Chapter title: Tourist behavior for Sustainable Development in the *Cumbres de Majalca* National Park, Mexico. Challenges in a post-pandemic context.

Authors
Manuel Ramón González Herrera
Silvia Giralt Escobar
Julián Alberto Álvarez Hernández

Abstract
The chapter's topic is related to the best tourist behavior practices for Sustainable Development in the Protected Natural Area of Cumbres de Majalca in a post-pandemic tourism context. The research problem is based on different sources of environmental impact like forest fires; uncontrolled grazing; use of off-road vehicles; the opening of unestablished roads that destroy vegetation, accelerated erosion, and generate dust pollution and harmful noise; as well as the over-tourism associated with vacation periods. This chapter aims to diagnose the current scenario and project management strategies for tourism with low environmental impact based on sustainability and responsible environmental behavior of visitors in Cumbres de Majalca National Park, Chihuahua. The study was based on qualitative, multidisciplinary, and transversal research principles; empirical methods such as observation, document analysis, diagnostic tests, and group work were used. The research of the visitor's behavior and their relationships with the experiential landscape was based on a field visit to the destination with undergraduate tourism students from the Autonomous University of Ciudad Juárez. The main findings are the diagnosis of the current scenario characterized by high negative impacts and the projection of the desired scenario based on the development of strategies for tourism with low environmental impact according to the sustainability principles and the environmental visitor's responsible behavior. This proposal allows the operationalization and instrumentation of the Park Management Program in a post-pandemic context.

Keywords: tourist, behavior, sustainable tourism, low environmental impact, post-pandemic, *Cumbres de Majalca* National Park.

Introduction

The approaches to sustainable tourism in Protected Natural Areas (PNAs) worldwide have been characterized in recent years by a more careful orientation towards environmental protection and the sustainability of natural and cultural landscapes, as well as the study of tourist behavior and sustainability in these natural spaces, especially considering the behavior of tourists in the post-pandemic context, due to the strengthening of new demands in favor of environmental protection and conservation in the current scenario (Becken & Job 2014; Sharmin et al. 2020; Spenceley et al. 2021). Thus, the study of environmental sustainability is increasingly oriented towards compliance with The United Nations 2030 Agenda, including 17 Sustainable Development Goals (SDGs) (European Commission n.d.).

There is a very close relationship between the SDGs and the approaches to environmental sustainability, low environmental impact tourism, and experiential landscape, expressed in how tourism can contribute to achieving such goals. In this sense, sustainability for tourist destinations in PNAs means the care of water and sanitation (SDG 6); the use of affordable and clean energy (SDG 7); the promotion of sustained and inclusive economic growth, full and productive employment and decent work (SDG 8); responsible production and consumption (SDG 12); action on the climate crisis (SDG 13); the care of forests, desertification, and biological diversity (SDG 15); as well as peace and justice (SDG 16) (World Tourism Organization [UNWTO] n.d.). To achieve the SDGs in PNAs, there is a Strategic Framework for Sustainable Tourism with a perspective of 2030 and management instruments such as the Management Program; Public Use Program; Tourism Carrying Capacity Study; and Acceptable Change Limit Studies. This management must receive special attention in National Parks due to their strategic value,

maximizing the social and economic benefits for the local community, visitors, and the natural and cultural heritage, through synergies among all stakeholders.

In the context of sustainability, national parks are reserved areas for preserving the natural and cultural environment for different purposes, such as tourism and recreation or visits of historical or scientific interest; not all national parks focus on the same landscape elements. The Editors of Encyclopaedia Britannica (2023) note that in the US and Canada, national parks focus more on land and wildlife protection, while in the UK, they tend to focus more on land, and add that parks in Africa focus mainly on the conservation of fauna. The source mentions that other countries such as Brazil, Japan, India, and Australia have large areas reserved for national parks.

According to The General Law of the Ecological Balance and Environmental Protection of Mexico, national parks are landscapes of scenic beauty and scientific, educational, recreational, historical, floristic, and faunal values. They constitute highly protected spaces in which only activities related to the conservation of ecosystems, research, recreation, tourism, and environmental education are allowed (Secretary of the Environment [SEMARNAT] 2017).

This chapter aims to diagnose the current scenario and to project management strategies for tourism with low environmental impact based on sustainability and responsible environmental behavior of visitors in the *Cumbres de Majalca* National Park (CMNP), located in the State of *Chihuahua*, Mexico.

The research problem is based on the fact that the sources of environmental impact for this park are the presence of forest pests and diseases; forest fires; uncontrolled grazing; use of off-road vehicles; the opening of unestablished roads that destroy vegetation, cause soil loss, accelerate erosion, and generate dust pollution and harmful noise; as well as the overtourism associated with vacation periods. The massive flows of visitors increase the number of arrivals, occupation of houses located within the park, uncontrolled vehicular traffic, firewood extraction, solid waste generation, degradation of rock formations, and damage to the built infrastructure.

Based on this problem, the following research questions were formulated: What are the characteristics of CMNP in the current scenario? What is the perception of the potential of recreational tourism use in CMNP? What are the challenges in the post-pandemic era to project the desired scenario for better sustainable ecotourism management and promoting responsible tourism behavior?

The research significance is associated with developing a proposal that contributes to the conservation of wild flora and fauna and the care and preservation of forest vegetation, as well as maintaining the recharge of aquifers and the functionality of the hydrological cycle, protecting the upper parts of the basins where the streams that feed the *Chuvíscar*, *Sacramento*, and *Santa Isabel* rivers are born. At the same time, the proposal suggests the reconditioning of the site, whose scenic beauty and geological formations satisfy the visitors' leisure needs in the context of the new normality of post-pandemic tourism.

Literature review

Sustainable and environmental protection of natural landscapes

According to the UNWTO (2013), sustainable tourism is "tourism that takes full account of its current and future economic, social and environmental impacts addressing the needs of visitors, the industry, the environment, and host communities" (p.1). Taking into consideration this source, the five key pillars of sustainable tourism are tourism policy and governance; trade, investment, data, and competitiveness; employment, decent work, and capacity building; poverty reduction and social inclusion; and sustainability of the natural and social environment, the last of these being closely related to this research. These five pillars influence tourist behaviors, satisfaction, and tourist experiences, which is of great interest for this study.

The current approaches to sustainability assume the environmental protection of natural landscapes with an integrative approach based on the preventive management of environmental impacts. In this sense, environmental sustainability uses different management instruments such as environmental planning, impact assessment, environmental monitoring, and environmental interpretation and education. The latter is of great importance for the protection of natural and cultural landscapes since the behavior of visitors is strongly conditioned by the environmental culture of the visitors and their environmental commitments.

Responsible tourist behavior and landscape education for a memorable experience are essential for sustainable tourism development. The World Tourism Organization presents a helpful definition in which Sustainable Tourism is conceptualized as (UNEP – UNWTO 2005) "Tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment, and host communities" (p. 11). It states that sustainable tourism development guidelines and management practices apply to all types of tourism in all destinations, including mass tourism and the various niche tourism segments. This source indicates that sustainability principles incorporate tourism's environmental, economic, and socio-cultural dimensions; they recommend promoting a balance between them to achieve the sustainability of tourism development in the long term.

In order to guarantee protection and sustainability in the tourist use of natural landscapes, it is necessary to consider the chain of impacts established between the visitors and the receiving environment. This means identifying the anthropic actions caused by tourism development and the behavior of visitors, which leads to the manifestation of positive or negative environmental changes. Consequently, impacts are generated, which can be beneficial or adverse according to the consequences for the recipients. This complex process requires a preventive management system since corrective actions always have residual effects.

Under this focus, maximizing the positive impacts of tourist behavior and minimizing the negative ones is possible. According to the Samalayuca Dunes Management Program, Low Environmental Impact Tourism is defined as an (CONANP 2013)

> environmentally responsible tourism modality that consists of traveling to or visiting relatively undisturbed natural spaces in order to enjoy, appreciate and study the natural attractions of these spaces; as well as any cultural manifestation of the present and the past that can be found there, through a process that promotes conservation, has low environmental and cultural impact and induces an active and socio-economically beneficial involvement of local populations (p. 112).

This concept relates to soft tourism because it "encompasses environmental and social compatibility, optimum wealth creation, and a new culture of travel" (Federal Agency for Nature Conservation 2020 p.1).

Tourist behavior and sustainability in Protected Natural Areas

Tourist behavior theory has acquired great importance for research related to the interactions between visitors and the visiting site, especially for the sustainability in PNAs. This approach has contributed to increasing concerns about environmental protection and the sustainability of natural landscapes. According to the definition presented by Elliot (2014) in the Encyclopedia of Tourism, it is assumed that tourist behavior is

> the process a tourist undertakes, both observable and unobservable, when planning and participating in tourism. It is the dynamic of affect and cognition, as well as biological and cultural forces interacting with marketing and environmental stimuli. In marketing, consumer behavior is a relatively young subfield that seeks to understand the where, when, and why of consumers and how their behavior might be influenced... In tourism, the challenge is to understand the complexities of behavior with the added dimensions of space, time, and the consumption of experiences (p. 1).

In the presented study by Zhang and Zhang (2020), related to Transport and Energy Research, the authors state that “Tourist behaviors and choices have significant impacts on energy use [and on the environment in general], ... [that is why] proper tourist decisions are important to enhance energy efficiency [and environmental responsibility] and realize sustainable tourism development” (p. 295). Derived from the previous approach, it is assumed that the behaviors and choices of tourists must be based on sustainability criteria.

There is a close relationship between sustainable tourist behavior and experiential landscape in PNAs. In this regard, it is considered that "tourism behavior is essential for the protection of the environment and the sustainability of destinations... [therefore] environmentally responsible behavior [is] an important tourism behavior" (Wu et al. 2022 p. 924). In the study How Does Tourist Experience Affect Environmentally Responsible Behavior? (Wu et al. 2022) the authors conclude that "… tourist experiences affect environmentally responsible behavior through

attachment to place. The connection with nature is the key factor of environmentally responsible behavior (p. 924)". For this reason, it is necessary to consider the contribution of the experiential landscape to tourist behavior according to the different dimensions of the tourist experience.

Thwaites and Simkins (2007), in their book Experiential Landscape: An Approach to People, Place and Space, define the experiential landscape as the holistic way in which relationships are established between people and open spaces, thus being a relationship between the outdoor spaces of daily life and the variety of human experiences that are generated. Under this approach, it is possible to recognize the experiential potential and character of outdoor settings, identify how they change, and create new settings (dynamics and evolution). In this way, applying the experiential approach to the relationships of the subjects with the landscape object of interaction allows for assessing the experiential characteristics during the interpretation and understanding of the visited sites.

A topic of great interest is undoubtedly the spatial relationship of visitors with the landscapes that are the object of observation and interaction, and the process of landscape construction in PNAs. According to Chhetri and Chhetri (2022) "the process of perceiving and experiencing landscapes is widely understood in the extant literature; however, the mappability of perceived landscapes is neither thoroughly investigated nor theorized from a multi-disciplinary perspective (p. 85)". According to these authors, perception and cognition are two aspects of great importance in the construction of the landscape since they favor the interpretation of observers and regulating their behaviors.

The process of perceiving and experiencing landscapes in PNAs on the part of the visitors needs to be oriented from a methodological perspective, through which the cognition of the attraction capacity and the affective-motivational relationships with the landscape object of visualization is facilitated. In this sense, it is considered that (Cepollaro & Zanon 2022)

> landscape education must play a key role … [in which] awareness-raising, cultural initiatives, and training processes require approaches and methods centered on experience, thus shifting from teaching to learning, from a passive to an active role of participants ... [in such a way that they] stimulate interest in the landscape and [help] to develop participatory, cooperative and responsible attitudes (p. 244).

Tourist behavior in the post pandemic context

The new travel culture in the post-pandemic stage (Çakmak et al. 2023) should promote responsible travel (Kaefer 2022) and therefore encourage responsible behavior of the new tourist (Eichelberger et al. 2021). This implies greater respect for the environment, making rational use of natural resources and preventing pollution; promoting the sustainable use of raw materials and natural resources; improving our environmental performance; promoting the involvement of all visitors in environmental protection matters; carrying out environmental protection programs; communicating and reporting on environmental management efforts; and preventing the purchase and sale of illegally harvested wood and timber products, among others (Song et al. 2019; Zahoor et al. 2020; Koval et al. 2021).

In the new post-pandemic era, new habits are reported in the behavior of visitors of PNAs. According to a report by Hosteltur (2021), there has been a significant concern for the health and security of the destinations to visit, changes in behavior in the way of making reservations, an increase in optimism and the motivation to resume travel to discover natural spaces since there has been a greater diversification in the reasons for the visits, while the increase in environmental awareness and the sustainability of destinations is of great interest. This could impact the reconversion of traditional tourist spaces and the change from irresponsible tourist behavior towards responsible tourist behavior committed to the communities and the destinations visited.

Methodological framework

The study method was based on qualitative, multidisciplinary and transversal research principles, using mixed information sources. Empirical methods such as observation, document analysis, diagnostic tests, and work in groups, as well as theoretical methods such as analytical-synthetic, historical-logical, geospatial, and conceptual modeling, were used. The methodological procedure consisted of data collection, analysis and interpretation, and elaboration of conclusions.

The study of the behavior of visitors and their relationships with the experiential landscape was based on a field visit to the CMNP with undergraduate tourism students from the Autonomous University of *Ciudad Juárez* (n= 16). The participating students were studying the subjects of Tourism and the Environment and Tourism Planning. The conceptual variables addressed correspond to tourist behavior, the responsible tourist, experiential landscapes, national parks, low environmental tourism, and sustainability. The activity was carried out through a field day in which the students explored the main areas of public use of the park, selected the ecotourist trails to be followed, located the visual observation basins, and took photos of the landscapes with which they felt cognitively and affectively related.

For the development of the practical activity, three questions were elaborated to assess the perception of the tourist potential for recreational use of the undergraduate tourism students who participated in the field day. These were (1) Tell a story based on your own life experience and offer the arguments that generated the emotional bond with the landscape of your choice; (2) Assess the capacity for attraction and motivational-affective relationship with the photographed landscapes according to the valuation sheet (Table 1); and (3) How would you rate your landscape experience using the following categories: very satisfied; satisfied; neutral; unsatisfied; very unsatisfied. The valuation sheet for interpreting and understanding the visited sites included the following indicators and perception scales:

- Attraction capacity: functional, ecological, aesthetic, symbolic-representative, cognitive-interpretative, authenticity, accessibility, infrastructure, and interpretive services values. The evaluation of each indicator was carried out at three levels: high (5), medium (3), and low (1).
- Motivational-affective relationship: spectacular (5), very nice (4), nice (3), moderately pleasant (2), unpleasant (1).

Findings

Characterization and diagnosis of the current scenario

The CMNP is located in the northern Mexican state of *Chihuahua*, approximately 48 kilometers north of the city of the same name and state capital. That is why there is a close relationship between sustainable tourist behavior and experiential landscape. The park's creation date was September 1, 1939, by decree published in the Official Gazette of the Federation, covering an area of more than four thousand hectares (SEMARNAT 2016). Its administration is based on a management program that "has the purpose of constituting the governing instrument of planning and regulation that establishes the activities, actions, and basic guidelines for the management and administration of the CMNP" (Official Journal of the Federation [DOF] 2016).

The designation of *Cumbres de Majalca* as a National Park "has as general objective the conservation of wild flora and fauna... due to the environmental services it generates for the region" (CONANP 2016 p. 13). Derived from the general objective, it is established to conserve wildlife and forest vegetation to avoid erosion and favor the recharge of aquifers; protect the upper parts of the basins and hydrographic sub-basins; and maintain the natural scenic beauty of the landscape components that satisfy the pleasure, distraction, entertainment, leisure, recreation, and diversion of the site, mainly due to the high value of the rock and forest formations that develop in this geographical space (CONANP 2016).

The geological-geomorphological basement is made up of a relief represented by fractured mountain chains of volcanic origin and modeled by exogenetic dynamic factors, which are separated by intramontane valleys in the form of canyons and large rocky outcrops with a stratified appearance, as well as great variety that gives it spectacular geodiversity. This mountain relief forms the Sierra de Majalca, belonging to the Sierra Madre Occidental of Mexico; it reaches a maximum height of approximately 2800 meters above sea level.

The hydro-climatic conditions are of the semi-desert and semi-cold type with altitudinal changes that reach the semi-humid vertical floor. The annual average temperature is close to 14°C, the warmest month is June, and the coldest month is January, which indicates a yearly thermal amplitude of approximately 8°C. The most abundant rainfall occurs in July and August, and the least in April, registering an annual average of close to 178 millimeters and the frequent occurrence of snowfall. From the hydrographic point of view, the park is located in the *Conchos*

River basin and comprises three micro-basins corresponding to the *Huerachi* River, *Majalca* Canyon, and *La Fortuna*.

The biogenic characteristics comprise pine-oak forests, oak-pine forests, oak forests, induced forests, xeric scrublands, and natural grasslands, notable for their high biodiversity. The fauna is mainly made up of mammals, reptiles, and birds. Among plants, the most frequent observations correspond to Echinocereus polyacanthus; the Green-flowered Pincushion Cactus (Mammillaria barbata); Coryphantha compacta; Echeveria mucronata; Dahlia sherffii; Pointleaf Manzanita (Arctostaphylos pungens); Prairie Pricklypear (Opuntia macrorhiza); Mexican Pinyon (Pinus cembroides); Alligator Juniper (Juniperus deppeana); Apache Pine (Pinus engelmannii); and Chihuahuan Pine (Pinus leiophylla) (Naturalista 2023).

The most frequent sightings of animals correspond to Yarrow's Spiny Lizard (Sceloporus jarrovii); Mexican Jay (Aphelocoma wollweberi); Acorn Woodpecker (Melanerpes formicivorus); American Robin (Turdus migratorius); Rock Squirrel (Otospermophilus variegatus); Northern Flicker (Colaptes auratus); Painted Redstart (Myioborus pictus); Mexican Rose Tarantula (Aphonopelma pallidum); Bridled Titmouse (Baeolophus wollweberi); White-breasted Nuthatch (Sitta carolinensis); White-tailed Deer (Odocoileus virginianus); Zone-tailed Hawk (Buteo albonotatus); and Steller's Jay (Cyanocitta stelleri) (Naturalista 2023).

The most widespread economic activities are tourist-recreational, agricultural, and livestock. Tourism and recreation are particularly interested in carrying out multiple activities such as hiking and free walks, observation of flora and fauna, observation of the geo-forms of the relief, horseback riding, quad biking, rappelling, camping, and sports events. These activities are more intense on weekends, Easter holidays, and July and August holidays. Although there are no official data, it is estimated that approximately 20,000 people enter the CMNP per year, without counting the local inhabitants, who, according to the INEGI 2020 population census, include 157 people in different localities, although to this amount are added around 500 people of floating population (M.C. Recoder, personal communication, 9 March 2023). The infrastructure and furniture, although not enough, include guardhouses; panoramic viewpoints; signaling and signage; health services; some tables, benches, and grills; camping areas; and roads for vehicular traffic.

Following the CMNP Management Program, the following are allowed: camping activities in the Mirador-Camping Areas Public Use subzone; scientific collection; construction of facilities for tourism support services; environmental education; campfires in designated places; filming and photography; scientific research and monitoring; maintenance of built infrastructure; traffic of vehicles on established roads; low environmental impact tourism activities; and sale of food and crafts. Low environmental impact tourism activities are also allowed in the *Mil Castillos-Penas Azules* preservation subzone; and in the subzone of human settlements (CONANP 2016).

The main negative environmental impact factors on the park's environmental systems that represent weaknesses for its strategic positioning are the risks of natural and induced forest fires; prolonged frosts; the presence of pests and forest diseases; uncontrolled grazing; use of all-terrain vehicles; the opening of rough roads that destroy the vegetation, cause loss of soil, and generate dust pollution and noise that is harmful to health; as well as over-tourism associated with vacation periods. These massive flows of visitors increase the number of arrivals, occupation of homes located within the park, create a high volume of uncontrolled vehicular traffic, lead to the extraction of firewood, generation of solid waste, degradation of rock formations, and damage to the built infrastructure.

The main strengths of environmental resources and services for the strategic positioning of the CMNP are the great tourist-recreational attractiveness for the inhabitants of the city of *Chihuahua* and nearby regions due to the high biodiversity and geodiversity that give it a high scenic landscape value, the comprehensive natural vegetation cover associated with the vocation of use of the territory; the variety of environmental services that it offers such as rainwater harvesting, which favors the formation of rivers and streams, and the infiltration that it provides to the aquifers that promote agriculture, livestock, as well as the supply to the City of *Chihuahua* and other settlements, at the same time it serves as protection and a source of food for wildlife and allows the capture of carbon dioxide (CO_2) that contributes to reducing global warming. The park also contains a great historical-cultural value in which an archaeological site with manifestations of

rock art stands out and is the scene of the culture of the *Conchos* Indians who inhabited northern Mexico. Also to be noted is the existence of medicinal plants used in local self-consumption.

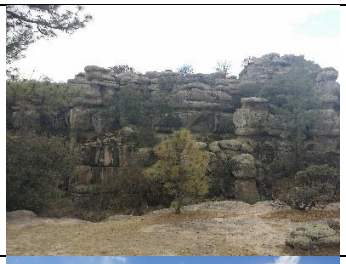
Perception of the potential of recreational tourism use

The participatory assessment of the tourist-recreational attractions of the CMPN was based on the relationship between affect and cognition generated in the form of stimuli by the landscape components on the behavior of visitors with an experiential approach. To foster the visitor-landscape links, the participants told a story based on their own experience and the arguments that generated the emotional bond with the landscape of their choice, noting the high incidence of scenic panoramic views, open visual fields, and color contrasts. The most used technique for the narration was the personification of the components of the natural landscape and the use of humor.

Through this activity, it was possible to recognize the experiential potential and the character of the outdoor settings of the landscapes according to their attractiveness and affective-motivational relationships (Table 1). The experiential approach applied to the subjects' relationships with the landscape made it possible to select the five most attractive experiential landscapes in the visiting area. The influence of the stimuli generated by the landscape's components on the visitors' behavior reflects the higher levels of attraction towards the relief and the vegetation as the most expressive perceptible components of the place. The preferred landscapes are of high functional value for recreation and tourism; high representative ecological, aesthetic, and symbolic value. They are characterized by high cognitive value and high natural authenticity. The visitor`s experience must be enriched in terms of accessibility and available infrastructure and services. In general, the assessment of the affective-motivational relationship with the landscape is valued in the category of ‘spectacular’, which indicates a solid and memorable experience.

Table 1 Assessment of the attraction capacity and motivational-affective relationship of the photographed landscapes.

Experiential landscapes	Attraction capacity	Motivational-affective relationship
	Functional value (5) Ecological value (5) Aesthetic value (5) Symbolic value (5) Cognitive value (5) Authenticity value (5) Accessibility value (4) Infrastructure and services (4)	Spectacular (5) 100% Very nice --- Nice --- Moderately pleasant --- Unpleasant ---
	Functional value (5) Ecological value (5) Aesthetic value (5) Symbolic value (5) Cognitive value (5) Authenticity value (5) Accessibility value (4) Infrastructure and services (4)	Spectacular (5) 100% Very nice --- Nice --- Moderately pleasant --- Unpleasant ---
	Functional value (5) Ecological value (5) Aesthetic value (5) Symbolic value (5) Cognitive value (5) Authenticity value (5) Accessibility value (4) Infrastructure and services (4)	Spectacular (5) 100% Very nice --- Nice --- Moderately pleasant --- Unpleasant ---

	Functional value (5) Ecological value (5) Aesthetic value (5) Symbolic value (5) Cognitive value (5) Authenticity value (5) Accessibility value (4) Infrastructure and services (3)	Spectacular (5) 100% Very nice --- Nice --- Moderately pleasant --- Unpleasant ---
	Functional value (5) Ecological value (5) Aesthetic value (5) Symbolic value (5) Cognitive value (5) Authenticity value (5) Accessibility value (4) Infrastructure and services (3)	Spectacular (5) 100% Very nice --- Nice --- Moderately pleasant --- Unpleasant ---

Own elaboration

Finally, the qualification of the experience with the landscape (experiential landscape) was evaluated by 100% of the participants and received the category of very satisfied. During the fieldwork, the students showed environmentally responsible tourist behavior, evidenced in the garbage waste collection in different parts of the park, which other visitors had left (Figure 1). This fact demonstrated an adequate level of landscape environmental education and participation in a tourism activity with a low environmental impact that promotes responsible tourism and visitors that respect the environment and sustainability.

Figure 1 Garbage collection during fieldwork in *Cumbres de Majalca* National Park

Challenges in a post-pandemic context and projection of the desired scenario

At an international level, before the COVID-19 pandemic, there were more than 8 billion visits/per year to protected natural areas, of which approximately 80% were concentrated in Europe and North America (Balmford et al. 2015). In the post-pandemic stage, the responsible recovery of nature-based tourism should consider the problem of mass tourism in PNAs due to their fragility and ecological values, paying attention to overcrowding, conflicts and derogatory

behavior of tourists, parking and traffic problems, social distancing, health, and hygiene maintenance (McGinlay et al. 2020).

This premise of recovery will require the strengthening of long-term resilience in terms of nature-based tourism in PNAs, which will demand the capacity of stakeholders to design innovative experiences for visitors, develop alternative income streams for local communities, address seasonality in a holistic, inclusive, equitable and adaptable way (Spenceley et al. 2021); as well as aligning the conservation and human development agendas (IUCN-WCPA 2020), and readapting carrying capacity and environmental planning of spaces for public use, avoiding intensive and expansive tourism models. The tourism allowed in the CMNP, due to its management category and based on the applicable legislation, is low environmental impact tourism.

In response to the question of how a tourism model with low environmental impact can be promoted in the NPCM, it is considered that the desired model of tourism with low post-pandemic environmental effects for this park should reflect a reconceptualization of environmental reductionism in the face of a holistic and integrating approach to the environmental system, in which the requirements of sustainable tourism and preventive management of impacts are implemented, thus reflecting the relationship mechanisms between nature and society in different spatiotemporal scenarios. At the same time, overtourism must be avoided, which is manifested through excessive tourism at certain times of the year, which generates overuse of resources, disturbance of wildlife, extreme concentration of visitors, intensification in the occupation of attractive sites, and congestion of vehicles. All of this means that these behaviors negatively impact visitors' experiences.

The sustainable management of the low-impact tourism development model must be based on the Strategic Framework for Sustainable Tourism in PNA with a perspective of 2030. In this way, a protocol will be adopted for the integration, classification, assessment, and prioritization of information from the CMNP, which allows the identification of the necessary components for tourism use and the minimum conditions for it to be successful, generating a baseline of strategic information that facilitates the decision-making process.

At the same time, manuals of Best Environmental Practices in Tourism should be established to promote an experience or intervention that guarantees responsible behavior of visitors, with positive results to prevent, correct, or improve the environmental aspects of integrated tourism development and that contributes to reducing negative environmental impacts. This result will be beneficial since it will contribute to protecting and conserving the environment and its natural resources; foster good relations within the local community and with surrounding communities; promote competitiveness in enterprises due to the improvement in quality and responsibility with the environment and local communities; and raise awareness among consumers, staff, and suppliers about the importance of having a vision of sustainability (SERNATUR 2011).

Another critical challenge of the new post-pandemic tourism model will be the education of the tourist and their performance as responsible travelers when visiting the CMNP. This strategy will require significant changes in visitor behavior and will positively influence the formation of an enriching experience. That training process must be based on the Global Code of Ethics for Tourism (UNWTO 2020), which considers self-education, mutual tolerance, and learning of the legitimate differences between peoples and cultures and their diversity as an irreplaceable factor. The education of governments, companies, and communities that can seek it will also be necessary, although the visitor can significantly support this objective in different ways.

The main mechanisms for the prevention and control of impacts should be based on the Regulations for the Management of Visitors supported by studies such as Limit of Acceptable Change and Tourist Carrying Capacity, and on the development of tourism initiatives based on Best Practices, for the benefit of the gateway communities and in the areas of influence of the CMNP. At the same time, Green Marketing strategies should be introduced as part of park management aimed at reducing raw materials use, minimizing the waste generated; promoting responsible consumption as opposed to conventional consumerism; and the commitment to environmental causes as belonging to each visitor in a participatory and collaborative manner, expressed through the positive demonstration effect of one over the other.

The strategic requirements for the consolidation of a tourism development model with low environmental impact and the management of change towards sustainability in natural-based tourism-recreational businesses should promote a sustainable strategic transformation oriented towards family recreation and recreation in such a way that the challenges represented by the weaknesses can be overcome and the strengths identified for the CMNP would be strengthened. These strategies will be appropriate to promote strategic sustainability, sustainable leadership, and responsible environmental behavior of visitors to *Cumbres de Majalca*. For this, the primary strategy to be implemented should consider the following recommendations:

- Implementation of a participatory environmental planning framework that allows the carrying out of a comprehensive strategic planning process
- Strengthening of the conservation subprograms regarding the protection of the environmental system; integrated management of the environmental system; environmental education and interpretation; responsible behavior of visitors, and the strengthening of the culture of participation and integration of all stakeholders for the sustainability of the CMNP
- Control and management of visitor flows and diversification of visitor sites to avoid high-concentration nuclei associated with the main attractions
- Efficient management of solid or liquid waste, avoiding the dumping of materials, substances, or products, such as insecticides, fungicides, and pesticides, which can contaminate soils and bodies of water
- Reconditioning the infrastructure and services in all the polygons where tourist-recreational activities are carried out
- Regulation of vehicular traffic and control of motorized recreation in natural environments, which degrade the environmental system
- Strengthening of environmental monitoring and control mechanisms
- Application for certifications and recognitions that accredit responsible environmental performance

This proposal will contribute to the updating, operationalization, and instrumentation of the Park Management Program. In it, the axes of environmental education and interpretation should be prioritized as the basis for forming the culture of the environmental traveler in National Parks, considering a new scenario of tourism recovery in a post-pandemic context. For this, a minimum system of key indicators of sustainable tourism development is proposed to be considered, which includes: protection of resources and attractions; pressure and intensity of use; water and energy consumption; consumption of local and national productions; waste management; social impact; contribution of tourism to the local economy; visitor satisfaction; satisfaction of the local population; and destination safety.

Therefore, for sustainable use in the projected scenario of the CMNP, the development of the Sustainable Tourism Protocol is required; the detailed study of the potential for tourist use and the elaboration of inventory sheets with the evaluation of attractions; determination of the carrying capacity and morphological/functional zoning of public use areas; design of interpretive trails with differentiated themes and suitable for different audiences; determination of scenic-landscape visual basins and their operationalization; and the proposal of a robust program of interpretation and environmental education based on a previous diagnosis of non-formal educational needs.

Conclusion

As a part of the tourist experience, the students satisfactorily undertook the process of group planning and participation in a field day at CMNP, revealing the affect and cognition towards the object of interpretation, as well as the forces that interacted with the environmental stimuli caused by the components of the experiential landscapes visited. In this way, the statement of Wu et al. (2022) was verified when stating that the connection with nature is a key factor of environmentally responsible behavior. It was possible to achieve behavior that made it possible to understand the where, when, and why of the visitors and how the activities carried out influenced their environmentally responsible behavior, perceiving at the same time the complexities of the

behavior related to the geospatial dimensions, the time that the activities and consumption of experiences related to the landscapes they observed and interacted with.

The study of behavior for sustainable development made it possible to understand that experiential landscapes contributed to landscape environmental education and interpretation and promoted environmentally responsible behavior in the CMNP, which favored the consolidation of sustainable tourism based on the principles of low environmental impact. At the same time, it contributed to the formation of tourists who are increasingly responsible and committed to an environmental cause. It was possible to verify how the theoretical pillars of tourism proposed by the UNWTO (2013) influenced the tourist behaviors, satisfaction, and tourist experiences of the students, who adequately carried out the perceptual assessment of the visited context and its components, especially about politics and governance; capacity development; poverty and social inclusion; and sustainability of the natural and social environment.

This proposal will allow the operationalization and instrumentation of the CMNP Management Program, which will contribute to meeting the new challenges in a post-pandemic context. Developing more scientific research with a post-disciplinary approach to generate new knowledge that serves as a basis for decision-making and managing visitor flows with a minimum impact approach in the public use areas will be advisable. The new post-pandemic projections should be based on the practical operationalization of the concept of low environmental impact tourism and the formation of a culture of experiential landscape interpretation, based on which it will be necessary to plan and schedule activities that promote authentic landscape experiences that strengthen behaviors which are more compatible with the functions of the park.

It will be convenient in the future to promote the mapping of the perceived landscapes of the CMPN from a multidisciplinary perspective, integrating the processes of feeling, perceiving and knowing the set of environmental components that are observed, and in the same way, giving particular importance to the construction of mental maps and drawings of the components of the landscape through the establishment of cognitive and affective relationships. As a line of future research, management and social mechanisms for greater resilience and systemic thinking for conservation and responsible use of environmental resources and services in CMNP should be promoted, strengthening the role of tour operators in the experiences of visitors and the pro-environmental responsible behavior of all stakeholders.

The key findings and implications on tourism behavior in the new normal denote the lack of knowledge among visitors, both from a cognitive and affective-motivational point of view, which causes negative attitudes and irresponsible behaviors that cause environmental deterioration and the unsustainability of the tourist use of the territory. The practical implications for practitioners and policymakers consist in the fact that they have scientific information in favor of decision-making processes, which can positively impact the design of strategies that cover behavioral problems that affect good sustainable practices in tourism. The future research directions suggested by the chapter are based on the continuity of this line of research with the participation of all stakeholders, the extension to all groups of visitors to the PNA, and the dissemination of the results for their practical implementation in the medium and long term.

References

Balmford, A., Green, J., Anderson, M., Beresford, J., Huang, C., Naidoo, R., Walpole, M., Manica, A. (2015). Walk on the Wild Side: Estimating the Global Magnitude of Visits to Protected Areas. *PLoS Biology*, 13(2), pp. 1-6. https://www.researchgate.net/publication/272842456_Walk_on_the_Wild_Side_Estimating_the_Global_Magnitude_of_Visits_to_Protected_Areas

Becken, S., & Job, H. (2014). Protected areas in an era of global–local change. *Journal of Sustainable Tourism*, 22(4), pp. 507-527. https://www.tandfonline.com/doi/abs/10.1080/09669582.2013.877913

Çakmak, E., Isaac, R., and Butler, R. (eds). (2023). *Changing practices of tourism stakeholders in COVID-19 affected destinations*. Channel View Publications. Bristol, UK. https://www.channelviewpublications.com/page/detail/?K=9781845418748

Cepollaro, G., and Zanon, B. (2022). The landscape as a learning space. The experiential approach of a 'landscape school' in Trentino, Italy. *Landscape Research*, 47(2), pp. 244-255. https://doi.org/10.1080/01426397.2021.1942442

Chhetri, P., and Chhetri, A. (2022). Theoretical Perspectives on Landscape Perception. In: Singh, R.S., Dahiya, B., Singh, A.K., Poudel, P.C. (eds) *Practising Cultural Geographies. Advances in 21st Century Human Settlements*. Springer, Singapore. https://doi.org/10.1007/978-981-16-6415-1_4

CONANP. (2013). *Programa de Manejo ANPFF Médanos de Samalayuca*. Editado por SEMARNAT. https://www.imip.org.mx/imip/files/planes/PROGRAMA_MANEJO_MEDANOS_DE_SAMALAYUCA.pdf

CONANP. (2016). *Programa de Manejo Parque Nacional Cumbres de Majalca*. Editado por SEMARNAT. https://iefectividad.conanp.gob.mx/i-efectividad/NSMOc/PN%20Cumbres%20de%20Majalca/Contexto%20y%20Planeacion/Uso%20de%20tierra%20y%20aguas%20adyacentes/PM%20Cumbres%20de%20Majalca%202016.pdf

DOF - Diario Oficial de la Federación. (08/08/2016). *Acuerdo por el que se da a conocer el Resumen del Programa de Manejo del Área Natural Protegida con el carácter de Parque Nacional Cumbres de Majalca*. https://dof.gob.mx/nota_detalle.php?codigo=5447074&fecha=08/08/2016&print=true%201/61 last accessed 2023/05/07

Eichelberger, S., Heigl, M., Peters, M., and Pikkemaat, B. (2021). Exploring the Role of Tourists: Responsible Behavior Triggered by the COVID-19 Pandemic. *Sustainability*, 13(11), pp. 1-14. https://doi.org/10.3390/su13115774

Elliot, S. (2014). Behavior, tourist. In: Jafari, J., Xiao, H. (eds.). *Encyclopedia of Tourism*. Springer, Cham. https://doi.org/10.1007/978-3-319-01669-6_17-1

European Commission. (n.d.). *Sustainable Development Goals*. https://commission.europa.eu/strategy-and-policy/international-strategies/sustainable-development-goals/eu-and-united-nations-common-goals-sustainable-future_en last accessed 2023/05/06

Federal Agency for Nature Conservation. (22 January 2020). *Soft tourism*. http://web01.bfn.cu.ennit.de/activities/tourism-and-sports/tourism/ecotourism/soft-tourism/?L=1 last accessed 2023/05/07

Hosteltur. (2021). Sorpresas en el comportamiento del turista postpandemia. https://www.hosteltur.com/144781_sorpresas-en-el-comportamiento-del-turista-pospandemia.html last accessed 2023/05/07

Kaefer, F. (2022). Jamie Sweeting on Planeterra and the Future of Responsible Travel. In: *Sustainability Leadership in Tourism. Future of Business and Finance*. Springer, Cham. https://doi.org/10.1007/978-3-031-05314-6_53

Koval, V., Mikhno, I., Udovychenko, I., Gordiichuk, Y., and Kalina, I. (2021). Sustainable Natural Resource Management to Ensure Strategic Environmental Development. *TEM Journal*, 10(3), pp. 1022-1030. https://www.ceeol.com/search/article-detail?id=977526

McGinlay, J., Gkoumas, V., Holtvoeth, J., Fuertes, R.F., Bazhenova, E.Y., Benzoni, A., Botsch, K., Martel, C.C., Sánchez, C.C., Cervera, I., Chaminade, G., Doerstel, J., García, C.J., Jones, A., Lammertz, M., Lotman, K., Odar, M., Pastor, T., Ritchie, C.A., Santi, S., Smolej, M., Rico, F.S., Waterman, H., Zwijacz-Kozica, T., Kontoleon, A., Dimitrakopoulos, P.G., & Jones, N. (2020). The Impact of COVID-19 on the Management of European Protected Areas and Policy Implications. *Forests*, (11), p. 1214. https://www.semanticscholar.org/paper/The-Impact-of-COVID-19-on-the-Management-of-Areas-McGinlay-Gkoumas/1a371ff47bc70ff0400ce66037f48ecb9e3e849c

Naturalista. (2023). *Parque Nacional Cumbres de Majalca - CONANP*. https://www.naturalista.mx/projects/parque-nacional-cumbres-de-majalca- last accessed 2023/05/07conanp?tab=species

SEMARNAT. (09 January 2016). *Parque Nacional Cumbres de Majalca*. https://www.gob.mx/semarnat/articulos/parque-nacional-cumbres-de-majalca last accessed 2023/05/07

SEMARNAT. (17 December 2017). *Parques Nacionales de México*. https://www.gob.mx/semarnat/articulos/parques-nacionales-de-mexico last accessed 2023/05/07

SERNATUR. (2011). *Manual de Buenas Prácticas, Chile por un Turismo Sustentable. Subsecretaría de Turismo*. Gobierno de Chile. https://chilesustentable.sernatur.cl/wp-content/uploads/2013/08/ManualGenericoBaja2.compressed.pdf

Sharmin, F., Sultan, M. T., Badulescu, A., Bac, D. P., & Li, B. (2020). Millennial tourists' environmentally sustainable behavior towards a natural protected area: An integrative framework. *Sustainability*, 12(20), p. 8545. https://www.mdpi.com/2071-1050/12/20/8545

Song, M., Fisher, R., and Kwoh, Y. (2019). Technological challenges of green innovation and sustainable resource management with large scale data. *Technological Forecasting and Social Change*, 144, pp. 361-368, https://www.sciencedirect.com/science/article/abs/pii/S0040162518311478?via%3Dihub

Spenceley, A., McCool, S., Newsome, D., Báez, A., Barborak, J. R., Blye, C. J., ... & Zschiegner, A. K. (2021). Tourism in protected and conserved areas amid the COVID-19 pandemic. *Parks*, (27), pp. 103-118. https://parksjournal.com/wp-content/uploads/2021/03/Spenceley_et_al10.2305-IUCN.CH_.2021.PARKS-27-SIAS.en_.pdf

Spenceley, A., McCool, S., Newsome, D., Báez, A., Barborak, J., Blye, C., Bricker, K., Cahyadi, H., Corrigan, K., Halpenny, E., Hvenegaard, G., King, D., Leung, Y., Mandić, A., Naidoo, R., Rüede, D., Sano, J., Sarhan, M., Santamaria, V., Sousa, T., and Zschiegner, A. (2021). Tourism in protected and conserved areas amid the Covid-19 pandemic. *Parks* (27) (Special Issue). https://parksjournal.com/wp-content/uploads/2021/03/Spenceley_et_al10.2305-IUCN.CH_.2021.PARKS-27-SIAS.en_.pdf

The Editors of Encyclopaedia Britannica. (23 January 2023). *National Park*. https://www.britannica.com/science/national-park last accessed 2023/05/07

Thwaites, K., and Simkins. I. (2007). *Experiential Landscape. An Approach to People, Place and Space*. Routledge. UK. https://www.routledge.com/Experiential-Landscape-An-Approach-to-People-Place-and-Space/Thwaites-Simkins/p/book/9780415340007#

UICN-WCPA. (16 December 2020). *Sustainable Recovery of Tourism in Protected Areas from The Covid-19 Pandemic. Transforming Vision into Action - Oped*. https://www.unwto.org/covid-19-oneplanet-responsible-recovery-initiatives/iucn-tapas- last accessed 2023/05/07group

UNEP – UNWTO. (2005). *Making Tourism More Sustainable - A Guide for Policy Makers*. https://www.unep.org/resources/report/making-tourism-more-sustainable-guide-policy-makers last accessed 2023/05/07

UNWTO. (2013). *EU Guidebook on Sustainable Tourism for Development*. https://www.unwto.org/EU-guidebook-on-sustainable-tourism-for-development#:~:text=Expressed%20simply%2C%20sustainable%20tourism%20can,environment%2C%20and%20host%20communities%E2%80%9D last accessed 2023/05/07

UNWTO. (2020). *Código Ético Mundial para el Turismo*. https://www.unwto.org/es/codigo-etico-mundial-para-el-turismo last accessed 2023/05/02

UNWTO. (n.d.). *Objetivos de desarrollo sostenible*. https://www.unwto.org/es/tourismo-por-los-ods last accessed 2023/05/02

Wu, D., Li, K., Ma, J., Wang, E., and Zhu, Y. (2022). How Does Tourist Experience Affect Environmentally Responsible Behavior? *Sustainability*, *14*, p. 924. https://doi.org/10.3390/su14020924

Zahoor, A., Muhammad, M., Muhammad, N., and Malik, K. (2020). Moving towards a sustainable environment: The dynamic linkage between natural resources, human capital, urbanization, economic growth, and ecological footprint in China. *Resources Policy*, 67, p. 101677. https://doi.org/10.1016/j.resourpol.2020.101677

Zhang, L., and Zhang, J. (2020). Chapter 13 - A systematic review on tourism energy consumption, sustainable tourism, and destination development: a behavioral perspective. In Junyi Zhang (ed) *Transport and Energy Research*, Elsevier, pp. 295-313, https://doi.org/10.1016/B978-0-12-815965-1.00013-2; https://www.sciencedirect.com/science/article/pii/B9780128159651000132