J. L. (2004). *Instsream community assess ment of aquaculture effluents*, Aquacult. 231, 149–162.

Trintignac, P., Le Berre, M., Haury J., Lambert, E. (2020). *Les étangs piscicoles, des réservoirs de biodiversité végétale*, Dynamiques environnementales, 45, 22-3, DOI: https://doi.org/10.4000/dynenviron.3783