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Historical Foundations of Green Developmental Policies: Divergent Trajectories in United States and France

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ABSTRACT

In recent years, many countries have adopted biodiversity offset policies to internalize the ecological impacts of land developments. Although national policies share the general principle of equalizing ecological harm with gain, there is substantial variation across programs regarding the institutional forms governing offsetting. In this paper, we compare biodiversity governance in the United States and France to reflect more broadly on the factors shaping divergent trajectories of green developmental policies. Both countries have some form of biodiversity offsetting in place, but the major fault line of difference is the more extensive use of market-based instruments (MBI) in the United States. Using a historical lens, we argue that one important reason for this variation lies in the different legal-institutional definitions of biodiversity. A narrower definition in the United States focused on individual species, versus a broader definition in France focused on ecosystems, has facilitated a more standardized biodiversity governance arrangement in the United States. Leveraging this standardization, biodiversity markets have expanded in the United States while similar efforts to institutionalize market mechanisms have struggled in France. The comparison allows us to draw insights into the challenges in greening economic development, particularly in showing how historical scientific, legal, and institutional structures condition policy outcomes.

1 | Introduction

Land use changes support important economic and social goals but are also the principal driver of biodiversity and species decline (Shukla et al. 2019; Diaz et al. 2019). As a sixth mass extinction looms (Kolbert 2014), it is increasingly clear that states are failing to regulate biodiversity losses, revealing the flaws of current institutional arrangements for managing the tradeoffs between protecting nature and permitting its destruction on economic grounds. In response, there are growing calls for more substantive and radical actions that contest the obsession with economic growth in our current capitalist economic system (Fletcher et al. 2020; Otero et al. 2020; Massarella et al. 2022). Such platforms require the state to check land use changes and protect existing habitats from developers. However, at present, states appear disinclined to engage these radical platforms and instead opt for incremental solutions, often characterized as green economy or green growth approaches. This idea of greening economic development is sustained through a general faith in the power of markets, incentives, and science to construct creative ways to achieve sustainability goals without inhibiting economic growth.

Biodiversity offsetting is one such novel policy instrument that regulates land development through a compensation mechanism (Calvet, Napoléone, and Salles 2015; Bull and Strange 2018; Benabou 2014). Rather than completely restrict harmful land developments, the state forces developers to internalize their externalities: any projects that harm biodiversity are made responsible for producing (and paying for) equivalent biodiversity

gains elsewhere. When biodiversity gains equal harm, ecologists say that “No- Net- Loss” (NNL) of biodiversity is achieved (Gardner et al. 2013). Although the idea of offsetting remains controversial (Maron et al. 2016), multiple governments and international agreements have embraced the general principle. However, aside from broad references to neutralizing harm with gain, there is substantial variation across national programs regarding the institutional forms for governing offsetting and the outcomes of these differences remain unclear. In this paper, we trace how the political economies of the United States and France have produced and sustained divergent structures for governing offsetting and how their distinct institutional histories shape green economic policies.

Both the United States and France have some form of biodiversity offsetting in place, but the major fault line of difference is the engagement with market-based instruments (MBIs). MBIs have been institutionalized more substantively in the United States relative to France. Whereas the United States has over 130 private land operations conserving habitat and species and selling credits in various private markets, France only has one such land operation, and scaling remains a challenge (Wende et al. 2018). In France, nonmarket approaches remain the main mechanism for offsetting. In comparing these institutional forms, we explore the historical factors that explain the selection of policy instruments. We do not analyze which policy instruments—markets or non-market forms of offsetting—are more effective. Determinations of success and failure are themselves politically fraught, especially when we set both these policy forms against the continuing decline of biodiversity around the world. Our argument is less about outcomes and more

about the historical processes that accrue over time to produce different institutional forms. The key contention of this paper is that the diffusion of biodiversity offset governance is explainable not only in terms of how states use (or do not use) markets but also through a second set of factors, that is, how states have historically related to the *idea of nature*.

Historical institutionalist (HI) scholars puzzle over the role of historic ideas in constituting public policies (Schmidt 2008; Cox and Béland 2013). In engaging HI scholarship, we examine the implications of ideas in terms of institutional arrangements and governance. We understand institutions broadly to include laws and formal rules as well as informal conventions, practices, notions of expertise, documentation protocols, and metrological systems (Vatn 2007). We approach the role of ideas as one underlying rationale from which stems governance, defined as the process of making and enforcing institutions. As green economic ideas replace traditional coercive policies, old institutional arrangements are being repurposed to construct market forms. It is not only the initial interpretations that create path dependencies but how the accumulation of smaller decisions over longer periods incrementally and progressively sediment into governance arrangements.

This multiyear study is based on a series of research carried out between 2016 and 2022 in both the United States and France. For both countries, we relied on the following data sources: (1) semi-structured interviews (policymakers, regulators, bureaucrats, environmental consultants, investors and conservation bankers, landowners, and environmental NGOs); (2) participant- observations (official training courses, policy working groups, expert meetings, and professional conferences), (3) case studies of market construction, and (4) gray literature (reports, laws, impact assessment documents). In total, the research is based on over 210 semistructured interviews with various levels of policymakers, consultants, and other stakeholders in the two countries.

We argue that the two countries have divergent trajectories with regard to how the legal category of biodiversity is made into a governable subject. Decisions, made years before ideas of biodiversity offsetting emerged, are an important reason why MBIs are proving difficult to set up in France, compared with the United States. Whereas in the United States, laws protect individual species, in France, laws govern ecosystems. The individualization of species in the United States facilitates the disentangling of the species from other aspects of the ecosystem which in turn makes standardization easier. Regulators measure or model the number of species impacted by the project and base compliance obligations on these estimates. In France, the legal definition is more encompassing, referring to the web of species interacting within a common territorial unit. This ecosystem approach requires a more case- by- case review that must consider many species, habitats, and their interactions. This more holistic approach limits possibilities for standardization. The difference may appear semantic, but these different legal definitions have over time encrusted into institutional structures and governance systems that are now difficult to alter. This tension across the old and the new lies at the heart of our analysis.

The article is organized as follows. In the following section, we introduce the core subject of our analysis, biodiversity offsetting, outlining key debates around the commodification of nature. Next, we present a concise review of historical institutionalism and highlight the importance of attending to the interaction between

science and law when studying institutional changes. In Section 4, we compare the policy histories in the United States and France, with a focus on how the term biodiversity has been legally framed over time and how the framings shape offset governance. We reflect on these differences in the discussion section and lay out insights for the broader study of national greening policies.

2 | Biodiversity Offsetting: Regulations and Markets

Until around the 1960s, the creation of national parks was the main mode for protecting nature. These policies focused on protecting charismatic natural landscapes like Yellowstone in the United States and La Vanoise in France. The environmental state was seen to have a mandate to bring such lands under strict public ownership, constraining all development activities. Post- 1960s, the harmful environmental impacts of development were becoming more evident. Limiting environmental protection to a handful of charismatic species was deemed insufficient and even problematic. The new scientific view was that although noncharismatic species and habitats did not justify creating full national parks, they did warrant some level of protection. As a result, governments such as in the United States, Europe, India, and elsewhere passed new environmental laws that regulated the ecological impacts of land developments, overexploitation of resources, and air and water pollution (Mazmanian and Kraft 2009). These laws did not ban all developments but aimed to control the most harmful impacts. Over the years, these land use regulations have come to be seen as excessive and an impediment to economic growth. At the same time, the continuing decline of at- risk species and habitats indicates that these policies were nevertheless failing to protect biodiversity.

Offsetting policies for biodiversity and habitats started to emerge in the 1990s, building off early policies for regulating air pollution (Robertson, Lave, and Doyle 2023). Such policies rely on the state to constrain harmful economic activities but introduce a compensation component. Polluters pay and collections support land conservation elsewhere. The rationale for offsetting rests on the ecological assumption that nature is fungible, that is, harm in one site can be neutralized by ecological gains in another site, and the idea that in net terms, the stock of biodiversity has remained constant (Carver 2020). Biodiversity offset policies parallel similar ideas in other environmental contexts such as sulfur dioxide, wetlands, and carbon (Lapeyre, Froger, and Hrabanski 2015). With increased attention to offsetting, new laws and bureaucracies as well as new social relations, professions, scientific communities, and technical systems have emerged to facilitate coordination.

The most recent push to institutionalize offsetting centers on designing MBIs (Bennett and Gallant 2017; World Bank 2020). MBIs are enjoying extensive attention across various environmental policy discourses. They are heralded by proponents as pragmatic and by critics as problematic. In a non- market approach to offsetting, the developer whose actions harm biodiversity is required to oversee a conservation project elsewhere or is required to pay into some environmental fund managed by a non- profit or public agency. In the market- based approach, the developer is allowed to buy a biodiversity credit from another private actor who has already overseen conservation. Essentially, under the market option, biodiversity is transformed into a commodity that can be traded in a compliance market.

The prospect of using markets to improve biodiversity governance is deeply contested (Ghosh and Wolf 2024). Proponents argue that MBIs are more flexible and efficient than traditional command- and-control policies (ten Kate, Bishop, and Bayon 2004; Kinzig et al. 2011). When done correctly, Takacs (2020) argues, they can harness the power of competition to spark innovation resulting in efficiency gains; outcomes for both ecology and economy are optimized (Salzman and Ruhl 2006; Grimm and Köppel 2019). On the other hand, critics argue that nature is not fungible; harms in one location cannot be traded off by gains in another (Apostolopoulou 2020; Carver 2020). Selling nature to save it, quoting McAfee (1999), may be politically practical in certain limited conditions, but such solutions would fall far short of challenging the dominant political economy of land development. In this article, we extend the critical analysis of offsetting by examining the conditions that facilitate market construction.

When studying market construction, scholars highlight the importance of measurement, quantification, and accounting as fundamental to commodification. These processes abstract nature from the local spatial context (Castree 2003), a phenomena Callon (1998) calls disentanglement. Furthermore, for nature to be made tradeable, units of it must be commensurable with other disentangled units of nature elsewhere. Suitable metrics or what Salzman and Ruhl (2000) call “currencies” establish these equivalences and are usually based on attributes of nature lost and gained. Once such accounting systems are in place, nature can be brought into the marketplace in the form of a legal tradable unit, such as habitat, species, biodiversity, or conservation credit. Such a process of commodification raises ethical and ecological concerns about what is being valued (and what is left out) and whether such metrics adequately quantify loss and gain (Apostolopoulou, Greco, and Adams 2019; Lohmann 2005; Cooper 2015).

It is important to note that the concept of biodiversity credits is directly tied to the presence of a regulated market. While the market is where transactions unfold, the state defines and regulates demand and supply through its regulatory caps as well as by overseeing the technical work of commensuration (Ghosh and Wolf 2024). Carruthers and Stinchcombe (1999, 378) call this “minting work,” referring to the “prior organizational work to simplify, stratify, homogenize, and standardize the asset.” The work of commodification enables buyers and sellers to compound a collection of things into a good and exchange it on a market.

To understand the variations across the United States and French biodiversity offset policies, it is important to examine the differences in how public authorities in the two countries have historically conceived of nature and how the commodification of nature has unfolded, that is, to analyze the historic production of governable legal categories of biodiversity and trace how these differences facilitate or hinder the commodification of nature. In the biodiversity offsetting literature, cross- national variations have received little scholarly attention (Adams 2008; McAfee 1999; Hickel and Kallis 2020). Much of the current scholarship examines specific national offset programs, tracing why these institutions emerge in specific contexts, and how responsibilities and obligations are structured (Primmer et al. 2019; Koh, Hahn, and Boonstra 2019). For example, Rea (2017) shows that the unique emergence of biodiversity offset market regulations in the United States was rooted in a temporary-specific moment of growing tensions between developmental and environmental groups in California. Similarly, Maestre- Andrés et al.

(2020) analyze offset schemes in Spain, showing how policies are contingent on shifting top- down political developments. In some contrast, scholars (e.g., Barral and Ghosh 2023) explore the emergence of offset policies through bottom-up negotiations in sub-national regions. While these studies help contextualize the nation/region- specific processes of institutionalization, there is a lack of comparative analysis of programs. Where studies do exist, they tend to be led by ecologists and rely on quantitative comparisons of biodiversity outcomes, rather than historical analysis of what conditions give rise to the institutional differences. By studying contrasting conceptions of biodiversity and related governing arrangements, this article examines the tensions at work between policy design and action in green economy policies. Through careful examination of how conceptions of the environment enhance or complicate the development of market- based policies, it offers useful analytical and methodological insights to grasp the political economy of greening policies.

3 | Historical Institutional Analysis of Environmental Governance

We adopt a HI perspective to understand the differences in contemporary engagements with market- based environmental policies in the United States and in France. In both countries, conservation policies date back to the 1970s. Through this engagement with historical institutional decisions, we demonstrate how past policy choices weigh on the prospects of institutional innovations today.

3.1 | Historical Institutionalism

Historical institutionalism (HI) is a subfield within neo-institutionalism focused on studying the role of history in shaping institutional processes. HI emerged around the mid- 20th century as a response to an increasing reliance on rational choice theory to understand institutional changes. Rational choice theory assumes that individuals determine institutional forms based on strategic calculations that aim to maximize their goals. HIs, in contrast, question the functionalist understanding of institutions, focusing instead on the messy relationship between historically contingent human interactions and institutional forms, and examining how and why institutions change over time (Meyer and Rowan 1977). In this view, individuals construct institutions with strategic aims in mind, but unlike the reified version of institutions in rational choice models, historical institutionalists view institutions as products of historical circumstances that become sticky with time (Hall and Taylor 1996; Fioretos 2017). Young (2006, 11) writes: “patterns of cross- level, scale- dependent interplay can prove remarkably resilient, even when the results they produce are undesirable or costly from any of a number of points of view.” HIs emphasize the staying power of institutions (Cox and Béland 2013; Schmidt 2008), and the emergent tension between the new and the old ways. Simply, whereas rational choice models leave the historical contingency of institutions “unarticulated,” HIs say this quiet part out loud (Suddaby, Foster, and Mills 2014).

It is useful to distinguish historical institutionalism from more linear theories of path dependency within neo- institutionalism. Pierson (2004, 13) defines path dependency as the “social processes that exhibit positive feedback.” This idea of historicizing institutions has

been a useful metaphor for understanding how past decisions contextualize present actions. It highlights the costs and difficulties in shifting from one institutional path to another. The same characteristics that make institutions stable also make them difficult to change. However, path dependency theory is also critiqued for a narrow understanding of history as a succession of events that cohere into unified causal mechanisms. According to institutional scholars such as Mahoney (2000), this veers too far into a deterministic view of institutional stickiness and change, erasing complexities, negotiations, and contingencies that shape institutional processes.

Historical institutional scholars instead study history as a non-linear, non-essentialist, and plural concept. New institutions are constructed upon old ones; at times they draw on existing rules and norms and at other times, disrupt and build anew. The future is not forever burdened by past actions, even as the past can explain differences in institutional trajectories in the present. Rather, historical constitutionalism views change as complex products of a “unique confluence of factors” (Suddaby, Foster, and Mills 2014, 104). Historical institutionalism calls attention to multiple historical pathways to explain institutional changes (Hoffman 1999). Change might emerge from actions taken at critical junctures (Capocchia and Kelemen 2007; Schickler 2001; Collier 1993) or through gradual incremental decisions (Mahoney and Thelen 2010).

We adopt a historical institutionalist perspective to understand how with time, environmental institutions have evolved differently in the United States and in France and how these differences matter to the diffusion of new policy ideas such as biodiversity markets. More precisely, the comparison of two biodiversity offset policies sheds light on the links between ideas, institutions, and policy trajectories. In our study, ideas of biodiversity do not determine policy outcomes per se, but they play an important part in explaining how biodiversity can be incrementally constructed—or not—into standardized categories, tied to specific rules, and regulated through related bureaucratic processes.

3.2 | Green Developmentalism

One explanation for divergent trajectories in the United States and in France lies in the overall political economic positionality toward markets versus state planning in the two countries. The embrace of market approaches for biodiversity conservation in the United States could be attributed to the market-friendly character of US politics compared with the more market-cautious attitudes in France. This political cultural difference is well documented, from Tocqueville to today (Lamont 2002; Fourcade 2011) and certainly offers an important scaffolding for analyzing divergent policy trajectories. However, it is possible to overstate the political economic explanation. As in the United States, in France too there have been serious efforts to institutionalize markets for various environmental problems. In fact, France has taken on a leadership role in global carbon market negotiations and has already set up an active and thriving domestic emissions market (Aykut 2014; Grimault 2020). Over the last decade, French regulators have also experimented with MBIs for biodiversity offsetting, taking inspiration from US policies. But where the US biodiversity offset markets are expanding, French markets remain at various pilot stages and struggle to scale on ecological and economic grounds. It is important then to go beyond political economic explanations and explore other elements of their institutional histories. We contend that the environmental laws in the

two countries have framed the concept of biodiversity in contrasting ways, which condition today's green economy policies.

Because nature is a vague concept that means different things to different people, to make nature governable and thus offsettable, there is a need for a common way to identify nature as a legal object. Smith (1994) explains that through the legislative process, “complex problems are broken down and presented into manageable forms.” In environmental law, legal categories delineate the scope of the environmental problem under regulation (type of nature and type of harm) as well as the regulatory target (in our case, the land development industry). The establishment of the legal category of biodiversity has implications for what gets counted as a harmful ecological impact, how impacts are quantified, how legal protections are enforced, how policy makers rely on scientific inputs, and how (and to what extent) new policy instruments such as market-based conservation can serve environmental goals.

In the context of biodiversity governance, scholars emphasize the importance of legal definitions in outlining terms such as wildlife, species, ecosystems, and importantly, biodiversity (Tian, Potter, and Phelps 2023). What gets counted as nature then goes on to shape what economic activities may be considered offensive by the law (Pascual et al. 2021). This is particularly important, as there is often no clear scientific consensus on what is meant by biodiversity. Conservation biologists coined the concept of biodiversity or biological diversity in the 1980s to raise awareness about the rapid decline in species and habitats (Takacs 1996). Soon the term was adopted by international institutions like the Convention on Biological Diversity and the UN program, The Economics of Ecosystems and Biodiversity, as well as environmental NGOs like the World Wildlife Fund and Conservation International. Biodiversity was appealing both for its descriptive and prescriptive aims. Descriptively, it refers to the sum of all natural units, at different organizational scales (genes, species, ecological functions, ecosystems) as well as all relations that link these many units (CBD 2020). Prescriptively it calls attention to the need to conserve landscapes or ecosystems, not only specific species. Ruhl (1997) argues that although the term has generatively balanced the science and public understanding around conservation, its interpretive properties make it difficult to assimilate into the fixist character of legal systems. Biodiversity laws process environmental issues through a linear sequence of micro-decisions whereas environmental problems are systemic, complex (socially and ecologically), and often large-scale. Overall, the term “biodiversity” is interpretively flexible, but the institutional arrangements that govern biodiversity have a more fixed character wherein administrations treat problems through sequential processes.

We consider how historical differences in the institutional forms for governing biodiversity affect the enactment of green development policies in ways that were unforeseen during the early phases of environmental state-building. Environmental social scientists note that countries have different cultural attitudes toward nature and these attitudes have come to structure the legal framing of what is considered threatened by development and what it is that states are mandated to protect. Recent work on environmental states centralizes a need to understand how the cultural and historically specific constructions of nature shape legal institutions (e.g., Jerolmack 2021; Scoville 2022). Rea and Frickel (2023) summarize the recent scholarly trend: “Explaining the environmental state's vast heterogeneity and uneven efficacy in environmental welfare

provision requires careful and explicit theorization of ... moral-cultural understandings of nature and justice as much as the political economy of environmental harm.” Any analysis of cross- national differences in environmental institutions benefits from combining a political economic analysis with attention to a more foundational question of how nature or biodiversity is historically formalized into a governable subject.¹

3.3 | Research Design

The study is based on qualitative research carried out from 2016 to 2022. The objective of the project is to develop a practical understanding of cross- national policy differences, from conception to implementation. Such attention to different moments of governing requires multiple data sources and methods. We combine semi-structured interviews with high- level policy makers, participant observation of official training sessions for bureaucrats, case studies of place- specific offset programs, and extensive document analysis. About 150 semi- structured interviews were carried out in France and 60 in the United States.

Data were collected at two levels. First, we used document analysis, interviews, and participant- observation to contrast national policy differences. We interviewed high- level officials in both countries, looking to understand how offset policies and their problems are framed. The authors also participated and observed multiple official training courses on biodiversity offsetting, policy working group meetings, expert meetings, and professional conferences. Besides primary research, a vast volume of policy and technical documents were analyzed. The data help to locate how historical choices contribute to these modern differences. Second, along with the interviews, we developed case studies of policy implementation to reflect on how these histories matter to the present- day regulatory practices (3 markets in the United States, 20 land development projects in France). The value of the case studies lies not in direct comparison, but in shedding light on the practical and organizational differences in implementation.

In the following section, we present the two national experiences with offsetting along three dimensions: (a) what is the legal category for governing biodiversity and how did it come about, (b) how is the regulatory apparatus organized around these categories, and (c) how do these old institutions matter to implementing new market institutions.

4 | Species Versus Ecosystems in United States and France

4.1 | US Conservation Banking Laws

4.1.1 | The Endangered Species Act: Focus on Species Conservation

The central law governing biodiversity impacts in the United States is the Endangered Species Act (ESA). The ESA was passed in 1973, in conjunction with other environmental laws including the Clean Air Act (1970), the National Environmental Policy Act (1970), and the Clean Water Act (1972). Together these laws are often considered the birth of the modern environmental state with its reliance on

different policy instruments such as standards and thresholds, bans, disclosure requirements, and tax policies and the setting up of environmental agencies such as the Environmental Protection Agency (EPA) (Gunningham 2009; Kysar 2010).

As soon as the law was passed, the ESA was under constant fire, primarily on grounds of government overreach (Farber 2001) but also ecological ineffectiveness (Rohlf 1991). Critics pointed to the high economic costs of ESA's absolute ban on all development activities if they would harm species (Lane 2012). As a correction, amendments in 1982 sought to dilute the strict command- and-control approach and introduced elements of partnership and voluntariness. This created opportunities for negotiation, compromise, and contextual flexibility between land developers and regulatory agencies (Ruhl 2003). The most important outcome of this amendment was to grant regulators the authority to permit harmful developments under some limited conditions. The idea of a market option for compliance emerges in the context of this new permitting process. The process required that developers first avoid and minimize their impacts, and for the unavoidable impacts, they were required to carry out offsetting.

Early ESA enforcement focused on species conservation. The law requires the regulatory agency—US Fish and Wildlife Service (USFWS)—to develop an “endangered species list.” This list is the basis for deciding when land use changes might be considered in violation of the ESA. Section 4 of the law states how species enter and exit the list, and the role of science in determining what constitutes the thresholds and metrics for endangerment, such as the species population status, immediacy of threats, and taxonomic originality (USFWS 2009). The list is based on a classification system: “endangered,” “warranted but precluded” (endangered but not a priority for the allocation of funds for conservation), and “threatened.” The process of listing a new species is advocacy-based: public researchers, environmentalists, and scientists use longitudinal data and models of species populations to petition the USFWS to do a status assessment that can then lead to a decision on endangerment. As of 2023, about 1300 species are listed as “endangered” and another 3000 are awaiting classification.

The construction of the list and the broader bureaucratic setup illustrate how the legal categorization of species sets up US biodiversity governance on a specific path. As Schwartz (2009, 1326) notes: “the stated goal of the Act is to ‘provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved’, the actual focus of its implementation has been dominated by actions to protect individual species, as opposed to the ecosystems on which they depend.” The focus on species, Schwartz and others note, limits the broader accounting of interactions among species and attests to the limited conception of environmental impacts. This is an important legacy of US environmental policies, stated not only in law but also in the character of the USFWS, which is organized around species- specific expertise.

4.1.2 | Standardized Markets for Species Credits

The use of MBIs in the ESA emerged in the context of the 1982 amendment and the new policies around conditional permits.

These permits allowed for the idea of offsetting as a means of compliance. Before the introduction of MBIs in the ESA permitting process, through much of the 1980s, the USFWS used a permittee-responsible approach for compliance. Under this non-market approach, the developer would be granted a permit if they undertook certain actions to minimize their impacts, and for unavoidable impacts, they were required to carry out conservation activities nearby. Developers work with environmental consultants and other experts to advance conservation equivalent to their impacts. This non-market approach is criticized by environmentalists for producing fragmented conservation and by developers for causing delays and complicating their legal liabilities (Kormos, Mead, and Vinnedge 2015).

Around the mid-1990s, the USFWS introduced MBIs that allowed the permittees to outsource their legal offsetting liabilities by either paying some third-party actor such as an environmental-NGO or a private conservation actor. The ESA's market approach followed similar policy innovations in other environmental spaces such as wetlands and air pollution (Salzman and Ruhl 2006). The MBI for ESA is called Conservation Banking and involves the regulators overseeing land conservation projects carried out by a professional. This actor has put some lands under legal and ecological protections in order to sell credits to potential developers facing compliance obligations. The state specifies what is considered conservation as well as how many credits a developer must purchase, but trading and prices are driven by private-to-private negotiations. Barral (2020) finds that in many cases, the state actually spells out precise ratios to commensurate types/size of impacts and offset sites, creating a standardized system of equivalences that endow a new exchange value to the landscape. Such state actions are akin to minting work because they create: "social knowledge about exchangeable things, built on a foundation of commitments, certifications, guarantees, endorsements, and other risk-reducing and epistemically simplifying mechanisms" (Carruthers and Stinchcombe 1999, 378).

Although Conservation Banking is indeed a novel policy instrument, it nevertheless relies on existing rules and bureaucracies, which in the case of the United States are organized around species protections. A species-level accounting of impacts and offsetting facilitates standardized measurement and commensuration. Population in one location can be compared with another, establishing an equivalence between ecological harm and gain. Species-based accounting could be consistently applied to all projects and allow for information sharing within the bureaucratic hierarchy (Barral 2022). As the idea of MBIs grew, long-standing species-based norms, accountability mechanisms, and resources built over the years such as inventorying and monitoring species, training programs for regulators, and certifications for experts were seamlessly redirected to the implementation of MBIs. The low density of listed species, a result of a legal-bureaucratic listing process, allows for easier policy implementation: a typical development might harm one or two species and regulators need only to evaluate the scope of the harm on that species² and determine offsetting requirements.

The species-level distinction is more amenable for the construction of MBIs. First, a species approach requires only to check whether the project is taking place on a protected habitat site and whether the endangered species is indeed present on this land, and it does not rely on a complex ecosystem assessment that could take years. Second, the developer's actions are quantified in terms of number of species

harmed or the acreage of habitat degraded. Third, similar standards are applied to the conservation site that is meant to serve as the supply of credits. The quantification of species population or by proxy, the counting of the species' habitat, provides the regulators a simple metric to establish the quality of offset and its equivalence with the harm site.

The focus on one (or two) species per project affords the production of a standardized technical basis for comparing impacts and gains. For example, in Oklahoma, one of the states where authors carried out case studies, there are two conservation banks for an endangered beetle. These banks sell credits to oil and gas companies in Eastern Oklahoma who need a permit to drill. An oil driller need only claim membership to an industry plan and not have to undergo an extensive environmental assessment. They are provided with standardized ratios for offsetting which depend on the location of their projects (whether or not projects fall within the critical habitat zone), the type of impact (long-term or temporary), and the protected status of the land. Credits are bought and sold in a private market. Prices are approximately \$12,000 per acre. The standardized and stabilized impact assessment process and the clearly stated equivalence ratios, allow for the emergence of the market option.

Many factors explain the rise of MBIs for biodiversity offsetting in the United States, though as we show, the historical construction of a governance arrangement centered around individual species as the subject of regulation facilitates the commodification of nature. These institutional forms involve the laws themselves but also the division of enforcement labor, implementation resources, certified structure for expertise, and other critical administrative processes. Relevant intermediaries such as consultants and technicians are also trained and certified based on species, which further deepens the practical processes of enforcing the ESA. As administrations get involved in minting work (through the definition of ecological ratios), they also standardize administrative processes and enforce biodiversity protection along the line of species. When in confluence with other factors for market emergence, such as supportive social movements that push states to enforce environmental laws (Rea 2017; Ghosh and Wolf 2024) and enabling local political economic conditions (Barral and Ghosh 2023), market mechanisms can establish and even thrive.

4.2 | French Mitigation Law

4.2.1 | Loi Sur la Protection de la Nature et des Paysages: An Ecosystem Approach

The French Ministry of Environment was founded in 1971, followed a few years later by an important legislative achievement: the passage of the Loi sur la Protection de la Nature et des Paysages (Nature and Landscape Protection Act, 1976). This Act subjects land developments to an Environmental Impact Assessment (EIA) and, where needed, mitigation. However, despite its legal standing, the EIA requirement was not systematically applied until the mid-1980s and offset requirements were only enforced in the mid-2000s.

Needing to show enforcement consistency, in 1982, regulators convened conservation experts from the National Council for Nature Protection to develop a ministerial ruling to assign categories of nature that would be protected. Experts interviewed for this study recalled advocating for ecosystems as the unit for biodiversity protection and opposed species as the legal category for regulation.

Prior to that, no legal definition of ecosystem was established. Even today, the term “ecosystem” is open to interpretation in French or European laws. Practically, regulators adopted a maximalist definition based on a collection of species. Using a very low threshold for endangerment, a large number of species were considered eligible for legal protection. Regulators were cognizant that such an exhaustive list of identified species on French territory may make policy enforcement unmanageable. As a compromise, experts selected two to three species as representative of various species communities (Chassé, 2021). This led to an official list of 9500 protected species, a number seven times higher than the listed 1300 in the United States, in a territory 20 times smaller. The French species list is not designed based on threat levels as in the United States but according to their representativeness for the entire ecosystems.³ Such an approach to defining the legal category of biodiversity granted regulators considerable leeway in assessing the ecological impact of a given development project and the interventions needed to mitigate these impacts.

When EU- wide biodiversity laws were passed, this French list became the basis for enforcing these other laws as well. This includes the 1985 Directive on Public and Private Project Environmental Assessment, the 1992 Directive on Natural Habitats and Wild Fauna and Flora, and the 2007 Directive on Environmental Responsibility. As pressure from the EU to address biodiversity impacts strengthened around the mid- 2000s, the French government found itself under intense pressure to conduct environmental assessments and enforce land regulations more systematically.

4.2.2 | Case- By- Case Negotiation of Impact and Offset Requirement

In 2008, French regulators developed a new multi- step protocol to assess the impacts of development projects and determine conditions for permitting land use changes. The first step involves site visits where a surveyor (almost always an environmental consultant acting on behalf of the land developer) is required to document the presence of all regulated species on the project site. This process is standardized in that the surveyor is required to visit the site at least four times a year (one visit per season). Usually, this produces an extensive list of over a hundred observed species. After the first list is prepared, environmental consultants filter this long list based on scientific literature and assessments of local threat levels to ecosystems and species. This produces a second intermediate list that is published in the official Environmental Impact Assessment whereas the previous longer list is recorded in the annexure. This intermediate list on average includes 16% of the species in the original long list (Guillet et al. 2019). The next step involves negotiations between street- level bureaucrats overseeing the assessment and land developers typically assisted by environmental consultants. It consists of a final filtering based on the specific nature of impact accruing from the project. This final list focuses on the developer's obligations, by crossing the list of species on site with the red list (Regnery 2013). This three- step filtration process usually results in a final list of 12 or so species. The primary justification for such a multistep process is that it creates several opportunities to evaluate the ecological impacts of development and integrate analysis of impacts on charismatic and noncharismatic species, which then informs decisions on what ecosystems to preserve and how. On average for each project, two to three different ecosystems are considered for offsets. All this means that the developer and the

regulator cannot at the onset foresee what might constitute impact and offset. Such a case- specific evaluation of impacts impedes the work in minting standardized biodiversity categories.

In theory, the French environmental impact procedure is based on the idea of “functional nature.” The species are exhaustively inventoried and carefully assessed in terms of their interactions with each other and the type of the project. However, in practice, the successive operations to assess impacts and design offsets consist of reduction and simplification to construct a more manageable list of species. Rather than the envisioned assessment of ecosystems, practical constraints direct regulators to select a few charismatic species as proxies for ecosystems. While this starts to look like the United States, there is an important difference: when regulators are paying attention to four to five species, the actual assessments tend to reflect impacts on some combination. Though the final list focuses on a few species, each list is specifically built in relation to the project and even projects in close geographic proximity may produce lists that are substantially different (Pelta, Bas, and Guillet 2023).

The relevance and sufficiency of mitigation measures vary substantially from one project to another. The final list is the basis for determining the size and scope of offsetting required of the developer. If the regulators determine that indeed there is sufficient impact that cannot be avoided or minimized, they require the developer to offset their impacts by paying for equivalent conservation elsewhere. An environmental science expert is commissioned to determine the acreage of the offset and management requirements that would constitute adequate conservation. The low- standardized approach makes it hard to set a general criterion for what constitutes a minimum level of conservation actions required to achieve compliance. Such a case- by- case and negotiated form of biodiversity regulation implies that impacts and offsets are not standardized or easily commensurable.

4.2.3 | Lack of Standards Complicates Market Construction

The main offsetting mechanism in France is the permittee- responsible approach, which is similar to the United States, but typically considered inefficient and, on some accounts, less ecologically valuable than a market approach. Seeing experimentation with MBIs in the United States, French authorities decided to apply the concept, aiming to encourage conservation investments that would put larger areas under conservation while allowing the investors to sell credits and developers to buy these credits as a form of compliance.

The first and so far, the only conservation bank in France was set up in 2008. Three other pilot projects were launched after 2016 but so far none of them had reached maturity. As for the existing one, the Ministry of Ecology authorized the Caisse des Dépôts et des Consignations (CDC), a French public investment bank, to invest in a large- scale ecological restoration site. This project focused on a highly threatened ecosystem called “coussoul,” a unique semi- arid prairie located in the South of France whose ecological history is tied to ancient grazing practices. During the 20th century, the area covered with coussoul drastically shrunk due to agricultural and industrial developments. Some of the remaining ecosystem is protected as a natural reserve. CDC paid about € 5.5 million to buy 357 ha. of an industrial orchard and carried out ecological restoration

operations to bring back historical fauna and flora species to this coussoul.

The project is generally considered meaningful from an ecological standpoint, but it has not galvanized the kinds of market interactions regulators expected to see, contrary to similar experiences in the United States. After more than 10 years since the end of the restoration, CDC is still struggling to sell credits and break even. Regulators have agreed to allow CDC to sell area-based units (“unite de compensation”) highlighting the possibility of producing standardized units out of ecosystem considerations. However, three major factors hindered the success of this policy. First, the coussoul is a very specific type of ecosystem with much of the region’s coussoul ecosystems already lost. Its reduced area and high ecological interest explain why it was selected as the pilot, but because existing coussoul are few, new development projects are not the principal driver of coussoul degradation. Where projects may feature on coussoul sites, regulators usually apply a strict avoidance clause. Together this limits the size of demand and as a result, CDC has struggled to find buyers for its credits. To solve this demand issue, CDC pushed regulators to allow developments on other ecosystems to buy credits from this project, but so far regulators appear reluctant, on the grounds of ecological equivalence. Second, this pilot did create a ratio-based mechanism for the production and trade of credits, but the pilot took place in an otherwise non-standardized administrative context. Specifically, what was not standardized was the process for determining impact, which as we summarize above is carried out in a case-by-case manner. Finally, the cost of the credit was substantially higher than the cost of pursuing conservation themselves, which may also explain why the demand for credits did not fully mature. Even on lands that might be considered equivalent to the coussoul, developers have tended to use the permittee-mitigation approach, rather than buy credits.

Seeing a need to standardize impact assessments as a precondition for advancing MBIs for offsetting, in 2019, a French Biodiversity Agency officer petitioned the Ministry of Environment to explore the possibilities of a more standardized approach to impact assessment. If successful, this would result in standardized ratios of impact which could be easily compared with offset credits. However, environmental consultants strongly contested these policy reforms arguing that standardization would undermine a scientific assessment of the case-specific nature of ecological impacts.

The French implementation of MBIs for biodiversity offsetting is stymied by a historically institutionalized commitment to govern biodiversity based on ecosystems, rather than species as in the United States. This results in considerable complexities and uncertainties in the impact evaluation process, which does not lend itself to minting work and standardization. This lack of standardization, we contend, is critical to explaining why the pilot project failed in finding buyers while similar efforts in the United States have found more success.

5 | Discussion

The state’s use of policy innovations to green the economy is an important social and political development. It is increasingly evident that these policies vary considerably across countries and their outcomes are also highly heterogenous, calling institutional scholars to analyze these differences and how they matter to the broader project of sustainability. In comparing green economic policies in the

United States and France, we identify important commonalities but also stark differences. In both countries, we observe governments wanting to but struggling with the use of market mechanisms to resolve contestations around land use change. The United States has found relatively more success in establishing market mechanisms than the French administrators where such innovations are limited to one pilot experiment and prospects of scaling or expansion are dim. Our analysis does not resolve whether the market or the nonmarket arrangement is more effective; in fact, evidence suggests that neither model for governing offsetting is effectively protecting biodiversity against the strains of development. Rather our interest lies in accounting for the divergent green economic trajectories among countries. Critical scholars recognize these different trajectories, yet there is limited comparative analysis of why the same ideas produce such different governance arrangements.

We analyzed these cross-national variations from a historical institutional lens, situating current policy innovations in the longer temporal evolution of the environmental state including laws and bureaucratic forms. Attention to the sequencing of institutional development and the incremental accumulation of ideas, actions, and practices over time allows the analyst to tease out the particularities of rules and administrative forms that exhibit a level of stickiness. By attending to these historical differences in environmental policies, the study informs broader discussion on the prospects of using markets and policy innovations to advance environmental goals.

5.1 | Legal Conceptions of Biodiversity

Greening the economy is cast as new and modern but actualizing such policies nevertheless relies on older definitions of nature. Following Rea and Frickel (2023, 256), we examined how “historically and culturally distinctive constructions of nature” matter to the establishment of biodiversity as a tradeable commodity. This approach has enabled us to show that the category precedes the instrument. In the 1970s, long before ideas of greening the economy, the United States and France, like many other countries, promulgated environmental protection laws which also required defining some legal foundation for what is meant by biodiversity. These definitions made 50 years ago are the basis for implementing institutional innovations like offsetting today. The United States organized its biodiversity laws around particular species. Over time, these definitions also related to the formalization of processes for deciding what to protect, resulting in what has become a long and rigorous process for determining whether a species is endangered enough to merit protection. The seemingly thorough process of listing an endangered species also causes delays. Several species are currently awaiting listing, and some are awaiting assessment. Because the listing process is complex and heavily scrutinized, few species end up on the endangered species list compared with what is proposed but the protections they receive are strong and well-enforced. This standardized enforcement process gives developers and potential conservation investors predictability and clarity about future developmental, compliance, and offset requirements. Because investing in conservation to sell credits requires a large up-front capital investment, the predictability of regulatory requirements on developers provides important clarity for managing investment risks, enabling market construction. In France, biodiversity governance is centered on ecosystems. As a result, reductionism plays out differently. More species find themselves under protected status. Yet

the enforcement of the protections proceeds on a case- by- case basis. Similar projects may find very different compliance requirements depending on the region and different projects in the same region may also find that their impacts and offset requirements differ given the nature of their construction. This approach allows for context-specific treatment of ecological harm and gain but hinders standardization because the commodity itself is not stabilized and is in flux. Its embeddedness to the contexts of the site and the specific project is not easily shed and this makes commensuration with another conservation site tougher to establish. These legal definitions are not merely a semantic issue but rather the differences afford different bureaucratic structures and practices.

A historical institutional perspective is an invitation for critical scholars of environmental markets to study the extent of sedimentation upon which new environmental institutions are constructed, echoing the well- established idea that laws necessarily entail some level of reductionism (Bosselmann 2010). We argue that contemporary differences in policy outcomes are traceable to the different “visions of nature,” to quote Scoville (2022), in the two countries, how these differences are formalized into law, and how established interpretations of nature interacted with novel policy ideas to green the economy.

5.2 | Bureaucratic Enforcement of Biodiversity Laws

While changing a definition seems relatively costless, such a change also requires rearranging the bureaucratic network and its connected practices. It would affect not only the prospects for MBI but all other policy instruments in biodiversity governance.

In the United States, the ESA endangered species listing provides a scaffolding for the governance of offsetting. The policy requires that regulators create critical habitat maps that outline areas where developments would be subject to offsetting. If a project falls within this land, the developer is aware that they may face regulatory scrutiny and possibly offsetting requirements. When considering offsetting, standardized tools such as bioindicators help quantify the property value including the biodiversity lost at the impact site and the requirements that would make “nature whole” again (Sullivan 2018). Similar developments such as around performance metrics help regulate and standardize the offset site. Even environmental consultants involved at different stages of the process are themselves governed by regulated certification requirements.

In France, the expansive listing of species has led to a case- by- case approach to the organization and implementation of biodiversity regulation. Such an approach offers the possibility of a more substantial and contextualized ecological impact assessment, but it also limits the standardization of biodiversity. French regulators use a three- step process of filtering to narrow the scope of impact. It is through this process of reduction that the total ecological impacts of a development project are established into a governable subject. This process yields different listings of species impacted across projects, which makes the compliance requirements difficult to predict for the developer. It also limits the ability of conservation investors to make specific capital investments into conserving a species because they cannot confidently forecast the demand for the credits they would produce. The open process also introduces micro- politics where developers, consultants, and regulators negotiate, often in very

asymmetrical power dynamics, to achieve compliance requirements (Barral and Guillet 2023). Consultants are paid by the companies, but they are also governed by industry norms. In some cases, the consultants must be certified by the state. Altogether, the French institutional arrangement for governing biodiversity impacts and their offsetting makes it harder to standardize species or make biodiversity into a credit for trading. The open definition of nature in France lends itself to a complex organizational process.

As the United States and France embark on similar commitments to use markets and incentives to green land use changes, the resulting policies are saddled to some extent by the organizational histories of their respective environmental states. While many scholars have emphasized the role of law and discourse in legitimizing market principles (Pistor 2019), others argue that commodification is preceded by processes of accounting and commensuration (Lohmann 2005; MacKenzie 2009). In bridging these studies, our research shows that the legal formalization of the term biodiversity and the construction of laws, rules, and practices to administer protections is an important factor determining how and to what extent governments are able to commodify nature in order to protect it.

Back in the 1970s when the environmental state was under development, biodiversity was a new concept. Today too, the term remains open to interpretive flexibility. Debates on what biodiversity is and how it should be governed are not foreclosed. Groups vie to define the term to their benefit and bend the rules to their preferences. In France, NGO practitioners and scientists are presently contesting efforts by regulators to integrate some level of prioritization for critical species, whereas in the United States, scholars advise tagging a landscape approach onto offset regulations (Kiesecker et al. 2010). Through these ongoing political and economic negotiations emerge institutional arrangements that then build up with time. The accumulation of several smaller governing actions means that, for policies to converge, much more than redefinition will be needed. In fact, change could require a tricky and expensive process of bureaucratic dismantling and reconstruction.

6 | Conclusion

Why does the same policy idea take such a different form in different national contexts? We argue that a historical institutional perspective can help understand differences and their effects on environmental outcomes. We showed how in the United States, market mechanisms are promoted for regulating biodiversity impacts but the limited and cumbersome process of listing an endangered species means only some species are subject to ESA enforcement, and thus available for command- and- commodify initiatives. However, where the market mechanism is available to developers, the permitting process is seen as simplified, faster, and with less regulatory uncertainty. In the French case, the ecological impact assessment process is structured to protect ecosystems and not isolated species. As a result, offset policies are better at accounting for local contingencies but they are less streamlined. These diverging trajectories in offset policy design and implementation are explained by long- established differences in legal- bureaucratic foundations. Such cross- national analysis of green economic policies offers a fresh perspective into the creative possibilities and limits of using markets to regulate environmental problems.

International organizations such as the Convention of Biological Diversity as well as global private capital promote offsetting to arrest the rapid decline of ecosystems and species. These green economy solutions are often viewed as a one-size-fits-all that can be seamlessly applied to a host of environmental problems such as biodiversity loss, climate change, and pollution. However, our analysis shows the reverse, that is, organizing market forms requires adapting them to the specific environmental problem and the institutional context that has historically grown to govern the problem. The study calls for a need to understand the national context within which such policies diffuse and circulate. This requires understanding not only the mechanics of a specific instrument but the intricate interplay between new policy ideas on the one hand and old laws and their established implementation forms on the other. Green economic ideas unlock fresh opportunities for governing nature, but their success also depends on how they align with existing institutional forms, laws, ecosystems, and legacies. Through interactions between old and new can emerge a diversity of policy trajectories and outcomes. Such policy experimentation allows opportunities for social learning that inform new policy ideas, laws, and implementation strategies, implying an accumulation of incremental steps that bend toward more effective environmental institutions.

Yet, it is also important to be cautious about what can be practically achieved with such novel policy instruments. While nonstate and market-driven approaches are fashionable today, in both countries, these schemes have struggled to stem biodiversity declines at any major scale (Dempsey 2016). Although the United States' experiment with market approaches for biodiversity conservation may be considered more robust than in France, their overall success in limiting biodiversity losses is tenuous (Ghosh and Wolf 2024). Such failures are usually attributed to political or ideological rifts (Fletcher 2023), but failures also stem from specific historical characteristics of national policy arrangements. Although the very appeal of green economy policies lies in their novelty, they nevertheless rely on institutional legacies: legal definitions, science and knowledge infrastructures, and the organization of work among agencies. Rather than a punctuated moment of creativity, learning, and breakthrough in environmental regulations, these national experiences with green developmentalism represent a historical moment ripe with rhetorical possibilities, but practical failures.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

Data sharing is not applicable to this article as no datasets were generated or analyzed during this study.

Endnotes

1 There is a cultural aspect to the legal differences that are worth reflecting upon. Cronon (1996) has shown how the idea of biodiversity in the United States is synonymous with ideas of wilderness. Thoreau (2003) eloquently puts it: "The West of which I speak is but another name for the Wild; and what I have been preparing to say is, that in Wilderness is the preservation of the World." This interpretation is encrusted into laws such as national parks where "nature" and "man" are separated. In France, the understanding of nature is shaped by a long history of settlement and agriculture. There is an emphasis on the complexity and interactional

character of nature. Instead of pristine nature, there is a constantly interacting space comprising humans, animals, plants, microbes, and so forth. Whiteside (2002, 74) explains that in France: "Nature is never simply out there," to be encountered in an unadulterated form. Neither is humanity "in here," the essence of an autonomous, reflecting subject. Nature's nature is inseparable from organized human practices. Human nature is inseparable from the influences of a bio-physical reality. This echoes what historical institutionalists such as Hargadon and Douglas (2001) call the "sedimentation of culture and meaning."

- 2 In rare instances, one may find a two and sometimes more listed species in an area. In such scenario, rules require attention to ecological interactions and more complex assessments of harm, including careful site- and project- specific analysis.
- 3 These are related to two different branches of ecological sciences: species ecology in the United States and functional ecology in France.

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