


THE PRACTICE OF KITESURFING ON THE COAST OF PIAUÍ AND ITS IMPLICATIONS FOR NATURAL HERITAGE

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André da Silva Dutra¹

Federal Institute of Maranhão (IFMA)

Federal University of Minas Gerais (UFMG)

São Luís – MA – Brazil

<https://orcid.org/0000-0003-4435-0021>

Maria Cristina Rosa²

Federal University of Minas Gerais (UFMG)

Belo Horizonte – MG – Brazil

<https://orcid.org/0000-0003-0534-9407>

ABSTRACT: Considered a natural heritage, the coast of Piauí is a Brazilian and international reference for kitesurfing, a little-studied nature sport, although it appears in research on the tourism development in the region. This article analyzes the implications of the practice of kitesurfing on this coast and identifies actions that may contribute to its conservation. Qualitative, exploratory research was conducted using bibliographic and documentary research. On specific beaches, there are conflicts between kitesurfers, fishers, and bathers, and the practice also poses risks to wild animals. However, some kitesurfers collect garbage at sea and promote discussions on the effects of the sport in the region. Addressing environmental education in kitesurfing certification clinics and regulating kitesurfing may collaborate to resolve conflicts and promote more sustainable tourism, aiming to conserve this heritage and its potential.

KEYWORDS: Water sports. Tourism. Environmental health education.

A PRÁTICA DO KITESURF NO LITORAL PIAUIENSE E SUAS IMPLICAÇÕES SOBRE ESTE PATRIMÔNIO NATURAL

RESUMO: Considerado patrimônio natural, o litoral piauiense é referência nacional e internacional para o Kitesurf, esporte na natureza pouco estudado, embora conste em pesquisas sobre desenvolvimento turístico na região. Este artigo analisa implicações da prática do Kitesurf nesse litoral e identifica ações que podem contribuir para sua conservação. Realizou-se pesquisa qualitativa, exploratória, mediante pesquisa bibliográfica e documental. Em certas praias há conflitos entre kitesurfista, pescador e/ou banhista; além da prática oferecer riscos para animais silvestres. Todavia, há

¹ Master's Student in Tourism and Hospitality – UNIVALI – SC. Integrated Network of Physical Education Teachers of the IFMA PROEF Network and Caparaó – Research Group on Nature (UFMG).

² Doctoral Student in Education – UNICAMP. Caparaó – Research Group on Nature and Research Group on History of Leisure (HISLA).

kitesurfista que recolhe lixo no mar e promove discussões sobre efeitos do esporte na região. Abordar a educação ambiental em clínicas de certificação de kitesurfistas e regulamentar o Kitesurf pode colaborar com a resolução de conflitos e perspectivar um turismo mais sustentável, almejando conservar esse patrimônio e suas potencialidades.

PALAVRAS-CHAVE: Esportes aquáticos. Turismo. Educação em saúde ambiental.

Introduction

According to Dias (2007), sports are, along with tourism, one of the primary forms of leisure in nature. Practiced in natural environments, nature sports, it is argued, are not restricted to bodily technique but are historically motivated by adventure and risk.

Kitesurfing is a recent nature sport that originated from inventions with inflatable structure kites by French brothers Bruno and Dominique Leganoix, who, throughout the 1980s and 1990s, perfected and recorded their inventions through patents, collaborating significantly for kitesurfing to reach the way it is practiced nowadays (ALCANTELADO, 2009).

Kitesurfers use a board attached to their feet and a traction kite with an inflatable structure, allowing them to glide over the water surface and, at the same time, take flight over aquatic surfaces such as seas, rivers, lakes, or reservoirs, with light or strong winds (ABETA, 2022).

Like other modern sports practices of a nautical and aquatic nature, such as windsurfing and stand-up paddleboarding (SUP), kitesurfing emerged grounded in a new aesthetic standard of an athletic body and under the domain of technological innovations nourished by the ideal of the interaction between the practitioner and nature (PEREIRA & DANTAS, 2019). Its primary characteristic concerns its relationship with wind direction and intensity (BERNEIRA et al., 2011; MACHADO & COERTJENS, 2011).

According to Bitencourt and Navarro (2006), kitesurfing started to be practiced in Brazil around 1996, more precisely in Búzios/RJ. After two years, the sport started to be developed in Guarapiranga/SP. Since the 2000s, with the holding of one of the stages of the Kitesurfing World Circuit in Barra da Tijuca/RJ, it became popular in different states of the country (BITENCOURT & NAVARRO, 2006; ALCANTELADO, 2009).

On the coast of Piauí, the locus of this study, specifically the Barra Grande Beach, kitesurfing started to be practiced in the 2000s, having as one of the leading advocates Ariosto Ibiapina—entrepreneur and physician from Teresina who was an apprentice of the sport at the time—who built on the site the inn Barra Grande Kite Camp (BGK) to offer support and structure to kitesurfers who started to choose this location to practice the sport (MACÊDO, 2011).

From this investment, it is considered that the kitesurfing practice extended to other beaches on the coast of Piauí, even producing in such coastal spaces a real-estate valorization logic (PEREIRA & DANTAS, 2019) not only because this activity is sportive and leisurely, but also due to the tourism flow of kitesurfers coming from urban agglomerations of other regions of Brazil and other countries, connected to Sports Tourism and Adventure Tourism.

It should be noted that on the beaches of the coast of Piauí, Adventure Tourism, which "comprises the tourism movements stemming from the practice of adventure activities of a recreation and non-competitive nature" (BRASIL, 2010, p. 14, our translation), occurs more regularly than Sports Tourism, which "comprises the tourism activities stemming from the practice, involvement, or observation of sports disciplines" (BRASIL, 2006, p. 23, our translation).

In Adventure Tourism, the practice of kitesurfing takes place freely on beaches, at the kitesurfing schools installed in the region, or social projects promoted by

Non-Governmental Organizations (NGOs); in turn, Sports Tourism occurs on an ad-hoc basis during some days of the year and on specific beaches chosen by entities responsible for organizing kitesurfing or downwind competitions.

Boosted primarily by the practice of kitesurfing as one of its economic activities (ARAÚJO & ROS, 2014), tourism has led to the transit of more people on the coast of Piauí, especially in the months in which the trade winds are stronger, eliciting the event of new practices and other forms of appropriation of spaces by individuals, which in recent decades, have modified the landscape, as well as the attitudes of humans toward nature (LEFF, 2019, 2010, 2011).

In this context, the following questions are asked: what have been the attitudes of kitesurfers toward local residents and the coastal space of Piauí? How have they dealt with this natural heritage? This study aimed to understand the implications of the practice of kitesurfing on the coast of Piauí considering the natural heritage and to identify actions that may contribute to its conservation.

Methodology

This qualitative study adopted strategies for exploratory and descriptive purposes: a bibliographic review (MENDES et al., 2008) and documentary research (CRESWELL, 2010). The review was carried out online in the database of the Capes Journals Portal (<https://www-periodicos-capes-gov-br.ezl.periodicos.capes.gov.br/?>) and the Capes Dissertation and Thesis Catalog (<http://catalogodeteses.capes.gov.br/catalogo-teses/#!/>) for scientific articles of the Brazilian and international literature on the topics of kitesurfing, tourism, leisure, nature sports, natural heritage, environmental education, and tourism on the coast of Piauí.

The documentary research occurred in two stages. Initially, data was collected about the ramifications of kitesurfing on the coast of Piauí on Piauí websites, such as news websites, blogs, kitesurfing schools, and NGOs. In this regard, the following web pages were searched: the news portal of TV Cidade Verde (<https://cidadeverde.com/buscar/noticias/kitesurf>); the G1 portal of TV Globo (<https://redeglobo.globo.com/busca/?q=kitesurf>); Jornal da Parnaíba (<https://www.jornaldaparnaiba.com/search?q=kitesurf>); the blog Barra Grande News (<https://barragrandenews.com.br/?s=kitesurf>); pages of the Kite Escola Paraíso kitesurfing school on Instagram (https://www.instagram.com/kiteescolaparaíso/?hl=pt&__coig_restricted=1) and Facebook (<https://www.facebook.com/kiteescolaparaíso>); the BGKite School portal (<https://www.bgk.com.br/en/bgkite-school>); and the NGO Projeto Vivo (<https://projetovivokitesurf.wordpress.com>). Additionally, the Facebook page of the Piauí Kitesurfing Federation (APK) (<https://www.facebook.com/APKitesurf>) was analyzed.

As an online search strategy for this research, the descriptor "kitesurf" and a combination of different descriptors were used: "kitesurf" and "turismo" (tourism); "kitesurf" and "natureza" (nature); "kitesurf" and "lazer" (leisure); and "kitesurf" and "conservação ambiental" (environmental conservation).

Later, the files and online collections of official websites of the city halls of municipalities on the coast of Piauí were examined in search of laws, memorandums, letters, reports, management plans, and strategic plans on the practice of kitesurfing, tourism, and nature preservation and conservation. These were: Ilha Grande (<https://ilhagrande.pi.gov.br/>), Parnaíba (<https://parnaiba.pi.gov.br/phb/?s=kitesurf>), Luís Correia (<https://www.luiscorreia.pi.gov.br/>), and Cajueiro da Praia

(<https://cajueirodapraia.pi.gov.br/>). In both methodological strategies, the documents that did not address kitesurfing on the coast of Piauí were excluded.

The collected data were categorized and analyzed according to the ordering, classification, and actual analysis procedures (MINAYO, 2014). As a general category, we established the implications of kitesurfing, from which two subcategories were designated: negative, to discuss conflicts with fishers, bathers, and the environment; and positive, to address conservationist actions and the possibility of contextualizing the environmental education theme when teaching kitesurfing. All data referring to these two subcategories were articulated initially to those of the general category and later to the relevant Brazilian and international literature.

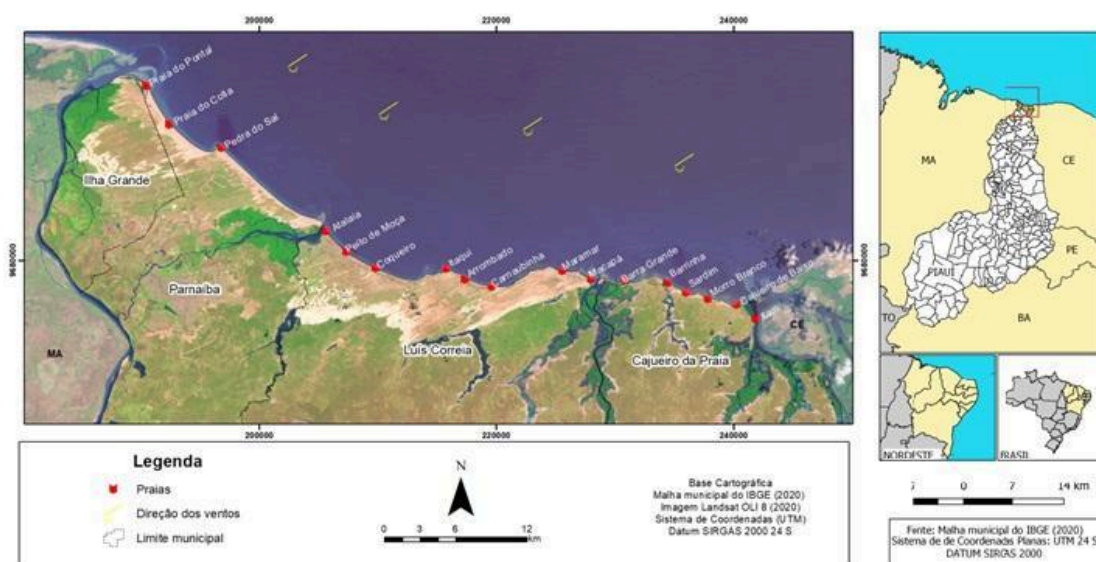
About the coast of Piauí and kitesurfing

With 66 km of extension, the coast of Piauí is comprised of four municipalities: Ilha Grande, located west, on the border with the state of Maranhão; Parnaíba and Luís Correa, in the central portion; and Cajueiro da Praia to the east, on the border with the state of Ceará. This territory has extensive fluvial-marine plains interspersed with a network of rivers that flow into the Atlantic Ocean, forming estuaries that are, in this case, transition environments between rivers and the sea (Figure 1).

The estuaries formed by the Parnaíba, Timonha, and Ubatuba rivers serve as nurseries and shelters for several endangered species, such as the birds *maçarico-de-papo-vermelho* (red knot), *maçarico-rasteirinho* (semipalmated sandpiper), *maçarico-de-costas-brancas* (short-billed dowitcher), and *maria-do-nordeste* (buff-breasted tody-tyrant), the mammals *peixe-boi-marinho* (West Indian manatee), *guariba-de-mãos-ruivas* (Maranhão red-handed howler), and *boto-cinza* (Guiana dolphin), and turtles *tartaruga-cabeçuda* (loggerhead sea turtle), *tartaruga-de-pente*

(hawksbill sea turtle), tartaruga-oliva (olive ridley sea turtle), tartaruga-verde (green sea turtle), and tartaruga-de-couro (leatherback sea turtle) (ICMBIO, 2022).

Figure 1: Coast of the state of Piauí (Brazil)



Source: prepared by the authors (2023)

On the border of the state of Piauí with Maranhão, the Parnaíba River branches off, forming five outlets: Igaracú, Canárias, Caju, Melancieira, and Tutóia, creating an archipelago with 70 islands and an area of approximately 2700 km² comprised of streams, mangroves, dunes, and lagoons (ICMBIO, 2022).

On the border with the state of Ceará, the Timonha and Ubatuba rivers converge, creating an estuarine basin and integrating a complex system of channels and river islands until reaching the fluvial-marine plain. There is a sole connection of this system with the sea, located between the beaches of Cajueiro, in Piauí, and Pontal das Almas, in Ceará (DIAS, 2005).

The entire coast of Piauí is part of the Parnaíba Delta Environmental Protection Area (EPA), a Conservation Unit (CU) category of sustainable use created by the unnumbered Federal Decree of August 28, 1996 (BRASIL, 1996), with the Chico Mendes Institute for Biodiversity Conservation (ICMBIO), the agency responsible in

this EPA for executing actions of the *Sistema Nacional de Unidades de Conservação da Natureza* (SNUC, National System of Nature Conservation Units), being able to propose, implement, manage, protect, inspect, and monitor the area. Moreover, it can foster and execute research, protection, preservation, and biodiversity conservation programs and exercise the power of environmental police to protect the unit (ICMBIO, 2020).

One of the main arguments for the mobilization and creation of this EPA was the considerable population of West Indian manatees on the coast of Piauí. It is worth noting that since 1994, activities of the West Indian Manatee Project—the unit of which operates through a partnership between the Aquatic Mammal Foundation and Petrobrás with the financial contribution of the latter (MACÊDO, 2011; DUTRA, 2015)—are carried out on Cajueiro Beach, in the municipality of Cajueiro da Praia, from environmental actions conducted by experts and local residents in schools and communities of the region, as well as tourists (MACÊDO, 2011).

The said beach is located in the first Brazilian municipality to receive the title of Natural Heritage of the West Indian manatee (NETO, 2006), which is why Municipal Law No. 51 of March 12, 2003, made the local city hall responsible for protecting this mammal in its natural habitat, i.e., in the estuaries, rivers, and sea, and gave this agency the right to exploit this title to increase the tourism activity in the area, as well as articulate partnerships with entities to preserve this species (NETO, 2006).

Inhabited by a culturally diverse population that cultivates traditional activities—such as artisanal fishing, passed down from parents to children, allowing to establish the everyday life pace in a permanent link with nature; plant extraction (collection of fruits and seeds); and family farming without the use of pesticides and animal husbandry, associated with the subsistence and food security of the families that

reside there (ICMBIO, 2020)—the coast of Piauí is understood, in the present study, as a natural heritage that "before all, is part of human life, not opposed to it" (SCIFONI, 2006, p. 27, our translation), i.e., part of a notion of heritage "connected to the social practices and the collective memory, thus involving a broad use and social appropriation" (SCIFONI, 2006, p. 27, our translation).

In the view of the aforementioned author, a natural heritage

does not represent only the testimonies of native, untouched vegetation or ecosystems little transformed by society but is part of the social memory insofar as it incorporates, above all, landscapes through which human life is produced and reproduced (SCIFONI, 2006, p. 16).

Such landscapes (BESSE, 2014) are composed of mangrove areas, dunes, and areas of ecological tension comprised of Caatinga to the east, Cerrado to the southeast, and marine systems to the north (CASTRO, 2007), the local population and tourists, due to the consolidated Sun and Beach Tourism that occurs in the region (ARAÚJO & ROS, 2014), which is backed by tourism activities related to recreation, entertainment, or rest on beaches due to the joint presence of water, sun, and heat (SNPT, 2006), as well as by the temperature, which is mild or hot throughout the year, favoring a warm and pleasant sea bath (FERREIRA, 2012).

In this environment, in which there are possibilities for different recreational practices, such as boat and canoe trips, free and autonomous diving, canoeing/rowing, surfing, windsurfing, cart rides, and hiking (ARAÚJO & ROS, 2014), the practice of kitesurfing stands out, with ramifications resulting from its full articulation with the natural attractions that exist, especially the taking advantage of the strong trade winds that occur notably during the second half of the year—a period that covers part of the Brazilian summer (CARVALHO, 2010; FERREIRA, 2012).

As a contemporary nature sport, investigations into its practice have increased in recent years despite still being reduced. Brazilian and international publications have

mainly shown interest in analyses of injuries and physiological aspects related to the practice of this sport. However, some studies have presented other perspectives, such as that by Alcantelado (2009), which discussed the role of leader kitesurfing users in developing the sport in the world, and by Pereira and Dantas (2019), which addressed the sociocultural valorization of coastal spaces in the tropics, in which the logic of recognition of these coastal spaces stems from conventional modern maritime practices—such as sea baths and sun baths, respectively—until converging, nowadays, with practices of a sportive, aquatic, and nautical nature, with greater emphasis on kitesurfing.

However, studies on kitesurfing on the coast of Piauí, a Brazilian and international reference for its practice, are still scarce, despite this being a topic particularly addressed in research on the tourism development in these locations, such as the studies by Carvalho (2010), Macêdo (2011), Ferreira (2012), Araújo and Ros (2014), Dutra (2015), Silva (2013), and Braga and Guzzi (2021), among others. Even less common are studies that reflect on the practice of this sport and its impacts on nature.

Although restricted, these studies have the kitesurfing practices on the coast of Piauí as a focus/highlight and help—together with the findings of the documentary research conducted herein— map situations that allude to the actions of kitesurfers in this coastal space, with consequent implications on the sport, with it being possible to identify both negative and positive consequences for the coast of Piauí, namely regarding the ramifications linked to Adventure Tourism.

On the Conflicts with the Practice of Kitesurfing on the Coast of Piauí

Among the negative ramifications, conflicts between local fishers and bathers on some beaches were observed, as well as risks to the environment, particularly some species of wild animals in the region.

As Silva and Santos (2017) stated, on Pedra do Sal Beach in the municipality of Parnaíba, local fishers claimed that kitesurfing drives the fish that serve as income sources from the beachfront, preventing fishing. However, according to them, the practice of kitesurfing is not frequent, and what generates the biggest concern is the installation of a residential and hotel complex, Pure Resorts Hotels & Residences, which maintains in its execution project a station for teaching and practicing kitesurfing for its guests and visitors.

As they showed, this undertaking and others that may arise in the location and which have actions that stimulate the practice of kitesurfing have caused fishers to fear that artisanal fishing is hindered or extinct, leaving them no alternative other than migrating to other places. Moreover, promises of short-term employment—made by the company responsible for constructing the resort—divided the community. Bearing this in mind and considering the damages that this undertaking may cause in the location, fishers, artisans, extractors, and other native residents of the community combat the policy of "divide and conquer" (SILVA & SANTOS, 2017).

Similarly, conflicts were observed on Barra Grande Beach in the municipality of Cajueiro da Praia between local fishers and kitesurfers due to the "scarcity of riverine fish that were pushed to the bottom of the sea due to the practice of kitesurfing, causing changes to the local ecosystem and traditional fishing habits" (MACÊDO, 2011, p. 60, our translation).

When discussing the actions of residents of this community with kitesurfers, a testimony evidenced in the study by Ferreira (2012) restated this situation:

one day, a group of fishers, tired of going home "empty-handed" because of the kitesurfers who, at high tide, migrate to the estuary of the Camurupim River and spend the entire afternoon kitesurfing, "driving away the fish" with the agitation and noise that the boards cause in the water, "put the gringos to run" with machetes and oars, threatening to damage the kitesurfers' equipment. They also destroyed the obstacles built with tree trunks by the kitesurfers to intensify the adventure experience (FERREIRA, 2012, p. 140, our translation).

It is clear from this account that the uses of the sea by the different individuals have caused different actions. In 2010, for example, the Association of the Residents of Barra Grande caused a discussion in the location and decided to contact the Port Authority to attempt to establish a use limit of the sea by the kitesurfers, but was not successful in its demand since the problem only worsened (MACÊDO, 2011).

The arrival of these individuals was and is stimulated by Adventure Tourism, under the pretext of the publicization of this coast as ideal for practicing kitesurfing by some people who reside in the region, by the municipal initiatives of Ilha Grande, Parnaíba, Luís Correia, and Cajueiro da Praia, as well as the Piauí state public power, betting on the publicization of this coast through publications on inn websites and folders and pamphlets of the Department of Tourism, besides promoting events and encouraging local, national, and international publications, among other actions (MACÊDO, 2011).

As an attraction and tourism product/on the coast of Piauí, kitesurfing started to move resources and attract investors who, through seaside holidays and the construction of second homes, acquired and acquire land in the location to establish housing and open commercial establishments.

Such a circumstance corroborates the findings of Pereira and Dantas, to whom the nature sports practiced by the sea, particularly due to the flows of mature sportspeople, reconfigure knowingly touristically well-structured municipalities and reach new destinations in states and municipalities being structured. Hence, the dissemination of maritime practices such as kitesurfing

has a dual spatial effect: I) it increases the hall of activities and attractions on the coasts (poles) that are consolidated and receptive to other modern maritime practices, such as Salvador (Costa dos Coqueiros) and Fortaleza (Costa Sol Poente); and II) it inserts in villages and new spa towns (e.g., Cajueiro da Praia in Piauí and Barreirinhas in Maranhão) the logic of valorization of coastal spaces, adding them to the network of urbanized places due to leisure practices and the flows of city dwellers from urban agglomeration from other regions and nationalities (PEREIRA & DANTAS, 2019, p. 19, our translation, emphasis added).

In the case of Barra Grande, the idea of the valorization of its coastal space occurred because the community "adopted a dynamic different from that of other locations of the coast of Piauí and bet on the Sports Tourism, Adventure Tourism, and, more recently, Gastronomic Tourism to attract a more elite tourist profile" (BRAGA & GUZZI, 2021, p. 11, our translation).

With this, local tourism has grown and attracted practitioners of adventure sports, especially kitesurfing. Consequently, this location has attracted investors, motivated the arrival of new residents and the construction of other housing, boosted the opening of new commercial establishments (DUTRA, 2015), particularly those connected to tourism, linked to the practice of kitesurfing, with the exploitation of the practice of kitesurfing and related activities—such as sports events—impacting both the hall of activities and the valorization of this coastal space, equally bringing tension to the region.

Soon, Barra Grande became the leading tourist destination on the coast of Piauí (CUNHA, 2016). Although Adventure Tourism is not the only segment exploited by the community nor the one that moves the number of tourists, "it is the one with the most significant symbolic strength in publicity, in institutional discourses, be it of NGOs or the government, by Brazilian tourists and even by the local residents within the village itself" (FERREIRA, 2012, p. 11, our translation).

Additionally, Ferreira (2012) stated that, apparently, a specific group of people, including former owners of second homes in Barra Grande, friends, and acquaintances,

were responsible for publicizing the community as an ideal destination for the practice of kitesurfing through "word-of-mouth."

Notwithstanding, the negative implications of the practice of kitesurfing on the coast of Piauí are not restricted to conflicts between fishers and kitesurfers on the beaches of Pedra do Sal and Barra Grande. According to Equipe 180 (2019), in an article published on the 180graus.com portal, kitesurfing became the target of complaints in Barra Grande because of conflicts between kitesurfers and bathers on Barreirinha Beach, located in the municipality of Cajueiro da Praia.

Equipe 180 published several complaints made by a couple of physicians who had resided in the village for over 30 years about the risks of the sport, particularly to children and senior citizens. Among the complaints, it was described that:

My wife and I were surprised by a kitesurfing board one meter from our backs, at high speed, a recurring fact. After we complained to the practitioner of the sport, we were literally attacked by him, as he turned around and came back pronouncing profanity, sailing with the board in our direction, about two meters away, shouting for us to look for another bathing area, with us being about five meters from the beachfront, at a depth of approximately 60 cm (EQUIPE 180, 2019, p. 1).

There is certainly no official document that regulates the practice of kitesurfing on the coast of Piauí; kitesurfers sail freely along the beaches, allowing this sport to take place in a disorganized manner, generating conflicts with local residents, fishers, and bathers, among other people who use such territories.

Resorting to the ideas of Berkes (2005), when discussing social and ecological systems and rights of appropriation of natural resources, it is understood that the Piauí beaches are common resources of free access that may present two substantial characteristics in the future: the first would be the exclusion of people from the beaches, preventing access to these locations; the second would be the creation of ways to control access so that people may partially enjoy that which belongs to all.

These two situations were not occurring on the coast of Piauí at the time of writing but will likely be in the long term. However, the free practice of kitesurfing on the coast of Piauí, as it has been taking place, could constitute a practice with destructive characteristics to the natural heritage, excluding people from both traditional communities and other locations.

This way, because it is a nature sport inserted recently in this context, kitesurfing has its degrading nature little visible but may be glimpsed in the future in the face of Adventure Tourism that is insensitive to natural heritage, such as by the accumulation of garbage and sailing equipment forgotten by the sportspeople on the sands of beaches and by the collision with bathers and wild animals—facts that occur with some regularity in the location.

Moreover, the practice of kitesurfing poses risks to some species of wild animals that are concentrated in the region. On the beaches Pedra do Sal and Barra Grande, for example, the nesting of leatherback sea turtles, one of the most endangered species in Brazil, was witnessed, and the nesting of hawksbill sea turtles, another endangered species, was recorded ³(DUTRA, 2015).

The nesting period of these sea turtles in the region of the Parnaíba Delta EPA occurs from January to July, with sporadic periods in December and August (DE SANTANA et al., 2016). Coincidentally, in the second half of the year, there is a more significant incidence of trade winds on the coast of Piauí, as pointed out by Macêdo (2011), Ferreira (2012), and Dutra (2015), and, as a result, a more significant number of kitesurfers sailing on the Piauí beaches.

³ The Delta Turtles Institute, through the Delta Marine Biodiversity Project (Biomade), began its conservation activities directed at the management of the reproductive behavior of the five species that occur in Brazil: *Eretmochelys imbricata*, *Lepidochelys olivácea*, *Dermochelys coriácea*, *C. caretta*, *C. mydas* (DE SANTANA et al., 2016).

It is possible that, oblivious to the reproductive behavior of sea turtles, kitesurfers may destroy the nests of these species when they move inadequately on beaches, whether using animal traction vehicles such as carts or automotive vehicles, when they assemble their sailing equipment or when, on the sand zone, they receive instructions when learning the sport, among other situations that are common in the dynamic of this sports practice.

Besides the turtles, the West Indian manatee is another animal whose behaviors are threatened by the free practice of kitesurfing on the coast of Piauí. This mammal has unusual habits; for example, in the first hours of life, the mothers carry their young on their backs, near the surface, facilitating their breathing and synchronizing their movements. This type of practice is essential for the survival of the young of the species, occurring for a few days until they achieve control of breathing and swimming (ATTADEMO et al., 2020). However, when the mothers are with their young on the water's surface, there is likely a possibility of being run over by kitesurfer boards.

Other behaviors of these animals on the water surface may lead to accidents with kitesurfers, particularly when they are resting and remain with their eyes closed, presenting only movements of unconscious displacement of their bodies; when they swim against the tide, holding their position in the same place; when they are mating—which would be the reproductive act of the species; or when they dive with or without exposing their tails (ATTADEMO et al., 2020).

It has been pointed out that the coast of Piauí is home to about 70 species of West Indian manatees, considered the largest in Brazil (TV CLUBE, 2022). They live in the estuary formed by the Atlantic Ocean and the Ubatuba River, between the states of Piauí and Ceará. Oblivious to this information and the behaviors of the species,

kitesurfers could sail in the Ubatuba River mouths or even enter it, possibly causing accidents with these mammals in their natural environment.

Mitigating Conflicts for More Sustainable Adventure Tourism through the Practice of Kitesurfing

Regarding the positive ramifications, mobilizations to resolve the identified conflicts, thinking of the common good of local residents, tourists, and the environment, were observed. In Barra Grande, for example, there were actions to mitigate the possible negative effects of kitesurfing in the village, as pointed out by Ferreira (2012):

[...] local residents transport the gringos and their kitesurfing equipment from the inns to the river by cart. "Before, they came and went by car, by Hilux or motorcycle, but now they go by cart, which is less harmful to the environment—the turtle nests, for example—and eaves income for the community (p. 12, our translation).

Other initiatives were also located, such as the holding of the First Forum on Territory and Rights of the Traditional Communities of the coast of Piauí, promoted by the Piauí Environmental Network (REAPI) and the Active Island Commission (CIA) (MARTINS, 2017). This event took place in the city of Parnaíba in November 2017, aiming at debating the environmental impacts caused by the practice of kitesurfing that lacked better scientific investigations, as ICMBio environmental analyst Patrícia Claro addressed.

The analyst mentioned above stressed that since the practice of kitesurfing was introduced on Barra Grande Beach and extended throughout the Parnaíba Delta EPA in recent years, it has been promoting concerning environmental impacts, such as the death of surface fish like tainha (mullet), sauna (saltwater catfish), curimã, and tataranha due to the kiteboard maneuvers in the water. Moreover, kitesurfers sail in areas called river mouths, which serve as marine nurseries (MARTINS, 2017).

Debates on the possibility of regulating this nature sport for this coastal region were also verified. In April 2018, the First Kitesurfing Colloquium on the coast of Piauí was held in Barra Grande. At the initiative of ICMBio and the *Serviço Brasileiro de Apoio às Micro e Pequenas Empresas* (Sebrae, Brazilian Micro and Small Business Support Service) of Parnaíba, the event aimed to "discuss and seek ways to regulate kitesurfing on the coast of Piauí" (CIA, 2019, p. 1, our translation).

In September 2021, in a meeting between kitesurfing instructors of the Barra Grande village, the Municipal Department of Tourism and Environment of the state of Piauí, besides the Municipal Attorney's Office, proposed a pact with kitesurfers, regulating the entry and exit of kites, bathing areas, and zones for the operation of kitesurfing schools (DA REDAÇÃO, 2021).

Additionally, a one-off conservationist action called Eco Downwind Kite Bagre was found that has been carried out often on the coast of Piauí. During downwind, which means sailing in the same direction as the wind, kitesurfers traverse the Piauí beaches and collect garbage from the sea, joining sport and sustainability.

The initiative came from Francisco Flávio, known as Bagre, the owner of the Kite Bagre School. In the action, which has been taking place since 2012, the kitesurfers traverse different Piauí beaches at specific times or days, stopping at inns or lodging pints for rest (DA REDAÇÃO, 2015). There are:

[...] 66 kilometers of much adrenaline and contemplation of nature because, besides being beautiful, our coast has strong winds, calm beaches, and beaches with waves. In addition, the event continued with the proposition to promote, through adventure sports, awareness of the importance of sustainable tourism and preserving our coast (DA REDAÇÃO, 2015, p. 1).

An activity such as this denotes that the practice of kitesurfing, contextualized with environmental education, may contribute to the formation of conscious citizens respectful of their acts in nature, favoring the qualitative development of Adventure

Tourism in the region, unlike the form of conventional mass tourism, large scale and multinationalized, organized with solely commercial purposes, which does not recognize the limits of growth and the risks deriving from it; in which the insensitive behavior of tourists toward the destinations and hosting populations predominates (PIRES, 2002).

The more significant connection of kitesurfing, in its different nuances, as practice, learning, publicization, etc., may render the experience of sailing in nature more enriching and pleasant, providing the opportunity to strengthen the importance of the coast of Piauí for the current and future generations; contributing not only to the reflection on the complexity of humans and the environment during the ramifications of the practice of kitesurfing in the region but also about the different possible contexts where it may take place.

Knowledge of Federal Law No. 9795 of April 27, 1999 (BRASIL, 1999), which provided for environmental education, instituted the National Environmental Education Policy and other provisions, seems fundamental to stimulate the approach of environmental education during the practice of kitesurfing, giving rise to the creation of opportunities to reflect on the practical repercussion of Adventure Tourism on the coast of Piauí, motivating the conservation of this natural heritage more and more.

Such education is understood as

the processes through which an individual and the collective build social values, knowledge, abilities, attitudes, and competencies aimed at conserving the environment, a shared resource of the people essential to a healthy quality of life and its sustainability (BRASIL, 1999, p. 1).

The Brazilian Kitesurfing Association (ABK), the institution that regulates the practice of this sport in Brazil, has as its primary objective to "disseminate and promote kitesurfing adequately, responsibly, and safely," with the "safe practice and teaching of kitesurfing being one of its priority responsibilities" (LIMA, 2020, p. 1, our translation).

But safety for whom? Would nature also be a priority? Is there an approach to environmental education? Upon examining the contents of the Level 1 Certification Clinics on the ABK website, it was observed that they cover the following topics: knowledge checking; code of conduct of the ABK instructors; risk settlement, workshop; meteorology; wind effects; localization; Personal Protective Equipment (PPE); equipment checking; safety systems; equipment assembly; basic exercises; self-rescue and pack-Down (rescue technique); preference rules; priority rules; ABK teaching standard (LIMA, 2020).

The main focus is on the technical evaluation of the participating instructors for the presentation of institutional standards centered on safety, which denotes the irrelevance of nature as a natural heritage in these qualifications. In this sense, for a qualitative leap to occur in Adventure Tourism, mobilized by kitesurfing on this coast, it is necessary for the topic of environmental education, like other subjects on leisure, nature, and landscape, for example, to be contextualized in the Brazilian or international Certification Clinics for⁴ instructors of this sport. They could be advised on behaviors and attitudes during the practice that are capable of supporting the preservation and conservation of natural resources, among other initiatives.

Another tool that could favor the qualitative development of Adventure Tourism, causing connections between kitesurfers and nature, would be access to the interpretation of the environment during the non-formal teaching of kitesurfing, which

⁴ At the international scope, World Sailing is the world governing body of the sport of sailing, officially recognized by the International Olympic Committee (IOC), in which kitesurfing is included as a sports discipline (WORLD SAILING, 2020). The International Kiteboarding Association (IKA) and the Global Kitesports Association are associated with World Sailing and responsible for the central and joint management of international kitesurfing competitions (IKA, 2020). In turn, IKO is focused on kitesurfing education and offers recreational and professional courses with international certification for instructors of the sport (IKO, 2021). In Brazil, ABK is associated with the Brazilian Sailing Confederation (CBVELA) and has the mission to develop, manage, and certify the practice of kitesurfing safely, following the standards established by World Sailing (CBVELA, 2021). Instructors with an IKO certification may teach kitesurfing anywhere in the world since they must master English, whereas the ABK certification—for which there is no requirement for mastery of foreign languages—grants the instructors the teaching of the sport anywhere in Brazil.

occurs in schools for teaching this sport.⁵ This process could occur mainly when instructors of different kitesurfing schools installed on the coast of Piauí are teaching the sport to their students.⁶ At this time, there is the possibility of providing essential information on the local environmental, historical, and cultural resources and of creating sensibilization experiences that could generate actions to care for the environment.

At the Paraíso Kitesurfing School in Barra Grande, for example, the teaching of this sport, which is similar in the different schools despite singularities, occurs on three levels. At Level 1, which lasts for one and a half to two hours, the process takes place on the sand, an area called the beach zone, near the sea zone, with the instructor contextualizing information and demonstrating to the student aspects such as wind direction; how to assemble the equipment, e.g., life jackets, helmets with radio systems, board, kite, ropes, and harness basically; safety systems; ways to launch and land the kite; how to control and maneuver the kite in the wind windows; how to eject the kite in emergency situations; and how to dismantle the equipment used in this practice. At Level 2, with a duration of two hours and a half to four hours, the teaching occurs at sea, with the instructor teaching the student to perform body dragging, which would be to drag the body in the water upwind and downwind; besides self-rescue techniques. At Level 3, with four hours of navigation and at sea, the students start to climb on the board, experiencing sailing downwind and upwind, in a process called water start (KITE ESCOLA PARAÍSO, 2023).

We highlight the potential of Level 1 for the knowledge work on environmental education because it is when the instructors and students are together, when theory and

⁵ Due to its voluntary nature, non-formal education is on the margins of the organogram of the formal educational system but also acts on subjective aspects of specific groups, such as culture, religion, identity, and citizenship, qualifying people to become citizens of the world, in the world (BRUNO, 2014).

⁶ On the coast of Piauí, kitesurfing schools operate with instructors who only have Brazilian certifications, while schools in other locations have instructors with both certifications or only international certification.

practice are contextualized concomitantly with the classes. In this sense, the educator is "the other" (GOHN, 2006) with whom one interacts or integrates. In turn, the maritime environment as the site, space, or territory of learning accompanies the life trajectories of groups and individuals outside the formal environments, in this case, schools, and presents intentional interactive processes (BRUNO, 2014).

Therefore, the non-formal kitesurfing education opens knowledge windows about the world that surrounds these social relationships, qualifying them to become citizens of the world, in the world (BRUNO, 2014).

In this educational process, the objectives are built from the interaction between instructors and students, not being previously determined, as in the formal educational context (BRUNO, 2014).

From this perspective, one may consider, in addition to the risks that the practice of this sport may offer its practitioners, the threats they pose to local fishers, bathers, and the environment, especially wild animals. The Delta Turtles Institute and the West Indian Manatee Project, for example, could extend to owners and instructors of kitesurfing schools installed in the region of their environmental education and beach cleaning campaigns already carried out in the traditional communities and schools, possibly being worked interdisciplinarily with the technical knowledge already developed in the certification courses, as well as the teaching-learning of the sport.

To give an idea, in Barra Grande alone, there are eight schools for teaching kitesurfing, namely: Barra *Kite School*; BG*Kite School*; EDS *Kite School*; Kite Escola Paraíso; Maresia *Kite*; Nativos *Kite School* BG; *Sunset Kite School*; and Toim *Kite School*. Among them, Kite Escola Paraíso has developed the Projeto Vivo (Live Project) since 2013, an NGO that socially includes children, adolescents, and youths who are native athletes through the practice of kitesurfing (ONG PROJETO VIVO, 2023). This

location, among the others on the coast of Piauí, has the most prominence for Adventure Tourism, with ramifications connected to the practice of kitesurfing (CARVALGO, 2010; MACÊDO, 2011; FERREIRA, 2012; ARAÚJO & ROS, 2014; DUTRA, 2015).

Therefore, it is believed that environmental education may be a significant strategy for the qualitative development of Adventure Tourism on the coast of Piauí through the practice of kitesurfing in favor of an environmental awareness through which "new principles, values, and concepts may be generated for a new productive and social rationality, and alternative projects of civilization, life, and development" (LEFF, 2011, p. 151, our translation).

Relative to the local environmental management, fundamental to the formation of ecological citizens, Leff (2011) pointed out that it should start from the environmental knowledge of the communities that are integrated into several processes in the exchange of knowledge about the environment:

- a) the environmental knowledge in each community inserted in its ideological formations, cultural practices, and traditional techniques;
- b) the environmental knowledge that is generated in the systematization and the exchange of experiences of use and sustainable development of natural resources;
- c) the transfer and application of scientific and technological knowledge about the environment, its cultural appropriation, and its assimilation into the practices and traditional know-how of use of the resources (LEFF, 2011, p. 154).

Given this, the political, economic, and cultural conditions of region and nation are intertwined with academic strategies, educational policies, pedagogical methods, production of scientific-technological knowledge, and formation of capacities to construct rationality and knowledge that guide nature reappropriation processes and sustainable development practices (LEFF, 2009, 2011).

Thus, if the practice of kitesurfing on the coast of Piauí is associated with environmental education, it may become differentiated and comprehensive for taking into account the interpretative educational experience, the valorization of local

traditional cultures, nature conservation, and sustainable development, possibly being the object of applicability of Piauí public policies aimed at the valorization and conservative of coastal landscapes.

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Address of the author:

André da Silva Dutra
Email address: andredutrinha_3@ifma.edu.br

Maria Cristina Rosa
Email address: m.crosa@hotmail.com