

Temporal polyphonies of humans and tortoises:
an anthropological approximation
from the Albera massif (Catalonia)

Eliseu CARBONELL

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Temporal polyphonies of humans and tortoises: an anthropological approximation from the Albera massif (Catalonia)

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ABSTRACT

This article analyzes the coproduction of temporalities between humans and tortoises from an anthropological perspective, using as a case study the last native population of Hermann's tortoise (*Testudo hermanni* Gmelin, 1789) in the Iberian Peninsula, located in the Albera massif, Catalonia. Drawing on the concept of the "myth of time" (Barreau 2000), we explore how tortoises have historically been used as symbols for the origin of time and, at present, as indicators of the end of time in a context marked by the ecological crisis and the notion of emergency in the face of extinction. The study combines ethnographic fieldwork with historical analysis to show how human practices –from domestication and trade to conservation– have configured the temporal horizons of tortoises, while their biological rhythms and longevity influence human imaginaries around becoming. We argue that the coordination between human and non-human temporalities constitutes a critical framework for thinking about shared futures that goes beyond anthropocentrism. The article's principle contribution is connecting the anthropology of time with multispecies anthropology, proposing that interspecies interaction produces not only cultural meanings, but also ways of experiencing time in crisis scenarios. In this sense, the relationship between humans and tortoises in the Albera becomes an opportunity to think about how the coordination between species could give rise to a notion of the future that diverges from catastrophist visions.

KEY WORDS
Multispecies anthropology,
anthropology of time,
Hermann's tortoise
(*Testudo hermanni*
Gmelin, 1789),
Mediterranean Pyrenees,
extinction,
future.

RÉSUMÉ

Polyphonies temporelles des humains et des tortues : une approche anthropologique du massif des Albères (Catalogne).
Cet article analyse la coproduction des temporalités entre les humains et les tortues depuis une perspective anthropologique, en prenant comme étude de cas la dernière population autochtone de tortues d'Hermann (*Testudo hermanni* Gmelin, 1789) de la péninsule Ibérique, située dans le massif des Albères (Catalogne). À partir du concept de « mythe du temps » (Barreau 2000), nous étudions comment les tortues ont historiquement fonctionné comme symboles de l'origine du temps et,

MOTS CLÉS
 Anthropologie multi-
 espèces,
 anthropologie du temps,
 tortue d'Hermann
 (*Testudo hermanni*
 Gmelin, 1789),
 Pyrénées
 méditerranéennes,
 extinction,
 avenir.

actuellement, comme indicateurs de sa fin dans un contexte marqué par la crise écologique et la notion d'urgence face à l'extinction. Cette recherche combine un travail ethnographique avec une analyse historique pour montrer comment les pratiques humaines – depuis la domestication et le commerce jusqu'à la conservation – ont façonné les horizons temporels des tortues, tandis que leurs rythmes de vie et leur longévité influencent les imaginaires humains sur le devenir. Nous soutenons que la coordination entre temporalités humaines et non-humaines constitue un cadre critique pour penser des futurs partagés au-delà de l'anthropocentrisme. La principale contribution de l'article est d'établir un lien entre l'anthropologie du temps et l'anthropologie multi-espèces, en proposant que l'interaction entre les espèces ne produit pas seulement des significations culturelles, mais aussi des manières d'expérimenter le temps dans des situations de crise. Ainsi, la relation entre les humains et les tortues dans l'Albera devient une occasion de réfléchir à la manière dont la coordination entre les espèces pourrait donner naissance à une notion d'avenir différente des visions catastrophistes.

INTRODUCTION

Searching for tortoises requires moving slowly, making your way through the brush stealthily and vigilantly, your head bent. You move with difficulty, using your hands and legs to push aside the branches of rosemary, rush, honeysuckle, broom, and bramble, while keeping your eyes and ears alert to the surroundings. We did this for more than five hours on a sweltering May morning – with Irwin, one of the herpetologists responsible for the population census of tortoises in the Albera – and we only found three tortoises because the weather conditions were not optimal. On a good day, it's possible to find eight or ten, and in exceptional cases up to 20 or 22 tortoises. Seen from the outside, searching for tortoises may look like moving in much the same way that tortoises do.

A tortoise's progress through mountainous terrain is reminiscent of a heavy tank. In fact, one famous Roman military formation is called the tortoise. However, in the twentieth century, the tortoise was used instead as an antimilitarist symbol. *Hangenmen Also Die!* is a 1949 film by Fritz Lang, with a screenplay by Bertolt Brecht, about the Nazi occupation of Prague. In two different scenes, pamphlets are distributed with a drawing of a tortoise calling for resistance: "Czech Workers Slow Down!" says one; "Citizens of Prague Keep Silent!" says the other. In Spain, the Conscientious Objection Movement, founded in 1977 to resist compulsory military service, published a fanzine featuring an antimilitarist character that is also a tortoise: "Felisa, the rebellious turtle." As we walked through the Albera mountains, occupied with the tortoise census, we discussed these facts, and Irwin's passion for herpetological fauna.

By the end of that May morning, our arms and legs covered in scratches from the bushes, we were ready to go back, but Irwin still wanted to explore a ravine where a small, nearly dry stream flowed, in case we found another one. All of a sudden, he started pointing to a spot where there was a pool: "There, there!" A female tortoise, *Testudo hermanni* Gmelin, 1789, had only her head and front legs sticking out of the water, clinging to a rock. When he lifted her out of the ravine, we saw that some type of mesocarnivore, perhaps a badger or a mongoose, had gnawed into her hind legs (Fig. 1). The

first thing that Irwin said, sorrowfully, was that even if they managed to save her, she would be unable to dig a nest with her hind legs to lay eggs. He weighed her, measured her and recorded her details in the census book. Then we brought her to the Centre de Reproducció de Tortugues de l'Albera (Tortoise Breeding Centre of the Albera, hereinafter CRTA), where we placed her in a plastic box in the sun to help her recover her body heat and administered initial treatment. But the next day, first thing in the morning, Irwin sent a WhatsApp message: "Felisa didn't survive the night."

This article offers a reflection on the coproduction of temporality between humans and tortoises, drawing on a long anthropological tradition of conceiving of time as a relational construct that emerges from the interaction between the social world and the natural environment. Several authors have noted that natural rhythms – whether seasonal cycles or life cycles of growth and decline – structure the ways humans perceive and experience time (Schippers 1986; Gell 1992; Munn 1992; Barreau 1996; Gingrich *et al.* 2002). Beyond studies of what is strictly the perception and experience of time, Classic anthropology had already observed how morphological transformations in the social structures of so-called primitive societies were coordinated with changes in the natural environment within seasonal cycles, as exemplified in the works of Mauss (1979) on the Inuit, Boas (1975) on the Kwakiutl, and Lévi-Strauss (1955) on the Nambiquara, to cite some of the best-known cases.

Also linked to environmental changes following the seasonal cycle, another source from which the human experience of time derives is our relationship with animals. In the field of the anthropology of time, the idea of a coproduction of temporality between humans and non-human animals can be found in studies on mammals such as dogs (Power 2009) or pigs (Remme 2021), and also insects such as cicadas (Terradas 1999) or bees (Phillips 2020). Malinowski's study on the Trobriand calendar showed that it was based on the annual appearance of marine annelids (*Eunice viridis* (Gray, 1847)) on the ocean's surface to spawn (Malinowski 1927). This seasonal proliferation served as an ecological marker to synchronize the lunar cycle with agricultural and festive activities. This phenomenon had not only a practical value in terms of calculating time, but, as Gell



FIG. 1. — Tortoise (*Testudo hermanni* Gmelin, 1789) rescued from a pool. Photo credit: E. Carbonell.

(1992: 308-313) pointed out, also a political one, reinforcing the authority of the elites of the Kiriwina district over the other districts of the archipelago.

The temporal characteristics of tortoises, such as their longevity and seasonal life rhythm, make them a transmitter of practices and memories between generations of humans. In addition, their habitual presence in domestic life makes them into a sort of gnomon that marks the passage of human time, whether within the annual seasonal cycle or within a family's history. Their longevity links human generations, as parents often pass them down to their children. But we can also consider the inverse perspective, how human acts affect the temporality of tortoises. Of course, removing them from their natural habitat to commercialize them as pets puts the long-term survival of tortoise populations in a given territory at risk. On the other hand, citizen cooperation with reintroduction programs, for example reluctantly relocating animals with whom an affective relationship has been developed to an animal sanctuary, can contribute to stemming or slowing down the process of extinction of this species in its natural environment.

The tortoise – a reptile that in the 19th century had the misfortune of becoming fashionable as a pet, pushing certain chelonian species such as the *Testudo hermanni*, which inhabits the forest and scrubland of the northern Mediterranean coast, to a critical situation due to their massive removal from the natural environment and other anthropogenic causes that we will

explore below – fits very well with what Haraway (2003) proposes in *The Companion Species Manifesto*. Haraway argues for substituting the concept of “companion animal” for “companion species,” which would include all animals, “all of whom make life for humans what it is – and *vice versa*” (Haraway 2003: 15).

Our focus on the coproduction of temporality in human-tortoise relationships is inspired by Tsing, who invites us to abandon the notion of progress, which she describes as a hegemonic form of temporality imposed by capitalist modernity. Instead, in the first pages of *The Mushroom at the End of the World*, Tsing (2015) proposes paying attention to temporal polyphonies, understood as assemblages of rhythms resulting from diverse world-making projects, both human and non-human. From this perspective, time becomes a process of interspecies co-creation. The case this article is concerned with, that is, the relationship between humans and tortoises and *vice versa* – as Haraway (2003) would say – forces us to reconsider temporal anthropocentrism and explore alternative forms of temporal synchronization in a context of ecological emergency.

MATERIAL AND METHOD

Located on the Mediterranean slope of the Catalan Pyrenees, close to the Franco-Spanish border on the Spanish side, the CRTA is an animal sanctuary whose primary function is the



FIG. 2. — A herpetologist taking Hermann's tortoise (*Testudo hermanni* Gmelin, 1789) census data in the Albera massif. Photo credit: E. Carbonell.

captive breeding and subsequent reintroduction into the wild of the *Testudo hermanni* tortoise and the *Mauremys leprosa* (Schweigger, 1812) turtle. Both of these species are native to the region and both declined to a critical level in the decades leading up to the founding of the centre. The case of the *Testudo hermanni*, Hermann's tortoise or Mediterranean tortoise, as it commonly known, was especially grave. Hermann's tortoise had gone extinct in the entire Iberian Peninsula and only survived in this remote corner of the Albera Massif when, in the early 1980s, a group of young naturalists took it upon themselves to protect this last remaining population and founded the sanctuary and tortoise breeding centre (Budó *et al.* 2025). The CRTA and the work of herpetologists in the Albera Massif offers an opportunity to think about time, and in particular, universal becoming from a more than human perspective.

Methodologically, the ethnographic fieldwork that this article is based on consisted of participant observation in the CRTA, as well as accompanying herpetologists in the field during interventions aimed at reducing the predation of nests or monitoring and population census campaigns in the Albera Massif between 2023 and 2025 (Fig. 2). Twenty

four semi-structured interviews were conducted with people who have spent their lives working in different agroforestry professions in the Albera Massif where the Hermann's tortoise lives: agriculture (primarily vineyards and olive groves), livestock farming (primarily sheep and cows), and forestry (primarily cork oaks for cork extraction), in addition to informal interviews and conversations. The article presents a case study on the management of *Testudo hermanni* in the Albera Massif (Fig. 3), but its arguments can be expanded to other territories, eras, cultures, and species of chelonians to explore the co-creation of temporality between humans and tortoises.

TORTOISES AT THE ORIGIN OF TIME

Barreau (2000) showed that the myth of time was one of the 10 invariants in the representation of time that can be found in all cultures, both traditional and modern, including in the context of globalization. The myth of time, according to Barreau, represents the simultaneity of coexistence that extends to "the entire inhabited world" (Barreau 2000: 311). The



FIG. 3. — A *Testudo hermanni* Gmelin, 1789 in the Albera massif. Photo credit: N. Torres.

myth of time expresses a universal becoming. The image of tortoises or turtles associated with the origin of human existence, the origin of life, or the pillars of the Earth inhabited by humans is prevalent in mythologies around the world. Geertz, in one of the most cited texts in contemporary anthropology (Alexander & Smith 2011), uses the image of a turtle that holds up the Earth to illustrate the principles of interpretivism. According to an Indian story, as Geertz (1973) explains in *Thick Description*, an Englishman asked, if the world rests on a platform, which in turn rests on the back of an elephant, which rests on the back of a turtle, what does the turtle rest on? The response that he received was, “Ah, Sahib, after that it is turtles all the way down” (Geertz 1973: 29). This image from Hindu mythology, which Geertz uses to reference the potentially infinite number of interpretive layers, connects to various mythological traditions where a turtle or tortoise is represented as the base and foundation of the world or even as the origin of the world, life, or human time. Tylor (1878: 323), in his pioneering study of the geographical distribution of myths, observed that the World-Tortoise was one of the most prevalent and widespread myths on the planet. Examples can also be found in the mythology of the Indigenous peoples of the Northeastern Woodlands of North America, that tell us that in the Beginning there was only water, and from it emerged the Great Turtle with mud on its shell, which

would be the origin of the Earth we live on (Miller 1974). Archeological evidence also shows that in various cultures from the Bronze Age, in China and India, but also in Europe and the Americas, tortoises and turtles symbolized the Earth and the celestial vault, as well as the origin of the universe (Rappenglück 2006). In Aztec culture, for example, a myth recorded by Bernardino de Sahagún dedicated to Ayopechtli or Ayopechtecatl references “a deity who presides over fertility and is the patron of births” (Garibay Kintana 1995: 130) and who rests seated on a tortoise.

This symbology extends to modern architecture: Antoni Gaudí, in the design of the Nativity façade of the Sagrada Família in Barcelona – conceived as an allegory of creation and the origin of life (Cussó 2010) – included a turtle and a tortoise as the base of each of the principal columns (Fig. 4). The column facing the sea is held up by a loggerhead sea turtle, *Caretta caretta* (Linnaeus, 1758), while the column facing the mountain rests on a Hermann’s tortoise, *Testudo hermanni*, thus establishing a symbolic connection between the geographical and the cosmic environment.

These examples demonstrate that tortoises and turtles, including *Testudo hermanni*, are central elements of mythologies and cosmologies of different peoples and cultures across the history of humanity that make sense of universal becoming. They metaphorically hold up the pillars of the Earth

and creation, situating them at the origin of time, the birth of humanity. So then, from the perspective of the recent history of the Albera Massif, the tortoise is also a symbol of the birth of collective processes linked to the protection of the territory and to environmental conservation. While there are certainly examples of other animals at the origin of collective processes similar to the one discussed below, in this case there is the particular coincidence that at the root of the citizens' mobilization to protect the Albera we find an animal, the tortoise, that many peoples around the world have placed at the foundation of their origin stories.

We now move to the Catalan Pyrenees, to the Albera Massif, in the years following the death of General Franco in 1975 and the restoration of democracy in Spain. Many new things were emerging in those years, such as environmental movements. In France, the "Fédération française des sociétés de protection de la nature" had been founded in 1968. Greenpeace was founded in Canada in 1971. In 1978, Spain saw the launch of its first environmentalist magazine, whose first issue featured on its cover the struggle of Occitan farmers in Larzac, in the Massif Central of France, comparing it to the situation in the Albera Massif. The so-called "Lutte du Larzac" lasted ten years (from 1971 to 1981) and succeeded in blocking the French Ministry of Defence's plans to expand a military base at the expense of forests and farmland. During those same years, farmers in the Albera region also opposed the Spanish Ministry of Defence's plan to expand a military base in the mountains. They were, however, unable to prevent the forced expropriation of more than 1 500 hectares in 1978, destined for live-fire military training exercises for recruits (Serrano 2018). For reference, the current protected area of the Albera covers 4 300 hectares. This expropriation of 1 500 hectares of forest and farmland (vineyards, olive groves, cork oak forests, and communal forests) was experienced as a bitter loss for the inhabitants of the area. Genís is a farmer from the village of Espolla who is about 65 years old. His parents left the countryside for the city, but he returned right at the time when the fight against the expansion of the military camp was taking place, while he was a student, and decided to stay on with his grandfather to take care of the family's vineyards and olive groves. Recalling that episode, he said, "It was as if they had taken away something we had a deep emotional attachment to, not just an agricultural holding."

But this loss would give rise to an environmentalist movement in the Albera Massif that was specifically focused on the protection of tortoises, a cause that coincided with the fight to defend an area of plain marshes on the region's coast (Aiguamolls de l'Empordà) that are of great importance for migratory birds, where the construction of a tourist development had been planned. These two struggles led to the creation of the Alt Empordanesa Institute for the Defense and Study of Nature (IAEDEN) in 1980, which remains one of the country's leading environmentalist movements today (Doyon & Bougie 2024: 3). IAEDEN environmentalists brought to light that the Albera Massif was home to the westernmost and last native population of the Hermann's tortoise in the entire Iberian Peninsula, where it had been going

extinct over the course of the 20th century. At that time, in the early 1980s, a large landowner was negotiating the sale of an area of 20 km² with the Ministry of Defence for a second expansion of the military base. CRTA staff recall organizing talks in towns and schools, exhibitions, campaigns to collect signatures, and creating the "Coordinating Committee for the Defence of the Albera," which brought together various local groups and associations: "It was the first serious campaign in defence of the Albera and to protect the Hermann's tortoise as a native species in danger of extinction" (interview with J. Fèlix and J. Budó in Masanés *et al.* 2018: 86). This time, the campaign succeeded in blocking the expansion of the military base and, in 1984, the Centre de Reproducció de Tortugues de l'Albera was created. The CRTA's mission is to protect tortoises and to breed them in captivity in order to be released in the wild when they are about three years old. In its 40 years of existence, some 3 000 *Testudo hermanni* tortoises have been released into the Albera mountains. Paradoxically, this has not led to a significant increase in the population, but this will be discussed below.

The tortoises of the Albera are thus at the origin of the country's environmentalist awakening in the context of Spain's budding democracy, regained after a war and almost 40 years of military dictatorship. Stopping the continued expansion of the military training ground in order to save the tortoises was no small victory. The Generalitat de Catalunya (Government of Catalonia), which was abolished during the dictatorship and had been re-established in 1977, declared two ecologically sensitive areas of the Albera Massif "Natural Sites of National Interest" in 1986. In 1988, it passed a law¹ that designated *Testudo hermanni* as a protected species, prohibiting its trade and possession in order to end, or at least hinder, the removal of tortoises from the natural environment. The tortoises had provided a reason to fight and defend the territory, first for the environmentalists, and later, in the view of a CRTA staff member, for the farmers and inhabitants of the Albera in general, as they gradually gained awareness that they had a unique species in their territory. Over its 40 years of existence since its founding in 1984, the CRTA has carried out continuous work in environmental education and outreach among the local population. According to the CRTA's visitor logbook, the centre receives an average of 8 300 visitors each year, of whom around 40% (approximately 1 500) are residents of the county. Among these, roughly one thousand are school groups from nearby towns². As one CRTA staff member explained, "everyone from the neighbouring villages under the age of 40 has almost certainly visited the Centre at least once with their

1. Law 3/1988, 4th of March, on animal protection. <https://www.boe.es/buscar/doc.php?id=BOE-A-1988-8112>, last consultation on 8 September 2026.

2. The Alt Empordà is the county in which the Albera Massif is located, which, according to official data from the Catalan Institute of Statistics, has a population of 150 044. This figure includes the county capital, Figueres, with 50 000 inhabitants, as well as large tourist towns such as Roses, with 20 000. If we focus specifically on the Albera area, it is home to 14 200 inhabitants, distributed across twelve small municipalities with fewer than 1 000 residents each and two medium-sized ones with fewer than 5 000. Source: Catalan Institute of Statistics. <https://www.idescat.cat/emex/?id=02&lang=en>, last consultation on 8 September 2026.



FIG. 4. — A Hermann's tortoise (*Testudo hermanni* Gmelin, 1789) at the base of one of the two columns that support the Nativity façade of Gaudí's Sagrada Família. Photo credit: M.A. Brochu.

school. People know the tortoise is an emblematic animal of the area, and they respect it.”

All of this hinged, however, on the notion of risk or danger of their extinction. We will return later to the question of extinction as a temporal ending, but first we would like to pause on a concept closely related to the extinction of a species: the notion of emergency.

EMERGENCY AS A TEMPORAL FACTOR IN WILDLIFE MANAGEMENT, IN CONTRAST TO THE CALM OF THE TORTOISES

The concept of emergency is increasingly used today to evoke alarm in the face of humanitarian or ecological issues. The tortoise conservation efforts carried out at the CRTA are guided by this notion: emergency in the face of the danger of extinction. This contrasts with the characteristics we usually attribute to tortoises: calm, slowness, composure, patience, old age, ancestrality, etc.

Tortoises help humans give shape to the abstract notion of time. Homes in the villages of the Albera usually have a backyard. One or more tortoises often live there. Until the end of the last century, people in the villages of the Albera who found a tortoise while working in the fields would often take it home to their children or grandchildren. Several people talked to me about the tortoise as “a prehistoric animal” or “a prehistoric toy.” Quirze, a retired gentleman who was one of the first workers at the “Natural Site of National Interest” in the 1980s, said to us as he was recalling his childhood, “What else could we children play with, apart from going hungry and cold? You touch its head, and it hides, the poor animal!” He was referring, of course, to the post-war period in Spain. Silvestre, who had been a goat and sheep herder with his father since he was a child, and later became a forest ranger until his retirement, told us in an interview: “It’s funny how much children like tortoises. A tortoise is a reptile. Children don’t like snakes, but they like tortoises. Of course, tortoises have appeared in stories since time immemorial (...) the philosophical passage about the hare and the tortoise. A child will climb on a tortoise and it won’t get crushed, but a snail will. A tortoise doesn’t do anything, poor thing. I think that (...) it’s been so many years now that it’s like a genetic memory that humans have. I don’t think there’s a child out there who doesn’t like tortoises. And old people too. Of course, if you liked them when you were little, you’ll like them when you’re old.” Tortoises inspire affection, evoke ancestrality, and connect generations. When the cold weather arrives in autumn, a tortoise looks for a place to burrow into the ground to hibernate, and when the spring comes it emerges from its hiding place, much to the delight of the people of the house. Martí, one of the driving forces behind the CRTA in its early days (now less involved because he is running his own business), told me, “Year after year, it reconnects you with your own reality. We wouldn’t even remember, but suddenly, in the spring, the trees blossom and the tortoise comes out.” Basilissa was born in 1927, the matriarch of a family of winegrowers that cur-

rently export their wines abroad. Remembering her childhood she recounted, “We had two tortoises at home. We thought they were so funny. We spent a lot of time watching them. In winter we wouldn’t see them, and when spring started, they would come out.” Gràcia, a woman born in 1949, remembered that her aunt, who was born in 1905, had a guesthouse in the village. When she was a child, she liked to go and look at the tortoise they had there: “When it sensed that the cold was coming, it would hide behind the flowerpots in the garden until the good weather and spring arrived.” These examples, among many others we could cite from our interviews, reveal a point of convergence between animal and human biorhythms, both within the lifecycle, across generations, and within the annual cycle, across seasons. This convergence also extends to a sense of ancestry connected to human attributes associated with old age, such as the wisdom and patience conveyed in Aesop’s fables, orally transmitted in popular culture.

The Hermann’s tortoise has a slow growth and reproduction rate. Its shell takes about three years to become firm and resistant. Females do not reach sexual maturity until they are 12 to 15 years old, depending on their development. They lay between three and six eggs per year, of which only a few will hatch due to the high percentage of predation of tortoise nests and a long incubation period of two to three months (Bertolero 2015). Reptiles of a similar size, for example the common wall lizard (*Podarcis muralis* (Laurenti, 1768)), reach sexual maturity between their first and second year and lay five to ten eggs that incubate in less than two months. Of course, the lizard lives for a maximum of ten years, while the mediterranean tortoise can live past 80. The time pressure of the notion of emergency is at odds with the life rhythm of a species that requires 30 years to produce a second generation, and to seeing the results of reintroducing individuals into the wild. A critical event such as a prolonged drought, a major forest fire, or significant predatory pressure caused by an imbalance in the ecosystem can produce effects that take years to recover from.

If the poaching of tortoises for trade was their biggest problem until the 1980s, today it is the predation of nests and juveniles by the abundance of predators produced by the eradication of the wolf (*Canis lupus* Linnaeus, 1758) and lynx (*Lynx pardinus* (Temminck, 1827)), which hunted tortoise predators such as the beech marten (*Martes foina* (von Schreber, 1776)) and the badger (*Meles meles* (Linnaeus, 1758)) (Budó *et al.* 2003; Vilardell *et al.* 2012; Guinart *et al.* 2022). The subsequent abandonment of agroforestry activities in the latter part of the 20th century also led to the proliferation of species such as the wild boar (*Sus scrofa* Linnaeus, 1758), which is also a predator of the tortoise. Wild boar density in Spain reached 3.48 individuals per km² in 2021 (Smith *et al.* 2026). Catalonia consistently exhibits the highest densities within Spain. According to the wild boar population monitoring report produced by the Catalan government,³ density in Catalonia increased from 3.45 individuals per km² in 2000 to 6.4 individuals per km²

3. <https://senglar.cat/programa-de-seguiment/>, last consultation on 8 September 2026.

in 2025. Within Catalonia, the county of Alt Empordà, where the Albera Massif is located, recorded the highest density, reaching 14.7 individuals per km² in 2025 with a peak of 22.8 in 2023, the highest figure ever documented in the country. It is because of this enormous predation that the tortoise population in the Albera Massif has not decisively recovered despite the efforts of the CRTA to breed them in captivity and release hundreds of individuals, when they reach three years of age, over the last four decades (Vilardell *et al.* 2012). Added to this are environmental problems such as pollution from the use of pesticides or a higher incidence of forest fires due to a combination of factors such as drought, high temperatures, and changes in the uses of natural areas (Cifre-Sabater 2023). In the great fire of July 19 to 25, 1986, some 20 000 hectares of the Albera Massif burned, killing 50% of the tortoise population (Fèlix *et al.* 1990).

Another problem that the herpetologists of the CRTA are faced with is species hybridisation. Quite frequently, tortoises of different species or subspecies, brought in through international trade, have lived together in captivity and interbred. Hybrid individuals pose a risk to wild populations because of the possible transmission of diseases and malformations (Pérez Ibarra *et al.* 2010: 43). For this reason, under the supervision of veterinarians, sick or hybrid individuals that arrive at the wildlife centres are euthanised with an injection of pentothal. Emergency conservation often involves making quick decisions that are controversial for the public. The elimination of individual animals to preserve a species is part of an ethical dilemma that has been addressed in environmental philosophy by authors such as Puig de la Bellacasa (2017), Rose (2012) or Van Dooren (2014). Species conservation often involves sacrificing other animals, in order to preserve the health or genetics of the species being conserved, or simply as food for carnivorous animals in animal sanctuaries. It also involves forcing animals to live in captivity in unfamiliar places, exposed to stress and aggressive practices, such as artificial insemination. This is what Van Dooren (2014) terms the “violent-care” of conservation, the latent violence that exists in the care of wild animals for the greater good of safeguarding the species.

Protective actions, prompted by a situation classified as an ecological emergency, are aimed at a species in general, not a particular individual or subject. This is a clear case of how a human notion of temporality, characteristic of our era, such as the notion of emergency in the face of the threat of extinction, has a profound impact on the temporality of tortoises, who go about their existence, with a slow life rhythm and reproductive cycle.

TORTOISES AND THE END OF TIME: EXTINCTION AS A TEMPORAL WINDOW

While ancient peoples used tortoises to explain the beginning of time through myths, modern societies have used them to imagine and become aware of the end of time through processes of the extinction of species, even at the risk of mythologising animal species once again, as Watson (2016)

warns. As Sodikoff (2012) explains in the introduction to her book, *The Anthropology of Extinction*, Charles Darwin did not discuss rapid and catastrophic extinctions, but gradual ones. However, his reflections on the laws of variation among species in the Galapagos served as inspiration for the image we have today of the sixth massive extinction, which began precisely at the time when Darwin lived, with the industrial revolution and western expansion underway. Zoologists are now detecting extinction rates so high that over the last 100 years, the number of vertebrates that have gone extinct is equivalent to what would have taken 10 000 years if it weren't for human activity (Ceballos *et al.* 2015). In the case of turtles, McCallum (2021) shows that starting in the 16th century, and becoming more accelerated since the 1980s, turtle species are going extinct at a rate that exceeds the losses observed at the Cretaceous–Paleogene border, when the massive and sudden extinction of three quarters of the planet's species took place some 66 million years ago, probably due to the impact of a comet.

When Darwin visited the Galapagos in 1835, it had been only three years since Ecuador had annexed the islands and settlers had begun to arrive. Before that, passing sailors and pirates had occasionally captured tortoises as a food source. However, the arrival of two or three hundred settlers with their domestic animals (dogs, pigs, sheep, and the like) meant that when a new naturalist expedition travelled through the Galapagos only 11 years after the HMS Beagle, they noted that “the progress of civilization had been great” (Günther 1877: 6), and that the tortoises had gone extinct. This is recounted by Günther (1877), director of the zoology department at the Natural History Museum in London, in a book entitled *The Gigantic Land-Tortoises (Living and Extinct)*. The introduction to this treatise is a chilling portrait of how tortoises became extinct from entire archipelagos such as the Galapagos or the Mascarene Islands, located practically on the other side of the world. This book was one of the first treatises on species extinction. Zoologists, naturalists and collectors themselves contributed to the extinction of animal species, as Van Dooren (2022) has extensively documented in the case of many species of snails in Hawai'i. But it was above all the organisation of colonial extractivism that wiped out animal species such as the giant tortoises (*Cylindraspis*) of the Mascarene Islands (Mauritius, Rodrigues and La Réunion). No more than the arrival of Europeans was enough to cause the extinction of the dodo in Mauritius, where “the coming of Europeans set off wild ecological oscillations” as Alfred Crosby puts it, leading to what he called European ecological imperialism (Crosby 1986: 91; see also, for Mauritius, Ray 2023: 126). On the island of Rodrigues however, the extinction of the tortoises was coldly and methodically executed: between 1732 and 1771, some 280 000 tortoises were captured and shipped off by a small group of soldiers and slaves (North-Coombes 1994). The cats (*Felis catus* Linnaeus, 1758), dogs (*Canis familiaris* Linnaeus, 1758), rats, and pigs (*Sus domesticus* Erxleben, 1777) that had been introduced did the rest, hunting tortoise eggs and juveniles until they were completely wiped out. The giant tortoise provided abundant fresh meat that could be transported and

was considered delicious (better than lamb according to the chronicles) during the period of colonial expansion across the oceans, preventing scurvy on board. They could be kept alive for up to three months without food or water (Devaux 1991: 49). Their fat was used as fuel for lighting, to caulk boats, and for medical uses (Hume *et al.* 2021). The tortoises were thus used as a pantry for colonial expansion, an expansion that, as we all know, meant the end of many human communities, many cultures and many living species.⁴

Although Darwin did not discuss the extinction of the tortoises, his writings on the Galapagos, widely distributed in Europe, as well as the incorporation of giant tortoises into zoological collections, contributed significantly to increasing their popular appeal. This was particularly the case in London, a city that in the 19th century had become the capital of the largest colonial empire in the world, and the centre of the global trade in exotic animals (Thomas 2014: 64). Tortoises soon became fashionable in Europe. By 1861, 20 000 tortoises were being imported annually to London from the Moroccan port of Essaouira alone (Thomas 2014: 56). At the beginning of the 20th century, tens of thousands of tortoises that had been taken from their natural habitat were sold in shops in England for only six pence or given away as prizes at fairs. The British climate and a lack of knowledge of how to care for them reduced their survival rate to less than 10% of the animals imported (Lawrence 1988: 187; Stanford 2010:153).

The *Testudo* genus (including *T. graeca* Linnaeus, 1758, *T. hermanni*, *T. horsfieldi* Gray, 1844, *T. kleinmanni* Lortet, 1883 and *T. marginata* Schoepff, 1793) was subject to intense international trade between 1975 and 2000, according to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) data (Türközan *et al.* 2008). During this period, more than two million live individuals were traded, of which 67% had been taken from the wild and the rest from commercial breeding farms. The principal exporters were Morocco, Turkey, and countries that made up the former Yugoslavia. The principal importers were the United Kingdom, Germany, and the United States.

Exact figures on the capture and trade of Hermann's tortoise in the Albera Massif do not exist. It is estimated that in Barcelona between 1965 and 1976, more than 55 000 tortoises of this species were sold, but the majority came from the Balkans or from Mediterranean islands, where they are more abundant than in the Albera (Soler Massana & Martínez Silvestre 2005). However, the volume of tortoises sold in Barcelona in ten years (55 000) is significant when compared to the estimated population in the Albera at the beginning of the 2000s, which was only 8 500. In our conversations and interviews with people from the Albera, several stories emerged about the plundering of tortoises from the natural environment. Several people told us that in the 1960s and 70s, people would go out with dogs that helped them locate the tortoises and they would take them away to sell them, just like someone going out to forage for mushrooms.

In 1982, EEC Regulation No 3626/82⁵ entered into force, which restricted the trade of certain endangered tortoise species taken from the wild, such as *Testudo hermanni* and *Testudo graeca*, but international illegal trafficking did not cease. In Catalonia, as mentioned above, trade in tortoises has been illegal since 1988. In fact, in 1987, the first CRTA premises –prior to its current location, where it moved in 1994 to improve security, among other reasons– were the target of a night-time robbery that took almost all the Hermann's tortoises in the centre at the time. They were never found, despite being marked and the various European herpetology associations being notified. The proximity to the border led the police to believe that the thieves had fled to France. According to official data from the Policia de la Generalitat-Mossos d'Esquadra (Catalan regional police), between 2005 and 2023, 376 Hermann's tortoise were seized, many of them coming from illegal trade on online platforms.

Removing tortoises from their natural habitat is something that humans have always done, and something that has clearly had an impact on their temporality. The consumption of this species was quite common in Europe through the modern period (De Grossi Mazzorin & Minniti 2000). In the Iberian Peninsula, specifically at the Atapuerca site in Burgos, archaeological records show human consumption of *Testudo hermanni* since the Lower Pleistocene (Blasco *et al.* 2011). In natural history treatises written since the 16th century, there are records of a tortoise in the southernmost part of Catalonia (bearing in mind that the Albera Massif is in the northernmost part) whose description matches that of *Testudo hermanni* (Bertolero & Martínez-Vilalta 1994), meaning that the *Testudo hermanni* population must have been very widespread throughout the territory. Over the centuries, it became extinct throughout the Iberian Peninsula, leaving the Albera with the only original (non-re-introduced) population. With the creation of the Ebro Delta Natural Park in 1987, *T. hermanni* were reintroduced into a protected area closed to the public, and other reintroduction projects are currently underway in various natural parks in the pre-coastal mountains of Catalonia (Bertolero 2025).

The near extinction of *Testudo Hermanni* has not only been caused by their removal from the natural environment for consumption or trade, but also, and above all, by the imbalance in the food chain caused by human beings: the use of pesticides in agriculture, large fires often started by humans, the construction of transportation infrastructure that fragments the territory, or, currently, the threat posed by the construction of large wind farms in the Albera Massif (Bougie 2023: 106, 107). This has a profound impact on the tortoises' temporality, bringing to a close their presence in a place they have inhabited for hundreds of thousands of years: archaeological findings provide evidence that Hermann's tortoise has been present in Catalonia since the Lower Pleistocene, some 900 000 years ago (Fèlix *et al.* 2006). A lineage extending back millennia is now becoming increasingly tenuous.

4. For specific historical-anthropological analyses of the relationship between the extinction of human groups and that of other living beings, see, e.g., Estes (2019) or Ghosh (2022).

5. Council Regulation (EEC) No 3626/82 of 3 December 1982 on the implementation in the Community of the Convention on international trade in endangered species of wild fauna and flora. <https://eur-lex.europa.eu/eli/reg/1982/3626/oj/eng>, last consultation on 8 September 2026.

MAKING SENSE OF THE LOSS OF THE FUTURE

Trouillot (1995) has shown that some historical events are “unthinkable” for their contemporaries, incidents that cannot be made sense of until many decades later. The Haitian Revolution, for example, or the principles that inspired it, were not understood in Western public opinion until 150 years later, after the end of the Second World War and decolonisation, according to Trouillot. When Darwin visited the Galapagos, the giant tortoises of Rodrigues (*Cylindraspis vosmaeri* (Suckow, 1798)) had already gone extinct, and in the Galapagos, the extinction of species such as the Pinta Island Tortoise (*Chelonoidis abingdonii* (Günther, 1877)) due to the effects of colonization was underway. But Darwin did not perceive this as a rapid and catastrophic extinction in the way that we might today. Forty years after Darwin, the zoologist of the Natural History Museum in London, Günther, described the extinction of various species of chelonians in detail, but he still saw it as something exceptional or circumscribed, as a secondary effect, or perhaps a lesser evil of the unstoppable progress of civilization (Günther 1877). Many years, almost two centuries, have had to go by in order to see the extinction of the tortoises as the prelude to something dire that also affects us human beings—in the words of Ceballos and his colleagues, as a sign that “the window of opportunity is rapidly closing” (Ceballos *et al.* 2015: 4). The difference lies in connecting the extinction of a particular species of tortoise to universal becoming or, in the words of Hervé Barreau, referenced above, to the simultaneity of coexistence that extends to the entire inhabited world.

In conversations with farmers of the Albera Massif about the Hermann’s tortoise, a detailed list of animals that have disappeared from its everyday landscape or whose presence has declined dramatically would always come up alongside the tortoises: mammals such as the water vole (*Arvicola sapidus* Miller, 1908), the polecat (*Mustela putorius* Linnaeus, 1758) or the common hedgehog (*Erinaceus europaeus* Linnaeus, 1758); freshwater fish such as the brown trout (*Salmo trutta* Linnaeus, 1758) or the mountain barbel (*Barbus meridionalis* Risso, 1827); insects such as the common glowworm (*Lampyrus noctiluca* (Linnaeus, 1767)); gastropods such as the garden snail (*Cornu aspersum* (O.F. Müller, 1774)); reptiles such as the asp viper (*Vipera aspis* (Linnaeus, 1758)); amphibians such as the common toad (*Bufo bufo* (Linnaeus, 1758)); and a large number of birds such as the chaffinch (*Fringilla coelebs* Linnaeus, 1758), the goldfinch (*Carduelis carduelis* Brisson, 1760), the song thrush (*Turdus philomelos* C.L. Brehm, 1831), the alpine swift (*Tachymarptis melba* (Linnaeus, 1758)) and Bonelli’s eagle (*Aquila fasciata* Vieillot, 1822), among others. Seated in his stone cottage nestled among the grapevines, an elderly farmer remarked with bitter irony: “Before, there were thousands of snails when it rained. Now there aren’t any. Not one, not anywhere. If you need one for a medical remedy, you won’t find a single one.”

However, in addition to citing the list of animals that you don’t see much anymore, they also insisted, in their accounts of the transformations of the natural landscape of the Albera,

in talking about rural depopulation and the end of agriculture. Sitting in front of the fireplace in the kitchen of an 18th century farmhouse, chatting with Climent and his wife, Llúcia, this topic came up. After telling us about each and every one of the difficulties they face in their agricultural and livestock farming activities (vineyards, olive groves, cows and pigs) due to high production costs and low market prices, and compounded by all the bureaucratic legal obstacles imposed by the government, Climent repeated insistently, with Llúcia nodding in agreement: “Agriculture has no future, it’s dead.” His grandson loves to ride with him on the tractor, but he won’t be able to follow in his footsteps as a farmer. This phrase, “agriculture has no future” sums up what many of the farmers, herders, and woodcutters we spoke with told us. A local historian, a retired teacher who since his youth and until today has walked the Albera Massif alone with his dogs in order to study popular architecture and rural history, told us as he showed us one of his books: “I’ve seen many of these farmhouses, I’ve eaten at the homes of these people, they’ve told me their stories, and now the highest wall is one metre high: destroyed.” (Fig. 5).

Julia is a biologist in his forties, born in the region’s capital, who works as an environmental educator. During our interview, he was talking about the most endangered species in the Albera (mainly the tortoises), about the effects of drought and climate change, about the abandonment of traditional activities and the rural depopulation that is leading to the ruin of old farmhouses, fountains, and paths. Suddenly, he said: “For the Catalan people, we have the sensation that we’re disappearing: the tramontana is disappearing, our language is disappearing (...)” The tramontana is a wind from the north, very characteristic of the region, and linked to the idiosyncrasies of its people. In the last ten years a 40% decrease in its frequency and duration has been documented, a fact attributed to climate change (Corral Buela 2024). And the social use of the Catalan language is rapidly declining for a variety of reasons that we do not have the space to detail here. Suffice it to say that 20 years ago, Catalan was the everyday language of half of the population and today of only a third, according to official survey data.⁶

The tortoises of the Albera have not yet disappeared, probably thanks in large part to the efforts of the CRTA over the last 40 years. But the spectre of extinction looms large for them and for Catalan culture as we have known it. The impression that there is a link between species extinction and human culture is being analysed from the perspective of environmental philosophy by authors such as Van Dooren (2014), Rose (2017), Albrecht (2019) and Mbembe (2023), between others. For example, in his latest book, Mbembe (2023) develops the idea of a “generic rupture” with the world that we have known until today because of climate change, the loss of biodiversity, and the exacerbation of political tensions and inequalities. This rupture was experienced by many of the Earth’s inhabitants before us, both human and non-human,

6. Statistical Institute of Catalonia. Survey on Language Uses of the Population. <https://www.idescat.cat/pub/?id=eulp&lang=en>, last consultation on 8 September 2026.

as a consequence of a long series of colonial destruction. For his part, Albrecht (2019), in his formulation of the concept of “solastalgia,” argues that the climate crisis – manifested in phenomena such as droughts, wildfires, pollution, and mass extinction – is causing the loss of landscapes that gave identity to their inhabitants. This gives rise to experiences of uprooting comparable to those experienced by indigenous populations in the wake of European colonization, when the devastation of their territories resulted in a rupture in the temporal continuities that sustained their social life. The loss of essential components of the natural landscape, such as the disappearance of plant and animal species, shapes the perception of a temporal horizon that is closing for human cultures, too.

CONCLUSIONS: BEYOND HUMAN TEMPORALITY

In this article, we have tried to show that the relationship between humans and tortoises in the Albera Massif is not only ecological, but also temporal. Humans and tortoises create polyphonic temporalities made up of different rhythms and meanings. Historically, tortoises have been used as symbols of the origins of time and, today, in the case of the Albera discussed in this article, as indicators of its end through notions of emergency and extinction. Inversely, human actions have shaped the temporal horizons of tortoises, in both detrimental and restorative ways. This dual dynamic reveals how non-human temporalities influence human imaginaries and concrete practices, from mythology to conservation policies. Likewise, we must consider the inverse perspective: how human temporalities have impacted and continue to impact the temporal horizon of tortoises. Ultimately, humans and tortoises inhabit different but mutually influential temporalities. The meeting point between the two may be found in the notion of the future, in the coordination between species, as Tsing (2015) proposes.

Almost a century ago, the Estonian biologist Jakob von Uexküll coined the term “*umwelt*” (perceptual life-worlds or subjective worlds). Although it is not possible for us to fully enter the “*umwelt*” of another animal, Uexküll (2010) invites us to make forays or excursions into the subjective worlds of non-human animals. On one such foray, the biologist leads us along the path of time by way of snails and concludes that the subjective time of a snail elapses at a rhythm of three to four moments per second, meaning that in the snail’s world, processes of movement occur much faster than in ours. Ethologists are well aware that the experience of time varies greatly from one living species to another. Healy *et al.* (2013), for example, showed that there is a difference in temporal perception between tortoises and humans similar to the one Uexküll described between snails and humans.

However, even though tortoises and humans live in different time-perception worlds, even though we perceive time at different rates, there exists an interconnection between the temporality experienced by tortoises on the one hand, and humans on the other. The coexistence of the people

of the Albera, whether farmers or herpetologist, with the Hermann’s tortoise has produced domestic temporal relationships, environmental associations, arguments to defend the territory from military threat, and, above all, a sense of the passage of linear time, stretching toward both the beginning and the end of time but also of cyclical time, in the synchronization of the seasonal and generational rhythms of tortoises and humans. We have tried to show that there exists a mutual influence, that the temporality of tortoises affects the temporality of humans and *vice versa*, within the reciprocal relationship advocated by Haraway (2003). The unhurried life of tortoises, their longevity and ancient appearance, have given rise to human mythologies that have allowed us to explain the origins of the world. In contrast, the explosive way of life humans have adopted since the emergence of capitalism has resulted in a context of ecological emergency – one that accounts for the end of the world for different species of tortoises that are in danger of extinction, that affects animal life but also human culture, and that warns of us of futures that are closing off before us.

Multispecies anthropology is not without its critics. Watson (2016) warned that it is prone to displacing social and cultural concerns onto animal life, in a context marked by global crises that are pushing humanity towards catastrophe scenarios. According to Watson, the so-called “animal turn” in anthropology tends to mythologize non-human animals, turning them into metaphors for the human world and its concerns instead of drawing on zoological studies to acknowledge their own experiences and problems, and ultimately projecting an anthropocentric gaze onto them. In this article, we have tried to avoid this pitfall by taking into account the impact of human temporality on tortoises while at the same time analysing the impact of tortoise temporality on humans. We have turned to myths, and in particular the myth of time – as formulated by Barreau (1996, 2000) – as a means of thinking about the coexistence of all living beings. But we have also sought to address what herpetology and the history of herpetological science can contribute to social anthropology in the study of the relationship between humans and tortoises.

Everything humans have done in relation to tortoises over the centuries – consume them, trade them, exhibit them, keep them as pets, but also study them and protect them – has had and continues to have an impact on their temporality. In the same way, the temporal existence of chelonians, their ancestry, longevity, slowness, seasonal and reproductive biological rhythms, etc., has informed the construction of a narrative of mythical-historical social time, as well as the narrative of human becoming toward an uncertain future in our current era. We believe that it is based on this recognition that we can build the foundation for a new vision of the future based on the coordination between species that Tsing (2015) advocates. In a context of ecological crisis, thinking about the coordination between human and non-human temporalities is not only a theoretical exercise, but also an opportunity to imagine shared futures. The anthropology of time, as it integrates these interdependencies, can contribute to redefining the notion of becoming beyond anthropocentrism.



FIG. 5. — Farmhouse in ruins in the municipality of Espolla (Albera massif). Photo credit: E. Carbonell.

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