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MMV

Monitoring and Management of Visitors 11

11th International Conference on Monitoring and Management of Visitors in Recreational and Protected Areas:

Behavioral changes of outdoor and landscape recreational consumption in Global Green Deal context

Abstract book

Editors:
Agita Līviņa,
Andris Klepers

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The Book of abstracts is finalised 15th September 2022. Minor changes in the List of participants as well as slight changes to the conference program might be. The changes will be available on the website: https://virtual.oxfordabstracts.com/#/event/2929/program .

FOREWORD

The MMV is much more than a conference. It is a meaningful global research platform on visitor management and monitoring outdoors. We are proud to host to this international event held in Latvia more than 100 participants in person and almost 10 participants virtually from 27 countries. It is truly gratifying that so many of us researchers care about mission-related research to keep the fragile natural heritage vital and available for generations to come.

We live in a changing world in which we have to adapt to many new conditions. The demand for the consumption of nature drastically increased worldwide in the last three years of Covid-19 pandemic. Even since the war in Ukraine, there have been changes in public behaviour, the scale of values and priorities. Although outdoor recreation activities in Ukraine are far from priorities, a new National Park was created there this year – Pushcha Radzivila National Park in Polesia.

Changes in the global economy have an impact on the natural environment and sustainable planning of resources. For example, the energy crisis to keep countries safe for energy supplies is driving demand for additional new solar and wind parks. Are the society, locals and tourists ready to accept these parks in scenic natural landscapes? How to manage the economic development principle "not in my backyard," and balance recreational activities, nature conservation, and wildlife? These are just few actual and challenging issues for managers and researchers – as part of the spark of problems and the time stamp of this moment. The keynote speakers will encourage us to reconsider values, attitudes, and training on sustainability understanding and acceptance in daily activities. In a public poll (2021) on nature conservation and protection in Latvia, 96 % respondents confirmed that it is significant to take care of nature. Still, less than 32 % of them accepted that their daily activities and decisions significantly influence nature.

This volume of research findings includes papers – extended abstracts from different disciplines on managing and monitoring protected and recreational areas, such as landscape studies, geography, geomatics, information technologies, biology, nature conservation, culture, history, economy, management, transport, building engineering and citizen science etc.

Beyond the active debates in Jūrmala conference venue there are three field trips included into the programme allowing to exchange the know-how on practices how to manage visitors in protected recreational areas and in nationally valuable landscapes such as the coast of the Baltic Sea, Gauja National park and Ķemeri National park.

We truly wish that the conference will enrich your research experience and open up opportunities for new collaborative networks to address issues that matter to society and nature.

Local Organizing Committee

Agita Līviņa, chair

Andris Klepers co-chair

CONFERENCE PROGRAM

19th September – Monday

18:00 – 19:00 Welcome reception

20th September – Tuesday

9:00 -10:40 Opening ceremony

Keynote speakers: Andreas Muhar and Agnese Balandiņa

10:40 – 11:10 Coffee break

11:10 – 12:50 Parallel sessions

Section 1A (Hybride) Monitoring and Management of visitors: lessons learned

Section 1B Different outdoor visitors: trends and new consumption pattern

Section 1C Recreational resources and impact from climate change, environmental and social crisis

12:50 – 13:50 Lunch

13:50 – 15:30 Parallel sessions

Session 2A Carrying capacity of the environment, ecosystem services and well-being

Session 2B Different outdoor visitors: trends and new consumption pattern

Session 2C Monitoring and management of visitors: lessons learned

15:30 -16:00 Coffee break and Poster session

16:00 – 17:40 Parallel sessions

Session 3A Carrying capacity of the environment, ecosystem services and well-being

Session 3B Different outdoor visitors: trends and new consumption pattern

21st September - Wednesday

9:00 -10:40 Parallel sessions

Thematic session 4A (hybride): Managing wildlife tourism

Session 4B Different outdoor visitors: trends and new consumption pattern

Session 4C Eco-innovations and technological advances in managing visitor flow in nature areas

10:40 – 11:10 Coffee break

11:10 – 12:00 Keynote speaker Hanss Stoops

12:00- 20:00 Field trip (lunch packed)

22nd September

9:00 - 10:40 Parallel sessions

Session 5A Theamtic session: Outdoor recreation advocacy as a social movement for sustainable development and change

Session 5B Different outdoor visitors: trends and new consumption pattern

10:40 -11:10 Coffee break

11:10 – 12:50 Parallel sessions

Session 6A (Hybride) Landscape quality monitoring and key performance indicators

Session 6C Development and quality of traditional and contemporary landscapes

12:50 -13: 50 Lunch

13:50 -14:40 Keynote speaker Simon Bell

14:40 -15:10 Coffee break

15:10 -16:00 Conclusions&closing

Lead researcher Andris Klepers, Local Organizing committee

Professor Peter Fredman, MMV International Steering committee

Professor Eick von Ruschkowski, MMV12.

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KEYNOTE THESIS

Concepts for the Integration of Ecology and Society and their Relevance for Sustainability Transformation

Andreas Muhar
University of Natural Resources and Life Sciences Vienna, Austria

In the past two decades, a number of concepts for the integration of ecology and society have been introduced into scientific debates to describe and analyze human-nature relationships, but also to frame societal processes and policy making: “Ecosystem Services”, “Nature-based Solutions”, “Blue/Green Infrastructure”, “Bioeconomy”, “Green Economy” etc. This year’s MMV conference specifically refers to the “Green Deal” concept in its subtitle.

All these concepts share the goal of balancing the needs of human society and the integrity of the planetary system. Some of them have a sound theoretical foundation, others often rather appear as short-lived buzzwords. Most of them have in common that they have originally been developed outside the MMV community, in disciplines such as economics, ecology or engineering. Thus, there is a time lag between the development of a particular concept and their discussion and implementation in contexts of the MMV community such as tourism, outdoor recreation and park management; and those who then implement the concepts might not always be fully aware of their theoretical backgrounds and limitations.

Researchers as well as experienced practitioners in the MMV fields tend to take a sceptic position towards allegedly new concepts, often feeling that these concepts are just a reinvention of the wheel or a rebranding of what had been well-established under a different term before. We propose to take a rather pragmatic approach and suggest that the following questions should be discussed when considering the adoption of a particular concept or framework:

- What opportunities can be generated from adopting a concept?
- Does the adoption of a concept influence the daily work of researchers or park managers?
- Which goals of park management can be supported by what concept?
- What fundamental understanding of the Human-Nature-Relationship is behind a concept?
- How does a concept relate to pathways for transformation towards sustainability?

When looking at Nature-Based Solutions as an example, we see an official definition of the EU Commission: “Solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience.” Practical examples can be green facades as well as the preservation of mangrove forests for coastline protection. One can easily argue that mangrove forests and green facades are quite different structures with little commonality, and that landscape planners had always advocated for preserving mangroves and greening buildings. However, when presenting proposals for mangrove protection or green facades in the context of the EU-adopted term Nature-Based Solutions, a larger number of funding possibilities might arise, and thus the

concept can prove to be beneficial despite its theoretical weakness. A similar pragmatic approach could be applied for most other concepts.

The recently published Sixth Assessment Report of the Intergovernmental Panel on Climate Change IPCC as well as many other publications present different scenarios for future developments and discuss transformation pathways towards sustainability and climate protection. These numerous proposed pathways can be condensed into four categories:

- Market reform: pricing of resource consumption and emissions along the whole value chain; abolition of climate-damaging subsidies; cost truth regarding indirect environmental and social impacts
- Technological Innovation: Cooperation between government, industry and research to increase resource efficiency via new technologies and artificial intelligence;
- Public provision: Climate-friendly spatial planning, investment in public transport; legal regulations to restrict climate-damaging practices
- Social innovation and sufficiency: Focus on regional value chains, social cohesion and endogenous regional development

It is helpful to investigate the explicit or implicit linkage of a proposed transformation pathway to the above-mentioned concepts and to the respective underlying fundamental understanding of the human-nature relationship. E.g., the Ecosystem Services framework considers nature as a service provider to humans. This does not reflect the diversity of relationships humans can have to nature (e.g. spiritual bond; humans as integral part of nature), yet it is very connectible to market-oriented transformation pathways that would provide levies on resource consumption and greenhouse gas emissions.

Researchers, park managers and planning authorities need to identify and consider the different consequences of these pathways for the multifaceted aspects of visitor management in recreational and protected areas. E.g., when implementing a market-based transformation pathway, travel costs to visit remote areas without public transport service will increase significantly, thus turning such visits into a luxury good. A technology-oriented pathway would entail sophisticated visitor monitoring and management approaches to optimize resource consumption. A sufficiency-oriented pathway with a focus on local economic and recreational activities might infer a higher use-intensity of recreational areas closer to the place of residence.

Discussions about desired transformation pathways are often overshadowed by ideological stances, where political actors tend to only favor one particular pathway. By demonstrating to politicians the different consequences of each pathway for a concrete field of implementation such as in our case tourism, recreation and protected area management, it can be shown that these pathways are not mutually exclusive, but need to be seen as complementary.

From obscurity to stardom. Boardwalk in Ķemeri Raised Bog as a witness of visitation changes in Latvian nature in the last two decades.

Agnese Balandiņa
Ķemeri National Park Nature Centre of the Nature Conservation Agency, Latvia

In 2000, one of the first publicly accessible boardwalks was built in Latvian raised bogs – in Ķemeri National Park, Ķemeri Raised Bog, paving the way to accessibility of an ecosystem which was previously almost never visited for tourism purposes. Due to a range of reasons – amazing scenery, closeness to the capital, accessibility by roads, etc.. – the boardwalk gained popularity over the years, the number of visits now reaching around 100 000 a year, photos of the raised bog appearing on national image brochures, the raised bog used as a stage for cultural performances, etc..

In 2006, large scale habitat restoration works were implemented in another part of Ķemeri Raised Bog, to reduce melioration impacts in a former peat extraction site. After the works were completed, the area started its way back to being a fully functioning wetland again, with water levels raising and nature values characteristic for an intact raised bog slowly making their return. Being a no man's land for tourism purposes in the beginning, the site is now experiencing operation of some 8 tourism companies providing bog-shoeing, canoeing and paddle boarding activities, with the number of visitors rocketing from about 20 in just 2018 to over 2000 in 2021.

Both these examples illustrate an overall tendency in Latvian nature – relatively wild places with close-to-zero interest in anybody becoming very popular in relatively short time. Fuelled by the COVID time, the significant increase in demand for nature-based activities has raised many questions as to whether and how to provide sufficient supply without compromising sustainability in Protected Areas.

The managing institution of the Protected Areas in Latvia – Nature Conservation Agency – has done a lot to improve both – managed and directed accessibility, as well as awareness about nature values in Latvia. More than 700 nature tourism objects – nature trails, tourism routes, birdwatching towers, etc. – have been installed across the Protected Areas in Latvia (www.tiekamiesdaba.lv), whereas 6 Nature Centres in the 4 National Parks and the Biosphere Reserve of Latvia provide various kinds of nature education offers for all kinds of target audiences. Yet, the demand seems to be bigger anyway.

To learn more about the current situation and tendencies in public attitudes towards nature values, a profound visitor survey was done by Vidzeme University of Applied Sciences together with Nature Conservation Agency in 2021 – 2022. The main conclusions reveal a lot of contradictions. Although the vast majority of respondents admitted using and benefitting from the ecosystem services provided by Protected Areas on regular basis (going for walks, making use of the tourism infrastructure, picking berries and mushrooms, etc.), many still expressed confusion about the various restrictions in place to ensure safeguarding the values. This indicates the long way ahead to arrive at general understanding and appreciation of

Protected Areas as sites of exclusive character, comprising the most valuable natural and cultural heritage.

On the one hand, people's turning to nature has a lot of positive aspects, including the huge potential in raising overall public awareness on nature related matters, possibly also leading to much needed changes in behaviour and everyday habits. Moreover, the role of nature in human wellbeing, both physical and mental, cannot be denied, and adequate possibilities should be provided.

On the other hand, Protected Areas have been designated with a special aim, and are home to our most sensitive natural, cultural and historical values. Thus, priority should be given to activities with high added value, e.g., in education, raising awareness, mental health, etc.., really focusing on the values of Protected Area.

In the same time, the undeniable public need for suitable outdoor recreation possibilities also highlights the essential need for less sensitive, yet still fully enjoyable natural areas, with environment close to what can be found is Protected Areas – beautiful sceneries and landscapes, forests with fresh air and at least some wildlife, etc.. Such areas are needed to provide sufficient alternatives for recreational activities with high emotional and health value, yet also higher environmental impact and less educational value, e.g., cycling, orienteering and other sports competitions, trail marathons, etc.. Such areas could serve as "buffers" taking the pressure off the Protected Areas, yet still providing sufficient amount and quality of ecosystem services needed by society.

In Ķemeri National Park, European Charter for Sustainable tourism is used as a tool to find the right balance among the different interests in the Protected Area; and Nature Conservation Agency works on spreading the good practice also to other Protected Areas in Latvia. Some of the best practice examples of increasing the added value to any Protected Area visit and contributing to sustainable management of visitors and their impacts include:

- campaign "Let's do good for nature";
- ongoing discussions with tourism businesses and trainings to increase their awareness, including on nature as a very unreliable and unpredictable business partner;
- campaign "Leave no waste";
- organization of Travel Day events in Protected areas;
- etc..

Environmental education through outdoor sports: the Sustainability and Environmental Education project

Hans Stoops
International Mountain Bicycling Association Europe and the Swedish cycling advocacy organisation Cykelfrämjandet. Sweden.

The SEE Project – Sustainability and Environmental Education in outdoor sports promotes education in and through sport with special focus on skills development for outdoor sports professionals such as outdoor sports trainers, guides, or instructors. The SEE Project also helps to promote increased voluntary activities in sport, together with social inclusion, equal opportunities and awareness of the importance of health-enhancing physical activity all in a frame of sustainable development and in line with the new Green Deal for Europe.

Over the three years, the project will aim to produce several research reports analysing challenges of sport in nature and the current developments in environmental education for outdoor professionals. An environmental toolkit will be created which will be specifically for environmental education and leadership training. The toolkit will act as a compilation of best practices, case studies and include new educational material for different landscapes/environments, different sports, different participants, and different formats.

Several exchange programmes will take place during the project. These exchanges will be based in Serbia, Portugal, France, Sweden, and Ireland and will bring together outdoor recreation stakeholders. The toolkit and the methods developed for environmental education will be tested and evaluated before the final publication. The project will finish with an international learning symposium.

The SEE project will gain a greater understanding into the challenges and issues that outdoor sports can create or must deal with when using natural or protected areas. This understanding will be essential to inform the pedagogical processes developed.

The SEE project will identify good practices of sustainability and environmental education in leadership training across the partner countries, but also on a broader European context and from a global perspective. Good practices will be identified through a systematic search for good practice examples in the curricula of educating organisations like outdoor sport federations as well as through a practical exchange programme to share methods.

Based on the state-of-the-art in leadership training and the compendium of good practice from the exchange programme, the partners will develop further pedagogical methods to fill the gaps identified, face actual challenges and provide highly innovative methods to motivate outdoor sports enthusiasts for responsible behaviour.

The developed toolkit will be shared within the partnership and connected groups and promoted to a broad range of relevant stakeholders in European outdoor sports.

The developed educational tools will be implemented in a series of case studies to test the methodology and to showcase how to (better) implement sustainability and environmental education in the curricula.

Within training courses and multiplier events to promote and share the toolkit, important stakeholders within outdoor sport and the educational system will be trained with the methodology and act as further multipliers in the future.

The toolkit itself is focused on helping outdoor professionals like sports leaders, guides and instructors who are often at the forefront of introducing new participants to outdoor sports and natural or protected areas, to include environmental education in their business of guiding or leading outdoor groups. It will therefore increase the competences of multipliers in the field of outdoor sport. By this, the toolkit will not only benefit the education system but also have a long-term multiplier effect by training later group leaders.

The project will also raise awareness on the importance of sustainability and environmental education and promote ethical behaviours and codes of conduct among sports people.

The European White Paper on Sport (2007) highlights that "sport makes an important contribution to economic and social cohesion and more integrated societies". However, it also highlights that "the practice of sport, sport facilities and sport events all have a significant impact on the environment. It is important to promote environmentally sound management, fit to address inter alia green procurement, greenhouse gas emissions, energy efficiency, waste disposal and the treatment of soil and water. European sport organisations and sport event organisers should adopt environmental objectives in order to make their activities environmentally sustainable."

Outdoor sports have a real potential to have an extremely high impact on the environment yet can also really engage and connect people with the environment. This project is focused on developing mechanisms to train instructors, guides, and leaders on how to communicate good environmental practices and ethics and thereby reduce this impact.

Furthermore, the new European Green Deal highlights that environmental responsibility is now rightly at the core of European thinking and this project recognises the needs to promote sustainability in outdoor sports.

Finally, there is a recognition that if participation in outdoor sports continues to grow and more people access natural and protected areas – it is imperative that they understand how to mitigate and minimise any impacts. Failure to do so could result in restrictions or exclusion and the benefits that can be accrued through outdoor sports would not be realised, while the opportunities for more people to participate in such health enhancing physical activity could be diminished.

More information, project reports and resources can be found on the project website, https://see-project.eu.

Landscape character and place value as a framework for sustainable recreation planning and management

Dr Simon Bell
Chair professor of landscape architecture
Estonian University of Life Sciences

Introduction

The concept of landscape character assessment as a tool to inventory, classify and determine development capacity has been around for three decades and came to the fore when the European Landscape Convention came into force. While landscape character is a neutral, value-free concept, nevertheless it can be used as a framework for assessing or ascribing value, sensitivity, pressure and, ultimately, capacity for development - including recreation and tourism. In outdoor recreation planning and design the landscape - the place, such as a forest, lake, coastline - has specific values - intrinsic and extrinsic - which makes it attractive to visitors. Without an understanding of the sensitivities and pressures associated with recreation, this valuable place is at risk of degradation. This presentation will outline an approach to resolve this, using experiences of teaching the subject in Estonia and working on the Latvian State Research Programme project "Sustainable Land Resource and Landscape Management: Challenges, Development Scenarios and Proposals".

Background

In 2022, 75% of the population of Europe live in cities. However, these urban areas occupy only around 5% of the EU territory. Rural areas form by far the largest space and contain many different land uses. In remoter regions traditional agriculture, forestry or fishing are declining as means of gaining a livelihood and are being replaced by tourism and recreation. In remoter areas, too, there is depopulation, land abandonment and a “rewilding” of the landscape. At the same time, urbanised people desire more leisure time and increasingly need to escape from the stresses of urban living, getting more in touch with nature – especially recognised as a result of the Covid pandemic. This increases the pressure on the most attractive landscapes and many suffer from over-use, ecological damage, pollution and over-development. Planning and designing for outdoor recreation and nature tourism is a growing area requiring a special skill set and is also a highly multi-disciplinary activity, working with many different specialists.

As society is changing due to many different economic, social, technological and demographic drivers, demand for outdoor recreation is constantly changing and the pressures visitors place on attractive landscapes affect their social, physical and environmental carrying capacity. In addition, many facilities are needed to service visitor requirements, to manage them and to protect the landscape being visited.

In the field of recreation planning and design the major problem is that an area is often valued for its landscape and other natural and cultural assets which helps to drive demand, so putting pressure on its resources until a point may be reached at which over-development, problems with carrying capacity, environmental degradation and reduction in the quality of the recreation experience result. When the area is a particularly sensitive one with high

biodiversity, aesthetic or cultural values, this may add additional pressure and raises many challenges for planning and management.

Visitor management tools – such as “Limits of Acceptable Change” have been around for a while and offer the means to help to control or limit damage before the visitor pressures have reached critical numbers. The approach outlined here aims to deflect this problem at the planning and design stage. Where other frameworks or concepts are in use – such as the Recreation Opportunity Spectrum (ROS) – these can be used in conjunction with the sensitivity and capacity method and in fact are very compatible, helping to determine the kind of ROS objectives most appropriate, for example.

The concept of landscape character sensitivity and capacity has been applied to the strategic planning of various forms of development, e.g. the location of windfarms in the Scottish Highlands for around 15 years and the general methodology was formulated some 30 years ago. Thus the key definitions and approach are well-established and now are being adapted in terms of scale and content to different landscape planning fields. The key aspect to note, however, is the use of a Landscape Character Assessment as the principal framework since this embodies all aspects which make a landscape what it is.

KEY DEFINITIONS

Landscape sensitivity

- Reflects the vulnerability of a landscape to change; the ability of a system to take pressure
- Within a landscape, certain attributes may be more vulnerable to change than others

Landscape capacity

- The ability of a landscape character type or area to accommodate a specific change without undesired effects, influenced by landscape sensitivity
- Varies according to the type and degree of change
- Reflects the value of the landscape

The landscape is sensitive to different forms of recreation and tourism activities.

- Capacity is the ability by which the landscape can accommodate a particular type or scale of activity in relation to its sensitivity.
- Thus a landscape with greater sensitivity to a particular type of development usually has lower capacity to accommodate this.

THE LATVIAN CASE

The project "Sustainable Land Resource and Landscape Management: Challenges, Development Scenarios and Proposals" nearing completion is structured around a comprehensive landscape character assessment undertaken for the country using a range of resources. It is hierarchical in scale and provides an essential framework for a number of landscape planning and management tasks. The application of landscape sensitivity and

capacity in relation to different forms of development is one particular aspect. As Latvia, Like Estonia, possesses significant landscape resources attractive for outdoor recreation and nature tourism yet has not so far applied any formal planning system, this offers a good chance to fill that gap based on an up-to-date assessment of the landscape and its values.

1

Observation and analysis of landscape views from tourism student perspective in Latvia

Agita Livina, Iveta Druva – Druvaskalne
Vidzeme University of Applied Sciences, Latvia

Abstract

Introduction and objectives

In this study, landscape means an area perceived by people, particularly by visitors, whose character results from the action and interaction of natural, cultural and/or human factors (modified from the Europe Landscape Convention, 2000). The landscape is an aesthetic resource of nature, providing aesthetic pleasure and triggering emotional survival (Dāvidsone, 1975), which is a crucial part of experiencing nature. The landscape has a central role in tourism, including fulfilling dreams and fantasies and influencing visitor behaviour (Terkenli, 2004).

The guidelines for implementing the Europe Landscape Convention (2008) identify nine principles. For recreation and tourism are significant considerations of landscape as a whole territory, recognizing the role of knowledge, raising awareness and integration of landscape in sectoral policies (including tourism, nature conservation as well as communication, energy etc.) (Council of Europe, 2008).

Landscapes and their viewpoints are diverse and change during periods and seasons by the influence of objects and elements and human actions (Biodiversity Learning Kit, 2017). Everyone can percept the view variously. Someone will see a peaceful landscape with a specific fragrance from a blooming bird Cherry. Others can see details in a vast landscape as small stones, vertical objects as a stack, or mobile towers.

Is the view influenced by the location of the landscape watcher and his understanding of the landscape? We involved second-year tourism management students to observe and analyse different landscape viewpoints in Latvia to understand better how landscape viewpoints present to visitors and tourists. We used an integrated training method, including individual observation of landscape viewpoints.

Methodology

We have 18 different landscape viewpoints (see Fig.1) for second-year tourism students to analyse these landscape viewpoints. The task consisted of five stages: 1) to check historical periodical analysis to understand if the place has been remarkable and famous in the past (written about in the press, photos published); 2) to carry out historical and actual maps of the place with the aim to understand changes in the landscape and try to determine the causes of the changes; 3) carry out an analysis of the nature and cultural and historical values of the landscape viewpoint area to be analysed to understand whom to pay attention to during the survey; 4) to observe designated landscape viewpoints (fieldwork). Observation included photos, assessment of visual and esthetic quality according to given criteria (adapted from N.Nitavska protocol), site improvement/infrastructure elements; 5) to conclude how the viewpoint can be used in tourism and recreation. What and how needs improvement if it is used in tourism?

Fig.1. Location of observed and analysed landscape viewpoints in Latvia.
Source: OpenStreet maps

Each student selected one viewpoint from 18 offered by living place or interest to observe a particular place. Excluding two places, others are connected with blue landscapes (rivers, lakes, sea, gulf, bog).

Results

The youth represented good skills to analyse and compare historical and actual maps, as well as they, found articles and explanations about landscape viewpoints in newspapers and journals several decades ago. According to a study of maps, students mentioned that there are changes in land cover, in some viewpoints, increased areas by forests instead of grasslands and the intensity of settlements or infrastructure elements have increased. Students also observed that the number of spectacular old trees in the landscape had declined. At separate scenic points, students acknowledged that water levels had increased (for example, due to the construction of a hydroelectric power plant), thus changing the landscape. Students explored changes in place economic development, for example, there used to be a shipyard, now just nature.

During the visit, students critically assessed the established infrastructure for recreation, benches, and tables because the infrastructure hadn't been restored.

Student A characterizes the landscape viewpoint of Cirgaļi inland Dune from aesthetic quality *"The landscape is harmonious, quiet and calm, but at the same time alive, as every now and then you can see a bird fly away, as well as special liveliness is given by the water seen in the landscape."*

Student B characterizes the impact of visitors to the landscape viewpoint of Lielupe White Dune "*Water and humans forgive the movement for liveliness, but can be described during summer periods as maddening with the high flow of people*".

Student C characterizes the viewpoint of Skanstupīte estuary in Daugava, " You can see a house somewhere in the distance, or leave a boat on the bank of the river, so the landscape is with individual human elements, but overall it creates pleasant feelings. Being at this point, on a beautiful sunny spring day, gives you a willingness to smile.."

Student D characterizes Gauja estuary as "*The colours are nuanced - the greyish blue of the waters, the brown of the sand, the green of the forests, the blue of the sky - all of which form a special and nuanced colour gamut. The landscape is unique because it is the only large inlet of the Latvian river with such a natural passage of life. Being in this place is enjoyable and*

calming. The environment is perfectly natural; looking everywhere around, you can't see any place where a person has changed anything."

Student E characterizes Lake Vaidavas *"The quality of the view - pleasant because the water creates a sense of tranquillity, as well as the trees moving when the wind blows up, which creates a pleasant feeling."*

Student E characterizes a new viewpoint of Gauja valley in Sigulda *"Watching the landscape gives rise to several sensations - pleasant, calming and inspiring. The view is magnificent and almost entirely natural, without human artificially constructed structures".*

Conclusions

By creating a new infrastructure like roads, and pedestrian lines, new viewpoints can be developed naturally by the demand of people. If it is impossible to maintain the infrastructure in order, it degrades the place and view. It is necessary to be very critical about the creation of infrastructural elements in natural areas.

We noticed that students over-emphasize a very groomed natural environment and do not understand biodiversity processes and their role in the landscape ecosystem as fallen logs, and natural grasslands. Students pointed out the different beauty of the landscape throughout the seasons in their assessments.

Following the conclusions and proposals of students to improve, and maintain landscape viewpoints, it can be concluded that natural tourists should be highlighted as a separate segment in the study process, as some of the landscape viewpoints would be for nature tourists. Criticism focused on the road pavement, distances from main roads, and signage, but for real nature tourists, these would not be obstacles to discovering scenic landscape viewpoints.

In our view, such an integrated teaching approach is valuable to increase landscape awareness.

Acknowledgment

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Teenagers' recreational forest use – influence factors and comparison to adults

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Abstract

Introduction

Extensive research has been conducted about adults' forest visit behavior, preferences and motives for forest visits, etc. However, little research has been conducted on teenagers' recreational forest use. It is assumed that teenagers probably visit forests more rarely than children or adults, and the scarce literature that exists on the topic focuses mainly on the importance of forest as a place for freedom and getting away from the restrictions of parents and society (Bell et al., 2003; Mäkinen and Tyrväinen, 2008). Therefore, we aimed to gain insight on teenagers' frequency of forest visits, the childhood's and leisure preferences' influence on it, as well as the motives facilitating and the constraints preventing forest visits (Oppliger et al., 2019). Our research questions were:

- Do teenagers visit the forest and if yes, with which frequency and which are the prevailing activities compared to adults?
- Which motives encourage and which constraints hinder teenagers to visit forests?
- Which further factors (leisure preferences, childhood) influence teenagers' forest visit frequency?

Material and Methods

A nationwide survey in Switzerland with a teenager sample enabled us to compare forest visit frequency, activities in the forest and reasons for visiting or not visiting forests between adults and teenagers. In addition, we carried out a survey with 643 teenagers aged 13-22 years in eight schools in Zurich and neighbouring regions in Switzerland. The questionnaire dealt with the teenagers' forest visit frequency, their forest usage during childhood, their leisure preferences, motives for visiting and reasons for not visiting the forest.

Results

The nationwide survey revealed that teenagers visited forests less frequently than adults and used the forest in a different way, with a greater focus on sports such as jogging and cycling and social activities such as picnicking and barbecuing, while for adults, contemplative activities like walking, unwinding and observing nature were more frequent. Motives for visiting the forest were partly similar to adults' motives, e.g. enjoying nature and fresh air, even if more so for adults than for teenagers. Both teenagers and adults visited forests equally often to spend time with friends and family, but teenagers more often sought fun in the forest

than adults. Teenagers' reasons for not visiting forests were dominated by not having friends visiting forests, having other leisure activities outside forests and preferring other green spaces, whereas for adults, apart from having other leisure activities, the presence of a garden played an important role whether they visited forests or not.

The survey at schools showed that in contrast to current literature, motives related to "freedom", such as being unobserved, being able to listen to loud music without disturbing others, not having to keep to rules, etc. played a minor role. Reasons for not visiting forests included not having time due to other leisure activities carried out outside the forest, finding forests boring and the presence of ticks, mosquitoes and other insects. The distance to the forest played a medium role. A direct fear of the forest, of being assaulted, of accidents happening, of getting lost, of diseases, poisonous plants, etc. was unimportant. A multiple linear regression with forest visit frequency as dependent variable revealed that the most important factors hindering teenagers to visit the forest were the feeling of boredom, the feeling of disgust in the forest, parents' fear of forest and a high amount of leisure time spent with electronic media (e.g. playing video games or surfing the internet). On the contrast, respondents visited the forest more often if their friends did so, if they had played in the forest unsupervised or with their parents as children and if they spent time with pets.

Discussion and conclusions

In summary, we found that teenagers visit forests less often than adults, and that their visits are dominated by different activities compared to adults. There is a strong influence of friends' forest visit behavior, forest usage during childhood and parents' attitude. The frequent use of electronic media increased the perceived boredom in the forest and subsequently led to less forest visits. Future management strategies to enhance teenagers' forest use should focus on encouraging children to visit forests from an early age on, without making it mandatory. Free play seems to be one of the key factors to reduce perceived fear, disgust and boredom and should therefore be encouraged. To get more teenagers to engage in forest recreation, leisure programs offering engaging forest activities such as youth groups should be sustained and promoted.

Acknowledgements

We thank the Swiss Federal Office for the Environment (FOEN) for funding the nationwide survey as part of the Swiss Sociocultural Forest Monitoring WaMos. The school survey was conducted within the Swiss National Forest Inventory and supported by the Swiss Federal Institute for Forest, Snow and Landscape Research (WSL), the Swiss Federal Office for the Environment (FOEN) and the Swiss Federal Institute of Technology.

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3

UPSURGE - Acceptance of new green infrastructure in European cities

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Abstract

Introduction and objectives

Many cities are planning to invest in blue and green infrastructure. The project UPSURGE funded by the European Union focuses on air pollution and ambient pollution, carbon-related issues ranging from greenhouse gas emissions to carbon shortages in soil and studies the opportunities provided by nature-based solutions (NBS) and the acceptance of changing urban ecosystems. Upsurge is considering all these aspects and is providing evidence-based targeted responses that will enable EU cities to transition into a more regenerative future. At its core, UPSURGE aims to present the European Regenerative Urban Lighthouse, which will enable cities to unlock their regenerative potential and provide them with knowledge and guidance in regenerative transition. UPSURGE motivates cities and other clients through its networking activities to engage and step aboard the regenerative transition under Lighthouse's leadership. However, the transition process is confronted with an extremely complex set of interdependent problems that have to be addressed as such – interactively, mutually and innovatively.

The paper at hand looks specifically at the acceptance of new green infrastructure and the trade-offs between the type and benefits provided by different types of new green infrastructure on one hand, additional costs and influence on the accessibility on the other.

Methodology

In order to study the acceptance, we developed a survey focusing on the living conditions of the respondents in five European cities and specific situation in the respective neighbourhood. In addition, we applied a choice experiment (CE) in order to understand the most important factors influencing the decision on new infrastructure (Pröbstl-Haider et al. 2020, Mostegl et al. 2017). Based on an extended literature review we defined eight attributes which are likely to influence the local decision-making process. To reach respondents living in different urban European environments we applied a panel in different country. The CE was programmed in the respective languages and provided as an online survey. The data were analyzed with the software Latent Gold.

Results

In order to study the acceptance of an adapted urban concept we hypnotized that the following aspects may have an influence on the acceptance and decision making on a local level:

- Residents may prefer a specific type of green area. Four Options are shown in the picture and text including communal gardens, rain gardens, street greening and a green corridor.
- The development of blue and green infrastructure in cities has positive effects on the air quality. We expect that the significant reduction of Micro-dust and NO2 is likely to have a positive effect on the overall acceptance.
- In addition, lower temperature at hot summer days may have a positive influence on health and wellbeing. This might be a reason for the acceptance of new infrastructure.
- New green areas may have positive effects on local biodiversity which may lead to more acceptance of green infrastructure.
- The development of new green infrastructure is more accepted if local people are invited to participate in the planning process.
- New green infrastructure may require more time to reach your home e.g. due to a detour. If a longer detour is required the acceptance is likely to go down.
- Many communities use a waste bin charge to refinance investments in green infrastructure. We expect that a significant increase of this communal fee is likely to have a negative influence on the acceptance of the development of new green infrastructure.

Currently the data are analyzed, to confirm the hypotheses mentioned above, including the trade-offs between these independent attributes. The preliminary results show a significant influence of costs. In addition, the study allows the discussion of cultural influences across Europe and an additional possible effect of the vulnerability to heat waves and effects by climate change.

Discussion & Conclusions

The UPSURGE project is addressing the multitude of interconnected problems faced by cities (e.g., climate crisis, high competition for space, lack of resources, inequality, lack of regenerative governance, pollution, acceptance, mental and general health) by introducing the European Regenerative Urban Lighthouse as a participatory, experience-based, measurable, smart and regenerative reference framework and network.

The survey imbedded in the large project will show and discuss the overall acceptance but also possible cultural differences between the countries involved (Greece, Italy, Poland, Slovenia and the Netherlands), testing the regeneration process developed in UPSURGE and analyze its replicability and transferability.

Acknowledgment

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5

What affects the patterns in water-based recreation? A study on two factors at Vltava River Cascade: climate-related water level changes and covid-19 measures

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Abstract

Introduction

The Vltava River Cascade is a system of 9 hydroelectric power stations built on Vltava, the longest river in the Czech Republic. In addition to provision of electricity production, flow regulation and flood defense, it is perhaps the most important water-related recreation area in the country. We look at the patterns of water-based recreation in the middle and lower reaches of the Cascade which extend along 59 municipalities (local administrative units in NUTS classification) directly adjacent to the river.

We observe and discuss the short-term changes in recreation patterns due to applied covid19-related measures, and analyze also the prospective responses of recreation demand to changes in water level that are driven by climate change. The knowledge on both these recreation patterns will inform scenario building on recreational water use for the pilot area.

Data

The short-term changes related anti-epidemic measures are observed in accommodation data. Geotagged social media data (used e. g. by Wilkins et al., 2021 in USA) are not very abundant in the Czech Republic which hampers their information value. Accommodation data then remain the most relevant secondary data source available, providing the necessary minimum periodicity and detail for such analysis.

An on-site survey of national visitors was conducted to collect the necessary data (N=460) on conditional reactions of visitors to water level changes. A multi-stage quota sampling technique was used to acquire a representative sample of the recreational user population of the extensive area.

Results and Discussion

During covid-19 pandemic, several anti-epidemic measures have affected the observable long-term visitation patterns: a) closure of country borders or even district borders and b) various restrictions placed upon economy, including accommodation services or food and beverage activities. Nonetheless, right after withdrawal of each measure, the visitation pressure quickly returned to its usual magnitude - this is observed for total numbers, but is especially valid for the segment of national visitors that account for the majority (85-90%) of the total visitation at the policy site.

The potential effect of short-term water level management on visitation patterns is studied using a contingent behavior study (Englin and Cameron, 1997). Surprisingly, the short-term demand for recreation (including both actual trips and decisions about conducting further trips into the area) does not relent even after a horizontal decrease of water level by up to 2 meters. We attribute this to several factors, including the variability of recreational activities offered by the pilot area of Vltava River Cascade and relatively common previous experience of recreationists with water level changes. Most visitors participate in several recreation activities at the policy site during one trip. Several rather popular activities do not involve presence in/on the water at all - e.g. hiking or camping. The area is also frequented with cottagers in secondary housing (less flexible to react) or fishermans (with highest numbers of visits to the area among all recreational activities) who may expect e.g. to find new fishing spots under the scenarios presented.

Conclusion

Recreation pressure on the pilot area of Vltava River Cascade is already very high - we estimate that cca 7 million person-days are spent yearly during recreation trips to the pilot area (including one-day and overnight trips, domestic and foreign visitors). Cca 70% of national visitors exhibit high affinity to this traditional Czech recreational area.

Based on the results of this study on recreation patterns and their changes, it can be deduced that neither short-term external factors affecting recreation possibilities such as strict covid-19 restrictions, nor less dramatic changes of water level will not play significant roles in the long-term visitation trends. The recreation pressure is therefore expected to continue growing and spatially expanding in the future.

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7

Economic effects of nature-based tourism - a pilot study on water recreation

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Abstract

Introduction

Knowledge on the effects of nature-based tourism on the economy is vital for decisions about the use of scarce natural resources among many competing uses. While most of the uses are associated with effects that are directly visible on the market, the effects of recreation possibility in nature remain hidden within the system of national accounts. Data on the national impact of tourism on GDP are available yearly through the Satellite Tourism Account, but a more detailed economic analysis is needed for the linkage of economic impacts of recreation to a specific nature-based area. However, more detailed or more complex data needed to accomplish this task are frequently either scarce or non-existing. On this account, we build a Leontief input-output model for the regional economy based on a curated set of primary data and secondary data available in the Czech Republic following the best available practice (Spenceley et al., 2021).

We test the approach at the pilot area of the Vltava River cascade, which is an important recreation area in the Czech Republic that is characterized by a series of dams and reservoirs. Traditionally, the area has been very popular for diverse open-space recreation activities linked to water ecosystems. The visitation pressure in the area increases in time, which is in sharp contrast with the expected challenges related to climate change in future that may force the water management authority to continually search for a new balance among socially optimal uses of water.

Data

The work presented here stems from a wide range of data:

- original survey on visitor spending (N=460) patterns in the pilot area, quota-sampled both for recreation areas around the Vltava river and recreation activities;
- data of visitation patterns based on mobile positioning data and other data sources;
- data describing the economic regional (NUTS3) and national symmetric input-output tables (SIOT);
- data describing the distribution of economic activities within the regions etc.

Results and Discussion

Using the Leontief input-output model, the open model and model closed for households are built. This enables us to address the full range of economic effects: direct, indirect and induced; and to derive type I and type II multipliers of economic effects. We focus on three

indicators of economic effect: gross output, gross value added and income (wages) of residents.

The results indicate that visitor spending stimulates a considerable amount of economic activity in local economies. We estimate that 1 CZK of tourists´ expenditure is associated with creation of about 0,41-0,53 CZK of gross value added in the region (this also represents a close proxy for the effect on regional gross domestic product). For all three indicators of economic effect, more than a half of the total effect of recreationists´ expenditure on the regional economy is realized through economic sectors of accommodation and food service activities.

Conclusion

The model and data available allowed us to go into more detail and width than what has been usual within the (still not many) available economic impact analyses of nature-based tourism (e. g. Mayer et al., 2010; Søndergaard et al., 2018). We plan to build on the experience in further economic analyses attributing the local economic performance to different open space recreation sites or nature management tasks, preferably retaining the methodology and data composition so as to ensure the comparability of the results across different pilot studies in the Czech Republic.

The results of this pilot study also help complete the picture on the up to now largely unknown role that recreation plays among all other uses of the Vltava River cascade. Typically for the other uses (i. e. electricity production, flood protection), at least some economic data have been already available to the Vltava River Basin management (Povodí Vltavy, State Enterprise). Also, the study enables to translate the effect of availability of the Vltava water ecosystems for recreation into economic terms, should the water-related recreation opportunities be affected due to climate change, droughts or floods and subsequent water management - and the recreationists would have to substitute their trips with another recreational site outside the pilot area. The results also yield information directly utilizable in the communication of importance of retaining the recreation possibilities in the area for the income of local communities and economy.

Acknowledgement

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9

Tourist attractiveness of protected areas and the influence of protection status on travel distance: Insights from Germany

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Abstract

Keywords: recreation area, tourist destination, tourist attraction, affinity, distance

Introduction

The Covid-19 pandemic has had various effects on the visitor use to protected areas worldwide: In some countries of the southern hemisphere, parks were closed, which caused an immense loss of income in the former lucrative tourism business. The Brazilian economy, for example, lost 50,000 jobs due to a lack of visitor income from protected area tourism (Spenceley et al. 2021). In Germany, on the other hand, the desire for outdoor recreation in contrast to crowded urban spaces caused an increasing number of people in more remote locations. Many protected areas experienced an extreme increase of visitors, which in some places led to traffic chaos and overloading of tourism infrastructure (McGinlay et al. 2020). In addition, international destinations could not be visited, which resulted in additional usage pressure on national protected areas.

Protected areas are thus not only important local recreation areas, but also significant tourism destinations within Germany. This is documented by scientific figures, according to which Germany's national parks are visited by 53.09 million people each year. Their visitor spending generates a gross sales of €2.78 billion in the surrounding regions. In Germany's biosphere reserves, the number of visitors is estimated at 65.3 million people, who generate additional €2.94 billion in gross sales (Job et al. 2013; 2016).

Conceptual framework

The touristic importance of protected areas for travel decisions is shown by the affinity to the label "national park" or "biosphere reserve". Some studies emphasize that the protected area label has a positive brand function, which influences visitor behavior and destination choices accordingly (Pröbstl-Haider/Haider 2014). Wall Reinius/Fredman (2007) identified that almost half of the visitors to Fulufjället National Park in Sweden made their travel decision based on the protection status. Another study by Fredman et al. (2007) showed effects of the national park designation on visitor numbers and characteristics in Fulufjället National Park. They registered a 40.5% increase in visitors due to the national park label. Such effects are also documented by a study from the Great Sand Dunes National Park, USA, where an increase in revenue of €1.6 million was recorded as a result of the increase in visitors due to the designation of the national park (Weiler/Seidl 2004).

In Germany, tourism studies in protected areas classify a core visitor group of visitors with a high affinity to the protected area. During on-site data collection surveys, visitors were asked about their awareness of the protected status and its role in their destination choice. Results show a tendency for the affinity to the protection status to be higher in German national parks

than in biosphere reserves. Mayer et al. (2010) conclude that there is a connection between the development and position of national parks as tourism destinations and the affinity to the protected area. The Black Forest National Park, for example, shows an affinity of 9.3%. This national park was studied shortly after its designation, when the label still played a minor role. The Bavarian Forest National Park, on the other hand, is the oldest national park in Germany. The affinity for this national park is 45.8% (Mayer 2013; Job et al. 2021). The Lower Saxony Wadden Sea National Park has a low affinity of 15.3%, because of the visitor use even without the national park in this important holiday region (Job et al. 2022a). In biosphere reserves, a historical brand function plays a lesser role. The highest value is achieved by the Schaalsee Biosphere Reserve with 21.5%, where the biosphere reserve label was used for the tourism marketing of the previously tourism-insignificant region. The recently designated Black Forest Biosphere Reserve, on the other hand, shows a low affinity of 0.7 % (Job et al. 2013; 2022b).

Objective

Thus, a correlation between the label and its role in the travel decision is evident. Considering the importance of protected areas as recreation areas or tourist destinations, which became very apparent during the Covid-19 pandemic, the question arises: Is there a relationship between the protected area affinity, travel distance for recreation or tourism purposes, and the protected area type?

Methodology

To investigate this question, the following research focuses on the distances between the visitor's place of residence and the destination. Using the benefit transfer approach, the relevant data is provided by on-sites studies in all German biosphere reserves (Job et al. 2013, 2022b). In accordance with Mayer/Woltering (2018), who estimate the recreational ecosystem services of Germany's national parks using travel cost models, the travel distance between visitor's places of origin and the biosphere reserve is calculated by using the five-digit postal code of visitors' residence and GIS applications. A centrally located postal code is also identified for the destinations. Considering that biosphere reserves – as well as the large-scale Wadden Sea national parks – can extend over a wide area, for large biosphere reserves more than one zip-code is used. The respondents are assigned to the centroid with the minimal distance to the survey point, where they were sampled.

Results and outlook

With this information and data on visitor structure regarding day-trippers and overnight visitors as well as the affinity to the protected area, the result can be compared to findings on national parks. Mayer/Woltering (2018) discovered a strong correlation between the mean distances of overnight visitors and non-local day-trippers, which reveals that an established destination generates a higher willingness to overcome distances for recreational purposes. Considered that the various visitor structures in the parks influence the results, overnight visitors travel on average 3.51 times farther than non-local day-trippers, whereas the latter travel 8.19 times farther than local day-trippers. This is to be examined for biosphere reserves as well and to reflect the results in the context of the affinity to the protected area. With this, the question can be discussed, what role different types of protected areas, national parks or biosphere reserves, play in destination choice and thus in the tourism landscape in Germany.

This reveals different local tourism structures that need to be addressed in the management and marketing of protected areas.

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Sociabilty and Current Trends in Outdoor Activities: Measuring Nature-Inclination in the Croatian Student Population

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Abstract

The concept of sociability has been approached differently across social sciences, with sociologists referring to it as “the play-form of association” without ulterior end in its pure form (Simmel & Hughes, 1949: 255), and psychologists defining it more precisely as the “preference for being with others” as opposed to being alone, distinguishing it from similar related concepts such as extraversion, impulsivity and shyness (see Eaves & Eysenck, 1975; Cheek & Buss, 1981). The use of digital media and technology-induced social interaction have resulted in a decrease of in-person social interaction, and adolescents who spend time on social media and rarely engage in face-to-face social interaction with peers report the most loneliness (Twenge et al., 2019). Similar trends have been observed when it comes to spending time outdoors, with youth preferring to spend their time in front of a screen instead of connecting to nature (Larson et al., 2019). Operating under the assumption that the technology-related processes might be at the core of humans’ alienation from both nature and each other, we wanted to examine whether a person’s sociability could be a predictor of their relationship with nature. As far as we can assess, this study is stepping into the new territory considering that no research or theory thus far has explored the relationship between sociability and nature-inclination. While many studies have analyzed the effects of nature-relatedness and nature-connectedness can have on individual happiness and well-being (see Howell et al., 2013; Zelenski & Nisbet, 2014; McMahan 2018; Pritchard et al., 2020; Barrera-Hernández et al., 2020; Stieger et al., 2022 etc.), few to none seem to have examined the interdependence between one's sociability and their relationship with nature.

The survey was conducted online with the help of the Google Forms software, where it was filled out voluntarily and anonymously. For data retrieval, we used a form of snowball sampling; the students were asked to hand out the (link to) questionnaires to their (other) student friends, and they were instructed to target as many as they can outside of the city in which they study (Zadar, Croatia). This resulted in, although a relatively small one, a nation-wide sample (N=422), with majority of the participants being from the major cities in Croatia. The online survey consisted of three sections: (1) the questionnaire of participants’ socio-demographic data, (2) the scale measuring their sociability and (3) the scale evaluating their preferences when it comes to spending time in nature or urban settings. The analysis confirmed high internal consistency and one-factor structure of both scales.

Despite our initial hypothesis that the students' sociability and their preference towards natural world might correlate, the data clearly showed absence of any significant correlation between the two constructs. Although the relationship between these two constructs is at the focus of this paper, we also reflect upon some differences concerning their socio-demographic

background and the scores on both Sociability and Nature-Inclination scale. When it comes to Sociability, there were significant differences between students in terms of their gender, religiosity and household income: (1) male students tend to be more sociable than female students, (2) religious students tend to be more sociable than non-religious and (3) students coming from a better financial background are more sociable than others. When it comes to students' preferences of natural settings, there were also differences in terms of religiosity and household income, as well as the size of the city from which they come: (1) religious students tend to prefer natural over urban settings, (2) those coming from a more modest financial background prefer natural over urban settings and (3) those coming from smaller cities demonstrate a greater inclination towards nature-based activities. Interestingly enough, a one-way analysis of variance (ANOVA) showed no significant difference between men and female students when it comes to their preferences between natural and urban settings.

Considering that religiosity and household income turned out to be the determinants for both Sociability and Nature-Inclination, the question remains why their direction was the same when it comes to Sociability, and yet it was different in terms of Nature-Inclination. When it comes to household income, the real cause of this difference might be in the fact that those coming from more modest financial background also tend to come from smaller cities in Croatia, which leads them to engage with nature more and thus appreciate it over urban settings. Finally, we conclude that the relationship between Sociability and Nature-Inclination can be approached from two standpoints. First, one could assume that less sociable people would prefer natural over urban settings because of the solitude and serenity it offers. On the other hand, one of the main traits of sociable people is that they are more open to new experiences, which is why they might be willing to engage in nature-based activities more frequently, or their social connection might talk them into it. In fact, one of the reasons for the absence of significant correlation between the two constructs could be in the fact that these two factors negate each other, i.e., each group of people tends to find in nature what they need, whether it’s the team building-like social experience with their friends, a more personal interaction between a few, or an escape from any social contact to seclusion and tranquillity.

	Household Income	Hometown size	Sociability	Nature-inclination
Household income	1.00	0.15*	0.21**	-0.12*
Hometown size		1.00	0.08	-0.18**
Sociability			1.00	-0.00
Nature-inclination				1.00

*p<0.05 **p<0.01

Figure 1. Determinants of sociability and nature-inclination (correlation matrix)

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Soundscapes in Nature Parks – how they contribute to recreation

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Abstract

Introduction

Sounds are strongly connected with environmental quality, as Carson (1962) describes with the absence of morning bird songs and insect sounds in her famous book 'Silent Spring'. Since that time, anthropogenic sounds have multiplied in many mountain regions with more traffic, motorized outdoor activities and the use of machinery for agriculture contributing to noise pollution in mountain areas including the European Alps.

It can be assumed that the decrease of natural sounds in connection with the increase in anthropogenic sounds will have consequences for recreational quality in mountain areas.

Natural sounds not only serve as an indicator of how well the environment is doing, they are also a decisive factor in how people value spending time in nature and how refreshed they feel (Aletta et al. 2018).

However, the question of how much anthropogenic sound a mountain area can tolerate is still largely unresolved. It is therefore important to analyse how people perceive and evaluate soundscapes in the European Alps, and especially in Protected Area such as Regional Nature Parks (RNP).

A soundscape describes the interplay of all sounds perceived at a specific place and time (Schafer 1977). Sounds within a soundscape are classified according to their origin, being either anthropogenic or natural.

Methods

Our study was carried out in summer 2021 in the two RNP, Beverin and Parc Ela in the eastern Swiss Alps. Out of a pre-study with noise modelling, we chose four study areas with a sound-transect with high, medium and low sound levels and ten sites in total. The high-level sites were mainly affected by main alpine transit routes. As an additional aspect, the sites were situated in a similar natural landscape regarding view, grassland and nearby forests.

At these sites we provided a questionnaire to 277 passing hikers. Respondents rated the individual 17 sound types on a 5-point Likert scale (from not at all [1] to strongly [5]) or on a 7-point Likert scale (from very negative [-3] to neutral [0] to very positive [3]).

Parallel to the questionnaires we measured sound pressure levels (dBA) on site with the sound level meter UNI-T UT333-BT.

For statistical analyses we used the R software, version 4.1.2 with the lme4 package. To analyse the sound level's effect on recreation we used Linear Mixed Models (LMM) with variables sound level, gender and residential location, as well as date, nested within area and survey respondent codes as random effects to correct for dependencies in the data.

Results

The average age of the respondents was 51 years, ranging from 16 to 87 years, and with a preponderance of female participants (55.6 %) over male participants (44.0 %.). Regarding the current motives for hiking, the three most common answers were enjoying nature/landscape, finding tranquillity/recreation and being active and doing something for one's health.

The sites with high (mean: 44.6 dBA), medium (mean: 38.6 dBA) and low (mean: 33.7 dBA) sound levels differed significantly from each other, but there were no significant differences between the four areas and the two RPNs.

Overall, natural sounds were rated more positively by RNPs visitors than anthropogenic sounds. All negatively rated sounds were of anthropogenic origin and therefore called noise. The sounds of motorbikes or quad bikes were rated worst, followed by cars, trucks or buses.

Across all areas, visitors in the RNPs generally underestimated road traffic noises on sites with high sound level. It was found that the deviation between expectation and perception of the specific sound type influenced its rating (regression coefficient=0.69, 95% CI=0.64 to 0.76, F=759.3 df=1 and p=<0.001). Unexpected sounds in Alpine nature parks were more likely to be rated negatively by visitors.

Regarding the question about how recreation was affected by noise, it was found that sound level was the most important factor (relative importance = 1). At high sound level sites, noise had a stronger negative effect on recreation compared to sites with low sound levels. The best LMM-models further contained the variables gender, residential location and the interaction between gender and sound level. The relative importance of those factors was however considerably lower than the effect of sound level (gender=0.36, gender: sound level=0.17, residential location=0.12).

Discussion and conclusion

Our findings that only anthropogenic sounds were perceived negatively are in line with other studies (e.g. Li et al. 2018).

Regarding the question about how sound level influenced RNPs visitors' recreation quality in Alpine areas, our study was able to provide new insights. In close proximity to anthropogenic sound sources and correspondingly in sites with high sound levels, visitors assessed noise as having a stronger negative effect on recreation. Noise had a clearly weaker negative effect on

recreation in sites with low sound levels, compared to sites with both medium and high sound levels. There was no significant difference in the effect sounds had on recreational quality between sites with medium and high sound levels, indicating that there might be a threshold level of noise (between 33.7 - 38.6 dBA), and if the overall noise exceeds it, sounds start having a strong negative effect on the recreational quality.

Natural soundscapes are an essential part of park experiences and play a key role in deciding where people choose to spend leisure time in nature. It is therefore important for RNPs to take measures to preserve the integrity of natural soundscapes.

Acknowledgements

We would like to thank the RNP Beverin and Parc Ela for their valuable collaboration.

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Recreationists knowledge of applicable rules in protected areas

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Abstract

Introduction

In many parts of the world, outdoor recreation activities are becoming increasingly popular. Not only has popularity risen in recent years, but also the spatial range and diversity of these activities, due to social trends and increasing leisure time. Many of these activities, such as hiking and mountain biking, are often practiced in remote mountainous areas. In many cases, these ecosystems are of high value for biodiversity in general and wildlife in particular.

However, outdoor recreation can have a negative impact on wildlife, which is well documented by research. For example, recreation has led to changes in behaviour and has negatively affected the physiology of wildlife (Larson et al., 2016). Still, many recreationists are not aware of their negative impacts on wildlife (Gruas et al., 2020) and significant gaps remain on recreationists knowledge of applicable rules (e.g. do not walk off-trail) in protected areas. In this study, we used a questionnaire to contribute to closing this knowledge gap.

Methodology

We distributed an online survey among people in the German speaking part of Switzerland who had conducted at least one summer tour (hiking, mountain biking, etc.) in the last year. We included questions about participants main activity (hiking etc.), motives and their demographics. To evaluate participants' knowledge of wildlife, we presented them three images of native wildlife in the Swiss Alps and asked them each time to select the correct species out of three options. To estimate their ability to read map content, we showed a hiking map and asked them to classify the shape of terrain and the road type at a given location. We also presented three different kinds of protected areas (i.e. wildlife sanctuary [German: Wildtierschutzgebiet; legally binding year-round], wildlife refuge [German: Wildruhezone; legally binding only in summer], nature protection area [legally binding year-round]) and asked for the evaluation of eight statements (i.e. applicable rules, see Fig 1) during a fictional summer hike. We also showed them four images of common signage related to outdoor recreation and visitor steering (i.e. sign of protection area, hiking path, etc.).

To statistically identify predictors affecting participants' map reading skills and knowledge of wildlife depending on main activity and demographics, we applied the ctrees function of the partykit R-package to build conditional inference trees. We did this to also test if predictors mentioned above affected knowledge of applicable rules. We considered p-values <=0.05 as statistically significant.

Results

Sample characteristics

Sixty-four percent of the 986 participants completed the questionnaire. Among them, the most frequent main activity was hiking (including alpine hiking; 75%) and the mean age was 47 years with most participants having a higher education (71%).

Knowledge of wildlife and map reading skills

While the chamois (Rupicapra rupicapra) was identified correctly by 96.8%, only 46.7% recognized the black grouse (Lyrurus tetrix). 50.9% mistook latter for the capercaillie (Tetrao urogallus). The roe deer (Capreolus capreolus) was recognized by 67.9% of participants and 29.9% mistooke it for a red deer (Cervus elaphus). Terrain was correctly recognized by 96.0% (i.e. ridge), but only 54.4% named the accurate road type (i.e. mountain road). Neither age, education, main activity nor gender correlated with participants' ability to identify the correct answer.

Knowledge of applicable rules

Most participants were familiar with the applicable rules in wildlife sanctuaries and nature protection areas. They knew that dogs must be kept on a leash (81.2% / 86.5%), and that camping (86.3% / 95.1%), flying a drone (68.2% / 71.7%) and making a fire (56.2% / 92.6%) are all prohibited. On the other hand, applicable rules in wildlife refuges were assessed incorrectly by most participants (Fig 1). Only 10.6% knew that camping in (most) wildlife refuges is permitted during summer.

None of the predictors tested were significant for the participants' knowledge of the applicable rules in the protected areas. Interestingly however, most of the participants were able to read signage related to outdoor recreation and visitor steering. Markings of a hiking path especially were assessed correctly (99%), but to a lesser extent those of a wildlife sanctuary (71.6%).

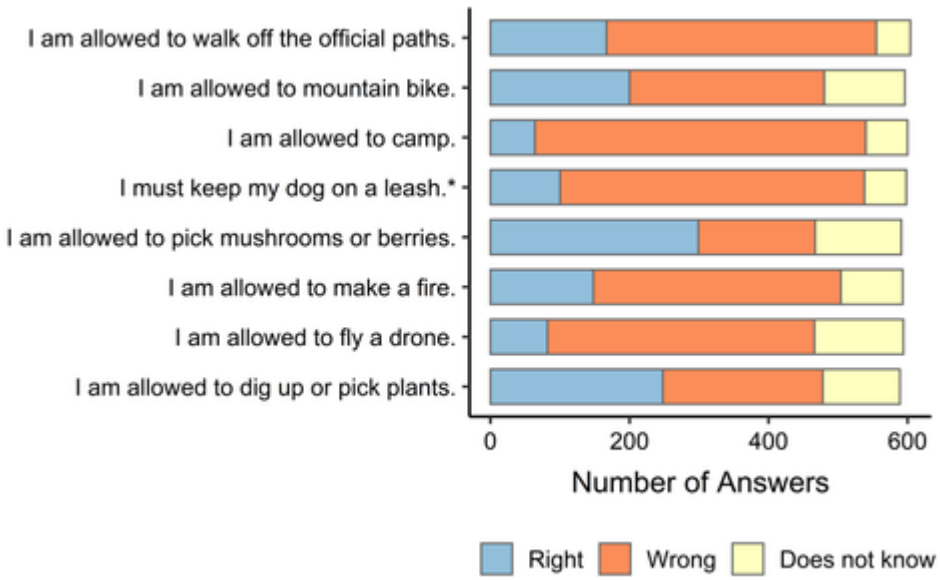

Figure 1: Participants' assessment of applicable rules in wildlife refuges, which are only in winter legally binding. The statements without an asterisk (*) are correct, the numbers in the bars represent the counts per category.

Discussion & Conclusions

Knowledge of applicable rules in protected areas, except those in wildlife refuges, was high among participants. Research about an awareness-raising campaign revealed similar results (Immoos and Hunziker, 2015). We could not identify predictors determining knowledge levels of applicable rules. In their review, Gruas et al. (2020) also found the influence of knowledge and demographics on awareness of wildlife disturbance to be inconsistent. We therefore would like to inspire further studies about recreationists acceptance of rules and predictors for awareness.

Using a convenient sample, we selected subjects that are more readily accessible. Therefore, the opportunity to participate in the survey was not equally distributed inside our target population. Consequently, the results are probably not generalizable to the whole population of outdoor recreationists.

To expand recreationists knowledge about applicable rules in protected areas and thereby better protect wildlife, it is essential to reach out to recreationists that have misconceptions or have had no contact with environmental education so far, also addressing differences in rules between protected areas. The knowledge gaps identified can help managers of protected areas and awareness-raising campaigns to sensitize recreationists and address them more directly.

Acknowledgements

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Long-term trends in recreation trip type and visitor spending patterns in the context of supporting an expanding recreation economy

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Abstract

Introduction and objectives

Engagement in outdoor recreation and nature-based tourism generates benefits for individuals and communities. For individuals, benefits include improved health and well-being. Communities can benefit from outdoor recreation and nature-based tourism through visitor spending that supports economic activity and the growth of nature-focused businesses. Nationally, in the U.S., outdoor recreation and nature-based tourism supports about 1.8% of U.S. gross domestic product. Visitors on different types of trips, such as groups on day trips versus those on overnight trips who are using private lodging, spend different amounts of money while recreating and purchase different types of goods and services (Stynes and White 2006, White 2017). In addition, different segments of visitors are reliant on different types of recreation infrastructure, such as roadways, campgrounds, and privately-owned lodging. The increasing popularity of short-term rentals, such as AirBnB, changes in how people travel to nature-based recreation opportunities—be it in electric vehicles or camper vans—, and reductions in leisure time all have the potential to influence the types of goods and services recreationists purchase and their reliance on different types of recreation infrastructure. Data from the U.S. National Visitor Use Monitoring Program provide the opportunity to examine long-term trends in recreation patterns and behaviors of visitors to U.S. national forests. We use data collected between 2005 and 2019 to examine trends in the types of recreation trips people take (day vs overnight trips), the types of lodging recreationists use, the types of goods and services purchased, and use of developed recreation infrastructure.

Results

Over the 15 years of data, we found general stability in the behaviors of national forest recreation visitors. The mix of day and overnight visits to national forests has remained almost identical over three rounds of data collection (Table 1). The share of visits to national forests that are day trips increased very slightly from 60% to 62% over the period. For overnight trips, the types of lodging visitors used has also remained largely unchanged. The lodging most used by those visiting national forests is privately-owned accommodations in nearby towns. Developed campgrounds located within national forests have consistently been the second-most used lodging type. We did find a slight increase in the most recent years in the share of visits to the national forest that were a side trip secondary to some other trip purpose, such as visiting friends and relatives or visiting a different recreation destination. In the most recent round of data, side trips accounted for more than 17% of visits, up from slightly less than 15% in prior years (Table 1). We have previously reported that, when corrected for inflation, the

total amount visitors spend during their trips has not appreciably changed over time (White 2017). However, we have found that, over time, day trip visitors have devoted a slightly greater share of their expenses to fuel purchases and slightly reduced their expenditures on souvenirs/gifts and entertainment, guide fees, and equipment rentals. Overnight visitors have slightly increased their spending on lodging and slightly reduced their spending on souvenirs/gifts and meals in restaurants and bars.

Discussion and conclusions

In considering how outdoor recreation and tourism can support a growing nature-based economy, we find stability in the types of businesses and infrastructure visitors need to support their recreation trips. Therefore, the likely challenge is not in deciding what types of goods and services to provide today's (and tomorrow's) visitors, but rather the challenge will likely be providing enough capacity—campgrounds, privately-owned lodging, and guides and outfitters—to support an increasing number of visits annually to national forests and other protected areas.

Table 1—Patterns in visitor trip type over 15-years of NVUM data

	2005-2009	2010-2014	2015-2019
Trip type			
Day Trip	60.0%	61.0%	61.6%
Overnight trip, developed NF facilities	9.0%	9.6%	8.7%
Overnight trip, undeveloped NF facilities	4.1%	3.0%	3.6%
Overnight, non-NF campgrounds	1.4%	1.5%	1.7%
Private hotel/AirBnB/lodges, etc.	14.6%	14.5%	14.3%
Home of friend/relative	4.8%	4.7%	4.5%
Second home	3.4%	3.6%	2.7%
Other	2.6%	2.1%	2.9%
Visits completed as a side trip	14.7%	14.6%	17.1%

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The influence of the recreational quality of beaches on risky swimming behaviours

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Abstract

Drowning is the third leading cause of accidental death globally. Many of these incidents occur in natural environments such as oceans, lakes and rivers, each of which presents its own specific hazards. These drowning fatalities very often occur in the outdoor recreation context.

Preventive measures are put in place to try to combat this problem, including safe bathing areas, which are generally demarcated with flags and patrolled by trained lifeguards. Where it is in place, it significantly reduces the risk of incidents. Nevertheless, individuals can still very often be observed swimming outside the patrolled areas (Hamilton et al. 2016).

Studies in this area have often highlighted the determining role of knowledge and risk perception, with people frequently underestimating the risks and then unwittingly swimming in dangerous conditions. Age and gender have also been shown to be significant factors, linked to the fact that young males are a priori more attracted than any other group to 'risky' activities. Some studies have approached the subject from a geographical angle. For example, Williamson et al. (2012) showed that in Sydney, Australia, coastal area inhabitants swam in patrolled zones less often than visitors from inland areas. Finally, Hamilton et al. (2016) shed new light in this context by identifying the role of behavioural beliefs, such as the feeling of being constrained in one's choices (if forced to swim in the patrolled areas) and the presence of attractions (such as good wave quality) outside the safe bathing areas (thus inviting one to venture beyond them). This broadening of the reflection is interesting because it reminds us that swimming remains a recreational activity engaged in first and foremost for pleasure and that any risk element is incidental.

In this study, we therefore analysed the influence of factors associated with the recreational quality of beaches (facilities provided, natural setting, activities available) on people's reported willingness to adopt risky behaviours.

Methods

The data were collected using a telephone survey conducted on a representative sample (n=500) of the population of the Aquitaine region in the southwest of France. The coastline in this area is prone to sea swells, which are generated by depressions crossing the North Atlantic and forming waves that are popular with surfers. However, underwater sandbanks created by a combination of sediment dynamics and marine energy produce dangerous rip currents (Castelle et al. 2018). Despite the presence of patrol measures along most of the coastline, there are still a high number of incidents. The survey addressed two types of risky behaviour, namely swimming outside of patrolled areas and swimming on wild beaches. In addition to

sociodemographic questions, the survey contained questions on the types of activities the respondents engaged in, the features they considered attractive or unattractive and the information they looked up before going to the beach. The analysis was carried out in two stages. In the first step, we applied a dimension reduction method to the recreational characteristics associated with a trip to the beach. In the second, we used logistic regression models to analyse the influence of these recreational characteristics on reported willingness to adopt risky behaviours.

Results

Our initial analyses have revealed that:

- 48% of the respondents reported they had visited the beach in the past year. Of these, 51% said they had swum outside a patrolled area at least once, and 36% had gone to a wild beach.

- the primary reason cited by those who had never swum outside a patrolled area was that they liked to 'feel safe' (64%, n=76). The primary reason cited by those who had swum outside a patrolled area was that they had wanted 'to avoid the crowds' (68%, n=83). It appears that COVID-19 social distancing measures did not prompt individuals to move outside the patrolled areas any more than usual.

- the dimension reduction method identified eight synthetic variables that clearly segmented the recreational uses of the beach: 3 variables characterised the activity type, 4 the perceived quality and 1 the sources of information consulted before going to the beach. Among other things, the results showed differences between what characterized the land and sea parts of the beach as well as between the appeal of natural aspects versus facilities provided.

- several of these synthetic variables had a significant influence on the likelihood of avoiding patrolled areas. For example, active pursuits (surfing, fishing, other sports) were associated with venturing outside the areas, while fears related to wave size were associated with cautious behaviour.

- sociodemographic characteristics had relatively little influence. In particular, gender and geographical origin were not statistically significant factors.

Conclusions and discussions

Managers needs to view the environment also from the perspective of the visitors. Beach lifeguards traditionally focus on avoiding costly liability claims, whilst visitors are seeking to have a positive outdoor experience.

Traditional awareness-raising policies based on age, gender and geographical origin seem to be ill-suited here. In our sample, the type of activity beachcombers are engaged in had a stronger influence on risky behaviours (i.e. going outside supervised areas) than sociodemographic.

Visitors who report being informed about hazards report more risky behaviour than others. However, research has also shown that there is a gap between what people think they know and what they actually know about rips. It is crucial to fill this gap therefore.

Some visitors (i.e. surfers) who go to unsupervised areas could act as bystander rescuers. It is important to ensure that they have the necessary skills, however.

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Perceptions of the risk of COVID-19 infection outdoors: a comparative study of several natural environments

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Abstract

Introduction

For many people who have experienced lockdowns and restrictions on indoor activities during the COVID-19 pandemic, outdoor recreation has provided one of the few opportunities to get out of the house, exercise and relax. On May 27th 2020, the European Commission announced its long-term recovery strategy (NextGenerationEU), which will guide and support EU member states as they recover from the impacts of the pandemic. The fundamental policy framework for the recovery is a combination of the EU Green Deal, a strengthening of the EU Single Market and adaptation to the digital age, and an inclusive recovery. One of the objectives of the programme NextGenerationEU is: "Working with nature to protect our planet and health". While many studies have documented the changes in outdoor activities that have taken place during this pandemic, few have examined people's perceptions of the associated risks.

It is now widely recognised that risk perception has a major influence on an individual's behaviour when exposed to a hazard, and that this perception is dependent on multiple parameters. The context in the first year of the COVID-19 pandemic proved to be a breeding ground for diverse representations and beliefs. The scientific knowledge base was still under construction during this period, the permitted activities (walking, relaxing, running) were generally not considered 'risky' (unlike other sports such as climbing or shooting), and the potential for infection by such viruses had, from a European perspective at least, only previously been associated with travel to 'exotic' destinations.

In addition, there has been an assumption that people have considered outdoor environments taken as a whole (Landry et al. 2021) to be less dangerous than enclosed environments taken as a whole (Kim and Kang 2021). However, we believe this assumption to be too generalised as some previous works have shown that many people do not seem to perceive naturals environments in the same way (Nutsford et al. 2006).

In this presentation, we propose to examine this question by analysing recreational users' perceptions of the risk of COVID-19 infection in several natural environments in France.

Methods

Our study was conducted in late 2020 and comprised two telephone surveys carried out on a sample of 500 individuals living in the southwest of France each. A professional polling company conducted the surveys. Interviews lasted between 13 and 14 minutes on average.

The surveys sought to develop a retrospective overview of 2020 by identifying the respondents' behaviours, attitudes and expectations concerning the options open to them with regard to spending time outdoors in local natural spaces. Each survey focused on a setting in particular, namely forests and Atlantic Ocean beaches. Questions cover activities, motives and trips conditions (time and place), among other things. The respondents were also asked to give their assessment of the risk of infection in each of these two target spaces relative to other destinations. To test the possible influence of exposure on perception, the same questions were put to individuals who had and had not visited these places in 2020. Several Socio-demographics were finally included. The statistical analyses were based on Chi-square pairwise comparisons.

Results

Our findings confirm not everyone had the same access to nature during the pandemic. There are important socio-demographic differences between individuals who visited one type of natural environment, both types of natural environments or neither.

The results also showed differences in several variables that characterised the respondents' exposure to the two natural environments, namely times and frequencies of visits, means of travel, composition of groups on the outing and activities engaged in.

Motivations were very varied in both cases. For example, 'contact with nature' was more frequently cited in relation to forest visits, while the need to 'see people' was more frequently reported in relation to beach visits. Compared to the beaches, the restorative function of the forest seems to have received greater recognition therefore.

Finally, forest seemed to be viewed much more positively than the beach in terms of risk perception (Table 1). Neither residential environment (size of hometown, housing type, presence of a garden) nor individual characteristics (gender, age) was statistically significant in explaining these differences, but exposure (i.e. frequentation of one or more natural spaces) was found to be a significant factor.

Discussions and conclusion

Our findings suggest that people enjoying the outdoors make significant differences between potential benefits provided by "green" and "blue" spaces respectively. In the short term, planners can use these results to adapt the conditions of access to both type of natural spaces, favoring those for which there is the greatest demand. In the long term, promotion about the benefits of blue health should be enhanced further.

Although access to nature in France is mostly free, social inequalities persist. Under these conditions, it is necessary to target disadvantaged populations that accumulate inequalities.

Generally speaking, it seems important to continue the research on this subject in order to better understand how individual representation and risk perceptions are constructed with respect to new risks and to anticipate associated behaviours.

As the number of studies on this subject grows, international comparisons should also be made given that, on the one hand, cultural specificities mean populations do not react in the same way to epidemics and, on the other, different health measures (some more restrictive than others) are imposed on different populations.

Table 1 Perception of risks of infection associated with visiting forests and beaches

Variable	Forest	Beach	p-value
Urban parks and gardens			***
Less risky	87.03	39.00	
Same	7.58	39.40	
More risky	0.80	11.80	
Don't know	4.59	9.80	
Pedestrian zones			***
Less risky	91.62	57.20	
Same	3.59	23.80	
More risky	1.00	12.00	
Don't know	3.79	7.00	
Forests			
Less risky	NA	18.60	
Same	NA	37.60	
More risky	NA	38.20	
Don't know	NA	5.60	
Beaches			
Less risky	65.27	NA	
Same	24.15	NA	
More risky	2.59	NA	
Don't know	7.98	NA	
Mountains			***
Less risky	29.14	17.00	
Same	56.09	44.20	
More risky	5.79	30.60	
Don't know	8.98	8.20	
Place of work			***
Less risky	47.70	33.00	
Same	8.18	13.60	
More risky	0.60	12.80	
Don't know	43.51	40.60	

- Note: 87.3% of respondents answered that forests were less risky than urban parks/green spaces from the point of view of COVID-19 infection. Chi-square tests of independence significance levels: ns = not significant; * p < 0.10; ** p < 0.05; *** p < 0.01.
- Source and field: Frequentation of natural spaces in Aquitaine - Forest 501 respondents & Beach 500

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18

Co-creating sustainable solutions in outdoor recreation and sports

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Abstract

Introduction and objectives

Loved by many, practiced by even more, recreation activities in the outdoors contribute significantly to society, support public health, civic spirit and environmental awareness. However, with the growth in popularity also follow serious environmental deficits: for example, damage to fragile ecosystems, emission of greenhouse gases, air and water pollution, land use changes and waste (McCullough, 2018). Like any other large sector of modern societies, sports and outdoor recreation activities cannot be reformed or environmentally improved in isolation. Successful transformation requires new relationships between societies and natural constraints, taking into regard wider changes in the human-earth relationship (Rockström et al., 2009).

This presentation summarizes key findings from the two first years with the Mistra Sport & Outdoors, a Swedish research and co-creation program for environmentally sustainable sports and outdoor recreation (www.mistrasportandoutdoors.se). A central feature of the program is to work in close collaboration between research and stakeholders through a co-creation process to start of a movement for more sustainable practices. Focus is on solutions to reduce negative impacts in six thematic areas: (i) knowledge, path dependencies and transformations; (ii) transport and mobility; (iv) land and water use; materials and equipment; (v) events and spectators; and (vi) behaviour, policy and future change (Fredman et al., 2020). The objective of the presentation is to discuss pros and cons from working with co-creation applicable to management of recreational areas as well as broader “green deal” contexts.

Methodology

The model outlining the co-creation process is based on theories about learning, governance, planning and innovation. At the heart of the model lies the assumption that the complexities inherent in the field of sustainable development in relation to sports and outdoor recreation require co-creation and collaboration between research and practice (Westin et al. 2016). The underlying assumption is that effective governance is the result of dynamic interactions and co-creation between different organizations, involving academia as well as civil society and authorities. This model implies a process where researchers and stakeholders work closely together through different steps, with the long-term aim of establishing a movement of larger number of actors working towards more sustainable sport and outdoor recreation.

Figure 1 provides an overview of the co-creation process. During the first four years of the program (Phase 1) researchers and stakeholders work together to; (i) Identify challenges, (ii) Plan the work, (iii) Develop knowledge and understanding, (iv) Develop solutions/innovations, (v) Test and evaluate the solutions/innovations, (vi) Develop concepts based on the solution and start the implementation, and (vii) Communicate with the aim to start a movement. During the next four years (Phase 2) this movement should grow at a larger scale.

	Phase 1 (year 1-4)			**Phase 2 (year 5-8)**
	Step 1 *Identify challenges*	Step 2 *Develop knowledge and solutions/ innovations*	Step 3 *Communicate and start a movement*	Step 4 *Implementation at larger scale*
'Co-creator group' and 'learning teams' (organizations and authorities in sport, outdoor, environment and academia):				
Activities:	Identify challenges	Plan, Study, Innovate, Test/evaluate, Concept/implement	Communicate the concept. Seeking actors for mobilization	Develop solutions and a mobilization. Movement towards sustainability
Benefit for society:	Identified challenges for more sustainable sport and outdoor recreation	Increased knowledge about and solutions to the identified challenges	Increased understanding among the sport and outdoor recreation actors	A more sustainable way of working is developed within the SOD sectors

Figure 1. The Co-creation process.

Results

The identification of challenges was done with a group of 16 participants representing the Swedish sport, outdoor recreation and environmental sectors. Through four online workshops the group identified six challenges related to each theme in the program:

Challenge 1: How and what change can we make in sport, outdoor recreation and the physical education and health subject for a more environmentally sustainable development?

Challenge 2: How can we create environmentally sustainable and attractive transport solutions that provide a fair and equal accessibility to sport and outdoor recreation for all groups in society?

Challenge 3: How can we manage impact from sport and outdoor recreation on land- and water environments in physical planning and management?

Challenge 4: What can contribute to minimized environmental impact and more circular solutions over the lifecycle, for materials and equipment within sport and outdoor recreation?

Challenge 5: How can we create environmentally sustainable events in sport and outdoor recreation?

Challenge 6: How can coordinated efforts be made leading to more streamlined decision-making to enhance the environmental sustainability within the sport and outdoor recreation sectors?

This was followed by the formation of ten learning-groups with representatives from seven universities and more than 30 partner organizations. To current date, only the initial results are visible from the activities undertaken in the learning groups, which for example include:

- A review of ongoing environmental work within Swedish sport organizations
- Development of a university course: Environmental sustainability in sports and health
- Procedures for increased accessibility to recreational areas through public transport
- A framework to evaluate ecological impact from outdoor recreation
- Social and environmental impacts from events in mountain areas
- Motorized recreation, conflicts, planning and management
- The development of artificial turf

Discussion and conclusions

The Mistra Sport & Outdoors program covers a broad range of topics related to environmentally sustainable management of recreational and protected areas. Many outdoor sports are performed in such places, and during the COVID-19 pandemic recreation in the outdoors boosted in many countries that did not undertake a complete lockdown. Another effect from the pandemic was also a shift away from indoor sports to physical activities in the outdoors, which put even more pressure on recreational and protected areas (Skriver-Hansen et al., 2022). The complexities of these impacts call for collaboration across boundaries and between stakeholders, and the vision of the Mistra Sport & Outdoors program is to provide a role model in sport and outdoor recreation, on track towards sustainable development, minimizing negative environmental effects through co-creation between research and practice, learning processes and mobilization.

Acknowledgment

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Use of mobile applications for hiking practice. Qualitative study in 4 protected areas of Aragon and the Valencian Community.

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Abstract

Introduction

Sport is one of the most present activities in people's daily lives, both in number of people who practice it and people who watch it, especially mass media sports. Wang (2015) indicates that sport is one of the sectors with the most digital presence today. One of the most used communication strategies are social networks (Facebook, Twitter and Instagram). Examples of it are the NFL or international tournaments like Roland Garros that can host millions of users and offer them instant information. In addition to social networks, most professional leagues, federations and high-impact sports tournaments already have a mobile application that allows live access to updated information (Stavros, Meng, Westberg and Farrelly, 2013).

More over, Chiu and Bae (2018) state that fitness applications are among those that have grown the most since 2015, 53% of mobile phone users use this category of applications to improve their health status and present a wide range of sports. Yuan, Wenju An and Shaheeni (2015) show that on the main application download platforms (Google Play and Apple Store), 19% of downloads are related to "health and fitness apps" and these are used for a lot of activities, predominating the foot race and walking along with the hiking option. The other type of apps are the specific for hiking, they offer data on unevenness, distance, duration, difficulty, route download, among others.

Active tourism activities have experienced a remarkable growth in recent years. As Carrasco (2020) indicates, active tourism grew 14.6% each year in Spain between 2011 and 2018. Hiking is the most offered activity in nature trips, 60% of reservations are related to this activity. In the latest survey of sports habits carried out by the Ministry of Culture and Sports (2020), hiking was practiced by 26.5% of the total population that practiced sports in Spain. After the pandemic, several cases of overcrowding in protected spaces could be seen in Spain (Kazdin and Vidal-González, 2021).

Hiking has experienced a big growth between 2010 and 2020. In 10 years, according to sports habits surveys, hiking has grown 17.9% among all people who practiced sports in Spain. The growth of hiking practice coincides in time with the growth of digitization, because people have much more information to prepare a route, minimize risks and not get lost thanks to the possibilities offered by new technologies being able to formulate the hypothesis that there is a link in this growth.

Methodology

For the development of the study, the qualitative methodology has been chosen and it has been carried out during the spring and summer of 2021. The qualitative study option was ruled out due to the small size of the sample, 50 hikers.

The target population are the hikers, and the information has been obtained using conversation as an instrument through a semi-structured personal interview.

The sample is taken from 50 hikers who practiced hiking in one of the 4 selected protected areas corresponding to the Sierra de Espadán, Sierra Calderona, Sierra Mariola and Valles Occidentales Natural Parks.

Results & General Conclusions

The results indicate an 86.9% active use of applications among the interviewees.

The specific applications are used to obtain route data such as distance, duration or difficulty as the most outstanding. Applications such as Wikiloc stand out to prepare the route (60%) and Strava, Polar, Garmin and the Health & Fitness Apps to follow the route.

After the route there is a high percentage of use of social networks to spread information in Instagram and Facebook posts, in hiking messaging groups and in sports and nature blogs. The hikers in the interviews indicate the possibilities of dissemination offered by different applications, highlighting Wikiloc in addition to the applications of the main social networks, Facebook, Instagram and WhatsApp to discover and visit new places.

The main reason for using these apps is the feeling of security, because hikers know what they are going to find. Another important reason is the ease of finding new routes and sharing them with family and friends.

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Pandemic Effects on U.S. Forest Visitation in Dispersed Recreation Settings during 2020 and 2021

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Abstract

The COVID-19 pandemic affected many aspects of life, including individual preferences for outdoor recreation and the types of outdoor recreation that were available. While many news reports indicated an increase in visitors to parks during the pandemic, on the ground changes in visitation varied depending on the type of recreation available and the extent to which closures affected different recreation sites.

Preliminary analysis of Forest Service visitation data shows that pandemic effects on visitation have been felt primarily in dispersed recreation settings. Previous analysis from the U.S. Forest Service showed statistically significant increases in visitation to designated Wilderness Areas when stay at home orders were lifted during the second half of 2020 (Bhadury and English 2021).

As the pandemic has evolved, recreationists have adapted their behavior to changing public health guidance and perceptions of risk. It is unclear to what extent these changes in behavior have affected overall levels of visitation to natural areas. Our analysis builds on the previous work by Bhadury and English (2021) to consider the effect of the pandemic on all dispersed National Forest recreation (both designated Wilderness and dispersed recreation in General Forest Areas) during 2020 and 2021.

Our analysis uses visitation data for recreation visitors to U.S. National Forests collected through the National Visitor Use Monitoring (NVUM) Program. The NVUM program collects data on visitation to each National Forest every five years. The NVUM sampling framework differentiates sites spatially by site type and by the expected volume of daily exiting recreation traffic. Observed on-site counts of exiting traffic are converted to estimates of daily exiting recreation visits (English et al. 2020).

The structure of the NVUM data allows us to compare visitation from a given year to the same set of forests five years earlier. Our analysis uses data from 22 National Forests across the United States that collected field data between October 2019 and September 2020, and 24 National Forests that collected field data between October 2020 and September 2021. We consider dispersed recreation sites which include access portals to both Wilderness and General Forest Areas, which are included as a site type in the sampling framework.

For each of the two time periods, we compared nationwide mean visitation rates using t-tests, by day of the week (weekday vs. weekend) and visitation volume strata (low, medium or high-

volume sites). We conducted the same analysis by Forest Service Region to determine if changes in visitation rates vary spatially across the United States.

Daily visitation rates to dispersed settings were significantly higher in 2020 compared to 2015 on our sampled forests. Our results show statistically significant differences in visitation rates across all use level strata, and across most use level/day of the week combinations at the national level. Regionally, most differences in visitation rates are also statistically significant across use level strata and use level/day of the week combinations.

While overall visitation in dispersed settings did increase between 2016 and 2021, our results show that daily mean visitation rates for dispersed settings in the 2021 sampled forests did not show a statistically significant difference compared to data from the same set of forests in 2016 except for a few isolated cases.

Our results show a statistically significant increase in mean visitation rates in dispersed settings for forests that were surveyed in 2015 and 2020, while those forests surveyed in 2016 and 2021 showed an increase in mean visitation rates that was not statistically significant. While the specific changes seen in visitation cannot be compared between 2020 and 2021 because we conducted field data collection on a different set of forests, the general trends over the time period indicate that the large pulse seen in dispersed area recreation in 2020 has, for the most part, not persisted in the second year of the pandemic. Whether these trends portend a permanent shift in visitation patterns and greater demand for dispersed setting recreation is something we will be watching more closely.

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Cyberranger: electronic management of protected areas

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Abstract

Introduction

Rangers are recognised as nature guardians working full time outdoors. As such, their typical attributes comprise binoculars, hiking boots, hat, and the countryside. Smartphone, computer, and office do not fit this image well. However, new technologies support not only ranger fieldwork, but also influence the way visitors act in the countryside. Office work is therefore increasingly important for rangers and other protected area (PA) managers to stay effective within their activities. The connection between PA management and the online world has become strong and inevitable. The term ‘‘cyber ranger’’ expresses a necessary shift in the definition of ranger work, which is also the objective of this article. This paper shows a new and innovative view of ranger work based on real-life experiences of rangers in the Czech Republic. It serves as an inspiration for PA managers and aims to initiate discussion more than being a regular scientific paper.

Electronic fieldwork

Electronic devices were welcomed a long time ago to help rangers outdoors. It started with walkie-talkies, providing immediate contact with headquarters, later widely replaced with mobile phones. Automated trail counters save time for many former fieldworkers observing visitors, sometimes sending real-time data on a GSM signal. Photo-traps have spread widely and, if not being controversial due to GDPR, to a much larger extent they would monitor human activities as well. Some rare protected species, like lynx or black stork, sometimes wear position monitoring devices and are, in this way, directly connected to the online world. GPS positioning, navigation, and mapping have almost replaced paper maps, formerly necessary ranger and visitor equipment. Finally, smartphones today allow much more than just calls. Rangers and other fieldworkers perform measurements and data collection in many various tasks, usually representing data input directly to online datasets: monitoring of natural features and visitor infrastructure, species occurrence, tree height measurement, noise and light pollution intensity and many more.

Monitoring and management of online resources

Geogames

The topic of geogames could be described through the example of geocaching. Geocaching was one of the first position-related outdoor activities that appeared after the switching off of the GPS Selective Availability feature. Potential threats from geocaching to protected

nature are regularly presented at geocaching giga events in Czechia (e.g., May 2022 in Prague). Nowadays, there are numerous similar geogames allowing some kind of player activity monitoring: Resources Game, Munzee, Flagstack, and others. In-game forums or associated social media groups allow PA managers to spread targeted information preventively as well as monitor and handle specific harmful activities of specific players. Some apps allow direct fruitful contact with game organisers, e.g. Peakpoint. The Nature Conservation Agency of the Czech Republic secured its goals through removing harmful points from the game, explaining the reasons in a player forum and sharing contacts to local NGOs, which now can get support for their conservation activities from game paid premium membership.

Web and social media

Currently, it is almost a must for every organisation of any kind to have its own webpage. Also, many individuals have personal webpages. Page content can inspire the public to visit places or perform activities in a way not complying with legal rules or visitor management strategies. When a ranger somewhere in the woods finds out that inappropriate behaviour of visitors is based on such a piece of internet information, the best solution is to get into contact with the page author and discuss possible changes. This is another typical task for a cyber ranger.

Social media, such as Facebook, often gathers the public into groups related to an area or activity. In such communities it is easy to share nature conservation information such as when and where to find wildflowers in blossom, which trails are temporarily closed due to falcon nesting, or what guided field trips are coming. On the other hand, some less-responsible visitors post detailed data of their rule-breaking behaviour – visits to places closed for public, offroad vehicle rides in forests, etc. Cyber rangers sitting by their computers can then easily fine such people without being at the right place and time.

Maps

Digital maps and their printed versions are another big issue for PA managers. There are several map publishers and providers for each area. Their usual aim is to describe the Earth's surface as precisely as possible and show as many interesting features as possible for the map users. This approach is best seen in the Open Street Map (OSM) community. Volunteers gather map data continuously in the field and upload it to the database almost in real-time mode. When they find a fire site, it can appear on OSM MapSource within hours or days, with no respect to whether or not fires are allowed at the current spot. Fortunately, mappers are usually open to discussion and sometimes they accept a request if they consider it does not decrease map value. However, this means that a small cave will remain on their map, even though wintering bats could be disturbed by an increased number of visitors, as mappers do not recognize visitor management as being part of their job. Really responsible map publishers contact nature conservation authorities prior to publishing a new edition of a map. However, such cases are rare; the usual ones provide more than enough opportunities for cyber ranger office work.

Conclusions

PAs are affected by their visitors. Visitor behaviour is significantly influenced by the information they get from online resources and from hiking maps in digital or printed form. Modern PA visitor management must deal with these online resources to stay effective. This approach brings more office work to wildlife ranger duties, and also a demand for new skills: communicate not only with visitors, but also with service providers and organisers, analyse online data and derive appropriate measures to be taken.

The activities described in this article clearly show that there are many opportunities in modern visitor management to employ not only rangers with good physical health, but also physically disabled people in the position of a cyber ranger.

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The Barefoot Trails in Israel Nature and Parks Authority sites – An evaluation study

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Abstract

Keywords: Barefoot Trails, Visitor experience, Values.

Over the past two years, Barefoot Trails have been set up in several Israel Nature and Parks Authority sites in northern Israel as a complementary experiential attraction. These paths enable visitors to experience various sensory experiences through their feet, often by making contact with surfaces of varying textures. The trails were created with the aim of providing visitors with a sensory experience getting in touch with nature, and as additional means of conveying the story of each nature reserve, as well as the values it embodies (Capaldi et al, 2014, Colléony et al, 2020). This experience does not require any entrance fees in addition to the regular entrance fee to the sites.

This past year, 2021, these trails were evaluated examining: 1. Visitors' satisfaction with the trails. 2. The managers' satisfaction with the operation of the trails. 3. The trails' contribution to visitors' connection with nature, and nature reserves' stories and values. 4. How and to what extent did features along the trails contribute to the visitor experience. The evaluation during 2021 combined methodologies including: 1. An overview and analysis of Barefoot Trails around the world. 2. Nine in-depth interviews with managers and other stakeholders. 3. Observations along most trails. 4. A visitors' survey completed by 568 respondents.

During the conference, I will be focusing on the first two of these: regarding the experiences, content and meaning from the trails, visitors reported being satisfied with the trails desiring to revisit the site. However, the study also revealed signs of discontent with the trails due to their limited length compared to past experiences with longer sensory trails and parks in Israel and worldwide. This may contribute to a gap between visitors' early expectations and their actual experience of the trail, leading to disappointment. Moreover, despite general satisfaction, there was a gap between the trails' declared aims and actual experiences. While the vast majority of respondents reported that it was important for them to connect their children to nature, only half of them reported that visiting the trails strengthened this connection.

Regarding exposing visitors to the trails and the marketing thereof, over half of the visitors to the sites reported not having visited the trails while being there. with two thirds of them indicating they were not aware of their existence. These findings somewhat contradict site managers' views were most of them felt that visitors' early exposure to the trails was sufficient. It seems that site managers' are concerned about raising prospective visitors'

expectations only to have them discover that the trails and visitor experience offered do not tally.

Based on the findings it is recommended that the Barefoot Trails are turned into institutionalized professional attractions starting with a few existing trails, but expanding once additional budgets are allocated. Also, trails' branding and marketing should be improved including emphasizing differences among them, in order to minimize possible gaps between visitors' expectations and actual experiences. Operatively Barefoot Trails should be extended in several sites. This includes expanding activity stations along the paths to enhance visitors' sensory experience and strengthen their connection to nature; add water and mud elements in light of visitors' interest in such features; increase interactions along the paths and with embedded content to deepen children's connections to nature and the story of the nature reserves; and create or enhance the themes that accompany the trails in relation to each site's unique attributes, and using natural local materials to strengthen visitors' ties to the nature reserve.

Within a short time, Barefoot Trails have enriched visitor experiences in nature reserves in northern Israel. The present study has shown overall visitor satisfaction, but also how they could be modified and improved. The recommendations presented above – with regard to content and experience, branding and marketing, making information more accessible, maintenance and safety, as well as budgeting – will all contribute to enhancing the trail experience, and better aligning them with their original purpose.

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Outdoor Recreation in Florida Keys National Marine Sanctuary, USA

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Abstract

This project examines the users who recreate in areas managed by the Florida Keys National Marine Sanctuary (FKNMS) to better understand their use patterns and the contribution of these activities to the Florida Keys economy. Data, stakeholder feedback, and other inputs collected in these efforts have been utilized in this project as a way to maximize efficiency and ensure comprehensive coverage of areas which may be used by visitors to FKNMS. The overall visitor monitoring research program includes a large spatial area throughout the upper Keys which includes the three focal sites of Carysfort, Horseshoe, and Cheeca Rocks for this diving and snorkeling specific project (see Figure). The findings of this project may be used to inform FKNMS managers about the social and economic benefits that public use provide. The project also quantifies frequency of visitor use, visitors' perceptions about the resources and activities, and their expenditures during activities. This information allows a better understanding of value of such activities to the economy and any potential resulting benefits for Monroe County, Florida.

Visitation Estimation and Patterns

In a typical year, the survey respondents reported spending an average of 38 days doing ocean recreation doing activities in FKNMS and an average of 21 days traveling offshore for any activity more than 3 miles. Visitors also reported that in a typical year they visit FKNMS 21 days on average. Visitors were more likely to go fishing during the four seasons than other activities. Overall, summertime was the period of the year when visitors spent more time doing recreation activities. Visitors were asked about what percentage of recreational activities are done in each site type. For this question, inshore was considered any location 0-3 miles from land and offshore 3-200 miles from land. Over one-third (35%) of the visitors go fishing in inshore open water, while only 3.2% go diving and 7% snorkeling in this type of site. Almost one-quarter (23.5%) of the visitors go fishing in offshore open water.

Trip and Group Characteristics

When visitors were asked about the activities they do during their ocean recreation trips in the Florida Keys, visitors were more likely to spend their days doing private fishing (mean = 25 days) and general boating (mean = 24 days), while only 8 of those days were spent doing charter diving. When asked about the size of the vessel they typically visit the ocean with, visitors commonly use larger personal boats that are 22.2 feet and, hire/charter boats that are 19.3 feet. Visitors FKNMS were asked how many years they have been participating in ocean activities. Visitors stated that they have been fishing for 29 years, diving for 14 years, snorkeling for 23 years and doing general boating for 29 years on average. Visitors have

approximately 3 people on average in their groups when fishing, 4 people when general boating and 2 when diving at the sanctuary.

Conditions that Influence Recreation

Respondents were asked to identify factors that influence their decisions to make a trip to FKNMS, using a 5-point scale, with 1 being not at all important and 5 being extremely important. Those factors that visitors were influenced were nice weather (mean = 3.3) and ocean conditions (mean = 3.3). When visitors were asked about factors that influence their trip for any ocean recreation, they reported that ocean conditions (mean = 3.8) and nice weather (mean = 3.7) were the most important factors to make that trip as well.

Expenditures by Recreation Activity

In the economic section respondents were asked to select the amount of money they use in each activity for a single trip in Upper Florida Keys, the results showed that visitors spend on average $260 on fishing and $167 on general boating, approximately $107 diving and $66 snorkeling. Visitors reported they spend an average of $1,745 on a typical trip to the Florida Keys. Lodging ($869), food at restaurants ($405) and fees for charter fishing ($398) are the categories with the highest averages of expenditure for a typical visit to the Florida Keys. The average amount of expenditures that visitors spend during the summer is $1,124, while fall ($670) was considered the season when visitors spend less money during their trip in the Florida Keys.

Conclusions

Visitors to FKMNS are provided with myriad outdoor recreation opportunities, one of the key attributes of public waters and lands. FKNMS users provide economic stimulus to local community businesses and reap countless benefits from their experiences. We need to better understand the motivations of public water users, such as FKNMS. As a suggestion for future research directions in this field, we recommend studies that identify the environmental perceptions between recreationists with biocentric values and recreationists with anthropocentric values. Future studies should also include a question that evaluates the expectations that recreationists have before snorkeling or diving regarding pollution levels, crowding levels, and natural environment conditions. Managing a marine protected area such as the Florida Keys involve multiple challenges, thus it is important to recognize that good management also depends on the availability of enough funding, staff, research, among others. Social science insights can be used to aid management strategies and increase the potential for actives such as snorkeling and SCUBA diving to contribute towards land and water conservation.

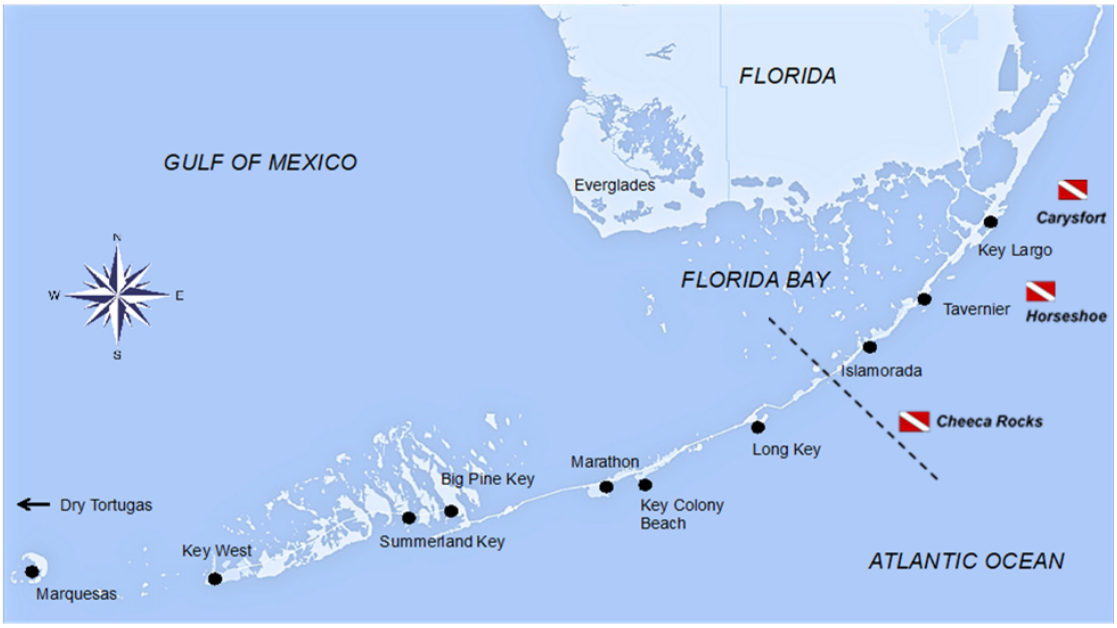

Figure. Study area in the Upper Florida Keys (north of dashed line) with focal diving/snorkeling sites associated shown with red diver flag symbols.

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Comparison of Crowding Perception Evaluation by On-site and Web and Impact of COVID-19 Epidemic in Shiretoko National Park, Japan

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Abstract

Introduction

Crowding perception of visitors is a crucial indicator to promote national park management appropriately (Manning, 2011). It indicates the discomfort in visitors' perception of congestion. The surveys have mainly focused on visitors who have visited the site, but some avoid visiting the site for several reasons. Crowding perception has also been shown to vary depending on the experience of the visit and whether the visitor is concerned about crowding (Aikoh et al., 2020). In addition, the COVID-19 epidemic from 2020 may have impacted tourism and may have caused changes in visitors' behavior and crowding perception (Wang and Ackerman, 2019; Humagain and Singleton, 2021). It is necessary to ascertain if there is a difference between the evaluations of on-site and unvisited visitors since there are visitors who are coping to avoid congestion. We aim to clarify the differences in crowding perception between on-site and web respondents and the differences before and during the pandemic. We will discuss the application of crowding that will contribute to a more accurate understanding of user attitudes when considering the appropriate capacity of the site.

Methods

The survey was conducted at Kamuiwakka Hot Spring Falls in Shiretoko National Park, Japan. In addition to an on-site questionnaire survey targeting visitors to Shiretoko National Park, a web-based questionnaire survey was conducted targeting the public living in the Tokyo metropolitan area to ascertain the attitudes of potential visitors. In the questionnaire, respondents were asked to rate the degree of crowding, their experience of visiting Shiretoko, whether they had ever coped with the crowded situation, and what they were concerned about when traveling. For the crowding evaluation, respondents were presented with a montage of seven photographs with different numbers of people using the Kamuiwakka Hot Spring Falls as a background and asked to select one photograph they judged to be unacceptably crowded. The percentage of respondents who could tolerate the number of people in each photo was calculated, and an acceptability curve was created based on the percentage. The comparison of crowding by year of the survey was analyzed using responses from the 2014 on-site and web surveys conducted in the same format as the 2020 survey.

Results

About 70% of the web respondents had never visited Shiretoko, and about 80% had not travelled there after the spread of COVID-19. The results of the crowding evaluation between

the on-site and web surveys showed that the web responses were less accepting of crowding than the on-site responses. Regarding the relationship between coping and congestion, a comparison of the acceptability curves of web respondents based on whether they had ever coped or not showed no difference. In a comparison of crowding by year of survey, respondents in 2020 were less accepting of crowding than those in 2014 (Figure 1), and respondents in 2020 were more likely to say that COVID-19 infection status was important when traveling.

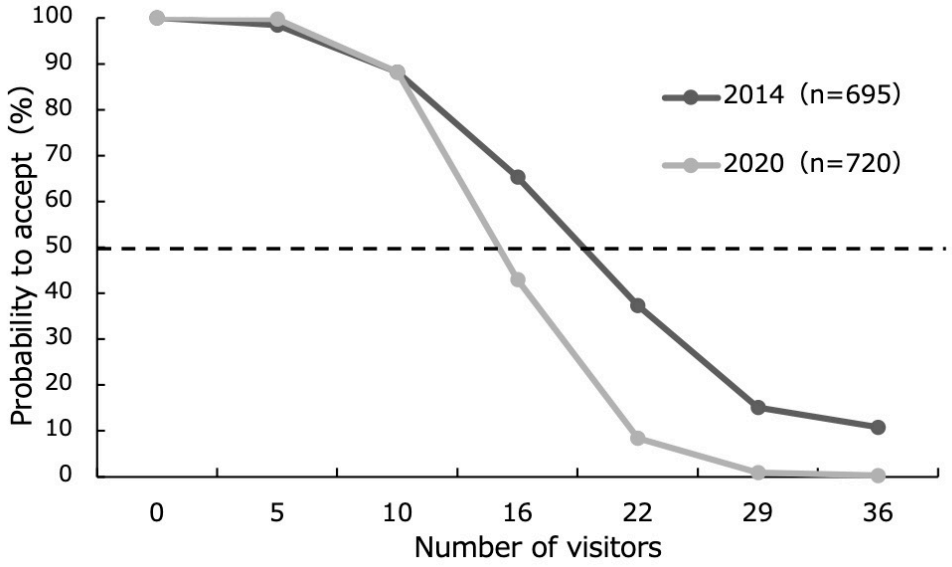

Figure 1. The acceptability curve of crowding norms before and during the COVID-19 epidemic

Discussion and Conclusion

Most web respondents refrained from traveling due to the COVID-19 epidemic and evaluated the crowding more severely than those who visited the site. We found that a certain number of people avoid travel based on the current situation via a web survey. Although there was no difference in the acceptability curve depending on whether the respondent had experienced coping behavior, a comparison of the on-site and web-based surveys revealed a relationship between coping behavior and crowding. A comparison of the years in which the surveys were conducted suggested that changes in social conditions, such as the spread of COVID-19 infection, may have influenced visitors' perceptions of crowding. Understanding the attitudes of potential visitors who avoid visiting the site due to coping and the changes in visitors' perception of crowding due to changes in social conditions, such as COVID-19, will provide a better visitor experience in recreational and protected areas.

Acknowledgment

The authors are very grateful to Utoro Ranger Office of Ministry of the Environment, Japan, and Shiretoko Nature Foundation. This work was supported by JST-Mirai Program Grant Number JPMJMI20D1, Japan.

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A pathway to legal and sustainable mountain biking trails – Case study from Switzerland

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Abstract

Introduction

Mountain biking has become a very popular outdoor sports activity in Switzerland in the last two decades. Currently, 7.9 % (680,000 people) of the Swiss population regularly practice mountain biking (Lamprecht et al., 2020). According to Swiss federal law, trails that are not suitable or obviously not intended for use by vehicles or bicycles - such as footpaths and hiking trails - must not be used by them. Exceptional permits for unofficial trails are possible at the cantonal level. To meet the needs and to better channel mountain bikers at places that are not critical for nature conservation and other stakeholders, such as hunters, infrastructure should be designed to be attractive and sustainable (Pröbstl-Haider et al., 2018). To ensure that trails are accepted and used by mountain bikers, it is crucial to involve the local mountain biking scene in the planning, implementation and maintenance of the proposed infrastructure (Hardiman & Burgin, 2013).

The aim of this study was to develop exemplary solutions for the legalization of existing trails for mountain biking. in a small recreational forest perimeter in the Canton of Aargau. Different methods such as user monitoring and participatory process management were applied. The study is not yet complete. This report provides an insight into the ongoing process.

Methods

Together with the canton of Aargau we identified a 4.8 km2 square kilometre forest patch, surrounded by settlements and suspected high levels of illegal mountain biking activity. To detect areas where it is possible to legalize existing unofficial mountain biking trails within the project perimeter, we had to bring together the relevant stakeholders (cantonal authorities, municipality, forest owners, forestry, nature conservation, hunting, mountain bikers and other forest users). Then we started a participatory process with several group meetings. The cartographic information (protected areas, animal habitats, etc.) was used as a basis for the discussions. As a key interest group, the mountain biking scene shared the currently (partly illegally) used trails, which was a central and relevant peace of information for the further discussions (Figure 1).

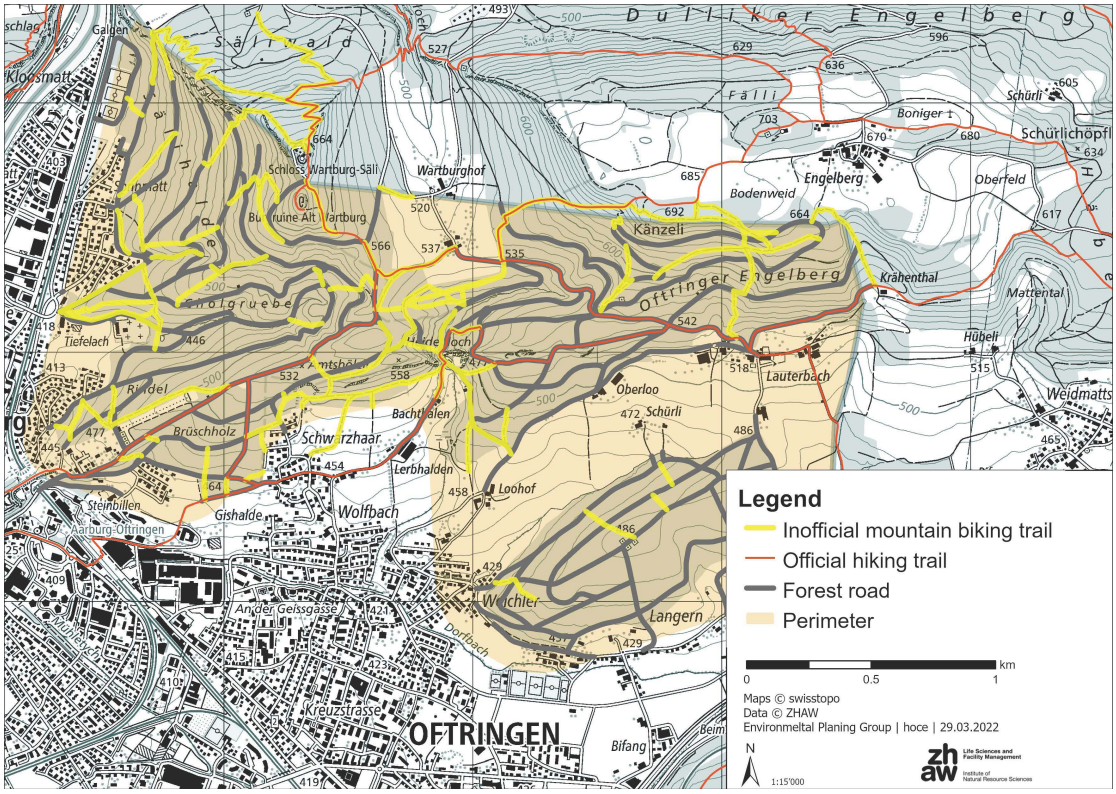

Figure 1: Network of currently unofficially used mountain biking trails in the project perimeter

In a workshop, the stakeholder groups were asked to divide the project area and assign them to three different categories (1. Mountain biking possible, 2. Mountain biking possible under conditions, 3. Mountain biking impossible). The maps were then overlaid and evaluated. Possible solutions were proposed on this basis. In parallel, visitor monitoring was carried out. In this process, mountain bike frequencies on selected and representative trails were recorded with slab sensors and trap cameras. Additionally, the use of STRAVA data allowed extrapolation of realistic numbers to the whole forest. These data were introduced in the participatory process as a basis for discussion and to objectify emotional discussions.

Results

In total, five stake holder groups (hunting, nature conservation, forestry, mountain bikers, cantonal and local authorities) could be identified in the project for the participatory process. At the first meeting, they mutually expressed a) their own main interests in the local recreational forest and b) their attitude towards mountain biking. The maps of the stakeholder groups showed different pictures. While forestry marked more than 70% of the project perimeter “mountain biking possible”, hunting marked more than 90% “mountain biking impossible”. However, after several discussions and iterations, we received relatively usable maps from all stakeholders. Of the current 23 km of illegally used trails, we were now able to submit about 3.5 km for legalization. Monitoring data showed high frequencies on mountain biking trails during evening (twilight) hours and weekends.

Discussion and conclusion

The study shows how complex and diverse the interests in a recreational forest in a densely populated area can be. All five interest groups have their own demands on the forest. For example, hunters and gamekeepers do not want any recreational activities in the forest at night, while mountain bikers want legal access to attractive trails. The different interests in the forest are common (BAFU 2022), but can lead to conflicts and emotional discussions. A first step towards a consensus is to bring the interest groups to each other's attention. There should be no time pressure in this process, as otherwise the stakeholders might not feel they are being taken seriously, and quickly withdraw from a constructive discussion. Monitoring data helped to objectify the discussions and to build fact-based arguments. It has been our experience that separate discussions must be held with individual interest groups. In this way, a consensus can gradually emerge towards sustainable solutions for the legalization of mountain biking trails.

We are not at the end of the project yet. The mountain bike trails derived from the process will now be submitted to the relevant authorities for approval. It is expected that a time-limited permit will then be granted to legalize the mountain bike trails. For the implementation and operation of the trails, a concept must be developed. The stakeholders concerned will again be involved in this process. In this study, we have set out on the pathway to legal and sustainable mountain bike trails in Switzerland. It is not certain yet how long it will take and how many curves and obstacles may lie ahead, but the finishing line is in sight.

Acknowledgements

We would like to thank the Canton of Aargau and the Bundesamt für Umwelt BAFU for their valuable support and collaboration.

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Analyzing the intensity of use of hiking trails in concern of absolute numbers, temporal-spatial distribution and type of hikers for strategy development to close gastronomic supply gaps in rural hiking areas – case study of the Nature Park Northern Eifel

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Abstract

Introduction and objectives

The Northern Eifel is part of the Eifel, a low mountain range in Germany that stretches across North Rhine-Westphalia and Rhineland-Palatinate. This natural region is home to six different landscape types and a great diversity of species. Several large protected areas, including the Eifel National Park and the cross-border, German-Belgian Hohes Venn - Eifel Nature Park, have been installed in the region. The German part of the park is divided into a North Rhine-Westphalian and a Rhineland-Palatinate part. The North Rhine-Westphalian part is the project setting for the present research project. The goal of the nature park region has been, in addition to protecting nature, to make it accessible and experienceable for visitors. Investments in hiking trails, lookout points or refuges have already successfully upgraded the region. One of the best-known examples is the "Eifelsteig", which invites hiking tourists from nearby regions for one-day or multi-day hikes. Overall, nature tourism has developed into a leading economy in the Eifel.

Within the tourism service chain, however, there are also areas which cannot support the development of the increased importance of active and nature tourism, which are essential for the overall tourism product. Restaurants and hotel businesses in the Eifel, as in many other rural regions, have difficulties in finding successors. Businesses close or have limited opening hours, and hikers look in vain for places to stop and spend the night. The result is a lack of supply along the tourist infrastructure.

The German Federal Ministry for Economic Affairs and Energy (BMWi) confirmed that this is not a typical regional problem, but that closing supply gaps and also dealing with succession issues can be classified as key challenges for tourism in Germany (BMWi 2019).

The ongoing COVID-19 pandemic as well as the flood disaster in July 2021 once again accelerated this trend in the northern Eifel.

The project "Naturpark Nordeifel - naturally sustainable" addresses the problem of supply gaps along hiking trails and develops innovative ways to establish decentralized, regional gastronomic offerings along these trails. The project is sponsored by the Naturpark Nordeifel e.V., supported by tourism and political cooperation partners.

The IU International University is involved as a further cooperation partner from the beginning to ensure the scientific accompaniment. The task within the overall project and at the same time the research project to be presented here is the evaluation of several hiking trails and tourist infrastructure. First of all, the current use of the hiking trails by guests and locals will be surveyed. Thereupon, the intensity of use, both in absolute numbers and in temporal-spatial distribution, and the lack of gastronomic infrastructure are to be compared with each other in order to generate a database for the development of innovative gastronomic offers with a regional reference.

Methodology

In the three-stage overall project, this research project focuses on the first project component, the survey phase. The overarching research questions for this are as follows:

- When, where, how many and which guests are on the nine selected hiking trails
- Where do gaps in coverage exist along these trails with high levels of trail use

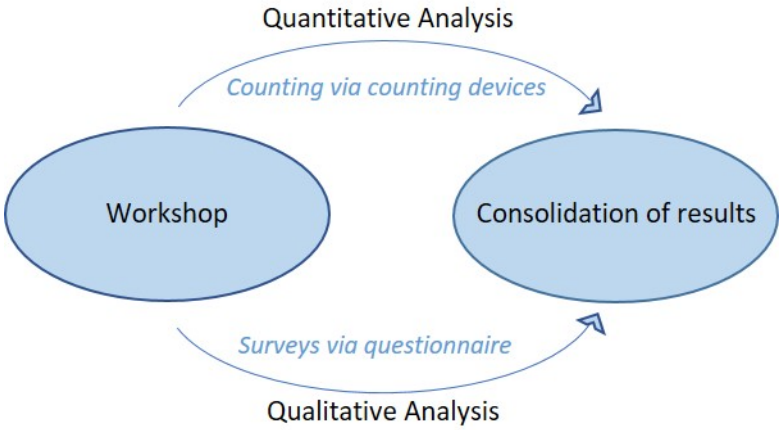
A mixed-method approach was chosen to work on the research project and to answer the research questions mentioned above. In the first step, a workshop was held to define the criteria for the data collection (table 1). The project sponsor, the three participating tourist marketing organizations and the IU International University as moderator were involved in this process. The criteria developed were, for example, a family suitability with a length of seven to ten kilometres, estimated supply gaps and an experience design to be improved along the trails.

Based on the results of this workshop, nine trails were selected to be subjected to data collection and thus constitute the project setting.

The data collection is divided into two parallel methodological procedures, which are combined with each other. On the one hand, a quantitative data collection is carried out (table 1). Using permanently installed counting devices, the hikers are counted on the selected routes in order to be able to precisely assess the use. For this survey, the nine selected hiking trails are currently being physically walked and analysed in late winter/spring 2022 in order to determine the counter locations. The counting devices will then be installed and continuous counts will be conducted throughout the 2022, May-October hiking season. In addition to the quantitative measurement of hikers, this will also generate an initial picture of the temporal-spatial distribution.

In order to sharpen this picture of the temporal-spatial distribution of hikers along the selected trails, a qualitative analysis is carried out. A survey of hikers at the counter locations on the use and selection of hiking routes is the methodological approach. In this way, the exact route selection of hikers can be analyzed (table 1). This survey also includes motives and decision criteria for the selection of certain hiking routes as well as needs regarding gastronomic offers in order to generate possible approaches for closing supply gaps. The survey period will also cover the hiking season May-October 2022.

Table1: Methodical approach



Reference: own illustration

Results

The research project is currently underway and the data collection covers the 2022 hiking season. The expected results will provide information on how many hikers use the selected trails and how they are distributed in terms of time and space. In addition, approaches for closing the gastronomic supply gaps will be developed. By the time of the conference (MMV11), decisive tendencies will be derivable and offer an insight into possible approaches.

Discussion & Conclusions

At this point in time, discussion and conclusions are not possible, since data collection has not yet begun. By the time of the conference (MMV11), decisive tendencies will be derivable and a discussion of the results developed until then, including conclusions, will be possible.

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Measuring recreational services of a terrace paddy landscape by mobile phone location data

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Abstract

Introduction

The study assesses cultural ecosystem services of agricultural landscapes by applying mobile phone data to the zonal Travel Cost Method (TCM) for a Japanese famous agricultural landscape. Agricultural land provides humans not only crops, fiber, and livestock but also nonmaterial benefits such as beautiful landscapes which can be tourism destinations (Swinton et al., 2007). Since nonmaterial agroecosystem services possess the characteristics of public goods and non-market services, farmers are often not interested in their maintenance to provide these services without economic incentives. Research valuating agricultural landscapes has increased in the last decade (Cheng et al., 2019). Many of these valuation studies used stated preference methods (e.g., Arnberger & Eder, 2011; Scarpa et al., 2007). A few studies only relied on revealed preferences for the valuation of agricultural landscapes. Big data has the potential to overcome several challenges in the valuation of the agricultural landscapes. Recently, application of big data has achieved useful results in the evaluation of natural resource benefits (Li et al., 2018). Big data such as mobile phone network data has also been applied to the TCM (e.g., Kubo et al., 2020). However, these studies only focused on recreational areas such as coastal areas, national and urban parks, and little is known about the detailed value of recreational agroecosystem landscapes. Therefore, the originality of the present study is the application of mobile phone GPS data to assess recreational ecosystem services of agricultural landscape.

Method

Research site (case)

This study focused on the Shiroyone terrace paddy land in the Ishikawa Prefecture as a case of beautiful agricultural landscapes in Japan. The terrace paddy land is also one of the most famous terrace paddy lands for outstanding cultural landscape in Japan. The terrace paddy land is a part of Globally Important Agricultural Heritage Systems (GIAHS), that FAO nominates as outstanding landscapes of aesthetic beauty, agricultural biodiversity and ecosystems, and a valuable cultural heritage to promote public awareness about sustainable agriculture and protect the social, cultural, economic and environmental goods. The terrace paddy land is also

nominated as the 100 best rice terrace paddy land in Japan. It is a nationally designated beautiful and famous landscape property.

Mobile phone data

The mobile phone data were provided by KDDI Inc., which is one of the most major mobile phone companies. KDDI data represent the visitor population which is estimated based on the KDDI mobile phone users in each grid (minimum 10 m2) and the market share in each area across Japan. The data are acquired every two minutes and include information about the visitors' residential area. Referring to the grid square code, we first selected four 250 m2 grids covering Shiroyone terrace paddy land. Daily data collected from June 1, 2018 to September 30, 2020 included number of visitors to a selected grid and visitors' residential areas. To remove the non-visitors (i.e., passerby), only people who stayed at Shiroyone terrace paddy land for over 15 minutes were included in our data.

Econometric model (zonal travel cost model)

A zonal TCM was applied to value cultural ecosystem services associated with agricultural landscapes. The zonal TCM is one of the traditional non-market valuation techniques for valuing recreational ecosystem services based on revealed behavior (e.g., Mayer and Woltering, 2018); it has been recently applied to big data in recreational services valuation (e.g., Kubo et al., 2020). The zonal TCM evaluates the monetary benefits (i.e., consumer surplus: CS) of agroecosystem services associated with agricultural landscapes by deriving a demand curve for the site. The curve is estimated by analyzing the relationship between the travel costs incurred to access a recreational site and the visitation rates. Referring to previous studies applying the big data to the zonal TCM (e.g., Kubo et al., 2020), we employed a log-linear model which is more suitable compared to other functional forms.

Result & Discussion

Those days with were few visitors and/or small varieties in visitors' residences were excluded since we could not estimate the coefficient of the travel cost by TCMs. As a result, our model estimated the CS, the benefits that one consumer obtains per visit, for 681 days. Figure 1 shows the means of the recreational value (i.e., USD) of Shiroyone terrace paddy land per month.

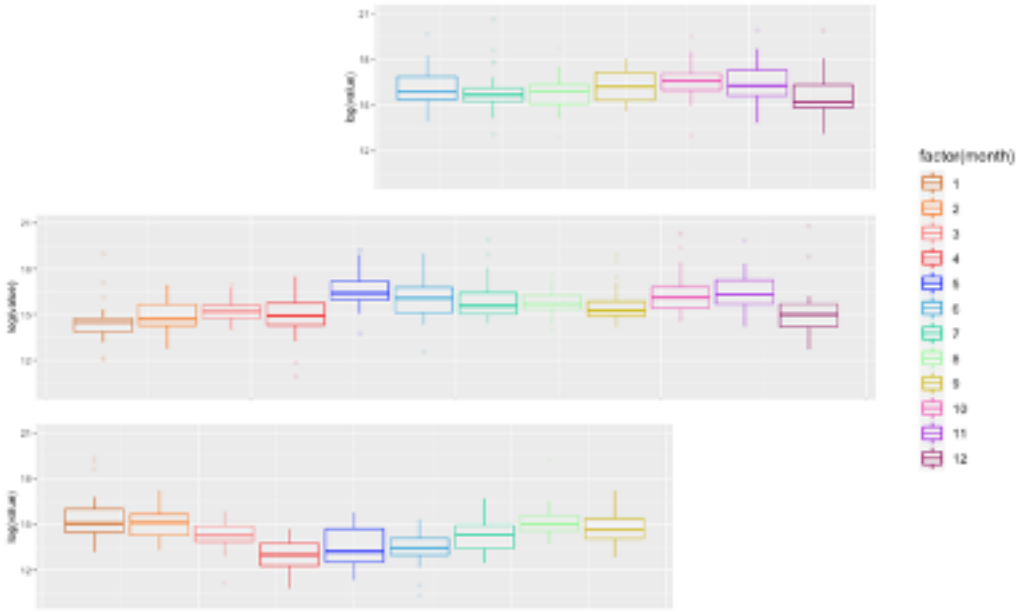

Figure 1. Overview of our estimated results per month and year (June 1, 2018 to September 30, 2020)

Of 681 days, the CS was statistically significant at least at the 10% and 5% levels in only 275 days and 193 days, respectively. The CS means were USD 49.74 (S.D. = 28.97) and 37.80 (S.D. = 19.88) at least 10% and 5% significance levels, respectively. The CS mean was highest in spring followed by winter. On the other hand, the recreational mean value was higher in autumn than winter. The recreational value means in each season were USD 83 965.63 (S.D. = 69 681.25), USD 36 711.54 (S.D. = 16 531.40), and 22 815.24 (S.D. = 9 372.43) at 5% significance level. Finally, the estimated annual total valuation of recreational services associated with Shiroyone terrace paddy land was about USD 976 000 in 2019.

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The distribution and behavioral characteristics of footpath visitors to the Tama Hills using human mobility data

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Abstract

Introduction

The number of visitors to green spaces has increased over the past few years as the health benefits of spending time in nature has become more widely popularized (Brett 2020). A similar trend has been observed for footpaths in one of the green areas in the countryside. In 2020, when COVID-19 became a pandemic across the globe, governments enacted various regulations to reduce human contact and to lower infection rates. One of the few privileges that remained was the opportunity to take walks and to exercise outdoors, activities that often took place in nature. Footpaths also became venues of these activities. However, the actual conditions of footpath usage are not studied.

Understanding the behavior of visitors in protected areas and other suburban open spaces, e.g., how their foot traffic is distributed temporally and spatially, is an essential step in managing its impact. It has been noted, however, that it is more difficult than generally expected to perform such aggregation in a reliable and cost-effective manner (Cessford 2003).

On the other hand, against the backdrop of improvements in ICT software and hardware services, research is beginning to utilize big data on human mobility obtained from cell phones in order to estimate the number of visitors and to understand their behavioral characteristics in protected areas and other suburban open spaces (e.g., Korpilo et al., 2017; Monz et al., 2021).

In this study, we attempted to calculate the number of visitors to footpaths in the countryside and to visualize the distribution of visitors and their behavior by using big data on human movement obtained from cell phones.

Methodology

The study focused on the Tama Hills Footpaths located in the Tama Hills, approximately 20 km southwest of Tokyo, Japan. The natural environment of the Tama Hills is characterized topographically by a landscape known as Yato valley, preserving the nature of the so-called satoyama which is one of the typical landscapes of the Japanese countryside.

The big data on human mobility obtained from cell phones used in this study was obtained from the location information big data of au (KDDI) smartphones, one of Japan's cell phone communication service providers. The data was obtained during a period of 28 months from

September 2019 to December 2021. To extract the number of users, a 125m x 125m mesh was created for the entire Tama Hills area using GIS (Geographic Information System), and subsequently data on the number of users for each mesh was obtained.

To visualize the distribution of visitors and their behavior, the density of use on the footpaths was calculated. The footpath routes were created as line data in GIS. The line data was overlaid with the previously created 125m mesh polygon data. Since footpath users rarely walk off the footpaths, the number of users per mesh is almost equal to the number of users on the footpaths. Therefore, the density of use was calculated by dividing the number of users per mesh by the total distance of routes per mesh.

Results and Discussion

First, the annual number of visitors for the entire study area was estimated at 543,285 in 2020 and 531,251 in 2021. In 2020, the maximum number of visitors per month was 51,094 in November and the minimum was 39,750 in April. The reason for the high number of visitors in November, 2020 was due to the autumn foliage, while the reason for the low number of visitors in April was the declaration of the first state of emergency by the Japanese government. Similarly, in 2021, the reason for the high number of visitors was due to the enjoyment of the autumn foliage. On the other hand, the lowest number of visitors was in August due to high temperatures and high humidity, which are characteristic traits of Japanese summers and have discouraged people from using the footpaths in order to avoid heat strokes in the low elevations of the Tama Hills.

Assuming that footpath visitors walk in a single file along the footpath, the distance between users was calculated from the number of people walking at each section (within a 125m mesh) and the distance of the footpath. As one of the results, we show the data for November 2020 in the Onojijo area, which is located in the center of the Tama Hills footpaths and has the most satoyama landscapes remaining out of the eight course areas (Figure 1). Among all 84 meshes of the Onojijo area, the minimum distance between users was 0.16 m/person, the maximum was 173.3 m/person, and the average was 23.3 m/person. Of the 84 meshes, the most common distance between users was in the range of 10 m/person to 20 m/person, which was 21 meshes (25%). This indicates that there were few situations in which the social distance was less than the 2 meters required by the government's Covid prevention measures.

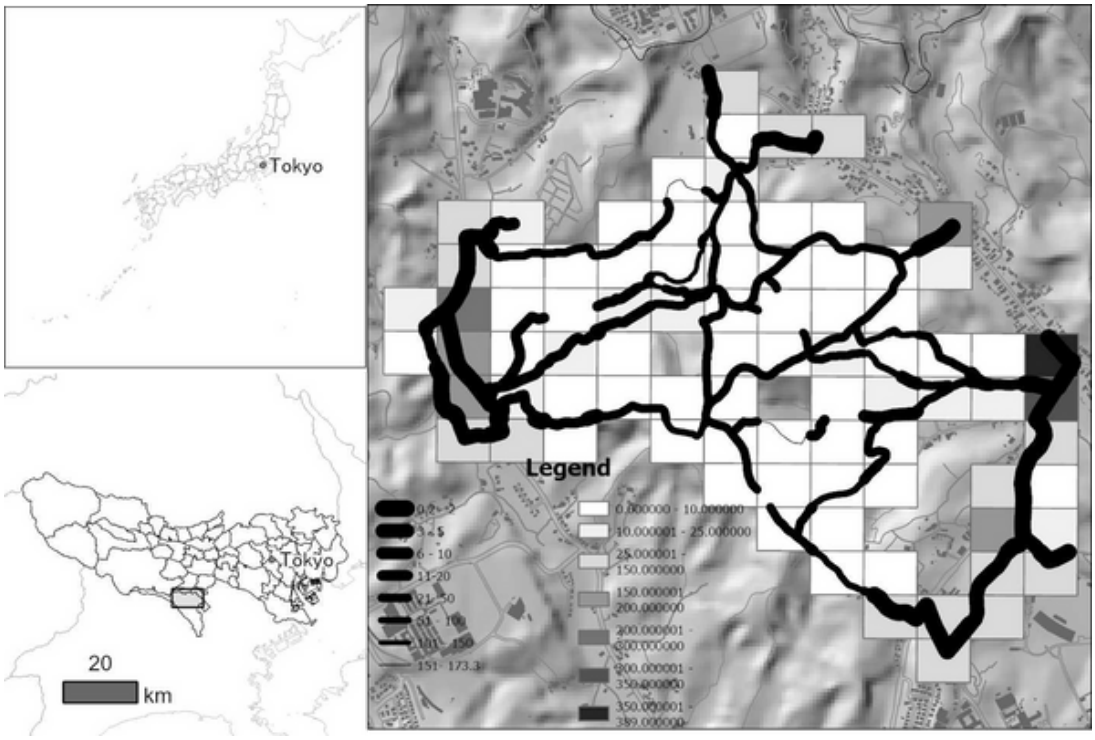

Figure 1. Distribution of visitors and distances between users on weekends in October 2020

Conclusions

By utilizing big data on human movement obtained from cell phones, we were able to ascertain the actual conditions related to the use of footpaths, where it is otherwise difficult to count the number of visitors. The data provided essential information for considering clear management goals for footpaths, and provided value-added information inferred from the types and numbers of visitors.

Acknowledgement

This study was in part supported by Odakyu Foundation Grant., and by JSPS KAKENHI Grant Number JP 20H04442.

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Managing recreational use in Estonian protected areas: the role of Everyman's Right

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Abstract

Introduction

Protected areas (PAs) are established to protect natural and cultural resources of a certain environment. PAs are tourist destinations allowing visitors to experience those resources and offer people engagement in different recreational activities (Eagles et al. 2002). Because of a growth of nature-based tourism (Fennel 2008), and higher demand in outdoor recreational activities (Puhakka & Saarinen 2013), PAs are under pressure for increasing visitation (Eagles 2004). This may pose a serious threat to the local resources. This complex situation of rising visitation adds a lot of pressure to the management of PAs. Especially, because the PA managers can be more orientated on nature conservation than visitation and every PA needs different management approach (Puhakka & Saarinen 2013). The active involvement of stakeholders in new recreational activities emerges rapidly and management principles need to be constantly updated. In Scandinavian and some Baltic countries (Estonia) managing visitation in PAs is strongly related to Everyman's right (ER). ER allows people to access both public and private land to engage in recreational activities. Research on recreational ecology has focused more on developed countries (Sumanapala & Wolf 2019) and more knowledge on this matter from developing countries can open new perspectives. This study assesses the willingness to accept restrictions in PAs by different recreational activity groups with the aim of discussing how does the ER stand the test of time in a modern environment of PAs?

Methodology

This research is a case study that is a part of a larger nationwide recreational research that bases on 6 different quantitative datasets that were collected between March 2021-September 2021) using Google Forms in collaboration with Estonian University of Life Sciences and Tallinn University during a project that examines tourism, sport and recreational activities in PAs. For all data collection rounds one questionnaire was used that was adopted according to specific recreational activity:

1. hiking (609 respondents).
2. mountain biking (589 respondents).
3. hiking with dogs (241 respondents.
4. paddling (626 respondents).
5. surfing/kitesurfing (54 respondents)
6. diving (73 respondents).

During the research most common recreational and sport activities were mapped, several of the most common activities were addressed with methodology developed to collect data from outdoor recreationists of those activities based self-administered questionnaires. Apart from those questionnaires were also sent to participants of non-professional outdoor recreation events, members of recreation clubs, groups and communities. Recreationists of each activity were contacted in the most suitable way for each community, using e-mail lists or forums of the community or club, social media groups, participant list of organizers etc. to receive higher percentages of respondents.

The basic questionnaire developed focused on recreationist habits and motives and preferred environment related to the particular outdoor activity, environmental impacts, social impacts and land use aspects related to their preferred outdoor recreational activity (all in all 20 questions). Depending on the researched outdoor activity questionnaires were modified in accordance with the specificity of the activity. Questions are multiple choice questions, open ended questions and Likert scale questions. This study focuses on one part of the questionnaire specifically on the views of recreationists when they are visiting PAs.

Results

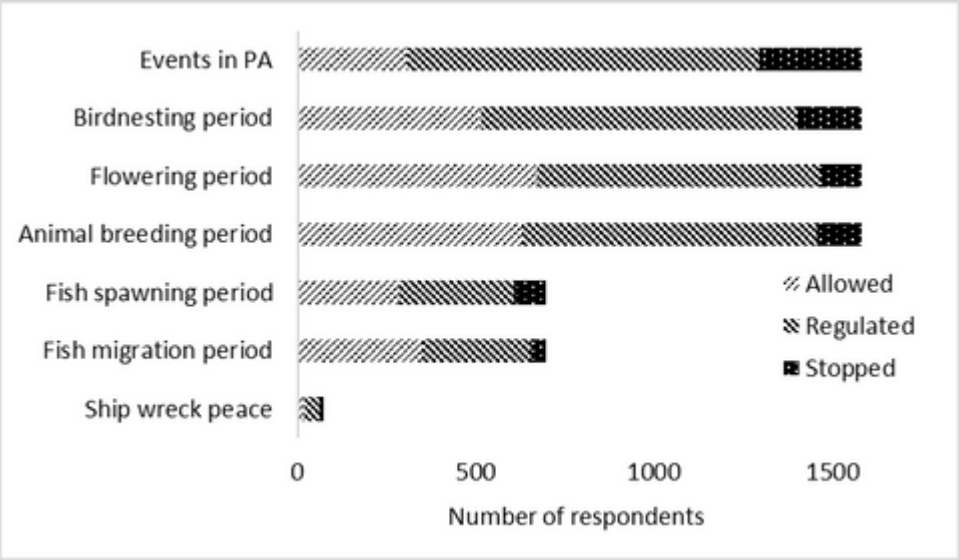

Figure 1. The recreationists' views about visiting nature areas in sensitive times and places.

The results show that the views of recreationalists in PAs are diverse within the outdoor activity and even within the segment itself. Often outdoor recreationists involved in a specific recreational activity do not share common views (Figure 1) on their impact when they are engaged in this activity. They have different opinions on how the use of PAs should be regulated.

Conclusions

Outdoor recreationists hold some knowledge about environmental impact and significance of natural environments related to the preferences of certain PA use for their activity. However, the principles of ER postulate that visitors of PAs should be highly aware of their impact on the environment and have a clear understanding of what is allowed and what is prohibited (Colby 1988). Results indicate that in this situation it is difficult to sustain ER as an only control mechanism over recreational use in PAs. With the knowledge that this kind of development is eminent in PAs certain control mechanisms can be established but the issue here is that legislation and infrastructure do not evolve at the same speed as those emerging activities. In the future, PA management should focus on voluntary codes of conduct or best management practices that might become interpretative link between formal legislation and ER for a certain recreational community to address commercial and individual recreationist. This study highlights that there is a need for collaborative dialogue between respective partners: nature-based tourism sector, sport event organizers, community representatives, protection agencies or other environmental authorities on future management perspectives of PAs.

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Are more experienced recreationists less likely aware of their impacts to nature and less likely to adapt to management regulations?

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Abstract

Introduction and Objectives

The variability in motives, norms and subsequent environmental attitudes among outdoor recreationists has been a challenge to recreation management stakeholders, land managers and also a potential for conflict amongst recreationists. Knowledge about environmental attitudes and behaviours can help managers to alleviate conflict between recreationists, and other stakeholders (Thapa & Graefe 2003) and show how different norms can be adapted and changed in the rapidly developing protected area (PA) environment. Experience-use history (EUH) refers to the sum of accumulated experience an individual has within a particular activity. Han *et al* (2018) brings attention to the value of EUH concept to recreation resource management, as experience with any outdoor activity or resource setting can influence how recreationists perceive impacts or management situations.

This study researches six groups of recreationists and according to their attitudes, motives and EUH aims to differentiate recreationists into clusters. As more experienced recreationists might become less attentive towards external regulations (Han *et al* 2018), we hypothesise that more experienced recreationists are less likely to adapt with management regulations and are less aware of their environmental impacts.

Methodology

The study used six data sets collected in 2021 in Estonia, where one according to the recreational activity slightly adapted questionnaire was used. Study objects were recreationists, individuals participating in outdoor activities – hiking (609 respondents), mountain biking (589), hiking with dogs (241), paddling (626), surfing/kite-surfing (54), diving (73). Each community was contacted in the most suitable way according to their belonging to clubs or communities, e.g. questionnaires were sent to participants of non-professional outdoor events, members of clubs, groups, communities. The questionnaire focused on recreationist habits, motives and preferred environment related to their activity, environmental and social impacts and land use aspects. Questions are multiple choice, open ended and Likert scale questions. For this paper questions regarding land use, environmental impact and environmental sensibility are analysed with multiple correspondence analysis (MCA).

Results and Discussion

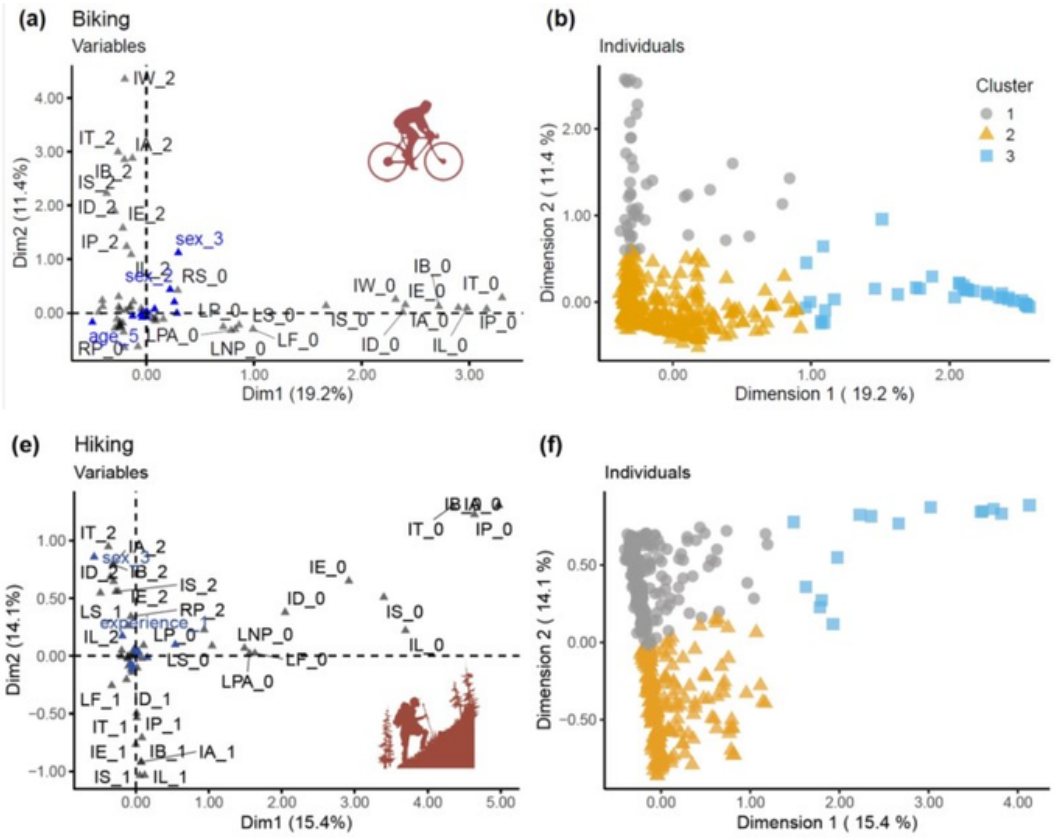

Figure 1. Example figures from two activities. Plot of (a, e) variables and (b, f) individuals obtained from MCA for (a-b) biking (n = 589) and (e-f) hiking (n = 609). The proportion of variance explained by each retained MCA dimension, the variable labels and the grouping of individuals according to hierarchical clustering on MCA dimensions.

The cluster analyses divided respondents into three sub-groups - "Open-minded" (cluster 1), "Self-aware" (cluster 2), "Ignorants" (cluster 3) - regarding potential compliance of management changes and awareness towards environmental impacts. In the current study previous results of Le Corre *et al* (2021) have been appreciated in clustering recreationists according to experience and motives.

"Self-aware" recreationists tend to be more focused on activity rather than impacts on environment, are more experienced in the field, most probably own equipment and, knowledgeable about the activity, enjoy nature and prefer to escape from everyday pressure. They tend to express less interest in the importance of the conservation aspects, in current study they consider impacts of their actions to be small or nonexistent. They are in favour of some regulations during sensitive times, but activities should mostly be allowed on PAs. It may be grounded with Han *et al* (2018) findings that more experienced recreationists might have internalised the norms within their social groups, and therefore become less attentive about external rules and regulations. Slight differences by activity exist related to social aspects or activity orientation between hikers and mountain bikers. Bikers are more activity-focused,

achievement-oriented and sport club dominated. Hikers relate more to family and friends and rely on their own choice of trails.

“Open-minded” recreationists tend to be more environmentally sensible (are more likely to support restrictions during sensitive times, evaluate the environmental impacts of their activity to be higher), have less experience of their own. They are more likely to agree with some activities being stopped or regulated on some sensitive areas or times. Due to less experience they mostly use public trails, PAs and national parks, often most use marked trails. It may be speculated that this segment of “open-minded” recreationists are less restricted to previous knowledge and perceptions, are more likely to be influenced towards the future development of PA management tools.

“Ignorants” can’t say if there are any environmental impacts of their actions despite, they seem to have longer experience. They seem to be process-focused, and might be more motivated by a calm and silent atmosphere away from crowded spaces. It can’t be speculated how they would support and perceive management decisions as they are not opinionated nor interested.

Conclusion

A large number of recreationists commit to a favourable activity and cannot assess the impact of their activity. It can be said that mostly less-experienced novice recreationists are aware that they have an impact on the environment during recreational activities. The more experience recreationists express, the less importance on impacts they consider. However, it seems that environmental awareness depends on the nature of the activity, and the context within which the recreationists were asked to express their opinions, e.g hikers are generally more aware of the impact of their activity than mountain bikers who were addressed in a competitive setting.

Larger EUH tends to lead to a situation where collective community norms are more relevant, meaning both impacts on nature and motives beside the activity itself become less important. This study shows that more experienced recreationists are less likely to adapt to management regulations and less-experienced novice recreationists see impacts to be higher and are more acceptable towards regulations on PAs.

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Outdoorvision: experimenting cross-reference of GPS tracks and count data to understand nature sports usage

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Abstract

Introduction and objectives

To better manage outdoor sports, Eco-Counter has worked in partnership with the French National Resource Center for Nature Sports, created by the Ministry of Sports, to qualify the data shared by participants (runners, hikers, skiers, cyclists). The mission of the Pôle Resources National Sports de Nature consists of disseminating know-how, promoting good practices and innovative actions, and sharing and providing tools adapted to the needs of those involved in the development of nature sports.

This presentation will focus on the feedback from the experimentation carried out by this National Resource Center for Nature Sports, in partnership with Eco-Counter, and more particularly on the representativeness study of GPS tracks used in the Outdoorvision platform.

Methodology

Outdoorvision is a platform dedicated to the managers of natural parks to help them better welcome users, while preserving and securing the sites, by having a better knowledge of user flows according to sports practices.

One of the challenges is to be able to analyze nature sports usage through a web mapping platform that analyzes both GPS tracks and automatic count data.

The experimental project was conducted in 2021, in the Auvergne Rhône Alpes region (south-east of France) and more precisely in Isère. It focused on the analysis of GPS tracks collected via connected watches from different sources (VisioRando, Garmin, Decathlon) and on 11 counting sites.

Results

A total of 112 220 tracks were collected for the analysis, over 4 years (2018-2021), representing 23 080 users. Those tracks were compared to count data at 31 locations.

Following this, a data analysis methodology was created, and a first report was provided to measure the correlation of the two data sources, to make recommendations to optimize

tracks collection and increase their representativeness, as well as the positioning of the counters.

Discussion & Conclusions

Phase 2 of the project, which starts this year, will aim to expand the collection of GPS tracks, analyze the impact of tracks collection campaigns on representativeness, and increase the platform's analysis capabilities: general view, by route, departure/arrival analysis, distribution by type of activity, break areas (time and location of stops).

In the long term, the project goal is to replicate this experimentation in other territories (75 user departments), and even on a national scale.

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Snowshoes on bogs - a novel activity and its' impact

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Abstract

Keywords: snowshoes, bogshoes, trampling, vegetation recovery, code of conduct

Introduction

Snowshoes are well known and common devices, used for hiking in snowy and icy conditions to prevent falling through snow or slipping on icy surfaces. In Estonia, which is rich in peatlands, especially raised bogs, in ancient times the devices, similar to snowshoes, were used for crossing these wet and quaking lands all year round. In 2000s Estonian nature tourism entrepreneurs started using these devices (calling them “bogshoes” in English) in bog hikes. The bogshoe hikes become very popular among the foreign visitors and last 15 years they have been a unique and specific nature tourism attraction for the country, claimed as most ecologically sustainable way of moving in nature and visiting the unique landscapes, mostly protected areas.

Our study indicated that there were 66 mires, used by entrepreneurs for bogshoeing hikes in 2021, of which 9 were not protected areas. There were about 50 entrepreneurs, offering the service and before COVID-19 situation about 15 000 annual visits to Estonian bogs were estimated.

As bogshoeing is not regulated in any other way than ordinary walking or hiking on bogs, the hikes often started from or crossed the boardwalks, leaving visible trails on wet surface. There were also complaints about disturbing breeding birds and embarrassing guided tours on boardwalks. In 2017 we started a research project in Kullisoo bog, North Estonia, to make a 10-year experiment of comparative trampling with boots and bogshoes, to analyse the impact and later recovery of the trampled surfaces.

Methodology

There are numerous methods for describing trampling on mineral soils (Cole 2004, p. 42) and few works, describing trampling effects on mires (Korolkova & Mironova 2019, p. 75-76), but there are no studies about assessing the effects of snowshoes in mires during vegetation period. None of the previous works have assessed the recovery processes of the trampled areas in mires during longer period.

We aimed to determine the effect of trampling on the vegetation of bog communities, trampling by boots and bog-shoes. We estimated the post-trampling recovery in the wooded hummock bog, wooded-hollow-ridge bog and hollow-ridge bog after replications of 80, 160,

320 times of tramples in 2017 late August. We established 10 m long transects and marked 0.5 x 0.5 m permanent plots. There were 4 transects for each experimental management, 4 plots on each. For each vegetation type 16 control plots were marked. We measured the vegetation height and coverage of all species before trampling and the percentage of trampled and damaged plants and disrupted peat after trampling in addition. The measurements were carried out in late August – early September to assess the changes in vegetation cover and species composition from 2017 onwards, the analyse considers the years 2017-2020.

Results

The field experiment showed that although ordinary walking and bogshoeing significantly affects the vegetation cover of bog communities, there is no significant difference in the extent of damage caused by trampling in either ways. The total coverage of bryophytes decreased the most in both trampling methods in the hollow-ridge bog habitat type (Figure 1). The peat moss coverage was estimated higher than next years, directly after trampling (2017), as it was difficult to assess, if the moss pieces were alive or dead. The next two years were crucial for the Sphagnum mosses, as most of the fragments died and especially rusty peat moss (*S. fuscum)* hummocks suffered from trampling and disturbance and lot of plants died on second year after trampling. It was found that red peat moss (*S. rubellum*) is the fastest regenerating moss species after trampling and recovers well after moderate trampling (80 and 160 number of tramples), but after 320 times of tramples it takes more than three years to start recovering.

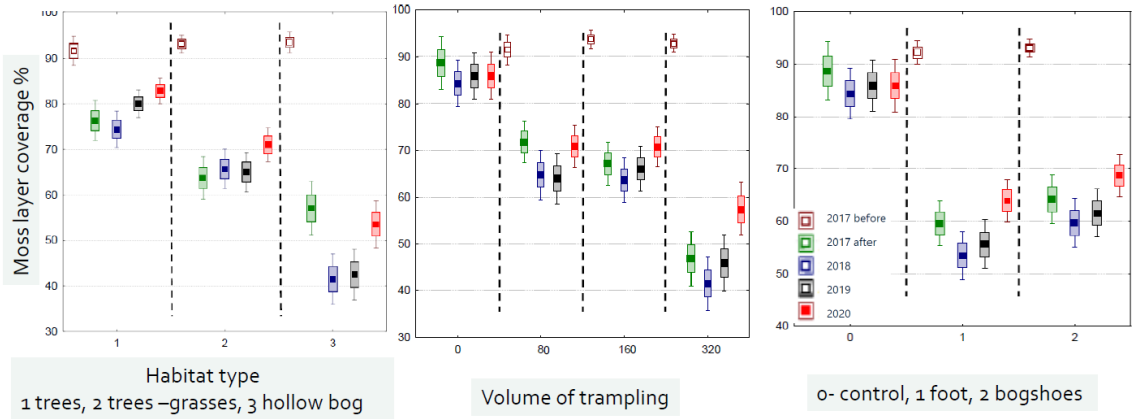

Figure 1. Trampling impact on moss layer coverage over all habitats, trampling volumes and trampling types.

At the same time with the field experiment we contacted the entrepreneurs, providing the bogshoe hikes, to discuss the environmental impact of the bogshoe activities as well as social carrying capacity issues. Together with the entrepreneurs, Estonian Environmental Board and Estonian University of Life Sciences in 2020 the Code of Conduct was elaborated and approved. The document is based on common values, suggesting the safest types of bogshoes and hiking strategies, promoting the “bogshoe peace” during the nesting period of bog birds and highlighting the environmental education issues. It can be found in Estonian, English and

Russian languages in Visitestonia.ee, Protected Areas web page (Kaitsealad 2020) and many others. In 2021 the first training to entrepreneurs was carried out to introduce the topic.

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To good neighbourhood! Park-people relationships of protected areas in the Polish-German Euroregion Pomerania

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Abstract

Introduction

In the last decades the analysis of attitudes of the local population towards protected areas (PA) has gained importance, on parallel with the rise of a participatory approach of protecting nature together with and not from local people. Strict protection measures are only to be realized when "accepted" by the locals. In Poland, for instance, no new national parks have been designated or have noticeably increased their size in the last two decades, mostly due to a lack of consent among the local municipalities.

In this vein the research field of park-people-relationship emerged which led to a considerable number of case studies world-wide, however, most often based on diverging conceptualizations and methodologies which hamper comparisons over time, between PA and countries as well as generalizations. To overcome some of these shortcomings we present a study about the park-people-relationships in 14 Polish and German large-scale PA (six national parks, one biosphere reserve and seven Polish landscape parks) in the cross-border Euroregion Pomerania (Zbaraszewski et al. 2014). The aim of this study is twofold: i) the development of a generalized park-people-relationship questionnaire and its testing in an international context with varying socio-cultural and socio-economic background (Mayer et al. 2019); ii) to analyze the influences of these varying contexts on park-people-relationships (e.g. which role do the different PA categories and their inherent restrictions/regulations play for the local population? What about the role of tourism/recreation intensity for positive attitudes towards PA?).

State of research

In Germany there are park-people-relationship studies about almost every national park, a quite number of biosphere reserves and also about some nature parks. However, most of them are not comparable, neither between the PA nor between different timelines. Job et al. (2021) sum up best the current state of knowledge.

Hibszer (2013) conducted studies for all Polish national parks about their perception among municipalities and local communities. Furthermore, the opinions of local people regarding the existence of national parks and their influence on the local economy were analyzed by, for

instance, Zawilińska (2016) and others. However, for the less strict PA category of landscape parks only few studies are known so far. In addition, almost all these contributions have not been published internationally.

Methodology

This contribution is based on representative standardized quantitative telephone surveys in 14 PA regions conducted in 2019 and 2020. Telephone surveys were chosen for practical reasons like missing online panels in the peripheral rural areas, the high efforts of postal surveys and financial restrictions. In each PA region between 370 and 403 interviews were done, in total 5,547, and weighted for age class and gender. The survey instrument contained 43 questions based on existing park-people-relationship studies. The analysis is mostly based on descriptive statistics and correlations.

Results

Regarding the overall attitude towards the parks, respondents overwhelmingly opted for the continued existence of the PAs: Seven out of 14 parks have >95%, only three have 80 to 90%. There are neither significant differences between Polish and German PA nor between the three PA categories. That means national parks with their higher level of restrictions are not less popular.

Over time, the attitudes towards PAs are quite stable with 76.1% of respondents indicating no changes since the designation of the PA. However, 16% of respondents have a more positive attitude, only 3.3% a more negative. Compared to Poland, the German respondents report more pronounced improvements of their attitudes (26% vs 13%; Cramér's V 0.239, $p<0,001$).

Regarding the level of respondents' activity in favor or against the PAs we identify three groups of parks: i) parks where nearly nobody is doing something related to it; ii) parks with a relevant share of the respondents actively working for them; iii) polarizing parks with groups of residents being active against and in favor of it. Thus, there are significant differences between the parks (Cramér's V 0.224, $p<0.001$). German parks have much higher shares of actively "pro park" residents (22.3% vs. 7.1% Polish), while Polish parks have more active adversaries and more passive residents (Cramér's V 0.242, $p<0.001$).

Discussion & Conclusions

The large-scale PA of the Euroregion Pomerania consistently enjoy high support from the local population. Compared to similar studies, the overall attitudes towards the parks is in line with results from German national parks (Bavarian Forest 85.8%, Berchtesgaden 96.1%, Job et al. 2021). However, there are reasons to question the practicability of this overall attitude measurement as it seems to lead to relatively one-sided results. Most likely there is not anything like "the" acceptance of PA but there are manifold attitudes regarding different aspects of park-people-relationships.

The overall attitude towards the parks has improved since their designation. This temporal habituation effect is in line with studies from German PA. There are significantly more activities of the local population in favor compared to against the parks, with Polish parks having more active adversaries and passive residents. Thus, the survey instrument seems to work fine also in an international context but nevertheless needs further refinement, especially a more differentiated measurement of the overall attitude towards PA.

Acknowledgment

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Title: Destination or place? A case study of social sustainability and tourism in Øyer, Norway

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Abstract

Introduction

The hit of the COVID-19 pandemic brought drastic changes for people, services and industries in Norway, and with closed borders and travel restriction it gave a significant boost to activities related (Ericsson, 2022)to outdoor recreation, domestic travel and staycations (Jacobsen et al., 2021). The use of nature combined with the mass phenomenon of access to second homes for leisure activities, typically located near ski resorts and in mountain areas, has caused an unsustainable development for local communities and negative implications (Xue et al., 2020). Moreover, the pandemic put even more pressure on existing conflicts.

Second-homes in Norway are of strong cultural and traditional significance, which was amplified during the pandemic where second homes were viewed as a safe haven in times of uncertainty (Haukeland et al., 2021), away from the city and risk of contamination, which caused tension between the local residents and visitors (Ericsson et al., 2022). However, there are still limited studies drawing focus upon the resident quality of life and the effects of living in popular tourist destinations (García-Buades et al., 2022). Although sustainability has played a central part in tourism development and policies since sustainable development goals (SDGs) were introduced (Hall, 2019) the sustainability discourse has been prominently dominated by the economic and environmental aspects (Eizenberg & Jabareen, 2017). The "social" was integrated late into the debates of sustainability development, and as a result nature-based tourism lacks theoretical contributions in in the context of sustainability (Sørensen & Grindsted, 2021).

This paper aims to investigate how tourism and second-home development have affected the local community of Øyer, the residents' quality of life and how private and public stakeholders handle this development. Located in the Inland region, Øyer, a municipality of roughly 5000 inhabitants, houses some of the largest ski resorts in Norway due to the hosting of the Winter Olympic games in 1994. The region has an abundance of accommodations in form of second homes, and while it is argued that it contributes to regional economic growth, it also creates tension regarding the residents' needs, right to roam and tourist development in untouched nature (Kante, 2021). With an increasing focus and political pressure on SDGs (Norwegian Ministry of Foreign Affairs, 2016), controversies may occur to how a region should maintain economic growth if the growth does not correspond with the social, cultural, and moral values of its residents (Maagerø, 2021).

Methodology

This study has chosen interviews and document analysis as approaches for this case study to increase its sufficiency in terms of validity and credibility. 10 interviews were conducted in the period of January-February 2022 with residents, second-home owners, and representatives from public sector administration. The interview guide and interviews were semi-structural to achieve a narrative without disturbances and influence, and included topics such as social sustainability, second-home development, place attachment and the life and changes during the pandemic. Document analysis was implemented to draw evidence of multiple sources and to examine whether what is written concurs to what happens in reality. Documents such as political policies and strategies from private and public stakeholders were retrieved to gain insight of what has happened within the community, to get an overview of involving networks and further plans regarding destination development. Documents have contributed to an early data analysis and discovery of knowledge gaps, as well as revealing development and activities independent of the researcher, avoiding biased information.

Findings and conclusion

The study found that the lack of resident involvement from public stakeholders and the municipality affects the residents' well-being. The fact that stakeholders does not collaborate professionally, effectively, and not having a clear destination development process affects both residents and second-home owners in terms of quality of life, destination image, place attachment and recreational prospects. Yet the perception that second-home development contributes to economic growth remains. This perception was also apparent in the document analysis, however the residents paint paints a somewhat a different image of the opportunities (jobs, activities, service offers) of tourism and second-home development brings the community and Øyer as a destination compared to the evidence drawn from the documents. This emphasizes the need for a social innovation approach, e.g. by identifying the residents needs and inclusion of local culture, and highlighting collaboration and co-creation of new services for long-term resilience. By viewing tourism as a social force rather than just a market opportunity it can contribute to a more sustainable direction, both in terms of economy, focusing on e.g. sharing-economy and local businesses to increase the local value creation and build alliances on shared social values in tourism destinations.

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Visitor's attachment and pro-environmental behaviors in nature-based settings: cross-country research in Vietnam and Italy

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Abstract

Environmental psychology studies in tourism often measure place attachment and other place-related factors to predict visitors' behaviours in natural areas (e.g., Ramkissoon et al., 2013; Stedman, 2002). Nevertheless, more resonant causes, such as what formulates place attachment, still receive little attention (Lewicka, 2011). Understanding which antecedents and how they affect attachment may enable a more accurate prediction of behaviors toward the environment. Accordingly, this empirical research aims at predicting the influence of activity participation elaborated by Dang & Maurer (2021) and place value proposed by Brown et al. (2015) on formulating place attachment and promoting pro-environmental behaviors of visitors. We continue to investigate the extended theoretical model proposed by Dang & Maurer (2021) that measures an entire process from input (activity participation) through mediators (place attachment, place value and place satisfaction) to output (pro-environmental behaviors). For cross-country research, a sample of 1829 observations was collected online from locals and tourists visiting five natural areas in Vietnam and Italy. The first stage of analysis was to run an exploratory factor analysis in SPSS for activity participation and place values to uncover the factors underlying the dataset and confirm their scale dimensionality. In the next step, this study uses PLS-SEM to evaluate the measurement model and test hypotheses in the proposed theoretical framework. Theoretically, it is foreseen that the model to be validated based on investigations of interrelationships with PLS-SEM. Finally, the model's generalization in cross-country research allows for its wide application in tourism management in numerous natural areas worldwide.

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Changes in the consumptions patterns in the Tatra National Park over the last 28 years - case study

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Abstract

Introduction

The Tatra National Park (TNP) is a mountainous park with an area of about 211 km2. In this relatively small area, an enormous amount of human consumption patterns exist and exert pressure on the park. These pressures include widespread tourism with 275 km of tourist trails in the park and a range of other human activities restricted to specially dedicated areas such as skiing, ski touring, climbing and caving. Moreover, despite the fact that the number of sport competitions organized in the park area is strictly limited, widespread interest in these competitions has increased in recent years. Over years of observing changes in consumptions patterns in the TNP we have noted a great challenge for managers both in terms of adjusting to increasing tourism demands on the park area and managing those transformations of the natural environment such increasing activity catalyzes and causes. The significant example of that changes was the Sars-CoV-2 pandemic.

Methods

The aim of the research was to compare the temporal and spatial distribution, as well as the size and structure, of different human activities in the TNP. This research is predicated on an analysis of tourist traffic which was carried out for 28 years (1993-2021). Changes in the annual number of tourists were calculated based on tourist traffic statistics from 16 to 18 entry ticket points (depending on the year), which together see all those tourists visiting the TNP, including hikers, ski tourers, cavers and climbers. The exact number of ski tourers is gained from direct counting at entry ticket points, while the number of climbers and cavers is based on a dedicated registration system. The temporal distribution of tourists were analyzed from a sampling of seven annual cycles: we examined the years 1993, 2000, 2010, 2015, 2019, 2020, and 2021; the spatial distribution, meanwhile was analyzed from four annual cycles, examining the years 1993, 2019, 2020, and 2021. The number of other activities such as climbing, ski touring, and caving were presented as a temporal distribution over the years 2015, 2019, 2020, 2021. Moreover, the amount of both planned and organized sport competitions were analyzed. The period of study overlapped with the outbreak of the Sars-CoV-2 pandemic, and analyses of its effects on tourism were conducted. The research focused also on the influence of tourism on the natural environment.

Results

Data obtained from ticket points from the last 28 years showed a gradually growing number of tourists. In 1993 the total number of tourists were 1 598 314 people. At the turn of the 21st century this number was more than 2.5 million. From 2011 the number of tourists have continuously exceeded the 3 million mark. During the year prior to the Sars-CoV-2 pandemic, that is 2019, the number of tourist was 3 947 350. In 2020, despite the temporary restrictions of traveling to the other cities as well as closure of hotels, guesthouses and restaurants and short-term closure of the TNP, the total number of tourists was only slightly lower - 3 470 343. In 2021, when the pandemic situation was still quite influential on travel and tourism, a lower amount of foreign travel from Poland and subsidies for trips within the country caused an enormous number of tourists, which increased to 4 788 788. In 2021, data analysis showed that 98.7 % of the total number of people visiting the TNP were hikers. The most popular entry point is Palenica Białczańska, from which the trail to the Rybi Potok Valley and the Roztoka Valley begins. In this entry point, the number of tourists in 1993 was 442 912; in 2021, this number increased to 874 082. An analysis of the tourist traffic structure shows that individual tourists dominated during the Sars-CoV-2 pandemic and that the amount of group tickets decreased significantly. In recent years, the number of ski tourers, climbers and cavers has also increased. The greatest differences were observed in the case of ski tourers. The number increased drastically, from 8 279 in 2015 to 43 351 in 2021. Even though the number of sport competitions in the area of TNP is strictly limited, the willingness to organize them rises from year to year. Conducted research shows also that the concentration of tourist traffic in selected sections of tourist footpaths initiates and accelerates the activity of morphogenetic processes (Gorczyca, Krzemień 2010). Research indicates that there is a gradual increase of degraded zones in the immediate vicinity of tourist paths in the TNP (Fidelus-Orzechowska et al. 2021).

Conclusions

Over the last 28 years significant changes in consumption patterns were identified. The quantity and kind of human activity has gradually increased. The sudden event which was the Sars-CoV-2 pandemic period caused a significant change in the structure of tourist traffic in the TNP. Thanks to continuous data on tourist traffic collected in TNP from 1993 till now, it is possible to monitor both the number and structure of tourist traffic. It may be edifying to add that TNP is one of the very few national parks in Europe which is in possession of this type of data. These data are extremely valuable and helpful in case of managing and protecting the natural areas. In addition to the problem of overcrowding, the mass tourism in the TNP contributes to the initiation of the growth of degraded zones. Such data may be useful in improving the surface of footpaths and facilitating the proper adaptation of tourist infrastructure in the face of increasing tourist traffic. It is important to monitor this matter in the case of sudden events in which tourist activity is unpredictable and may increase dramatically, as was the case with the Sars-CoV-2 pandemic.

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Private – no access! A national registration of signs and obstacles that potentially constraint public access to nature in Denmark

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Abstract

Introduction and objectives

In Denmark, Outdoor recreation experiences in natural environments are highly depending on access to privately owned land. Legislation provides detailed rules for public access (Baaner, 2018) whereas public access in other Scandinavian countries is mainly rooted in customs under the notion of the "Allemansrätt" (Sandell & Fredman, 2010).

Despite the legal framework, public access to nature is contested. One challenge is an ongoing concentration of farmland on fewer landowners and changing farming practices. Farm fields have been merged and consequently many dirt roads formerly accessible to the public have disappeared (Caspersen & Nyed, 2017).

Another challenge for access is rooted in the owner's right to prevent access under certain circumstances. No-access signs are legal if the access causes significant disturbance of privacy (e.g. a trail few meters from windows); creates conflict with production (e.g. dangerous machines); or damages nature values (Baaner, 2018). No pre-approval of no-access signs by the authorities is needed. Hence, the landowner might post signs without a valid reason.

Another type of signs is the "frightening signs" and they are illegal. They are not as such stating a closure of access, but the appearance potentially creates uncertainty about the access for the visitors. For example, a sign posting "private".

Finally, some land owners construct different kinds of obstacles like a fence, a chain or a bar across a road. Obstacles also includes vegetation, felled trees, trunks etc. that constraint access.

While research has been made about the reduction of dirt roads and trails (Caspersen & Nyed, 2017; Højring, 2002), limited knowledge about signs and physical obstacles is available. A research project aimed at estimating the extent of no-access signs, frightening signs and obstacles in Danish landscapes. The paper presents selected results from the project (Søndergaard Jensen, Olafsson, et al., 2020).

Methodology

A sample of 74 case areas, each covering four square km, was selected for field registration. The 74 areas covered 286 km2. The areas included 1164 km roads and trails of which 45 % paved.

The selection was a two step stratified process. First, the 98 Danish municipalities was ranked on each of seven characteristics namely the proportion of: urban-fringe, secondary homes, state owned forest, other forest, coastal zone, agricultural land and protected nature. High-ranking municipalities were selected for each of the variables. Representation of municipalities in all regions served as an additional criteria. Furthermore a few municipalities were selected due available data from earlier studies. Totally 31 municipalities were selected. Two randomly selected 4-km2 squares among all squares related to the selection criteria in each of the municipalities. Further 12 squares were selected to cover former research areas. The figure shows the selected municipalities (dark grey) and the sample of 74 case areas (black).

It is not possible to estimate whether the sample is representative on national level. But the stratified selection of the 74 areas (0.7 % of the Danish land surface) secured that a broad variety of case area.

The constraints were registered in a PPGIS including photos. All 1164 km of roads/trails and accessible nature areas were screened for no-access signs, frightening signs, and obstacles. It

was not possible to register whether the no-access signs were legal or not – this would have needed a juridical evaluation by the municipality in every each of the cases.

Results

Totally 519 constraints were registered in the case areas. Signs were nearly 60 % of those. The rest were obstacles, mainly manmade barriers like bars, chains and fences (fences livestock pastures were not included), while natural impediments were only 6 %.

A correlations analysis was made to test a possible correlation between numbers of constraints and case area selection variables. Length of roads, numbers of trails and size of population was also tested. A buffer of 2 km around the case areas was included to better capturing the local context and landscape characteristic of each case area. The analysis reveals that:

Manmade obstacles are more likely in areas with high proportion of state forest. The correlation is negative between obstacles and agricultural area. Both types of signs also correlate negatively with the proportion of agriculture. There seems to be fewest constraints in areas dominated by farming.

Length of all the types of traffic infrastructures are all correlated with the frightening signs while this is not the case with obstacles. The length of trails is the only type of infrastructure that correlates with the number of no-access signs.

No-access signs are negatively correlated with farmland, but positively with trails, state forest and population size. Hence, a high level of potential visitors due to population size or attracting characteristics (state forests and trails) might be a reason why land owners are more likely to impose no-access signs.

Conclusions and perspectives

The amount of constrains is 1.8 / km2 in average. If the sample is considered representative – as mentioned this was not possible to conclude upon – the results equals approximately 70-80,000 constraints in Danish landscapes. If municipalities or state authorities wants to improve outdoor recreation opportunities, a check on the legality of these constrains seems relevant. The correlation analysis reveals that some areas and contexts might be relevant to start with, not only to identify and remove illegal constraints but also to address the possible conflicts that might be the reason why landowners are posting: “private – no access!”.

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Wildlife tourism in Chitwan National Park, Nepal: Unpacking visitors' preferences and sentiments with TripAdvisor reviews

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Abstract

Introduction

Wildlife tourism is an important component of nature-based tourism, which is a large and growing sector of global tourism. It can generate revenue, contribute to local economies, and increase peoples' appreciation of wildlife and its conservation (Gnanapala et al. 2017). To enhance the sustainability and competitiveness of wildlife tourism destinations it is important to understand tourists' experiences including their preferences and satisfaction.

Increasingly tourists share information about their experiences with wildlife and other types of tourism online including via social media (Teles da Mota and Pickering 2020), and review websites such as TripAdvisor. Such user generated content is often seen as more reliable by others than information provided by tourism organizations (Garay 2019). Researchers have started to evaluate online tourist created content, but mainly for tourism destinations in high-income countries (Teles da Mota and Pickering 2020). However, access to detailed low-cost data about visitor experiences can be even more valuable for low-income countries with popular wildlife tourism destinations, but where resources are limited (Bhatt and Pickering 2021, 2022).

We use TripAdvisor reviews of Chitwan National Park in Nepal as a case study to explore how such online data could be used to understand tourists' experiences. Elephants are important for tourism in the Park, both wild elephants and those in semi-captivity, some of which are used for elephant rides. Therefore, we assessed overall themes in tourist's reviews, how they rated their experiences and the sentiments they expressed, including those talking about elephants.

Methods

Chitwan National Park is an UNESCO World Heritage Site, and the most popular nature-based tourism destination for domestic and international tourists in Nepal (Bhatt and Pickering 2022). Reviews for the Park from 2015 to 2021 were downloaded from TripAdvisor using the 'Selenium' tool in Python. This included the text of the reviews along with metadata such as home location of reviewer (if provided), date the review was posted, and their ratings of the Park on a scale of 1 to 5 (1 = terrible and 5 = excellent). Leximancer, a text analytics tool, was then used to identify major themes in the reviews and generate concept maps, while the VADER (Valence Aware Dictionary and sEntiment Reasoner) lexicon was used to analyse the sentiments expressed in the reviews using NLTK (Natural Language Toolkit) package in Python.

This was done for all reviews, and then for just those that talked about elephants. The ratings and sentiments were then compared between reviews about elephants and others using Chi-squared tests in Excel.

Results

There were 399 reviews about the Park posted by tourists from 47 countries, with most tourist reviewers from the USA (57), India (53), UK (49), Nepal (36) or Australia (32). The reviews mainly focused on nature, wildlife, and tourism activities (Figure 1a). More than half the reviews (52.6%) talked about elephants including their welfare, such as how they were chained for long periods (Figure 1b).

Most tourists rated the Park as excellent (58.1%), or very good (26.8%) and expressed positive sentiments (85.7%), but a few considered it average (8.5%), poor (2.3%) or terrible (4.3%) and expressed neutral (2.8%) or negative (11.5%) sentiments (Figure 1c). Those talking about elephants were less positive (82.9% vs 88.9%) or neutral (1.4% vs 4.2%) and expressed more negative sentiments (15.7% vs 6.9%) than other reviews (Chi-square = 9.996, $p < 0.05$). Rankings also differed with fewer excellent (54.3% vs 62.4%) or average (6.7% vs 10.6%) reviews, and more poor (3.8% vs 0.5%) or terrible (5.7% vs 2.6%) reviews about elephants than others (Figure 1d) (Chi-square = 11.081, $p < 0.05$).

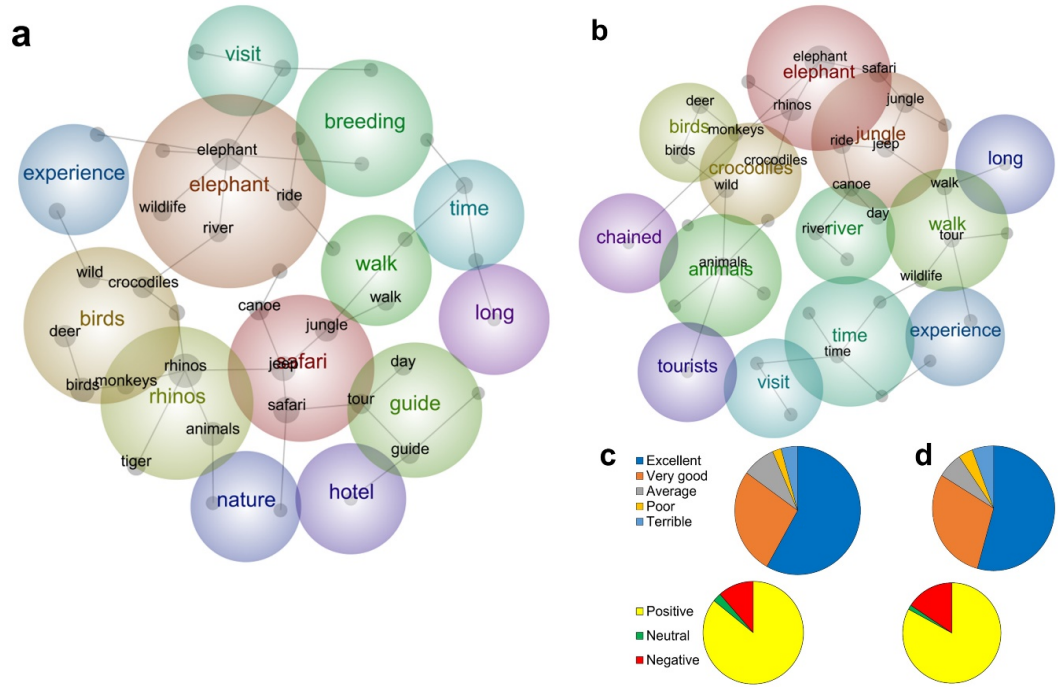

Figure 1: Results from the analysis of TripAdvisor reviews about Chitwan National Park: a) concept map of all reviews b) concept map of reviews about elephants, c) proportion of ratings and sentiments for all reviews, and d) proportions of ratings and sentiments for reviews about elephants.

Discussion

On TripAdvisor tourists described how they enjoyed many aspects of their visit to Chitwan National Park with generally high ratings and positive sentiments expressed in reviews. However, there was concern about the welfare of elephants including lower ratings and more negative sentiments in some reviews. This is of concern and could impact wildlife tourism in the Park, as elephants are one of the main attractions and there is growing concern about elephant welfare in tourism more generally (Gnanapala, et al. 2017). Further research into these reviews for the Park, but especially those for the Elephant Breeding Centre in the Park, are likely to provide additional insights including into visitor's specific concerns regarding elephants in semi-captivity and elephant rides.

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Insights into wildlife tourism research

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Abstract

Keywords: bibliometric, literature review, environmental sustainability

Introduction

There is increasing recognition of the popularity of wildlife tourism globally, including its importance in particular countries and regions (Africa, Central America and SE Asia) (Newsome et al. 2005, Bhatt and Pickering 2022). Much of this tourism occurs in protected areas, and can contribute to conservation, but also can have adverse impacts on wildlife including direct effects on animals (physiological stress, disruption of foraging, breeding and provisioning), but also broader impacts on wildlife habitats. There is also interest in human-wildlife engagement which includes the tourism industry, economics, management, local community benefits as well as the effect on tourist experience and other key actors (Newsome et al. 2005, Moorhouse et al. 2017). To provide insights into this topic, we provide a snapshot of current research on wildlife tourism using a bibliometric/scientometric approach highlighting major themes and future foci.

Methods

To assess the current status of research the large comprehensive academic database Scopus was searched in March 2022 for all articles, reviews and conference papers on 'wildlife' and 'tourism'. Books and book chapters, although important, were not included here as they are indexed in different ways including missing keywords. The metadata for all the resulting publications was downloaded as a csv file and then imported into Excel where basic analyses were undertaken including assessing when and where research was published and by whom. Then research themes were identified using keyword analysis in the bibliometric program VosViewer.

Results

There were 2,174 publications relating to wildlife tourism, most of which were articles (1,930), but also some reviews (134) and conference papers (110). The research was predominantly within the areas of Environmental Science (48%), Social Science (39%), Agriculture and Biological Science (33%) and Business, Management and Accounting (25%), with many publications appearing in journals relating to more than one subject area. Outlets for the research were diverse with publications in 780 different journals and conferences, but those

with a focus on the topic included the Journal of Sustainable Tourism (82 publications), Journal of Ecotourism (69), Tourism Management (62) and Biological Conservation (59).

The earliest article in by Thomson in 1970 examined chemical pollution affecting flamingos in Lake Nauru in Kenya, and its impacts on a wildlife sanctuary in the journal Oryx. There was small but steady stream of research on wildlife tourism over the next few decades, increasing more rapidly in from 2000, peaking with 241 publications in 2021.

Important themes were apparent when the keywords from the publications were assessed, with a strong focus on ecotourism, protected areas, sustainability and recreation (Figure 1). In terms of where research was undertaken, it included Australia, African countries including Zimbabwe, Botswana, Kenya, South Africa, Uganda, Tanzania, as well as the USA and Canada, China, India, Europe and New Zealand. In contrast, most researchers were from the United States (543 publications), Australia (345), the United Kingdom (263), South Africa (170) or Canada (157), but there were at least 10 publications or more from researchers from 54 countries reflecting diversity in research interest in this topic.

In terms of specific types of wildlife examined it was mainly concerned mammals, birds and fish as well as forests, with publications on whales, sharks, elephants, cats and dolphins, primates and bears, including endangered species. The research examined ecology, conservation, ecosystems, disturbance, anthropogenic effects, physiology, behaviour, and habitats.

There was also research on the business, management and human side of wildlife tourism including examining economics, environmental protection or management, nature-society relations, tourist perceptions, behaviour, activities, attitudes and attractions, but also hunting, local participation and stakeholders.

Some of the key authors whose publications are regularly cited within this research include Roy Ballantyne, Jan Packer, Karen Hughes, Lars Bejder, Philip Dearden, David Newsome, Charlie Huveneers, Susanna Curtin, Sue Moore and David Lusseau.

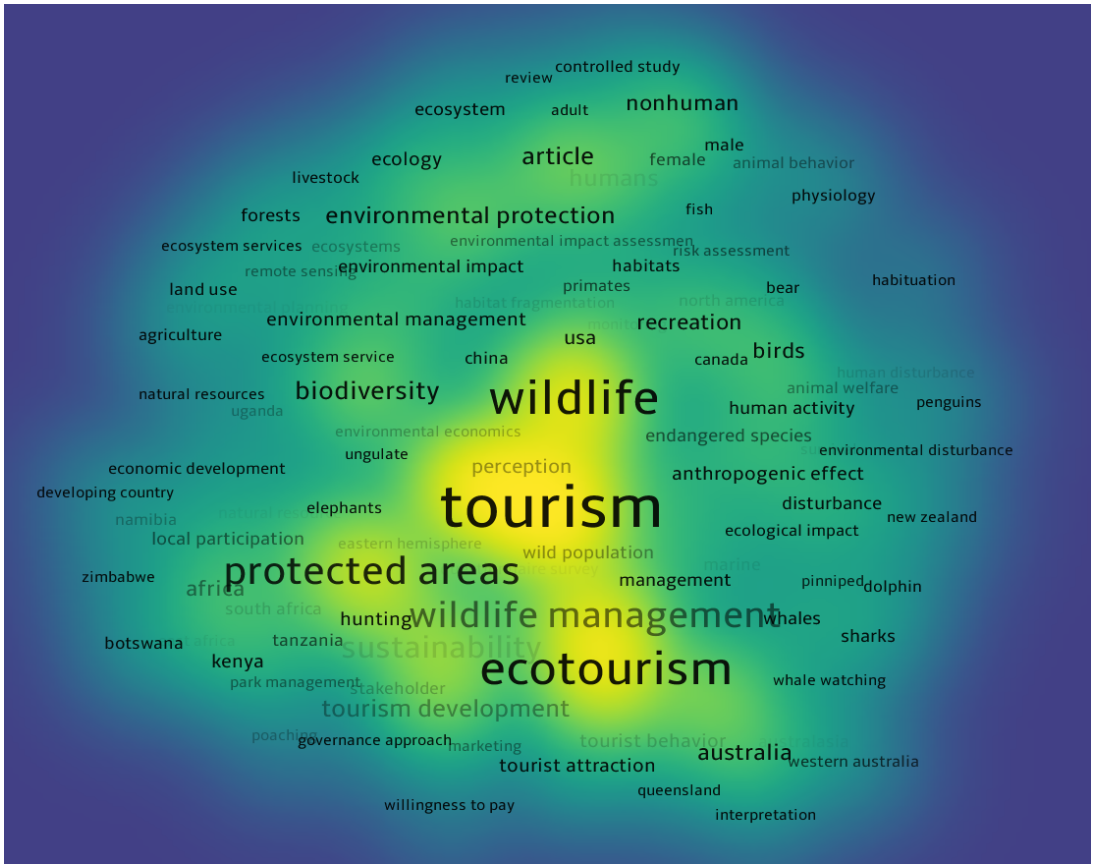

Figure 1. Visualization of themes within keywords for research on wildlife tourism from the bibliometric program VosViewer, where the size of the term reflects how often it was used, while terms close together were more likely to co-occur in publication keywords.

Discussion and conclusion

This rapid assessment of the articles, reviews and conference papers highlighted the social, ecological and business focus of much of the research on wildlife tourism, but also identified some gaps that could benefit from future focus. This includes research on the impacts of climate change on wildlife tourism, including from changes in the distribution and abundance of wildlife, and putative tourism movements due to increasing sensitivity regarding carbon footprints seen in terms such as flight shaming, as many wildlife tourism destinations attract tourists from far away. Another obvious theme would be the impact of the COVID-19 pandemic, with resulting restrictions on travel, again affecting some destinations with rapid collapse in visitation (Newsome 2020). Changes in tourism within and from Asia is also an important aspect (Bhatt and Pickering 2022). The use of new technologies such as social media, machine learning and other online sources and their influence on promoting destinations and experiences, are also contributing to debates about welfare issues with wildlife tourism (Mangachena and Pickering 2021, Bhatt and Pickering 2022). Wildlife tourism research is poised to diversify while continuing to contribute to environmental sustainability.

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How popular are Global Positioning System devices with park visitors, and who then shares their data online?

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Abstract

Introduction

Increasingly researchers are exploring how Global Positioning System (GPS) route data from websites and sports apps can provide insights into outdoor and recreational use of natural areas. This includes harnessing data from GPSies.com, Wikiloc.com, STRAVA, MapMyFitness and other GPS route data sources. These data can be used to examine where, how, and when people visit natural areas, including those in and close to cities, as well as how visitation varies among recreation activities (Campelo & Nogueira Mendes, 2016; Norman & Pickering, 2017; Santos et al., 2022).

Although small GPS mobile devices were seen as niche gadgets in the past, they are increasingly standard equipment for people engaging in outdoor activities. This is due in part to advances in technology and declining costs while easier access to the internet with lower cost mobile data results in rapid posting of data online. This also reflects changes in how people interact in an age of social media where almost everything leaves a digital footprint (Walden-Schreiner, et al. 2018). In natural areas, particularly close to cities, physically demanding and faster outdoor activities such as running, and mountain biking are increasingly popular. As a result of all these factors, there is increasing amounts of Volunteer Geographic Information online and some of the original voluntary sharing platforms for recreation, such as GPSies and Wikiloc, have been transformed into true digital business models such as STRAVA.

For researchers harnessing online GPS routes, key issues remain about the representativeness and reliability of the data, including who shares the data and where. Using Serra de Collserola Natural Park in Spain as a case study, we surveyed who uses GPS devices, who then shares the data and on which platforms. We compared results for those engaging in more intense recreation, such as mountain bikers and runners, with those going on long hikes or short walks.

Methodology

Visitors to one of the largest urban parks in Europe, Serra de Collserola Natural Park, near Barcelona, in Spain were surveyed using a stratified sampling design. This IUCN Category V protected area covers 8259 ha with 450 km of trails and is popular for recreation (Farías-Torbidoni & Morera, 2019). The surveys were conducted at the main entrances to trails from September to November as part of a three-year joint project with the land managers. There were 900 questionnaires completed and a 96% response rate, giving 95% confidence intervals.

Results

Although the use of GPS devices (34.5%), and then sharing the data with others (20.5%) was relatively common, it varied among activities (Figure 1). Mountain bikers were the keenest users of GPS devices to record their activities (58.7%), followed by runners (50%), but with fewer hikers (21.8%), and walkers (17.2%). Willingness to share the resulting data (i.e., to upload their GPS tracks) also varied, with most bikers recording GPS routes then sharing them with others online (71.3%), over half of runners (54.7%) and many hikers (46.2%) also shared data, as did some walkers (37.1%). Which platforms were used also varied with STRAVA the most popular, particularly with mountain bikers (68.3%), followed by Wikiloc (19.8%). Walkers and hikers were more diverse in their preferred platforms, often choosing platforms where GPS routes are accessible to all other users, as opposed to sports apps that function more like social media networks (45.5% and 33.3%, respectively).

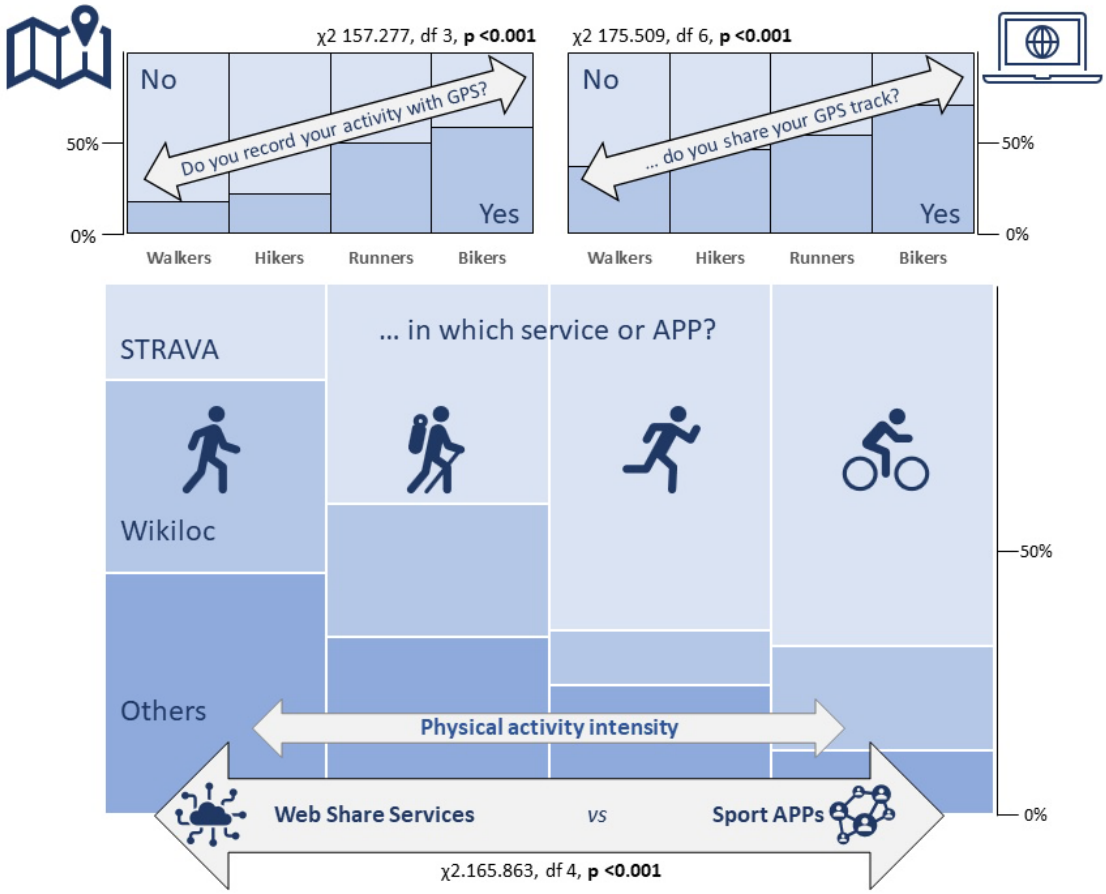

Figure 1 – Patterns in the way visitors to Serra de Collserola Natural Park use GPS tracks and share their data.

Discussion & Conclusions

With one in five people sharing GPS data from their park visit there is lots of information online, particularly for mountain biking and running, with the platforms also used by others to find new destinations. Further research examining how demographic and other factors also contribute to differences in the use and sharing of GPS route data is likely to provide additional insights, including why some people share data, but not others and what they share (and do not share) and when. What is clear is that as a remote and often low-cost source of data, GPS route data likely to be increasingly important for research and management.

What was interesting here is not only did the use of GPS devices, and then sharing data vary with activities, so did the platforms where data were shared. The most active visitors covering greater distances were more likely to use STRAVA, a sports app often used to track, analyze, share, connect, explore, and compete with others. In contrast, Wikiloc, a webshare platform more orientated towards exploring nature and the outdoors was preferred by walkers. An account, either free or premium, is needed to access routes, but all routes can be explored and searched without logging in, in contrast to the sports apps. Those engaging in lower intensity, more nature-focused activities are keener to use open/semi-open websharing

platforms while those engaging in more competitive activities prefer sports apps that function more like social media options with premium services.

Acknowledgments

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Experimental Evaluation of a Campaign Aiming at Reducing Nature-Impacts of Stand-Up Paddling

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Abstract

Introduction

Stand-up paddling is becoming more popular in many countries including in natural areas, where it may have environmental impacts. Although across the broader Swiss population less than 0.4% of people practiced stand-up paddling as a sport (Lamprecht et al. 2020) more recent data indicates that as many as 20% people indicated they use a stand-up paddle board at least once a year (Demoscope 2021). However, disturbance of fauna and flora is possible through stand-up paddling. Paddling in waters close to habitats important for birds can interfere with foraging or breeding, and birds lose a lot of energy through evasion and flight.

A campaign about the ecological impacts of stand-up paddling explains nature-friendly behaviour when stand-up paddling including how it is possible for people and nature to coexist. Specific recommendations of the campaign include:

- Keep your distance from the reeds. 100 meters wherever possible. Many birds breed and hide in the reeds.
- Keep your distance from gravel islands and sandbanks. If possible 100 meters or more. Many birds rest and breed here or look for food.
- Keep a large distance from bird gatherings. In autumn and winter, do not travel along stretches of water where birds congregate. Disturbances are possible from a distance of 1 kilometre.
- Respect protected areas. Always stay outside the boundaries. Some of these are marked with yellow buoys or boards and marked on maps.

In 2021, the campaign was used across four lakes in the canton of Zurich in Switzerland. In order to publicize the campaign, in addition to distribution via the outdoor, tourism and leisure industry and awareness-raising measures via the media and relevant web portals, posters were put up on site near the lakes, leaflets and stickers were distributed and stand-up paddlers were informed personally. The objective of the current study was to evaluate the success of this campaign, i.e., to measure (a) how the campaign was perceived and (b) if it was effective in convincing people to abided by the four behaviour recommendations.

Method

The campaign's success was evaluated using a written survey that people could access either via a flyer with a QR code (to be filled out online) or using a tablet who were stand-up paddling at Greifensee lake, with one survey before and one after the implementation of the campaign, with a control survey on another lake. However, due to the small number of stand-up paddlers and deviating activity-related characteristics, the control survey was discontinued.

Results

At Greifensee 136 people completed the first survey prior to the campaign, and 141 people in the second survey after the campaign. Results In the first survey, 31% of stand-up paddlers were aware of the campaign, and this increased to 36% in the second survey, although this difference was not statistically significant. However, stand-up paddlers who were aware of the campaign were more likely to adhere to the behavioural guidelines (three behavioural recommendations and one legal regulation) than those unaware of the campaign.

More details will be presented at the conference (and are included in a manuscript submitted to JORT, and can, therefore, not be further described here).

Conclusions

As new actives become popular it is important to minimise environmental impacts including by better educating participants. Here for stand-up paddling this could be done in cooperation with large distributors and online retailers, producers and importers. Information on site is also important, and easily visible and comprehensible information should be displayed on Swiss waters, such as the use of the posters tested here, although this could be further improved.

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Urban protected areas between traditional and contemporary landscape conservation and rural-urban demands – examples from Germany

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Abstract

Keywords: urban protected areas, cities, nature conservation, urban-rural linkages, governance

Introduction & objectives

Urban protected areas, which are located near cities or in the vicinity of urban agglomerations, have experienced over the last years increasing attention in science and practice (Dogse 2004; Trzyna, 2014; Ammering et al., 2020; Ioja & Breuste, 2020). On the one hand, in an urbanising world the protection of distinctive nature and landscapes has become more important than ever, on the other hand these areas are significant for the city population as places for nature experiences and recreation. Often, these protected areas are less than 50 kilometres from major cities, therefore they are mostly relatively easy to access for a large number of people by car but also by public transport.

This paper deals with first findings of an empirical research conducted in 2022 in three German protected areas. The main objectives of the study are to explore if the experts see the protected area as an Urban protected area, how they describe the relation to the city, and identify rural-urban connections as well as demands.

Methodology & case study areas

Three case studies in Germany have been selected – the Saxon Switzerland National Park (1990, 93,5 km2, strict zoning strategy with core zones, Dresden with 561.002 inhabitants), the Biosphere Reserve Bliesgau (2009, 361,5 km², core zone, buffer zone and transition zone, Saarbrücken with 183.662 inhabitants) and the Barnim Nature Park (1998, 750 km2, large parts under landscape protection, Berlin with 3 775 480 inhabitants) (see figure 1). The three protected areas have important landscape characteristics e.g. the national park is mainly characterised by forests and impressive rock towers and walls; the landscape of the nature park featured mainly large areas of forests as well as various lakes, moors, and river valleys. The specificity is that parts of the nature park belong to the city of Berlin. The biosphere reserve can be described as hilly and shaped by fruit tree orchards, beech forests, grasslands. The northern region of Bliesgau is an urbanised catchment area with a high population density. For all three protected areas expert interviews were conducted online with the protected area authorities and members of the respective city administration – usually from

the department of urban planning or regional development. Each interview started with questions about the current position of the interviewee, before the definition and the significance of UPAs for cities and protected areas were discussed. In addition, (future) opportunities and challenges of UPAs and cities were asked and the governance of the areas and actors was addressed. The interviews were recorded, transcribed and analysed (qualitative content analysis Mayring, 2010).

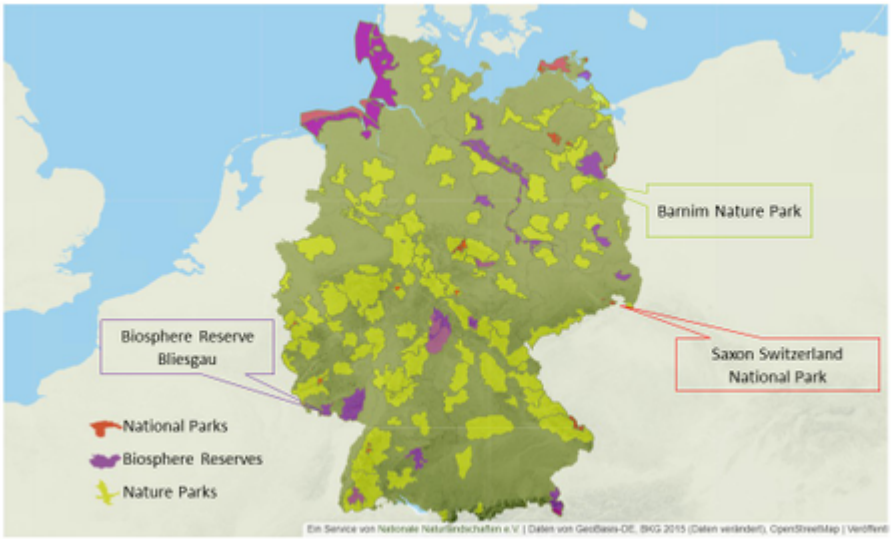

Figure 1: Case studies (Source: Based on Nationale Naturlandschaften, https://nationale-naturlandschaften.de/)

Results & discussion

Awareness & significance of UPA

During the interviews, many participants spoke positively about the protected areas, calling them the "green lungs of cities", the "front garden [of the city]" or the "oasis of the metropolis". The Barnim Nature Park for example actively advertises its close relation to the city of Berlin (“Oasis of the metropolis”). But also, the Biosphere reserve states it is “…consequently shaped by the presence of cities. The relationship between the city and the country […] is an important focus of scientific research in the biosphere reserve”. The National Saxon Switzerland National Park only state on the homepage the close distance to Dresden (“The National park is located only about 40 km south of Dresden, the capital of Saxony”). Only the National Park indicates the visitor numbers (more than 2 Mio. tourists per year). More (exact) data on visitor numbers is needed.

However, the perception and awareness of UPA is still very different among the urban actors interviewed. Some cities clearly understand the protected area in their region as an urban protected area and are able to define UPA as such. Other actors, however, are not aware of the existence and the term. They do not see any connection to UPA and in some cases cannot

even imagine to deepen this topic in their city. When asked which category of protected area is suitable for a UPA, the interviewees also gave very heterogeneous answers. Some can imagine all categories as suitable.

Potentials & challenges of UPA for landscape and urban planning

All three protected areas have to deal with urban (such as increasing building activities, recreational demands) but also rural demands (demands from agriculture and forestry). During the Covid19-Pandemic the pressure on (urban) protected areas even increased dramatically (Hockings et al., 2020; McGinlay et al., 2020). The interviewees report that not only the pressure of use in the area has increased due to the increasing number of visitors, but also the pressure of settlement is taking up more and more area. For example, more and different visitors have led to massive disturbances in protected areas (ibid.) Disturbances include, for example, wild camping or improper disposal of litter. The increased pressure is particularly noticeable in protected areas that are close to agglomerations. In the periphery, pressure has also increased, but larger (urban) protected areas in particular have been overrun. This can have the consequence that biodiversity and species diversity can be impaired. Stakeholders have already observed that species feel disturbed by the large number of visitors. Therefore, data on visitor numbers, their modelling and monitoring as well as a sufficient management become more urgent than ever. Promoting more destinations could reduce the pressure of use and at the same time provide further (new) attractiveness for the cities and regions.

Conclusions

Urban protected areas are unique. Some of them can really function as sanctuaries for biodiversity and safeguard the traditional landscapes, but others have to find a way to deal with the increasing urban and rural demands. New or intensified cooperation's and dialogues are needed and more (European) studies with focus on the urban but also rural population are necessary.

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Global coordinated study on plant diversity changes on nature trails

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Abstract

Keywords: Nature trails; Trail biodiversity; Visitor´s load; Plant ecology; Coordinated global experiment

Introduction and objectives

Recreation activities and tourism sector are globally becoming more popular (Balmford et al. 2009, Eagles 2014). Although the tendency of people's interest in nature is rather positive, it can also have harmful effects on the biodiversity and vegetation as the extent and frequency of disturbances grow (Monz et al. 2010). Nature trails are basically linear corridors of disturbances (Marion & Leung 2004; Wimpey & Marion 2010). By bringing visitors to fragile and protected areas, there is an impact on surrounding environment according to changes in biodiversity, endangered species and species composition due to alien species and other disturbances. There have been plenty of studies about tourism impacts, however, the weak theoretical background, lack of species approach, incomparable study methods with data often estimated and on a relative scale contribute little in this research area (Monz et al. 2010; Metsaorg 2016). Therefore we have very limited knowledge of how this affects nature, and what are the effects in different regions, habitats or trail types. Here we present the rationale for the methodological approach, and call for a coordinated global effort for collecting comparable and comprehensive data of diverse aspects of nature trails on local, regional and global scale, with the focus on plant diversity.

Methodology

In this study we present a proposed methodology for carrying out a global coordinated experiment for exploring vegetation diversity and changes in it on nature trails as related to visitors' load. As a pilot study to test the methodology we studied 32 nature trail in Estonia that are managed by RMK (State Forest Management Centre), who provided visitors' load data for each trail. Fieldwork was carried out from May to August on 2019 and 2021. In every trail we set up transects and the number of transects per trail depended on the habitat types. The habitat types on these trails were divided into three broad categories: forest, wetland and grassland. In every habitat type we assessed at a minimum of two transects with different, empirically assessed within-trail visitors' load. The transects were perpendicular to the trail and consisted of 1m x 1m plant quadrats with an interval of five meters (Figure 1). In each plant quadrat we registered species list, mean height of vegetation, plant species cover (%), lichen and bryophyte cover (%), tree canopy cover (%) and trampling (4 levels based on visual inspection).

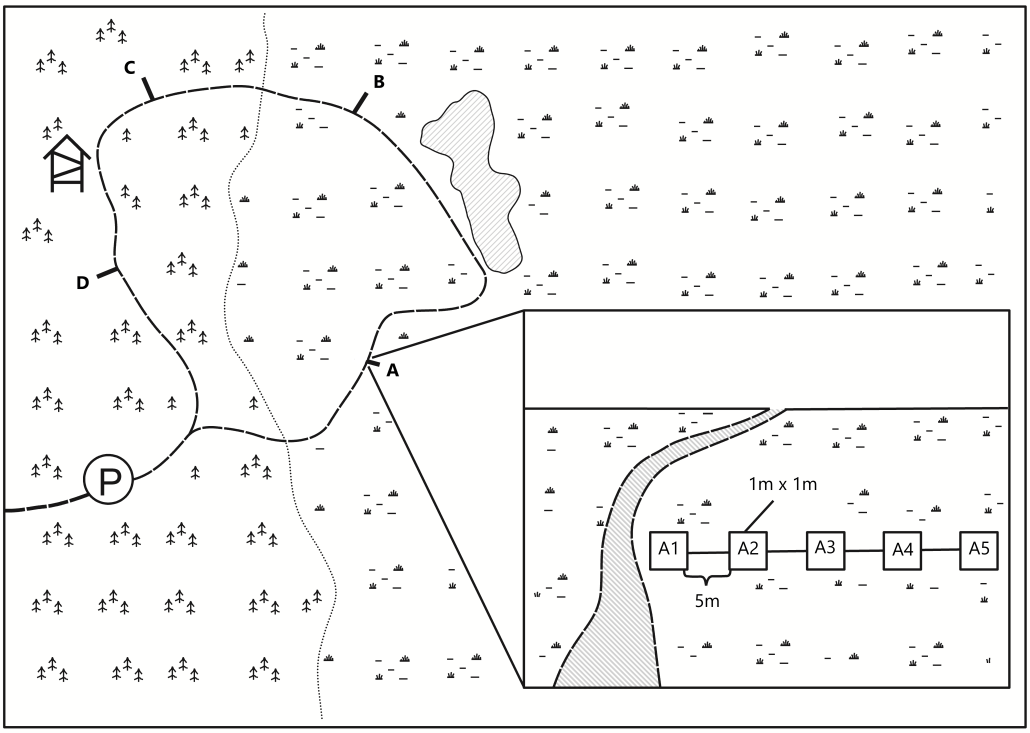

Figure 1: Field scheme of a trail with two habitat types: forest (left side) and wetland (right side). Striped area on right up represents a lake, and on the magnified panel (lower right corner) the trail is striped. Construction on the left side is a viewpoint. A, B, C, D are transects and A1, A2, … are plant quadrats. P is parking lot and the beginning of a trail.

We used general linear models (GLM) in Statistica 8.0 (StatSoft Inc., 2007) for analyzing the effect of visitors' load on mean species richness per transect (both factors were log-transformed).

Results & Discussion

Our analysis showed a statistically significant negative relationship between visitors' load and plant diversity on nature trails. These results suggest a couple of important implications. Firstly, even in a quite sparsely populated country like Estonia (28 p/km2), the visitors' load had a significantly negative effect on vegetation diversity along the trail. In the initial analysis we did not separate alien and native species, while it is known that nature trails can be corridors of species invasions (Wells et al. 2012). Even if non-native species can compensate for the loss of native species in a community, the functionality and specific interactions with other native organisms could experience drastic loss when habitat-characteristic species pool is replaced with derived species pool (Helm et al. 2015). Secondly, the negative effects of visitor's load on plant diversity near the trail did not depend on the broad habitat type (forest or open wetland habitat) nor the type of pathway or trail cover. All of the open habitat dominated trails in this analysis had boardwalks, while forest dominated trails pass mainly through bare earth pathways (with the occasional boardwalks built on more wet sections). Geographically and culturally wider sampling provided by the coordinated experimental

framework provides would allow us to test if these trends are general when a wider range of habitat types and trail covers are taken into account. So far, comparable global scale data for such analysis has been missing (Ballantyne & Pickering 2015).

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Comparative analysis of the factors influencing visitors' load in 20 Estonian nature trails

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Abstract

Introduction and objectives

Recreational activities such as visiting nature trails are increasingly popular (Pickering et al., 2018; An et al., 2019), but popularity comes with raising number of visitors in the destination causing potential harm. The number of people visiting a nature trail within a calendar year, ie visitors' load of the trail, depends on various factors which the trail infrastructural and natural environment has to offer. Thus, it's essential to know which factors are influencing visitation the most, in order to maintain sustainable use of natural environment in destinations with increasing levels of visitors, develop marketing and management strategies, and improve visitation areas through available research data, and proper trail planning (Lee et al., 2010; Pickering et al., 2018; An et al., 2019, Svobodova et al., 2019). However, it is complicated to find accurate visitor monitoring data, especially the number of visitors to individual trails and previous studies have been focusing mainly on sustainability, vegetation and wildlife of the protected areas, attractiveness of the destination, or the motives of people visiting these surveyed areas (Pickering et al., 2018; An et al., 2019; Svobodova et al., 2019). The factors considered to affect visitors' load, differ greatly depending on the research area and its scope. Thus, the aim of our study was to quantitatively compare which of the nature trail factors are best correlated with trails visitors' load in Estonia, quantifying a wide range of factors (informational, infrastructural, natural and accessibility) at the same time, covering holistic cultural space.

Methodology

Based on theoretical part of the study, the most common factors of previous studies were selected to pay attention to during the fieldwork (May-August 2019), carried out on twenty Estonian nature trails dispersed around the country in order to collect information about these trails. Additional visitation data (257 286 annual visits), and trails viewing data (clicks on trails webpage and mobile application) was requested from RMK, the State Forest Management Center, who manages the trails. The diversity of the vegetation near to the nature trail was assessed during the fieldwork using multiple transects of plant quadrats on a single trail situated crosswise to the trail. Based on the obtained species data from all the quadrats in a single trail, trail´s species pool was compiled. The model of the factors influencing visitors' load of nature trails was constructed in two steps: first, a correlation matrix with all the factors, and then a generalized linear model (GLZ).

Results

Our comparative analysis shows that a variety of very different types of factors significantly affect the visitors' load of nature trails, from finding information to the diversity of vegetation and proximity to amenities (Table 1).

Table 1. Results of the generalized linear model analyses of the nature trail factors, factors in bold are statistically significant

Trail factors	Degrees of freedom	Log-likelihood	Chi-square	P
Intercept	1	-25.01		
Webpage and application visits (log)	**1**	**-22.37**	**5.29**	**0.02**
Proximity to nearest county center	**1**	**-20.24**	**4.24**	**0.04**
Distance from Tartu (km)	1	-19.86	0.78	0.38
Distance from Tallinn (km)	1	-19.26	1.19	0.28
Trail length (km)	1	-19.08	0.36	0.55
Proximity to nearest bus stop (km)	**1**	**-16.48**	**5.21**	**0.02**
Proximity to nearest catering (km)	1	-15.85	1.26	0.26
Proximity to nearest accommodation (km)	1	-15.71	0.27	0.61
Number of land cover types (1-4)	**1**	**-12.61**	**6.21**	**0.01**
Number of toilets	**1**	**-10.26**	**4.69**	**0.03**
Parking capacity (cars)	1	-9.42	1.69	0.19
Species pool (log)	**1**	**-6.64**	**5.55**	**0.02**
Accessibility by car	**3**	**-2.73**	**7.83**	**0.05**
Dominant land cover type	1	-1.53	2.41	0.12

Discussion & Conclusions

The goal of our study was to find out which of the diverse set of trail factors, whether informational, natural, location based or infrastructural, have the greatest impact on the visitors' load of the trails. The results present the importance of seven statistically important factors influencing nature trail visitors' load in Estonia, based on the twenty trails covered in this study. Additionally, the results fits well with the average visitor of nature trails of Estonia who usually visits nature with family or friends, has an higher education, is with high professional status and/or income, and is visiting recreational facilities more often than other visitors (Market Research Ltd., 2020).

As the visitors' load is formed by a combination of several very different types of factors, making it a complex assessment system, there is a need for systematic research in the future to find out whether the correlations as in our study, exists also in other countries, using the same methodology. In order to get a full picture of visitors and their needs when going to the nature trails, the information about their motivations, wishes and habits can be added to the existing data. The importance of current study lies in the methodologically uniform and comparable assessment of different factors influencing trail visitors' load across a whole cultural area.

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Positive trigger: COVID 19 restrictions as impulse for local solutions in visitor flow management in Vidzeme region 2020 – 2022

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Abstract

Introduction

COVID-19 pandemic created both – positive and negative impacts on any sphere of life globally, thus Vidzeme region has not been the exception. Besides primary impacts induced by legal measures, secondary impacts should be considered, such as changes of the values, attitudes, mindset and behavior of various groups of society. The restrictions affected any public gatherings, border crossing, simultaneously stimulating demand for the recreation outdoors as considerably safe and accessible. This resulted in dramatic increase of volume of recreation visitation amongst both experienced and inexperienced within protected areas worldwide (Derks et al., 2020, Ferguson et al., 2022).

Segment of inexperienced visitors demonstrated specific pattern of behavior, for instance, they use only popular territories with infrastructure and services etc. which means that crowding making risks should be considered. Beery et al. (2021) suggest visitor management principles to reduce anthropogenic pressure, educate visitor, thus enhancing experience: service relevance to the new and inexperienced users (education and communication to guide them) and providing adequate opportunities for basic outdoor recreation activities; proximity access for public; facilitation of connectedness with nature through the role of outdoor recreation managers.

Since March 2020 in Latvia there were several periods of national level state of emergency with strict epidemiological safety measures in Latvia with duration of several months (incl. shorter periods of a strict curfews with considerable restrictions on movement and contacts) (Ministry of Economics Republic of Latvia, 2022). For example, in Vidzeme region, outdoor recreation demand in territories of natural heritage has grown 2-3 times, in some even 10 times. Data proves significant increase in demand in Gauja National park, the coastal zone of Riga gulf and at and near bigger populated centers (Klepers 2022). We have to emphasize that crowding in outdoor recreation areas was observed creating next epidemiological concerns, besides anthropogenic pressure.

Method of Research

In this research we focused on the best case example analysis of the practices and projects implemented to respond negative effects on natural heritage (including protected territories) induced by increased visitor flow and pressure in Vidzeme region as a result of COVID 19

pandemic (2020 – 2021). The data gathering for analysis was done in several steps. Firstly, desk research by experts of Vidzeme planning region, secondly, survey of thematically involved local regional and national level bodies, thirdly, meeting with stakeholders and, finally, interviews in depth (n=9) with representatives of selected projects and practices. Projects or practices after selection were analyzed by certain range of criteria: general data (duration, partners, funding, argumentation); background and context (preparation, objectives, beneficiaries), implementation (activities, obstacles, problem solving practices, innovative elements) and transferability.

Results

8 practices were selected for analysis, mostly representing local level solutions initiated in response to COVID 19 induced effects (see Table 1.).

Table nr.1 The problem solving in the best case practices and projects to reduce negative effects on natural heritage induced by increased visitor flow in Vidzeme region as a result of COVID 19 pandemic.

Title	**Problem solving practices result**
Campaign *#AtklājVidzemi (#DiscoverVidzeme)*	Reduced crowding and anthropogenic pressure. Also, supported local tourism companies and promoted alternative destinations, travel and recreation ideas for individual visitors.
Solutions to reduce anthropological pressure and enhance visitor experience in nature trail Līču-Laņgu klintis (Gauja National park)	Reduced anthropogenic pressure by renovation of infrastructure, enhanced visitor safety and experience by changing the direction of visitor flow, location of parking and improving information on site.
Zilaiskalns: natural and industrial heritage integration in sustainable destination development	Positive impact on visitor flow distribution to avoid crowding, rail-bikes are safe outdoor activity for individual visitors. New destination with attractive offer reduced some pressure to another tourist, recreation sites in region and created a value for tourism entrepreneurs in area.
Military heritage revitalization and solutions for individual visitation of soviet period nuclear weapon base Zeltiņi	Solution allowed to visit object independently, avoiding unnecessary contacts, and receive high quality information, objective interpretation.
Digital game for epidemiologically safe visitor experience in Alūksne city.	Solution allowed to visit object independently along with objective interpretation and interactive experience of explorer. It helped in distribution of visitor flows, to some extent unloading the most popular sites such as coastal zone of Alūksne lake.
Gaming as solution to maintain tourist flow and offer exciting experience in Gulbene town and county.	Positive effect on distribution of visitor flow, safer individual visitor experience. However, it is important to stress that it was not only user directed but to help local entrepreneurs to survive during restrictions.
Integrated digital solutions for promotion of tourism destination Saulkrasti	Epidemiologically safe experience for visitors, simultaneously promoting not so popular tourist sites and integrating special nature values.
Public even during pandemic: case of Gulbene tourism rally	Creative solution to substitute traditional public event. Besides offer of new sites of independent visitation for participants, tourism entrepreneurs were instructed on organization of epidemiologically safe visitor experience.

Source: authors

The majority of cases were funded by local sources (budget< 5000 EUR, mainly the costs of human resources), also, they play an important role for locals (including support activities for local tourism and recreation managers) or could become a catalyst for engagement of community. In 7 of 8 cases the initiator was municipality or another public body, only in 1 case the idea and initiative belongs to informal local community organization. The main objectives of implementation of specific practices and projects were: distribution of visitor's flows and education of them about new destinations, epidemiologically safe visitor experiences and de-

crowding, added value to local heritage, reduction of consequences of anthropogenic pressure on natural territories.

Conclusions

Data analysis revealed that a response to COVID 19 negative consequences in the context of natural heritage visitation in Vidzeme region has been implemented through small scale, easily adaptable practices to provide dynamic, direct, flexible effective and rapid solutions mostly with local resources. Nearly in all of the cases we observed informational and educational focus on both – experienced and inexperienced visitors, however solutions are rarely connected with infrastructure development. More evident is role of the digital solutions followed by proof of enhanced recreation manager skills to use them. Despite that recreation managers support has not been a primary target, it appeared as a secondary effect and in similar situations in future should be more accented. Yet there is lack of investment - economic benefit evaluation, which is rarely done especially in public projects.

Acknowledgements

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Spatial patterns in tourism encounters with lion, leopard and cheetah in South Africa: Insights from social media

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Abstract

Introduction and Objectives

Wildlife tourism is popular with people spending considerable resources to encounter specific species in the wild including in South Africa. Some of the most popular species for wildlife tourism in the region are lion, leopard and cheetah (Mangachena and Pickering, 2021). Tourists can encounter these species in natural or in semi-natural environments such as public protected areas including Kruger National Park (KNP), in private protected areas (SANParks, 2020) but also in zoos, sanctuaries, wildlife ranches and farms including outside the species' natural ranges (Maciejewski and Kerley, 2014). It is important when managing and monitoring tourism to understand where tourists encounter wildlife including for marketing, as well as allocating resources for tourism and species conservation (Drugova et al. 2020). Traditionally, wildlife tourism data has been obtained through fees, road and trail counters as well as visitor surveys, but obtaining such data for a whole country is challenging (Wilkins et al. 2021). Recently, researchers have started using user created online content, including geotagged images from social media platforms such as Flickr, to obtain insights into spatial patterns in wildlife tourism (Wilkins et al. 2021). Such data can be free, relatively quick and easy to acquire, provide historical and current insights into visitation and assess wildlife tourism over large spatial scales (Wilkins et al. 2021).

To assess spatial patterns in encounters with popular wild cats in Africa we assessed geotagged data from the photo-sharing platform Flickr for lion, leopard and cheetah. We specifically examined 1) where were hotspots and coldspots of encounters including for different land tenures, and 2) where were encounters outside species' traditional ranges. We discuss factors that may account for the differences in the spatial patterns of encounters.

Methodology

We collected metadata for 142,318 images tagged with lion or leopard or cheetah and 'South Africa' from Flickr using an API and R Studio (R Development Team, 2021) on 15 March 2021. Metadata per image included user identification number, geographic coordinates where the image was taken as well as date and time when image was taken. To deal with people posting many images of the same animals at the same time, and so its similar to visitor-day data, we randomly selected one image per person per day resulting in 4,946 wildlife-encounter-days (WED) from geolocated images within South Africa. Then the WED data was combined with protected areas spatial layers (UNEP-WCMC, 2018) and spatial distribution data per species (IUCN, 2020), to map where people engage with these species in QGIS (QGIS Development

Team, 2020). We then visualised the distribution of encounters including hotspots for wildlife tourism using heatmaps.

Results

There was a total of 142,318 images of the three species South Africa posted on Flickr tagged South Africa but a total of 2,507 WED for lion, 1,416 for leopard and 1,023 for cheetah. While KNP in the northeast of South Africa was a clear hotspot for encountering all three species, there were also hotpots in other public and private protected areas for lion and cheetah (Fig. 1a). Other hotspots for lion and cheetah were in zoos, sanctuaries, wildlife ranches and farms outside any type of protected area. For all three cats, most encounters (80%) were in some type of protected area with 35% in private protected areas, 27% in KNP and 16% in other public protected areas (Fig. 1b). For leopard there were very few encounters outside of protected areas (Fig. 1b). With leopard natural range covering all of South Africa, all encounters were within this distribution. In contrast for lion and cheetah, many encounters were outside their natural range (Fig. 1c).

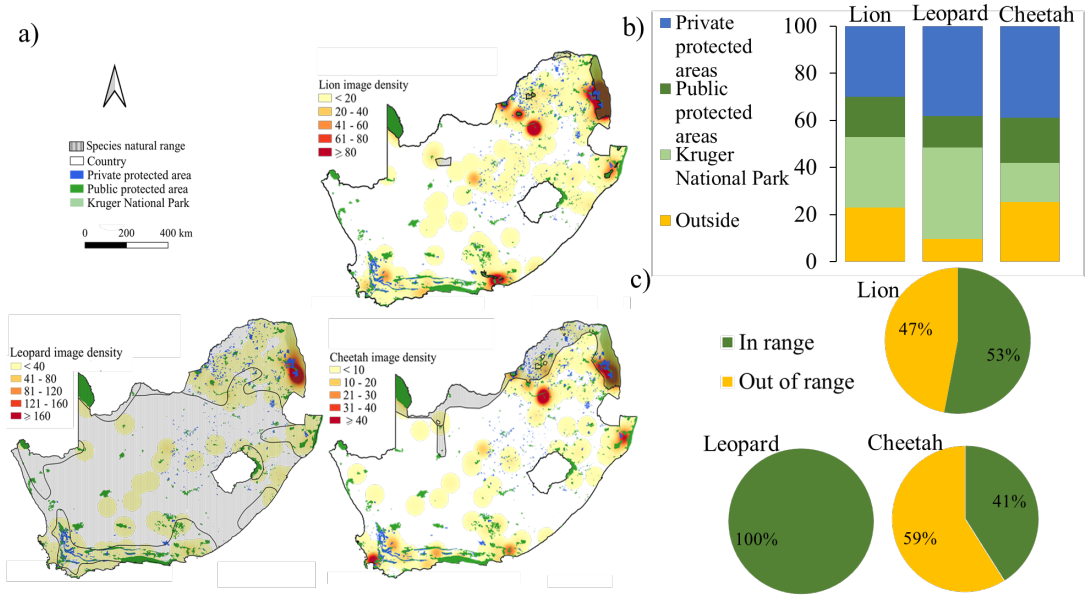

Figure 1. a) Hotspots of tourists' encounters with lion, leopard and cheetah, b) proportion of encounters in private, public, Kruger National Park and outside protected areas and c) proportion of encounters in and out of species' range in South Africa based on geolocated images on social media.

Discussion & Conclusions

This research shows how there is relevant data on social media platforms such as Flickr for assessing wildlife tourism. The large number of images of lion, leopard and cheetah on this and other social media platforms reflect how people want to share encounters with these species, with lions being the most popular. Some of the differences in the number of images reflect how easy it is to encounter them, with lions often in large prides, sleeping and hunting

during the day, while leopards are solitary, and cheetahs are rare in the wild (Okello et al. 2008). In addition, the patterns in images reflect where tourists go to engage with wildlife, with hotspots for all three species in KNP, the flagship wildlife tourism destination in South Africa (Maciejewski and Kerley, 2014). Many encounters with lions and cheetah occurred outside the species' natural ranges. This could reflect people's desire to engage with them easily in zoos, sanctuaries, wildlife ranches and farms due to higher stocking densities in relatively confined spaces. Results from our study highlight the importance of protected areas in South Africa for wildlife tourism but also how areas outside protected areas are also important for tourism.

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Wildlife Tourism: Imagining a virtual future

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Abstract

Wildlife tourism is one of many spaces in which human and non-human animals engage with each other. In this space, the animals may be captive such as in zoos, or free-ranging such as in national parks. They may be deliberately targeted as the central tourism attraction, or accidentally sighted. The tourism may be consumptive, resulting in the deliberate death of the animal through activities such as hunting and fishing, or non-consumptive such as bird watching (Burns 2017). Despite the wide range of ways humans engage with wildlife in tourism, the activity is besieged by challenges. Population sizes of wild animals decreased 68% between 1970 and 2016 (WWF 2020), the planet is engulfed in a pandemic limiting travel, and pre-pandemic the increasing pressures of overtourism were felt globally. This is coupled with decreasing acceptance of poor treatment of animals for the purpose of human entertainment and increasing movement away from keeping wildlife captive. Faced with a grim looking future, imaging how wildlife tourism might operate in a virtual space is worthy of consideration.

Here we highlight examples of tourism involving wildlife in virtual settings to explore possible advantages and disadvantages of this type of experience for both humans and non-humans, and are particularly interested in ethical considerations. If we start with the premise that any activity that confines wildlife and forces it to perform for tourist entertainment is ethically problematic, then the necessity of exploring alternatives becomes apparent. Given the broad range of welfare criticism on the use of animals in wildlife tourism, virtual tourism may seem a step forward: as it avoids physical abuse of real animals. However, further investigation is required into whether other harms, such as misrepresentation and denial of agency, remain (Burns & Benz-Schwarzburg, in press).

Our exploration of virtual wildlife tourism (VWT) does not include films of real animals used as marketing tools to entice people to travel to destinations or live streams of animals from zoos or non-captive settings. The virtual and augmented reality (AR) tourism we explore is unreal – the presentation of wildlife as images, designed to entertain, that does not include the use of animals that are alive and real.

To date, tourism experiences involving non-real wildlife are few in number, but growing. The German Circus Roncalli, for example, recently experimented with holographic images of animals to replace real ones (Burns & Benz-Schwarzburg 2021). Tourists still enter a real circus tent and see performances by real people but performances by some animals – elephants, horses and goldfish – are holograms. For display in the marine park entertainment industry, “real-time animatronic” dolphins are being developed to substitute for captive real ones (Edge Innovations 2021). A ‘pop-up’ zoo without animals, using only AR images, trialled in Korea

(KoreaBizWire 2020) and holographic dinosaur adventures are offered in Australia (Holoverse 2021). These virtual experiences are largely unchartered grounds from an ethical perspective.

For VWT to be viable, it needs to offer benefits for both humans and wildlife - and it clearly does so. Humans cannot be physically harmed by animals in VWT, yet they can be guaranteed a sighting of the animal they want to encounter. For operators, although VWT experiences can be expensive to establish, a circus of hologram animals or an aquarium containing robotic dolphins can offer financial benefits because the cost of care, training, feeding and insurance are significantly reduced.

From the animals' perspective, advantages are also obvious. In VWT no real animals are held captive, and thus welfare issues associated with this context are removed. Similarly, in VWT real animals are no longer positioned to entertain humans. Furthermore, humans not venturing into wildlife habitat removes potential for disturbance of natural animal behaviour.

However, there are many unknowns. Will experiencing non-real wildlife encourage humans to conserve real ones? Will it satisfy human desires for close encounters? Will it perpetuate the objectification of animals, continuing to represent them as existing for our pleasure and entertainment? Although VWT is not dependent on mistreatment of real animals, what is being represented in it still matters. For example, although in VWT settings animals no longer labour for our entertainment, they can be represented, virtually, as doing so. And they can be misrepresented, through images of them performing unnatural behaviours – such as a holographic elephant doing a handstand. Whether the representation respects the agency of the portrayed animals is an important question. Such representation can show an animal with species typical behaviour, thus representing her interests, preferences and agency, or it can follow human interests and desires for entertainment. The latter is likely to result in a performance perceived as entertaining and humorous from the tourist's perspective. Such representations can fall prey to a disrespectful, even humiliating portrayal of the animal and her agency.

Considering the advantages of VWT, it could be offered as a guilt free form of tourism - where the tourist no longer has to concern themselves with the conditions in which the animals live, or whether their presence is causing harm. However, in VWT the animal is still presented as a commodity for the human and cannot guarantee understanding from the perspective of the animal. Without care for representation, VWT can perpetuate the presentation of animals as existing for human use and not foster care and respect for their natural way of being, or provision them with rights or agency.

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#stay at home or go outdoors? Re-discovery of urban green spaces during COVID-19 pandemics and its transformative capacity for urban sustainability - a case study of Vienna, Austria

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Abstract

Introduction

The COVID-19 pandemic posed serious challenge for securing public health worldwide. Public health preparedness planning and introduced restrictions affected many aspects of human life, including leisure activities and access to outdoor recreation destinations. Green spaces have become one of the few sources of resilience during the crisis, due to their restorative effects on psycho-physical health and well-being of the society. Especially, urban areas faced severe challenge to provide recreational opportunities and contact with nature to their inhabitants. International community of scholars and practitioners highlight the transformative potential of the pandemic experiences towards more resilient, sustainable and liveable cities. Therefore, the objective of this study was to explore the significance and use of open green spaces during COVID-19 pandemic from the urban inhabitants' perspective and to interpret the results within the context of urban sustainability targets.

Methods

The study (online panel survey) has been carried out in Vienna - the capital city of Austria - in early summer 2021 and is based upon a representative sample of 1012 respondents. Target sample considered quotes corresponding to actual population distribution grouped by gender, age (>16 years) and city regions.

Selected Results

The results show that spending time in nature has become more important during COVID-19 pandemic than before (68% of the respondents shared this opinion); having access to private green areas, such as garden or community garden gained in importance; also access to green open spaces in close proximity to home turned out to be more important than before pandemic period. Figure 1 illustrates opinion changes towards green spaces among Viennese inhabitants.

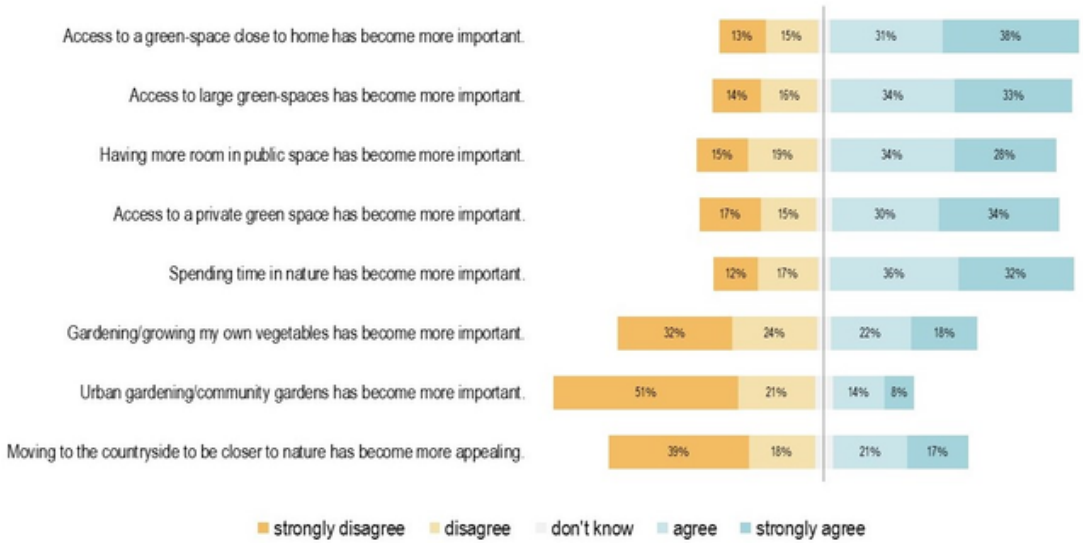

Figure 1. Opinion changes towards green spaces during COVID-19 pandemic among Viennese inhabitants (n = 1012).

The opinion changes were observed in all age categories, yet especially strong in younger city inhabitants (16-18 years and 19-39 years). Access to green-space close to home became significantly more important to Vienna inhabitants in comparison to the respondents living in the surrounding municipalities. Respondents attributed strong positive impacts of time spent in nature with regard to mental and emotional health and well-being.

Discussion & Conclusions

The study findings reflect societal changes that are crucial in the social movement for sustainable development and change through the lessons learned during the pandemic. Increased importance of nature and urban / sub-urban green spaces in society may be used as an important driving force towards planning a more sustainable urban environment. Public support for maintaining various types of urban greenery, nature appreciation, along with public desire for preventing uncontrolled land consumption and sealing should be more frequently integrated in urban planning processes. Provisioning local, nature-based recreational opportunities, enhanced walkability and bikeability positively affect urban liveability, health and well-being of city inhabitants. Those planning measures are also largely compatible with climate change mitigation and adaptation strategies, as well as reduction of energy consumption. Thus, a pandemic re-discovery of the nearest neighbourhood along with an increased importance of nature may become an important transformative capacity for more sustainable, resilient and liveable cities in the future.

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Payments for ecosystem services in nature-based tourism in Finland

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Abstract

Introduction and objectives

In Finland, the rapid growth of nature-based tourism has increased attention to sustainability aspects such as improved management of forest or other natural amenities and needs to reduce carbon emissions of tourism. Recreationists and tourists cannot influence the landscape and environmental quality in private forests and, most private forest are mainly managed for timber production. There is, however, a high recreational and tourism use pressure along with the demand for attractive natural landscapes near tourism destinations and larger cities surrounded mainly by private forests. In these locations there are frequent conflicts linked to intensive forest loggings and therefore, incentives to enhance landscape and biodiversity values in private forests are needed.

Payments for ecosystem services (PES) have been suggested as one tool to improve the supply of ecosystem services and support quality of the nature environments. PES can be defined as "a voluntary transaction in which a well-defined environmental service is 'bought' by a beneficiary for the provision of the service" (Wunder, 2005). PES and conservation payment programs have aimed at, for example, wildlife habitat restoration, water quality improvement and prevention deforestation (e.g., Chen et al., 2009; Perevochtchikova & Rojo Negrete, 2015). Although the number of studies on PES have increased during last decades (e.g., Wunder et al., 2018) the discussion of PES models in tourism has been limited.

Previous studies exploring ecosystem services via payments from tourism sector have mainly focused on visitors' willingness to pay for ecosystem services (e.g., Birdir et al., 2013, Enriquez-Acevedo et al., 2018), while willingness of tourism businesses has gained less attention. Although tourism industry benefits directly or indirectly from local nature areas, the firms are often not actively contributing to landscape or nature conservation targets. This may be partly due to the tourism firms' somewhat limited understanding or heterogenous attitudes towards the benefits of ecosystem services for their businesses, but also partly due to due to the lack of well-functioning channels to contribute.

An example of tourism related PES is Landscape and Recreation Value Trade (LRVT) targeting private forests in Finland, where landowners mainly get income from timber sales. In this model tourism industry compensates the income loss from timber sales to private forest owners, if they commit to sustain biodiversity and landscape values in their forests (Tyrväinen et al., 2014; Mäntymaa et al., 2019). The model focuses safeguarding mature forests with high biodiversity and landscape values in their regeneration stage and aims at, in particular, avoiding clear cuts or other intensive logging in sites important for tourism. The funding is

planned to be collected from tourism firms and tourists visiting the destination. The preconditions for launching the LRVT model and the perceptions of landowners and tourists have been studied (Tyrväinen et al., 2014, Mäntymaa et al., 2018). The studies show that tourists are rather willing to contribute to LRVT and landowners are relatively interested in joining the PES model if economic losses from decreased timber sales are compensated (Tyrväinen et al., 2014; Mäntymaa et al., 2018).

Study area and methods

The case area, Ruka-Kuusamo, is a key nature-based tourism destination located in northeastern Finland. In the region, both commercial forestry and nature-based tourism are important industries. Majority of the municipality's total land area is forested, and 82 percent of the forest has non-industrial private ownership (NFI 9, 2016). About two-thirds of employed people work in services such as tourism, one-sixth in processing industries, and about 10 percent in primary production.

The majority of the tourism firms in the region are small and medium-sized businesses. Tourism in the area is mainly nature-based tourism and the activities focus on Oulanka National Park and Ruka ski resort. The key activities include downhill and cross-country skiing, snowshoeing, snowmobiling, husky safaris, as well as hiking, cycling, canoeing and observation of birds and other boreal species.

In this study a participatory action research method was used. A model for piloting LRVT was developed together with a Multi Actor Group representing the local key stakeholders. The group consisted of 25 members. Also the previously collected research information regarding the acceptability of the model was used in the co-design process. The study consisted of a planning process to select valuable forest areas in terms of biodiversity, landscape and carbon stock and, a pilot project to collect and distribute funds to implement forest management changes to support the provision of ecosystem services (ES) in these valuable areas. The funds were collected from local visitors, tourists and tourism entrepreneurs through a media campaign during autumn 2020 for three months. Donation were possible by text message, phonecall, MobilePay, payment to bank account. Collected funds would lead to taylor-made contracts (10 years) with landowners owning mature forests in valuable tourism areas that included, for example, key views, sites along trails and roads.

Results and discussion

The experiment showed that securing funding through voluntary donations based on mild persuasion and nudging can be difficult. Amount collected did not reach the targets and the campaign resulted one fixed contract for 10-years in a forest area in joint ownership. Around 200 tourists made a contribution, but tourism entrepreneurs' actions were rather limited. The media campaign got mainly positive feedback and raised also national interest resulting an increased awareness of the new ways to support quality of the operational environment for NBT.

One key problem in Finland is strict fiscal regulation allowing only non-profit organizations to collect funds for this type of purposes. Since 2020 small-scale collection of funds (maximum 10 000 €/ 3 months) was allowed. It also proved difficult to find an organization to actively lead the collection and governance of funds.

In conclusion, payments for forests ES were something new for stakeholders and, raising the awareness of this type of mechanisms needs a lot of communication. Tourism sector less well organized than forestry sector and institutional support to entrepreneurs is limited. A spin-off research includes a study looking at possibilities to link the selected forest sites with carbon compensation markets as a part of "Forest-based models for compensating carbon footprint of tourism sector" -project.

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Trail Running in Protected Areas. Comparative analysis of two national parks in Portugal

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Abstract

Introduction and objectives

Trail Running, according to the International Trail Running Association ITRA (https://itra.run/), is a pedestrian race practiced in a natural environment on paths and/or trails, with a minimum of paved surface (< 20%). It should also, ideally, be practiced in self-sufficiency or semi-self-sufficiency and respect environmental ethics. This sport emerged in the last decade as one of the most popular outdoor sports, leading to what has been called the Trail Running boom (Urbaneja and Farias, 2015).

Athletes value being closer to the natural environment as one of their main motivations for practicing this sport (Julião et al, 2018). Thus, the search for natural spaces means that many Trail Running events take place in territories of protected and classified areas, which raises new challenges in terms of their recreational use. The impacts on the most sensitive areas of these territories cannot be considered irrelevant, not so much because of the activity itself, but because of the number of participants and their concentration in a short period (Ng et al, 2017; Pickering et al, 2010).

Portugal was not immune to the phenomenon of growth in the practice of Trail Running. This paper presents the status of Trail Running in Portugal and an analysis of the practice of this activity in two protected and classified areas, the Natural Parks of Serra da Estrela (PNSE) and Sintra-Cascais (PNSC).

The PNSC is located in the Lisbon Metropolitan Area, covering 14,583 hectares spread over the municipalities of Sintra and Cascais. Its delimitation as a Protected Area aimed to minimize human activity in one of the most significant natural areas of the metropolitan region. The PNSE is located in the Center region, covering 89,000 hectares. It is part of the western end of the Cordillera Central of the Iberian Peninsula and was delimited as a Protected Area due to the need to preserve unique natural values in the national territory.

Methodology

Recording and georeferencing trail running events and making a comparative analysis between the PNSE and PNSC, through questionnaires applied to more than 100 participants in events located within the perimeters of these Natural Parks, it is possible to understand that each Protected Area relates differently to Trail Running, considering its geographical location and insertion in the urban network.

Results

Considering the organization of Trail Running events, in 2018, 11 took place in the PNSC and its surrounding area, totaling 17 races. In terms of participants, around 4,600 athletes participated, only between February and October, which represents the interval between the events. Regarding PNSE there were 8 events (7 took place between May and October), totaling 18 races and 2,334 participants.

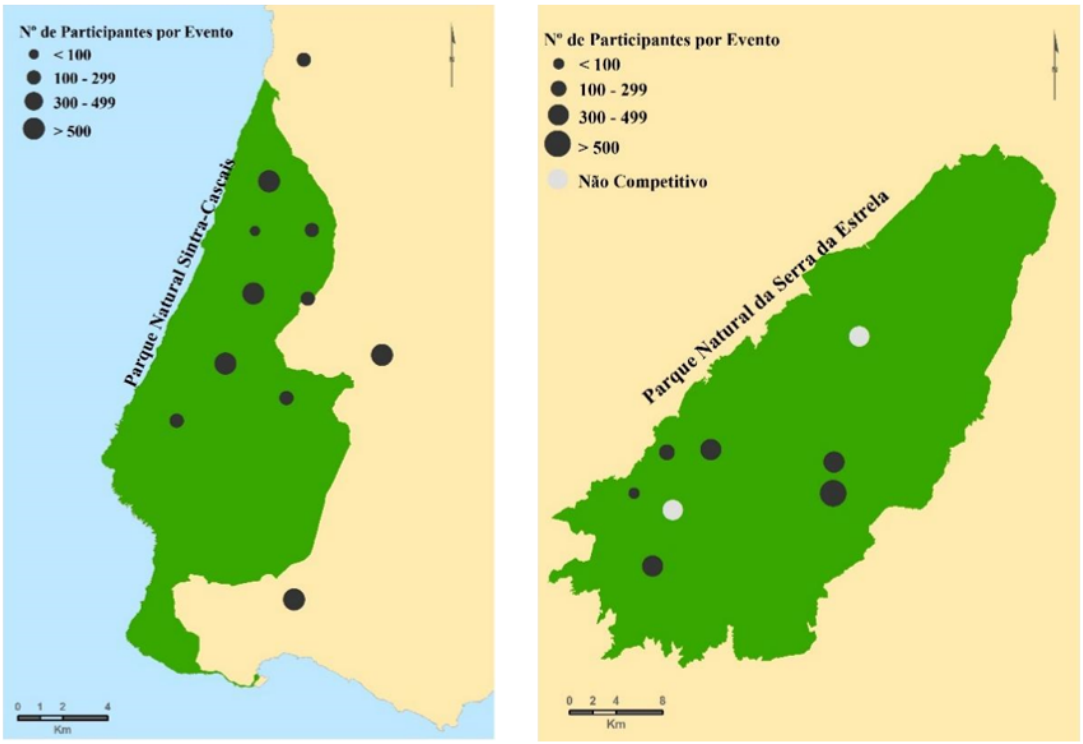

Figure 1 – Study areas and race locations with the number of participants.

Considering the answers to the questionnaires, the regional importance of the PNSC was verified where, despite the significant number of events carried out in 2018, the demand for training proved to be the main focus on a usual basis (52%). About 25% of them stated that they had visited the PNSC more than 5 times in the last 3 years. Among the main reasons for visiting PNSC, respondents most frequently mentioned participating in training, visiting Palaces, and engaging in active tourism. The PNSC assumes a more relevant role in terms of training, even though it is the most sought-after place for organizing events at the AML.

In the case of the PNSE, the scenario proved to be quite different, assuming national importance in the context of Trail Running, not only for participation in events but also for training. Events in PNSE occur sporadically and require a purposeful movement on the part of athletes, who identify this Natural Park as an area of excellence for sports, but also for the enjoyment of the singularities of its landscape. In terms of visits, these are less frequent, but also almost mandatory for athletes. About 37% of respondents said they had visited the Park between 1 and 2 times in the last 3 years and only 18% more than 5 times. Among the main reasons for visiting this Protected Area, respondents more frequently mentioned participation

in trail running events, active tourism, and snow tourism, but also participation in training, albeit with less weight compared to the PNSC (less 12%). Despite a smaller number of organized events, athletes take special pleasure in participating in races in this area, highlighting the landscapes and the uniqueness of the trails, when considering the national competitions.

Discussion & Conclusions

The results presented in the paper highlight the high demand that has been observed in terms of events and participants, which has the double effect of increasing pressure on potentially sensitive areas, but at the same time creating an opportunity to capture interest in rural areas, enhancing their values and resources.

The close relationship between the practice of trail running and the territories that integrate or are close to protected natural spaces must be analyzed carefully, considering the motivations of the event organizers, the expectations of the participants, and the carrying capacity of the natural environments. Mutual gains must be used rationally and sustainably, keeping the focus on preserving areas with characteristics of vulnerability. Garcia, J.; Alandi, C. (2016) give an excellent example of how trail running activities in natural spaces can be designed and monitored, ensuring that there is an effective positive balance between the benefits retained in the region and the impacts on natural systems.

There was a difference in the demand profile between the PNSC and the PNSE that needs to be better analyzed, namely concerning the percentage of tracks overlapping the different zoning areas defined in the respective management plans. Further work should focus on management issues and conflicts between trail running activities and protected areas.

Acknowledgments

This work was financed by national funds through FCT-Foundation for Science and Technology, I.P., within the scope of the project “UIDB/04647/2020” of CICS.NOVA-Centro Interdisciplinar de Ciências Sociais da Universidade NOVA de Lisboa. The third author was financed by national funds through the FCT, under the Norma Transitória-DL 57/2016/CP1453/CT0004.

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Framing overtourism in mountain national park in post-Covid-19 period. The case: Stołowe Mts. National Park, Poland

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Abstract

Introduction

National parks are generating increasingly more interest that results in increasing number of visitors, puts more and more pressure on natural resources and local communities due to the various effects of overtourism. The outbreak of the Covid-19 pandemic in 2020 has not stopped an increase in visitors number, as society deemed national parks and outdoors to be safe areas without Covid-19. The aim of this study is to characterise the effects of overtourism in the spatial, temporal, and quantitative sense as well as to create a plan in order to mitigate the problem. The proposed plan could be acceptable to local stakeholders including national park managers, local service providers, local residents, local governments, and national park visitors. The research was conducted in Stołowe Mts. National Park (SMNP) located in the Sudety Mountains at the Polish-Czech national border (SW Poland).

Methodology

Overtourism describes destinations where 'hosts or guests, locals or visitors, feel that there are too many visitors and that the quality of life in the area or the quality of the experience has deteriorated unacceptably' (Goodwin 2019). Overtourism is not only characterized by too many visitors. It occurs when the following conditions are met: 1) tourism carrying capacity (TCC) is exceeded; 2) visitors express "dissatisfaction" due to the presence of too many people in same place; 3) local residents note problems due to an excessive number of visitors. This research uses the Visitor Experience and Resource (VERP) model (Manning 2002), which will be adapted SMNP in the context of opinions expressed by all surveyed stakeholders. Analysis by Mandić and Marković (2021) suggests that VERP is more useful in the mitigation of pressures related to excessive number of visitors and addresses complex socioecological challenges such as overtourism in national parks. Its implementation could contribute to reconciling conservation and recreation goals. However, certain improvements, particularly those related to process simplification, are needed.

Results

According to previous study (Rogowski 2019), relationship between degree of tourists' satisfaction at certain hour and number of visitors' passings (IN+OUT) on a trail were revealed. Respondents expressed their dissatisfaction in hours during which the highest number of passings were observed, i.e. between noon and 2 PM. At 12 PM, when maximum passings of

1,191 visitors were noted on a study trail, up to 70% of visitors were unsatisfied. It was revealed that visitors dissatisfaction rate depends on number of visitors.

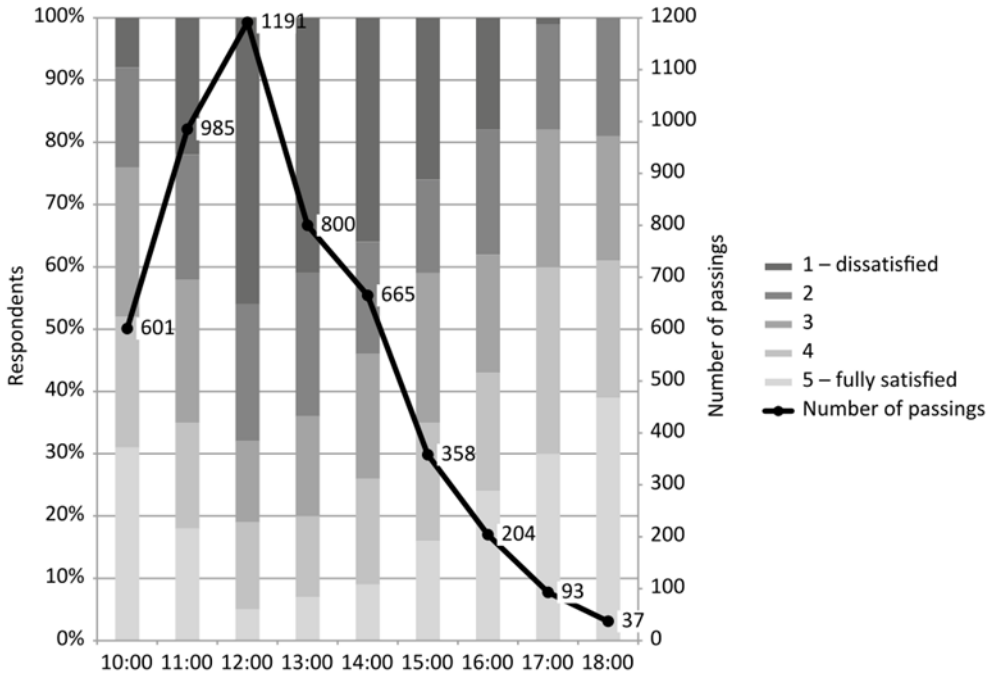

Figure 1. The relationship between the number of visitors passings (IN+OUT; black line) of the trail in Szczeliniec Wielki (Stołowe Mts. National Park, SW Poland) and the degree of visitor's dissatisfaction (grey bars) (Rogowski, 2019).

The Monitoring System of Tourist Traffic (MSTT) performed in SMNP from year 2017 to 2021 has provided detailed measurements of the visitor flow in Błędne Skały in hourly resolution. The comparison between the number of visitors on a trail and theTCC indexes is shown in the Table 1.

		2017	2018	2019	2020	2021
Number of hours with Błędne Skały TCC exeeded in Month	April	4	11	4	0	0
	May	38	61	49	4	12
	June	27	36	24	25	38
	July	57	65	65	87	98
	August	62	77	14	111	118
	September	1	13	0	22	33
	October	0	8	0	8	20
	November	0	0	0	0	12
TOTAL		189	271	156	257	331
Number of hours with	7.00 – 8.00	0	0	1	0	0
	8.00 – 9.00	0	0	0	0	0
	9.00 – 10.00	0	2	0	0	2

Błędne Skały TCC exeeded	10.00 – 11.00	10	10	12	10	17	
	11.00 – 12.00	34	57	33	48	59	
	12.00 – 13.00	50	70	48	66	79	
	13.00 – 14.00	44	59	30	62	75	
	14.00 – 15.00	31	44	14	45	52	
	15.00 – 16.00	14	20	12	20	31	
	16.00 – 17.00	5	8	4	6	12	
	17.00 – 18.00	1	1	2	0	3	
	18.00 – 19.00	0	0	0	0	1	
Highest number of hourly visitors in Błędne Skały		596	662	654	698	738	

Table 1. Number of hours with Błędne Skały TCC exceeded

In all years, we have noted an increase of the TCC. For this reasons SMNP has established an entry limits in from April to September 2022.

Preliminary results that will be obtained during first year of field studies i.e., in summer 2022, will consists of the assessment of current functioning of entry limits in SMNP and three types of identified zones: (I) visitor flow measurement, (II) visitor's dissatisfaction and (III) local community dissatisfaction. Zones that overlap will yield Potential Zones of Visitor Experiences and Resource Conditions. Each zone will be characterized, and sites in SMNP will be assigned to each respective zone.

Conclusions

Overtourism indicators will be used to determine the extent of overtourism – these will include indicators measuring social factors in relation to geographic distances to the largest concentrations of visitors. The monitoring of visitor flow in the following years will indicate changes and trends in overtourism in SMNP.

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Time variability of canoeing tourism in the Drawienski National Park (NW Poland) in 2015-2021

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Abstract

The aim of the research was to characterize the daily, weekly and seasonal variability of canoeing tourist traffic on the Drawa River in the Drawa National Park (DNP) in 2015-2021. The time scope of the research allowed to capture the changes caused by the COVID-19 pandemic.

The DNP is located in north-western Poland in the lake district. Canoeing tourism is by far the dominant form of tourism in this national park. The DNP maintains the infrastructure for kayaking tourism, which includes, among others: 6 camping sites, launching and stopping places.

The Drawa River is situated in the Odra River basin. It is 200 km long, the average river slope is 0.6‰. In the DNP area, the Drawa river flows within 10-15 m3 / s. It is a river of varying difficulty. There are from 1 to 25 obstacles in the river bed, mostly fallen tree trunks. The entire route is 43 km long, and it takes 2 to 3 days to complete it.

Kayaking and the use of camping sites in the DNP is payable. The analyzes of the variability of the canoeing traffic were performed based on the data from the ticket sales system calibrated based on direct counting by the observers. The variability of the river traffic was compared with the load on campsites. The indicators of seasonality and concentration of tourist traffic were calculated.

In terms of daily variability, it was found that kayakers move in waves - they start kayaking between 9am and 12pm, and finish between 4pm and 7pm. The maximum intensity of canoe traffic was up to 209 people and 109 kayaks per hour (on average, a canoe every 30 seconds).

When analyzing the weekly variability, it was found that 33% of canoeists use the river on Saturdays, 25% on Sundays, and 13% on Fridays. The share of days from Monday to Thursday is 24%.

When analyzing the variability of traffic over the year, it was proposed to separate 4 periods: high season (last days of June, July and August), medium (September), low (from October to mid-March) and the closing period (formal ban on canoeing tourism from mid-March to almost last days of June).

The concentration of tourist traffic is very high. The daily Gini index amounted to 0.86 - 0.89, and on a weekly basis - 0.82.

Monthly data show that July and August collect almost 90% of the canoeing traffic a year.

In the DNP, a daily limit is introduced - amounting to 750 kayakers. Situations of exceeding this value were found.

During the pandemic, greater canoe traffic was found. The average until 2019 was just under 20,000, and in 2020-2021 - around 24,000. The share of canoeists on working days was also greater. Increased traffic was also observed on September weekends.

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Wildlife tourism and fragile populations – a case study from the dolphin watching industry of a resident population of bottlenose dolphins (Tursiops truncatus) in Setúbal Bay, Portugal

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Abstract

Introduction & objectives

Wildlife tourism has been growing all over the world, developing from a niche sector commonly engaged with ecotourism projects held on large national parks to a multi-billion-dollar industry spread around different markets and products from birdwatching, safari parks, shark diving, whale watching, among others. By itself, wildlife tourism has also been responsible for the establishment of many protected areas, engaging economic development for different stakeholders, and raising awareness about conservation and biodiversity which has led to real conservation strategies and actions for many endangered species and habitats. Nevertheless, the frontier between strict conservation needs and the development of strategic plans to increase the number and satisfaction of visitors is thin, making carrying capacity a concept that should be considered with exceptional emphasis due to the fragile ecological status or high conservation values of many of wildlife species targeted by this industry.

Although its simplicity, the theoretical concept of carrying capacity is not easy to apply. Regarding recreational outdoor uses on land, researchers, park managers, and users can propose limits, monitor visitation, and act according to signs of overuse such as soil degradation or users' conflicts. Regarding other activities that depend on wildlife, and especially does that happen on coastal or open waters such as whale and dolphin watching, defining and monitoring the real signs of overuse is trickier. Changes in the behaviour are normally used as a sign of stress, but these are just a small part of the real effects inflicted by the industry. Vessel noise, the high number of boats, and pursuits, for example, are common long-term perturbances that led to fitness consequences and decreased numbers of populations of dolphins and whales all over the world.

In the Sado estuary, within Setúbal bay, Portugal, a small resident population of 27 bottlenose dolphins (*Tursiops truncatus*) has been exploited for dolphin watch over the last 25 years. The estuary includes a marine protected area, a natural reserve, and the adjacent coastal waters. While the decreased numbers of dolphins are also related to other ecological and environmental issues, there's a global perception that the current 47 licensed boats (from 22 operators) are too much. While most of the activity happens during the summer season,

dolphin watching is also carried by private boats and sometimes by non-licensed operators, which has led to the need to re-establish a new carrying capacity. The objective of this paper is to present and evaluate the main factors that should be considered for establishing the new carrying capacity taking into account the needs and expectations of the different stakeholders.

Methodology

To characterize the status of the activity of dolphin watching around the Sado's bottlenose population a strict field protocol, 2 anonymous questionnaires, and 3 stakeholders' workshops were carried out during 2020/21. The field sampling was carried out during the summer months by tracking the dolphins from a medium distance (100~300 m) recording all boat iterations in terms of position, duration, and vessel identification. The first survey (held in 2020) was designed to replace presential interviews, to characterize the operators and their perceptions and expectations regarding the activity. Due to the COVID-19 restrictions and effects, the second survey (held by the end of the 2021 season) was designed to compare the project results to the pre-COVID-19 situation.

During the workshop field protocols, results and findings were presented and validated together with the stakeholders. Global options and strategies for the carrying capacity were also discussed.

Results

Data from the 80 field trips have shown the actual displacement of the activity within the study area (Figure 1). Regarding the number of boat interactions (858 in total), there is an attitude spectrum between a small number of boats (and operators) that are strictly dedicated to Sado dolphins watching with multiple trips/day, to boats and operators that barely target this population. 38% of the licensed boats were never seen during the field trips, and 20% of the interactions were made by private boats and non-licensed operators. Punctual behaviours in disagreement with the code of conduct namely approximation route and waiting order were registered, but excessive proximity to the animals or overtime of permanence within the observation area (between 30 and 100 m) did not happen. The estuary mouth is the area where major conflicts and concerns about the regular movements of Sado dolphins happen, and some boat operators do not confine their activity to the areas they are licensed to. The excessive number of boats close to the dolphins does happen, mainly within the estuary mouth, and usually involving private boats depending on the location and movement of the dolphins, tides, and time of day.

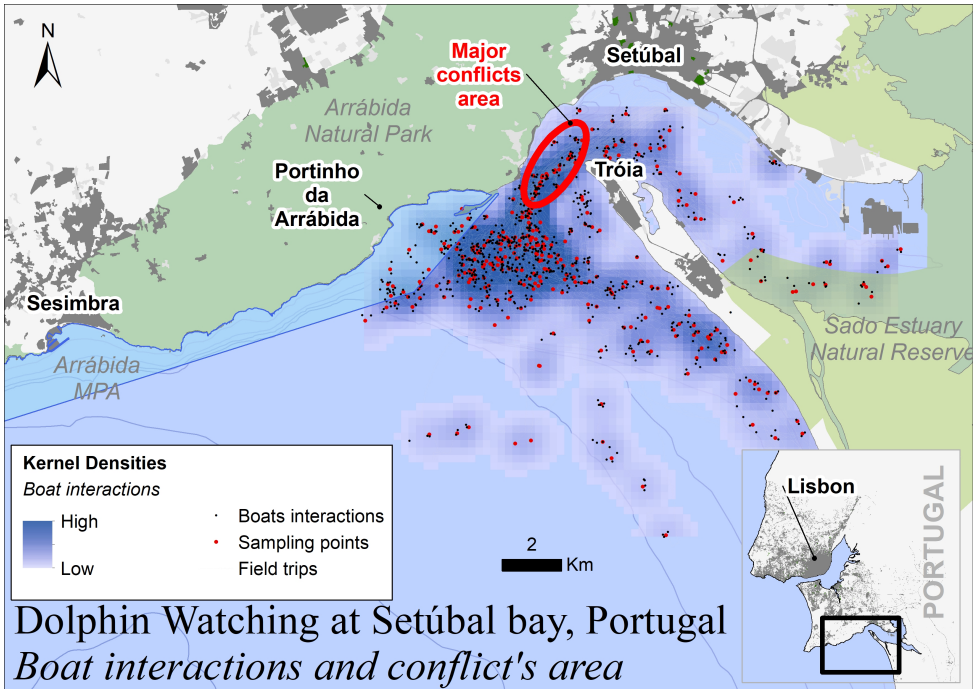

Figure 1 – Study area and major results.

Discussion & Conclusions

In general, the perception that activity needs to be better regulated is considered a good starting point. New rules to better clear apart licensed operators from private boats, and a new zoning plan is welcome as well as the implementation of real-time vessel monitoring mechanisms. Reducing the number of licensed boats is not consensual among boat operators', but our results show that the actual licenses do not reflect the real activity that targets Sado dolphins. A possible solution could be to attribute the license to the boat operators independently to the number of boats owned but limit the number of allowed daily trips. Such a plan would need to be supported by a real-life web-GIS open to all involved stakeholders and reinforced surveillance from park rangers and the national maritime authority. Non-observation and exclusion areas are needed, but these could be difficult to implement.

Acknowledgments

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Visitors Safety in Protected Areas of Greece

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Abstract

Introduction

Protection and management of the protected areas of Greece were done by the Management Bodies (M.B.), over twenty years. Until 2018 they operated in Greece 28 M.B. Two years ago (2020) according to the last law (Law 4685/2020) of country (www.et.gr), created by the union of Management Bodies, 24 new services which renamed Management Units (MU) for the Management of the protected areas of Greece as local departments in Ministry of Environment. Protected Areas of Greece amount to 127 sites (http://www. ypen.gov.gr) according to Law 3937/2011 (Efthimiou 2015). The activities which are used by the units of management are the information of visitors, the organizing of visiting inside the protected area with aim the awareness of visitors in all grades of ages. But as a result of the intense of visiting and the big variety of activities in protected areas it was observed the increase of the risk of accidents and emergency situations. For that reason have created some questions about the safety of the stuff in Management Units (MU) of protected areas and the safety that provided of visitors on responsible region of MU.

The aim of this research is a first approach of visitors' safety in protected areas on responsible region of MB in Greece.

Methods

The investigation accomplished by May to December of 2017 with mission to send questionnaires in Management Bodies for the collection of information of the recording of accidents, emergency situations, the existence of legislative cover for every MB, the safety of the stuff and also for the training of the stuff in matters of safety.

Results

1. Safety stuff in MB

By the data that collected, observed that the biggest percent in MB (92.85 %) have given negative answer in existence of legislatives cover for the stuff of MU, but the other percent answer (17.85%) that the specific legislative cover has included in, regulation function for every MB, based in work law that legislation and also in the existence of safety technician. As far as the education of the stuff of MU, in first response of emergency situation, there is the will by the stuff to follow that training in first response with purpose the acquisition of certification, and also the training in tactical temporal spaces for the best speed and

responding amount of accident. In the continuation of the investigation it was set the question if the number of stuff in every MB, could manage the number of visitors in the area of their responsibility. The majority (39.28%) MB answered that could manage the number of visitors, but only the 1/3 of them (28.57%) of MB confirmed disability. It's worth to bring up that the analogy of visitors with the stuff of MB it is ranging according to the season, the area of responsibility region in protected areas of MB (Efthimiou and Roussou 2018). As the ¾ of MB (75%), before the begging are giving a lecture about the dangers witch exist in entrance, exit and staying in protected areas.

2. Safety visitors in MB

About safety of visitors in responsibility region of Management Bodies, M.B. were questioned, about enact local authority law or the existence of law cover. The answer was negative. The 85.71% of MB answered that there isn't relevant legislative who provide the application of management safety plan for visitors in emergency situations.

Of course, as mentioned above as a result of analogy which exists is between stuff and visitors , for every responsibility region in protected areas of MB is incomplete beside of visiting size, in the question if the MB invited to response some emergency incident or accident only the 32.14% of MB answered positive, the other half of MB (50%) gave negative answer , because they didn't responded some serious emergency incident. In conclusion, the data who collected from recording of accidents in a period of eight years (season 2010-2017) only the 1/5 (percent 17.85%) of MB gave data. By collection of accidents, the number is very small, total 7 incidents that considered small injuries. Emergency incidents encountered 46.42% of MB, the other 39.28% of them didn't encountering some incident in responsibility area. Only one small percent (10.71%) didn't have available data.

Proposals

Therefore, accounting all research findings and considering the bibliography are proposed the further down of improvement the conditional of visitors in protected areas in our country:

- Contribution sum of money for the cover of costs that required for emergency first response training of the stuff and the management of outdoor emergency situations.
- Contribution sum of money for the buy of cover suitable equipment
- Creation of new work positions in MU, persons with necessary skills and knowledge and the certification in emergency first response.
- Lawmaking legislative cover for safety of the stuff in MU
- Lawmaking legislative cover for safety of visitors in MU
- Briefing to visitors for the necessary equipment and the contingent dangerous, who could be confronting at the staying in protected areas

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The rise and fall of Flickr: examining the present and future of a social media platform popular in visitor studies

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Abstract

Introduction and objectives

In many protected areas, visitor monitoring programmes are not in place, only carried out occasionally, or considered expensive and laborious. Alternatives or supplements for onsite visitor monitoring have been sought actively. Data collected by various mobile apps, and social media in particular, have been considered a promising source for visitor information in many scientific publications (Toivonen et al., 2019; Teles da Mota and Pickering, 2020; Wilkins, Wood and Smith, 2021). Social media platforms are considered a valuable information source in addition to systematic monitoring schemes because of their ability to collect spontaneous observations by people, potentially empowering the visitors.

Due to their popularity, Meta platforms like Facebook or Instagram would have the highest potential as sources of useful visitor information (e.g. Tenkanen et al. 2017; Hausmann et al. 2018), but their data are difficult if not impossible to get access to (Bruns, 2019). The photo sharing platform Flickr, on the other hand, has offered access to its content, provided detailed geotags, and allowed the use of computer vision for mining the photo content (Väisänen et al. 2021). Consequently, Flickr has become one of the most used social media platforms in nature-based tourism research over the years (Wilkins et al., 2021). Despite abundant use in research, Flickr has been gradually losing users (https://www.flickr.com/photos/franckmichel/49788632377/) and its user-base is shown to be biased (Väisänen et al. 2021). In this presentation, we critically examine the usability of Flickr as a data source for visitor monitoring now and in the future. We will draw from examples from the published literature and a new analysis. We will concentrate on how Flickr serves in understanding where and when protected areas are visited, by whom and for what purpose (Figure 1).

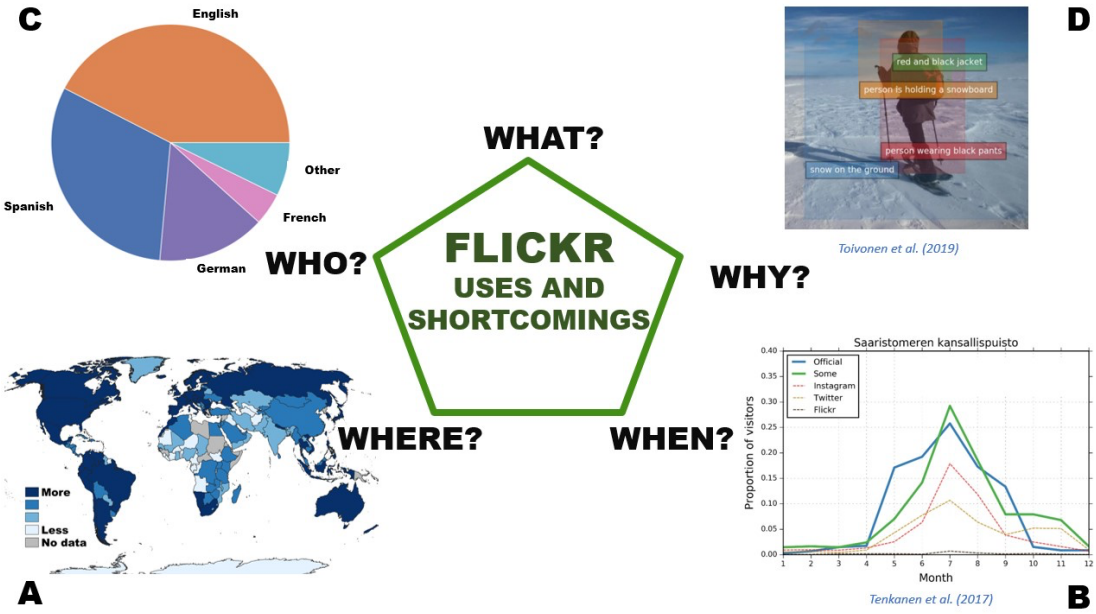

Figure 1. Our presentation will examine the use and usability of Flickr platform in understanding people's visits to nature. We will draw from our results of the global to local analyses, demonstrating e.g. How Flickr user days distribute between countries, what kind of biases are present and how to deal with them (A), How well Flickr is able to predict the temporal user patterns of people and when (not) to trust the results (B), How language detection can illustrate the visitor base but also reveal major biases in the data (C) and How content analysis may give hints on the activities visitors practice and which activities are missing (D). We will discuss our findings critically against the falling popularity and relatively biased user base of Flickr.

Methodology

Literature review. We carried out a review of the research literature to see how much Flickr has been used in research for analysing people in nature, and how it has changed over time. We reviewed the current studies and counted which biases and benefits these studies identified in the use of Flickr.

Global Flickr analysis. We collected a global dataset of geotagged Flickr posts spanning a decade (2010–2020) and covering protected areas that are presented as polygons in the WDPA database (www.protectedplanet.net). This yielded a total of ~8.5M photos and ~1.8M social media user-days (SUD) in 55,147 protected areas. We determined the home country of those visitors who had self-reported their home location in their profile (n=374,769). Based on this information, we categorized the SUD's as either national or international at a country-level and used this information to analyse the global visitation patterns.

Local Flickr analysis. To understand better the local characteristics of Flickr data, we used three distinct study areas of different sizes: the Canary Islands (regional), Finland (national) and Sub-Saharan Africa (continental). Using the global analyses and the examples drawn from the case studies, we discuss the potential and the biases of Flickr-data as a source of visitor information.

Results & Discussion

Our results clearly illustrate that Flickr continues to be extensively used among researchers to derive information on nature visits. At the same time, our analysis shows that not all protected areas are represented in Flickr during our 10-year study period: over half of the protected areas have less than five visitors and only a few of them plenty of visitors according to Flickr user days. There is a clear bias towards the Global North where also the most extensive monitoring schemes are in place. It may be that Flickr has the least potential in those areas where information needs are the highest due to the absence of systematic monitoring schemes.

Furthermore, we find that since the mid-2010's, Flickr's use has declined. This pattern could easily be interpreted as a decline in visits to the global protected area estate, but as official statics in many countries show a reverse trend, it is likely to be related to changes in the platform popularity.

Based on the recognized home countries of users and other background variables, we demonstrate some major biases in Flickr's userbase. Users of Flickr come mostly from the Global North, men are overrepresented (case Finland) and some language groups are excluded (case Canary Islands). Such biases should be considered when interpreting the results, but also when scoping the potential of the platform for new study areas and research questions.

Based on our study, we call for a thorough examination of the potential skewness of the user base when conducting analyses using Flickr. Furthermore, we warn against using Flickr data for long-term studies without normalizing the data with the platform popularity. Finally, we conclude that the sparsity and the biases as well as the declining popularity of Flickr data means that researchers may need to look for alternative platforms for studying nature visitations.

Acknowledgments

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Trends in Outdoor Recreation in Finland: what has changed in 20 years?

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Abstract

Introduction and study objectives

The aim of the national recreation monitoring studies are to produce information of outdoor recreation demand, to monitor changes, and to measure demand of natural resources for recreational purposes. Research on outdoor recreation provides information for setting policy goals and choosing means for outdoor policy and resource use.

Finnish National outdoor recreation demand inventory is a large population survey which has been conducted in every 10 years. The results of the third inventory 2019–2021 can be compared to previous inventories conducted in 1998–2000 and 2009–2010.

Methodology

Random sample -based survey targeted to 15–80 years of Finns covered 6 separate survey rounds between December 2019 and July 2021 (n=8 673, response rate 36%). Almost one third of the data was received before the Covid19-pandemic started and around two thirds were collected during the pandemic. Around 83% of responses were received via web survey and 17% by mail responses. Each survey round was followed ca. 50 non-response interviews (total 396 interviews, 90% response rate) indicating that the survey responses represent the sample rather well. The inventory also included GIS-information about the recreation visits based on survey responses. Study also provides information on many timely research questions regarding outdoor recreation including the Covid19-pandemic.

Results

Engagement on outdoor recreation has stayed at the high level, 96% of Finns participate in outdoor recreation annually (in 2000 97% and in 2010 96%). In 2020 around 80% of the adults, and 70% of among the group of 15-17 yrs. and slightly over 70% among the age group of 0-14 yrs. had made recreation visits in the past week before the survey.

The number of annual recreation visits is higher among the female (average 191) than male (average 172). Female also slightly more often engaged in outdoor recreation activities than male (female 97% and male 95%). The results of the new inventory shows that more elderly people in age group of 65+ engaged in outdoor recreation than in 2000 and 2010.

The estimated number of annual recreation visits ranged from total of 740 million visits outdoors to around 600 million visits. The estimated numbers are based on the average

number of visits 182 (medium 146) among the participants and over 4.1 million adult population engaged in outdoor recreation every year. Based on the monitoring we estimated an 18% increase in number of visits to all recreation areas due to Covid19- pandemic.

About 85 percent of the visits (duration maximum one day) took place in maximum 10 kilometers distance and around 30 percent less than 0.3 kilometers from residents' home.

The duration of the single recreation visit (day visits) has decreased in 20 years: in 2020 47% of visits were maximum 1 hours (average duration 1,8 hours), in 2010 45% (2,1 hours), and in 2000 the proportion were 35% (2,8 hours).

The most popular recreation activities in terms of amount of participants are walking for pleasure, swimming in natural waters, spending time at summer cottage, cycling, berry picking and viewing and enjoying the nature.

Increasing number of participants was also seen in day hiking, picnicking, nature photography (and painting), bird watching etc., cross-country cycling, terrain running, paddling and SUP-paddling, and disc-golf. Snowshoeing, geocaching and winter-swimming engage smaller number of recreationists but the participation in these activities has increased.

There was decreasing trend in activities like fishing, hunting, boating, skiing, snowmobiling as well as participation in guided tours and nature camps. Some of the trends has been decreasing for a while (e.g. fishing and hunting), some changes could be directly linked to the Covid19-pandemic (limited participation due to social distancing e.g. guided tours and nature camps) and some of them to the warming climate: especially the winter 2020 was exceptionally warm in Southern Finland impacting on the popularity of winter activities.

Discussion & Conclusions

Moving towards the post-pandemic period, the carrying capacity of nature areas in terms of visitor numbers has been discussed both in cities and in most popular nature-based tourism destinations. New activities and extensive recreational use may lead to use of new places for outdoor recreation. At the same time with densifying housing areas this may lead to higher recreation demand in some areas, but at the same time, smaller hectares of natural environment are available for recreational use. In the long run, only an adequate supply of recreational areas will make it possible to adapt to increasing number of visitors and different visitor needs.

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Management of Visitors in Protected Areas in the face of the pandemic: An analysis of the emerging challenges from their management perspectives

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Abstract

Introduction and objectives

The multiscale implications and prolonging effects of the pandemic impacted both people's behavior (Anke et al., 2021) and the management of visitors in Protected Areas (PAs). In 2020, multiple European countries reported an increasing interest of people in these areas, meaning also repetitive overcrowding events and conflicts between visitors and residents in PAs (McGinlay et al., 2020). According to the *Servei d'Informació i Difusió Turística of the Government of Catalonia*, Spain (2022), the total number of visitors registered in 2020 in PAs drastically dropped in comparison to the records made in 2019. Nevertheless, in comparison to the same period of the previous year, the number of visitors in the main PAs of the Province of Tarragona duplicated the arrivals between July and October 2020. This trend continued in 2021, as the number of visitors reached and surpassed those of 2019. Furthermore, national visitors accounted for almost the totality of the records made, indicating a significant boom of proximity tourism in the post-lockdown period.

Given the emerging challenges and the actions implemented to manage these atypical visitor flows, our objectives are (i) to know the perception of different stakeholders about the impact of the pandemic in visitor's management in PAs; and (ii) to identify the strategies proposed to address the changing in four PAs of the Province of Tarragona (Figure 1).

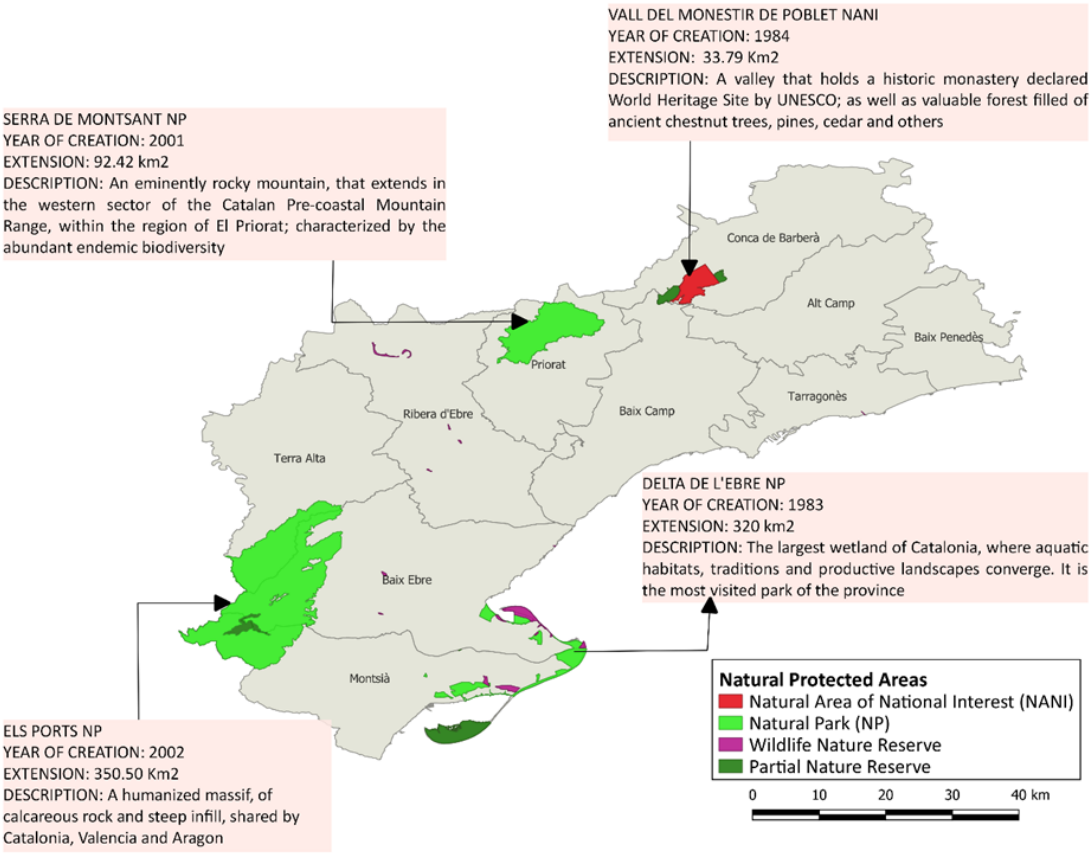

Figure 1: Natural Protected Areas of the Province of Tarragona included in the study
Author's own elaboration, based on Cartographic and Geologic Institute of Catalonia and Generalitat de Catalunya

Methodology

To develop this analysis, we considered the perceptions of multiple stakeholders. The information was retrieved through a participative process in two phases: the first one, an exploratory semi-structured questionnaire to differentiate the contexts before and during the pandemic, which was answered by five managers of PAs, four Rural Agents from the Government of Catalonia, one representative of the Department of Territory of the Government of Catalonia, and three representatives of the municipal government. Then, we raised a discussion group, with the participation of four managers of PAs and one representative of the province government. This group worked as feedback of the information arising from the previous phase.

Results

According to the information retrieved from the questionnaires, there was a change in priorities in the context of pandemic. The excess of visitors became the main preoccupation for the stakeholders, surpassing constraints that used to be priorities before the sanitary crisis, such as weak financing and lack of staff. According to the perception of the stakeholders, the incoming visitors were, mostly, small groups of family and friends, national or locals. These visitors were unfamiliar with the environment and were more likely to cause damages due to inappropriate behavior. Therefore, there was also a higher concern related to bad behaviors,

littering, environment degradation, parking in unauthorized fields, and conflicts with private landowners. Of course, the sanitary protocols also indirectly influenced certain practices between the visitors (e.g., the temporary closure of restaurants induced them to picnic more frequently). There was also an excessive increase of private vehicles in specific periods and places, that clashed with the lack of physical and organizational capacity to receive them.

In response to these challenges, the stakeholders implemented multiple measures, most of them temporary (Figure 2). Those related to the public administration, mentioned actions focused on legal enforcement (such as municipal ordinances). In some cases, the Government of the Province supported with signaling and coordination between municipalities. However, according to the managers, the effectivity of these actions was hindered by the lack of support and surveillance from authorities, lack of staff for environmental education and information, lack of coordination between stakeholders, and the excessive bureaucracy to hire seasonal staff or dictate public ordinances. Additionally, it was pointed that these constraints have been in place since before the pandemic, and the urgent nature of the crisis made it clear that these deficiencies are symptom of weak planning and monitoring processes.

Emerging Challenge	Actions implemented	Serra de Montsant NP*	Delta de l'Ebre NP*	Poblet NANI*	Els Ports NP*
Visitor's profile change: less informed, inexperienced, poorly prepared	Signaling		x	x	x
	Reinforcement of environmental education and information		x	x	x
	Temporal closure of information centers	x			
Conflicts related to uncivic behavior	Coordination with other information and patroling institutions				x
Significant increase of private vehicles, motorcycle, and RVs Poor reception capacity	Early Booking System				x
	Regulation or prohibition of access to vehicles	x	x		x
	Parking payment system		x		x
	Implementation of differentiated rates for parking	x	x		
	Reorganization of vehicles circulation and parking lots		x		
	Closure of crowded parking lots and/or accesses	x			
Overuse of specific public areas in occasional periods of the year	Limit of carrying capacity in viewpoints and facilities for public use		x		
	Regulation for the public use of beaches		x		
	Implementation of municipal ordinances	x	x	x	
	Diversification of the recreation offer	x		x	

Figure 2: Emerging challenges and actions implemented by the management of the Protected Areas

Discussion and Conclusions

Recalling to the actions implemented in PAs, they were mostly focused in solving emerging issues at a short term. The actions implemented were conditioned, not only by the uncertainty in the evolution of the pandemic, but also by the geography of the territories themselves, the administrative constraints that hindered their tasks and the weaknesses carried since before the pandemic. The managers have a wide knowledge of their own territories, but they still

lacked connection with other agents of the territory. They also needed updated managing, planning and decision-making standards, to act more effectively in the face of similar crisis.

The pandemic increased the complexity of visitor's management but opened the debate to work on issues that remained unattended since before the pandemic, such as overcrowding and the improvement of management guidelines.

This analysis has the limitation of being based in the perspective of different stakeholders, and as it is an ongoing research, results are partial. However, we still consider that the variety of stakeholders participating in the study allows us to affirm that the results provided are not biased in favor or against the visions of the managers. These results contribute useful information for stakeholders involved in the management of PAs, and the definition of new research lines. Future research may continue with a longitudinal analysis that includes perceptions of visitors, as well as a deeper study of the visitor's management plan and policies updates in the face of the changing context after the pandemic.

Acknowledgement

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Recreational outdoor activity versus nature protection: The case study of National park Krka

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Abstract

Summary

In order to preserve its most beautiful phenomenon, the travertine barriers in Skradinski Buk, the management of the Krka National Park has, together with the national government, Ministry of Economy and Sustainable Environment (Ministry) decided to forbid swimming in Skradinski Buk, which is the most visited site in Krka National Park.

This paper will show how the preservation of the protected area can cause a serious problem – create a very negative image of the protected areas within the local community and visitors, through the example of swimming prohibition in Skradinski Buk in Krka National Park. The Decision to prohibit swimming has a political, social and financial impact, not only for National park Krka, but also for the local community.

Introduction

Krka river and its National Park is the most significant tourist attraction in Šibenik-Knin County. Krka National Park was established in 1985 with the purpose of preserving and promoting the natural as well as the cultural and historical resources in the Krka River Basin, which today covers the central area of the County within 109 km².

Travertine is frequently found in the surface watercourses of the Dinaric karst, though it rarely builds the waterfalls like those on the Krka. With its seven-travertine waterfalls, Krka River is a natural and karst phenomenon. Travertine is the fundamental phenomenon of Krka National Park: the creation and the development of travertine barriers has shaped the present day appearance of the riverbed and the characteristics of the living world of the Krka River. Skradinski Buk consists of seventeen barriers spread over 800 m: the longest travertine barrier on the Krka River and one of the most unusual and beautiful landscapes in Krka National Park.

Problems and proposals

The existing system intended for visiting the Krka National Park is approaching its saturation point, but the situation is like this only at the Skradinski Buk cascades, where there is a real danger to the eco system and especially to the travertine, which is a fundamental phenomenon of the Krka National Park, while other parts still have substantial unexploited growth potential or they are almost unvisited. In 2019, NP Krka had nearly 1.5 million visitors,

95% of which visited Skradinski Buk. 35 years of swimming in Skradinski Buk has extremely damaged the travertine barriers, especially in the last decade.

The management of the national park together with the Ministry has decided to preserve this phenomenon and decided to prohibit the swimming in Skradinski Buk. They were fully aware that swimming prohibition is a big political issue: that the decision will have a huge impact on local residency, visitor experience and local economy.

Without swimming, the average stay in Skradinski Buk is around 3 hours, meaning that the tourists can have a one-day trip without the necessity of spending the night.

Despite this, the government has passed the law on protection and preservation of the Krka National Park on the 19th of December 2019, in which the swimming in Skradinski Buk is prohibited. This law came into force on 1st January 2021.

After that, the local community became extremely negative towards the Krka National Park. They sent protest notes to the management of the park, the Ministry of Environment, the Government of the Republic of Croatia, to the media and TV stations. They organized many protests in front of the main entrance of the Krka National Park. Once, they even tried to block the entrance of the National Park for visitors, resulting in many police officers around the park, which in turn caused a very bad reputation for the NP. Furthermore, this subject was covered on all local and national media outlets: TV, internet portals, etc., on a daily basis.

Taking into account the profile of the locals, the only way to avoid or at least to moderate these problems is to work on better cooperation, but not through internet channels and social networks, which represent a common way of communication in today's world, as most of the locals are not familiar with IT technology, but through meetings, forums, and other ways of organized gatherings.

Due to this, it is very important to announce this kind of decision a few years in advance to give enough time to the management of the National Park, to communicate with locals and to give the locals enough time to understand the importance of a specific action in nature preservation.

Quality communication channels and time are the basic tools that are necessary for working with the locals and people in general, on the education in regards to the significance of the protected area, so that the goals of the National Park can be publicly seen and understood.

Conclusion

Nature protection can have a great influence on the local community and can seriously damage the cooperation with local residents who may feel that they are harmed by living in protected areas as this imposes many restrictions on them.

This paper shows the problems that the management of the protected areas is dealing with in their efforts to preserve nature and which relate to the local community, politics and

visitors. Therefore, it is very important to put in work, on a daily basis, in the field of education and cooperation to make the locals and people in general, aware of the importance of nature protection. Furthermore, it is very important to announce this type of a decision a few years in advance in order to give the management of the protected area enough time to communicate it to the locals, as well as to give the locals enough time to accept some actions performed for the preservation of nature that might affect them directly. Activities on nature protection must be beyond any political, social, economic and traditional influence if we want to have a long-term quality management of the protected areas in the years to come, and patient work on education and cooperation, with local people as well as people in general, is the only way to achieve this goal.

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Institutional framework of National Parks and Nature Parks in the Republic of Croatia vs. new challenges

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Abstract

Introduction

Panta rei - today we witness to the constancy of change. These dynamic currents of the modern world pose some special problems for the protection of nature. It is no longer just a matter of the basis of action on protected areas - the preservation of the world of biodiversity and the development of "green" awareness, which the protected areas should weave into all pores of society. Today, more than ever, visitors do not just want to see protected areas (national parks), take home pictures and brochures along with visual impressions; visitors imply that they need to make the most out of their free time in national parks, and this is not just about the usual outdoor activities. Climbing, kayaking, canoeing, zip line, hang gliding, and other exotic outdoor activities pose an enormous challenge to national parks. Between the rapidly growing visitor expectations in these exciting times, on one hand, and the primary role of national parks – protecting nature, on the other hand, the dam, but also the bridge is the legal framework, which makes it a sensitive sui generis mechanism. Evidently, there are problems, as will be briefly presented in this paper on the example of the legal framework for the management of national parks in Croatia.

Some limiting consequences of the public entity character of national parks

National parks are public institutions founded by the state. Differentia specifica of national parks as public institutions, in relation to other institutions is their pronounced character of a public entity. National parks perform their main activity – protection of nature as a public service.

When it comes to the driving force of national parks, which is the human resources, national parks are obliged to employ through public tenders, while respecting different and lasting preparations and procedures, primarily in order to make the public service equally accessible to all citizens of the Republic of Croatia, which is a constitutional norm.

Salaries and other material income in national parks are determined by laws and bylaws. The possibilities of some sort of intervention are narrowed and depend mainly on the general political-economic climate and, consequently, on the negotiating directions of the Government and trade unions.

National parks are obliged to conduct formalized public procurement procedures. All procurement of equipment, materials, services and works, whether minor or major, is subject

to strictly formal and rigid deadlines, rules and procedures in accordance with the Public Procurement Act.

These restrictions do not represent something negative per se, they are a traditional and valuable product of the need for transparency and quality of use of public money as well as equal availability of public assets and jobs to all citizens. However, in modern circumstances, when a fast and flexible response is often sought, national parks have great difficulties in making business turns and respond slowly and with difficulty to the new changes necessary in their actions, which has been particularly pronounced in the pandemic conditions (caused by Covid-19 disease). In a situation where it was risky to hire new workers due to uncertainty of a tourist season and optimization of expenditures, long and formal recruitment procedures did not offer any good solutions. In a completely opposite situation, when the tourist season is booming, even the most undemanding jobs in the national park cannot compete with the attractiveness, primarily in the sense of material conditions, of the private tourism sector.

This does not mean that there is an intention of entering particularly into the problem of decision-making in national parks, which is reflected in the often long and uncertain decision-making path through the bodies of national parks to the competent Ministry and other state bodies and back, but this will be mentioned, because this is also, in the modern dynamics, an increasingly aggravating factor.

It is clear that national parks are still finding it difficult to respond to the harmonized adaptation of nature protection with the increasingly demanding visitor management due to the above-stated problems. Flexible and swift hiring of quality human resources (new or existing), quality and up-to-date procurement of equipment and services, fast and well-paced decision-making, all of this affects the coping of national parks with new, modern challenges, as well as the enrichment of sports and recreational outdoor activities and the protection and preservation of nature. Quality solutions are not only good but also timely solutions.

Conclusion

The protection of nature with the need to adapt to the dynamics of predictable and unpredictable new circumstances in order to manage the increasingly demanding visitors in a subtle and sophisticated manner requires, primarily, a legislative effort to update. The rules should not be reversed, they are, in essence, necessary, and are there for the basic operational settings of national parks, with the purpose of achieving an adequate balance between the fundamental action with the purpose of nature protection and the growing possibilities of the acceptable visitor facilities within the protected area. The rules need to provide more flexibility and pragmatism in some aspects of the public entity character of national parks without interfering with their objective.

It is certainly possible to achieve this, at least in part, by softening outdated and rigid labour law provisions. The provisions that govern the labour relations certainly have room for improvement in terms of a simpler way to assure the work processes. Outsourcing certain peripheral activities to the private sector can ease the problem of the lack of human resources

as well as the problem of demanding public procurement procedures. Concession approvals are an interesting form of enriching and improving the offer of national parks, which enable the expert and professional entrepreneurs to provide services to visitors that the national parks are not able to provide at all or are not able to provide in the satisfying quality.

The above-stated must not result in the disruption of national parks, but in bringing the protected nature closer to visitors in new ways, which are harmonised with the Park's core values. It is a winning combination for both the nature and the people.

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Introduction of new technologies in protected area management - risks and advantages of online ticketing

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Abstract

Summary

This paper provides an overview of organizational and methodological experiences and assumptions related to the existing system of online ticketing as well as the adequacy and the necessary infrastructure in order to minimize the risks of these activities and to affirm the technological potential. The goal is to establish an efficient, stable ticketing system, where the need for personal contacts with visitors is significantly reduced or not necessary at all, and the consumption of the service and the availability of the Park's premises is not questioned. At the same time, online ticketing is an excellent tool to anticipate the trends in the visits to the Park, and indirectly along with other measures "influence" – manage the volume and the dynamics of visits to the Park and thus manage visitors in a better way.

Introduction

Since its establishment (1985), the park has been organizing a system of payment of the entrance fees. It is a "classic" ticketing system with tollbooths, where reception desks can be found along the edge of the Park, on the main roads, i.e. land routes through which you can access the Park, including one "water" entrance.

Online ticketing is a "common" practice and a service that customers nowadays consider a standard offer, especially in the private sector. The public sector still has plenty of room for improvement. With that in mind, on 30/10/2020 the Park decided to introduce its own online ticketing system. The decision came into force during 2021.

Methods - The business challenges and risks, which we have defined and encountered during the introduction of our own online ticketing

At the beginning of 2022, we carried out an internal audit of our online ticketing and the analysis of the data, which sought to identify and (re) define the premises in the context of the challenges and risks that the Park encountered during the first year of the newly introduced online ticketing system.

In accordance with the challenge that the Park faced, which is to ensure credible and organizationally applicable methodological assumptions, we have established the following:

- The Park has designated an internal organisational unit that is in charge of receiving visitors and collecting tickets, however, the tasks in relation to online ticketing are not explicitly defined through task descriptions of the internal organisational unit.
- The Park has adopted certain work procedures that do not explicitly prescribe activities and actions related to online ticketing, and the tasks are performed based on the usual "good" practice.
- The Park did not carry out any special education of employees.
- The Park has provided hardware and software support ("WSPay Payment Service" for the control and online ticketing).

In line with the challenge faced by the Park, which is to ensure efficient, secure and transparent online ticketing, we have determined the following:

- The Park has completed a formal harmonization with the Regulation on Personal Data Protection - "General Data Protection Regulation".
- The Park has published on its website the terms of purchase (in the context of consumer rights and protection), which, however, are not formally - substantively sufficient, nor are they sufficiently transparent and understandable.
- A "disproportion" in relation to the prescribed purchase conditions on the Institution's portal and the accepted practice has been established.
- There are cases that discredit the autonomy of the system and indicate that the system is not unambiguous and that it has limited control functions.
- A significant number (approx. 30%) of unauthorized transactions were recorded, which unfortunately cannot be influenced by the Park.

Conclusion

The experience of the Park after one year of practice indicates the existence of significant advantages, but it also indicates disadvantages and challenges; the Internal Audit has singled out the following negative aspects and made the following recommendations:

- The Park is obliged to complete the standardization of the existing practice and to formalize the organizational and methodological assumptions for the performance of above-stated tasks. Ensuring quality, adequate and educated staff is an imperative of the Park.
- Ensuring quality hardware and software support, requires additional time and significant resources from the Park.
- The Park is obliged to pay more attention to the provisions on personal data protection and to publish and update the terms of purchase.
- Thus, the implementation of the own online ticketing is extremely complicated, requires a professional and planned approach and significant resources to ensure the necessary functionality along with the mandatory security and legal protocols.

The positive sides that affirm the online ticketing system are:

- Compared to the classic billing method, crowds and waiting lines are reduced, which directly positively affects the faster flow of visitors and a more humane approach to guests.
- The possibility of errors in ticketing is reduced.
- The possibility of manipulation and abuse of employees or personnel involved with sales is reduced.
- In accordance with the "online guests" announcements, the Park can control and plan the maximum daily peak loads of the Park area, especially in micro-locations and specific areas within the Park, but now in relation to all visitors.
- The system can be largely automated by creating and preparing various accounting and other related records, which directly relieves the pressure on the administration and positively affects the credibility of data and reporting.
- In the long term, such a system can also significantly affect the number of employees necessary for the classic (on the spot) ticketing. Thus, it is also possible to control the costs of employees. In the conditions of restricted movement and contact (pandemic conditions), visitors could avoid unwanted contact but still enjoy a visit – a tour of the Park.
- Of course, it is also a technological advancement in the context of modern business and it strengthens the public trust and reputation of the Park.

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Distribution of Eight Views (Hakkei) in Japan

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Abstract

Summary

The Eight Views is a typical Sansui (mountain and water landscape) painting, was painted in old China of Sung Dynasty, circa 10th century. The painting was introduced to Japan in 14th century and affected to the landscape appreciation of Japanese geographical condition until now. The questionnaire survey was held on to local administrations to investigate the distribution of the 8 views in Japan. The results are obtained as followings: 84 Xiaoxiang type (Chinese type appreciation) 8 views, 48 modified type 8 views, and 176 famous places type 8 views are found. Eight views were observed throughout Japan. However, northern most distribution of Xiaoxiang type shows the boundary within Honshu and none in Hokkaido and Okinawa. The appreciation has the popularity at the Edo Era (1603-1868).

Introduction

The Eight Views of Xiaoxiang painted during the Song dynasty is one of the landscape paintings that began in China. This was introduced to Japan and gave a great influence on the Japanese view of the landscape. It was introduced as a painting in the Muromachi period (1336-1573) and many eight views similar to the 8 views of Ohmi (Fig 1) have been established in the topography of Japan. By clarifying the distribution of the 8 views found in Japan up to the present, the influence of the Xiaoziang 8 views will be clarified. This document introduces the distribution and established ages of the 8 views by local governments of Japan. The materials up to 1999 have sufficient value to estimate the influence of China to Japan.

Eight views, which gave a great influence on the appreciation of Japanese landscape and became the subject of many paintings, was originated to China. This shows that a style of landscape evaluation was born in China (Suzuki 1981) and was introduced from ancient China to Japan as well as letters and various techniques. Eight views is a landscape evaluation style that has been widely spread to Korea, Taiwan, and Japan (Tanaka 1989-98). As the scenery was obtained by the actual experience, 8 views was an experience in a place which was difficult for Japanese people to visit at that time. Therefore, 8 views was conveyed by abstract concept of painting. And Japanese sought an aerial view associated with paintings in a familiar area and tried to realize the concept images.

The difference in geographical condition gradually changed the content of the landscape evaluation, and provided a new element of landscape evaluation. In this survey, finding the

location of the eight views in Japan, we will clarify the diffusion of the eight views, the transformation of the concept, and the propagation of landscape evaluation.

Survey method

In June 1996, a questionnaire was sent to the person in charge on the board of education of each prefecture, and their responses were obtained until August regarding the locations and the features of 8 views. And, the answers were compiled and the contents of the answers were confirmed until December 1998. The contents of the survey are the area of distribution, the local administrations, the individual names of the 8 views, the period when they were enjoyed, the presence of paintings, the presence of photographs, and the presence of descriptions as documents. In addition, the name of the person in charge who filled out this survey form was also included. This is for the confirmation of the contents of the investigation in future.

Distribution of 8 views in Japan

As shown in Table 1, the landscapes called 8 views are widely distributed in Japan from Hokkaido the north to Okinawa the south. There are the prefecture to have 51 eight views the most and none the least. Although we did not investigate the cities, towns and villages, which may have more local 8 views, there are areas where 8 views has spread and areas where it is not propagated. We cannot find the reason why 8 views was not propagated by climatic and topographical conditions, nor why 8 views was not transmitted as a culture by the knowledge so far. As 8 views is distributed in Hokkaido, the selection of 8 views was tentatively transmitted to the whole country by the 1965s. There are 3 types of 8 views selected in Japan. The first was called the 8 views of Xiaoxiang (Xiaoxiang type) and the second was partially different or added (Modified type), and third was famous local scenery (famous spot type) which involved about 6-12 views. And as the times elapsed, the number of Xiaoxiang types decreases. This is consistent with the report of Xiaoxiang in South Korea (Kang and Kim 1991).

In Japan, the Xiaoxiang type 8 views born in China was found from Aomori prefecture to Miyazaki prefecture.

According to the response of the local government, Mito 8 views is the eastern end of the famous 8 views known to the general public. This might have caused some delay or inconvenience in the spread of the 8 views in Mito the east end of Japan. The 8 views of Mito became popular in the latter half of Edo era, and at that time, 8 views were established in Aomori and Morioka the north end of Honshu main island of Japan, so the culture of 8 views was transmitted to the whole part of Honshu main island of Japan.

Distribution in the local governments

Hokkaido region

Eight views was known to be located in Akkeshi Town and Muroran City in Hokkaido. Both places have been designated 8 views in recent years and they are famous places in the area.

The development of Hokkaido was begun after the Meiji era. It is reasonable because the interest in landscape evaluation has arisen in recent years in Hokkaido, such as popularity of Furano and Biei areas.

Tohoku region

Aomori Prefecture has 8 views in Hirosaki City, Hachinohe City, Hiranai Town, Kanita Town, Fukaura Town, Hiraga Town, Kodomari Village, and Kawauchi Town. There are 4 Eight Views of Xiaoxiang and 6 famous scenery types. Except for Kodomari, all were designated after the Meiji era. And Iwate Prefecture has Xiaoziang type 8 views in Morioka City, and was designated by the Nanbu Clan in the middle of the Edo period. As the painting materials are also left, so it is easy to identify the visual object. This follows the eight views of Xiaoxiang. Miyagi Prefecture reported that there is no record of 8 views. Akita Prefecture has one 8 views in Kakunodate town, and Yamagata Prefecture has two 8 viewss in Sakata City and Yamagata City. All of these are famous scenery type. Fukushima Prefecture has 8 views in Aizuwakamatsu City, Inawashiro Town, Iwaki City, and Soma City.

Kanto region

In Ibaraki prefecture, 8 views was widely distributed in the prefecture, and 51 eight views were reported. There are 24 Xiaoxiang type, 12 modified type, and 15 famous scenery type. Tochigi prefecture has one 8 views in Nikko. Gunma prefecture has 42 8 views widely distributed in the prefecture. There were 5 Xiaoxiang type and 17 modified type. Saitama Prefecture has 8views in Kumagaya City, Satte City, Koshigaya City and the west of the prefecture. Chiba Prefecture has 8 views in Inba Village, Ichikawa City, Sodegaura City, Kisarazu City, Togane City, Ichinomiya Town, and Ichihara City. Xiaoxiang type was found in 3 eight views, and famous scenery type was seen in 3 eight views. Tokyo did not respond an answer. Kanagawa Prefecture has 8 views in Yokohama City, Yokosuka City, Hiratsuka City, Fujisawa City, Zushi City, and Miura City.

Chubu region

No answer was obtained from Niigata Prefecture. There was a reply that it was not from Toyama prefecture. Ishikawa prefecture has 8 views widely in the whole area, and there were 14 Xiaoxiang type, four modified types, and 16 famous scenery types. Fukui prefecture has 6 eight views in Tsuruga city and Katsuyama city. Yamanashi prefecture has 8 views in Enzan city, Yamanashi city, Otsuki city, etc. Nagano Prefecture has one deformed type was found in Kiso Valley. Gifu prefecture has one modified 8 views. Shizuoka prefecture, has one Xiaoxiang type in the central part of the prefecture. There was a report that it was not in Aichi prefecture.

Kinki region

There was a answer that 8 views was not in Mie prefecture. Shiga Prefecture has the 8 views of Ohmi at Ohtsu City. In addition, two famous 8 views were reported. Kyoto prefecture has no 8 views. Osaka prefecture has 8 views in Osaka city, Sakai city, and Osakasayama city.

Hyogo prefecture has 8 views widely distributed in the prefecture, and there were 4 Xiaoxiang type, 6 modified type, and 20 famous scenery type. Nara prefecture answered one famous scenery type. Wakayama prefecture has no 8 views.

Chugoku region

Tottori prefecture has one Xiaoxiang type and two modified type in Tottori City and Yonago City. There was an answer that 8 views was not in Shimane prefecture. No answer was obtained from Okayama prefecture. Hiroshima Prefecture has three 8 views in Hiroshima City and Miyajima Town, and all of them were famous scenery type. Yamaguchi prefecture has 8views in Shimonoseki City, Yamaguchi City, Hagi City, and Nagato City, with one Xiaoxiang type and five famous scenery types.

Shikoku region

Tokushima and Kagawa prefecture answered no 8 views. Ehime prefecture has 8 views widely distributed, and there were 5 Xiaoxiang type, two modified types, and 16 famous scenery types. Kochi prefecture has one 8 views.

Kyushu region

Fukuoka prefecture has 8 views in Kitakyushu City and Soeda Town. Saga prefecture has one 8 views in Mitsuse Village. Nagasaki Prefecture has one famous place type around Sasebo City. Kumamoto prefecture has 8 views in Kumamoto City, Yatsushiro City, Kikuchi City, Misumi Town, Matsubase Town, Choyo Village, and Ashikita Town. Xiaoxiang type was seen in 3 eight views and famous place type was seen in 10 eight views. Oita prefecture has one famous place type in Beppu City. Miyazaki Prefecture has 8 views in Kushima City and Takachiho Town. There was one Xiaoxiang type, one modified type, and three famous place types. Kagoshima prefecture has one famous place type in the Oshima branch office.

Okinawa region

Okinawa prefecture has four modified type 8 views in Naha City. The direct effect of China was found in Shuri 8 views and Chuzan 8 views.

Distribution by era

Table 2 summarizes the settings of the 8 views by the era. The Muromachi period (1338-1573), when the 8 views began, has 3 eight views, the Azuchi-Momoyama period (1573-1603), has 0 eight views, and the Edo period (1603-1868) has the most 114 eight views which indicates the popularity of 8 views. The Meiji era (1868-1911) has 50 eight views, the Taisho era (1911-1926) has 15 eight views, the Showa era (1926-1989) has 37 eight views, and the Heisei era (1989-2000) has 7 eight views, which is still showing one type of landscape evaluation in Japan.

Judging from the length of the era, there are more Hakkkei in the Meiji era than in the Edo era. This is because the spread of 8 views began in the late Edo period. The evaluation of 8

views is still ongoing, but there are cases where the Xiaoxiang type was lost and new 8 views are selected, and there are cases where the completely different type of views was selected. By analyzing these transitions, the change of the landscape evaluation will be found.

Discussion

Up to now, 223 eight scenic landscapes have been found nationwide in this survey. And 84 places were found to follow the Eight Views of Xiaoxiang, and 48 places were found to be modified type. The number of 8 views may increase by the further research for local governments, e.g. cities, towns, and villages. This indicates that the landscape evaluation is a widely enjoyed by Japanese people. Therefore, it is important that Appleton (1980) tried to associate the landscape evaluation with science.

The phenomena of landscape appreciation was influenced by the level of human intellectual (Aoki 1997), so it represent one aspect of the development of culture in the society. And we found some natural conditions which can not to follow Xiaoxiang type. For example, the meteorological condition of snow cover in Okinawa was suggested (Kobayashi 1993). So the distribution of the 8 views tells us how far one way of evaluation transmitted. This revealed that the landscape evaluation style established in China in the 10th century spread throughout Japan over the centuries, and reminded us of the magnitude of the influence of Chinese culture on Japan. This is the same as what Haga (1986) pointed out in the influence of 8 views painting. As long as the landscape evaluation has such a strong cultural color, the landscape evaluation may change due to the influence of Western culture and the influence of culture that is not yet known in Japan. On the other hand, looking at the transformation of 8 views in Japan, we could find the influence of natural conditions in Japan. The future landscape planning will require the understandings of such phenomena, to evaluate landscapes common to humankind, and to know the changes caused by climate.

Conclusion

The following points were clarified by conducting a questionnaire survey on 8 views to the persons in charge of prefectures nationwide.

1. More than 200 eight views evaluated landscape groups were found in Japan. And 84 Xiaoxiang type Eight Views born in China were found in Japan.

2. The landscape evaluation method of 8 views is widely enjoyed all over Japan.

3. There is a limit of natural condition to distribute the scenery type of Xiaoxiang.

4. There was a time when 8 views were spread rapidly in Japan.

Acknowledgments

The idea of the nationwide survey was given by Prof. Osamu Shinohara of the University of Tokyo. We thank the kind cooperation of prefecture government officials in Japan. In the 8 views Survey of Ibaraki Prefecture, we referred to the materials of the teacher of Taisei Girls' High School, Takeo Kawasaki.

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Fig.1
Ohmi 8 views

Explanation of Ohmi 8 views in Japan below.

Picture 1 left: Karasaki no Yau唐崎の夜雨night rain on pine tree at Karasaki area.

Picture 1 right: Yabase no Kihan矢橋の帰帆returning boats to Yabase port in fine day.

Picture 2 left: Hira no Bosetsu比良の暮雪snowed Hira mountain range at dusk.

Picture 2 right: Katada no Rakugan堅田の落雁 flock of geese coming down to the building at the shore of Katada.

Picture 3 left: Ishiyama no Shugetsu石山の秋月 autumn moon on Biwa lake seen from Ishiyama temple.

Picture 3 right: Mishui no Bansho三井の晩鐘 sound of bell at Mii temple in dusk.

Picture 4 left: Awazuno no Seiran粟津の晴嵐 wind on fine day at Awazu shore.

Picture 4 right: Seta no Sekisho瀬田の夕照 sun set glow at Seta fisher's village.

These scenery require meteorological condition also.

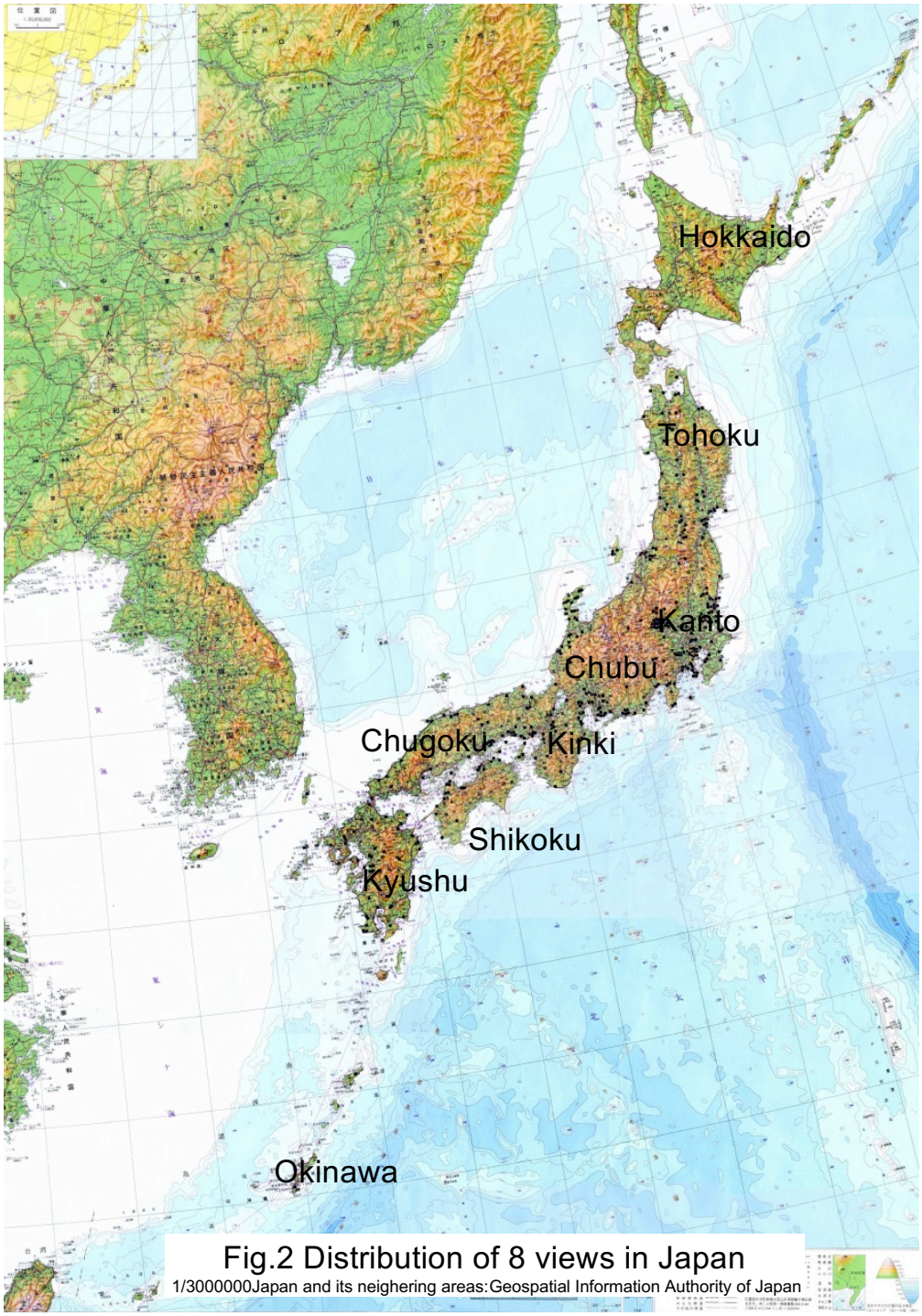

Fig.2 Distribution of 8 views in Japan

1/3000000Japan and its neighering areas:Geospatial Information Authority of Japan

Table-1 Distribution of eight views (Hakkei) in Japan (as of January 23, 1999)

Prefecture	Name of 8views				
Hokkaido	Muroran 8views(Muroran C.)	Kanko 10views(Akkeshi T.)			
Aomori	Tsugaru 10views(Hirosaki C.)	○Hachinohe 8views(Hachinohe C.)	Shinhachinohe 8views(Hachinohe C.)	○Hirauchi 8views(Hirauchi T.)	Hirauchi 6views(Hirauchi T.)
	○Kanita 8views(Kanita T.)	Fukaura 12views(Fukaura T.)	Tochiku 8views(Hiraga T.)	Kodomari famous 12views(Kodomari T.)	○Nishimata 8views(Kawauchi T.)
Iwate	○Morioka 8views(Morioka C.)				
Miyagi	none				
Akita	Akita 12views(Kazuno T.)				
Yamagata	Yamagata city 10views(Yamagata C.)	Yamagata 10views(Yamagata C.)	Sakata 10views(Sakata C.)		
Fukushima	Honkakuji 8views(Aizuwakamatsu)C.	○Inawashiro 8views(Inawashiro T.)	△Hiramagematsu 8views(Iwaki C.)	△Kubota 8views(Iwaki C.)	○Onahama 8views(Iwaki C.)
	△Kitayama 8views(Soma C.)	Yamatsuri 8views(Yamatsuri T.)			
Ibaraki	○Mito 8views(prefecture)	○Hitachi 8views(prefecture)	○Kasumiura 8views(prefecture)	○Shinkasumigaura 8views(prefecture)	○Senbanuma 8views(Mito C.)
	Kurizato 8views(Mito C.)	Kanzaki 8views(Mito C.)	○Higashikawachi 8views(Hitachi C.)	Kawajiri 8views(Hitachi C.)	△Kawajiri 8views(Hitachi C.)
	○Namerikawa 8views(Hitachi C.)	Ouse 8views(Hitachi C.)	Suwa 8views(Hitachi C.)	Okubo 8views(Hitachi C.)	△Kawarago 8views(Hitachi C.)
	△Kuji 8views(Hitachi C.)	Sakashita 8views(Hitachi C.)	○Tsuchiura 8views(Tsuchiura C.)	○Tsuchiura 8views Numajiri(Tsuchiura C.)	○Koga 8views(Koga C.)
	○Ishioka 8views(Ishioka C.)	Shisen-Ishioka 8views(Ishioka C.)	△Shimodate 8views(Shimodate C.)	○Kahsima 8views(Kashima C.)	○Kashima 8views Meiji(Kashima C.)
	△Iwama 8views(Iwama T.)	Ishigami 8views(Tokai)	○Nakamachi 8views(Naka T.)	○Sugaya 8views(Naka T.)	Naka 8views(Naka T.)
	△Motokomezaki 8views(Naka T.)	○Kizaki 8views(Naka)	Urizura 8views(Urizura)	○Tatsunokuchi 8view(Omiya)	△Yamada 8views(Suifu V.)
	△Kegano 8views(Suifu V.)	△Daigo 8views(Daigo T.)	△Shimokanazawa 8views(Daigo T.)	Haguro 8views(Daigo T.)	Miotoshi 8views(Daigo T.)
	Hachiryu 8views(Daigo T.)	Yamatsuri 8views(Daigo T.)	○Kuji 8views(Daigo T.)	○Kitaura 8views(Hokta T.)	○Itako 8views(Itako T.)
	○Sakuragawano 8views(Iwase T.)	△Omiya 8views(Kasumigaura T.)	○Yasato 8views(Yasato T.)	△Yasato 8views Showa(Yasato T.)	○Makabe 8views(Makabe T.)
	○Shiiomeishojo 8views(Makabe T.)				
Tochigi	Nikko 8views(Nikko C.)				
Gunma	Gunma Meishosho(Prefecture)	Gunma Meishou(Prefecture)	Numata Meien 10places(Tone gun)	△Maebashi 8views(Maebashi C.)	△Maebashi 10views(Maebashi C.)
	△Maebashi Kouen 8views(Mabashi C.)	Maebashi City 10views(Maebashi C.)	Maebashi 12views(Maebashi C.)	△Kamihsoi Shiki 8views(Maebashi C.)	○Namie 8views(Takasaki C.)
	△Takasaki 8poetry(Takasaki C.)	△Daisenji 8views(Takasaki C.)	Kuragano Mitate 8views(Takasaki C.)	Tennouzan 8places(Takasaki C.)	Choushouzenji 8views(Takasaki C.)
	○Isezaki 8views(Isezaki C.)	Nisinagaoka 8views(Isezaki C.)	Numata 8views(Numata C.)	△Tatebayashi 8views(Tatebayashi C.)	△Takane 8views(Tatebayashi C.)
	Shibukawa 8views(Shibukawa C.Edo)	Shibukawa 8views(Shibukawa C.)	Shibukawa 10views(Shibukawa C.)	Arima 8places(Shibukawa C.)	Ishihara 8views(Shibukwa C.)
	Fujioka 8views(Fujioka C.)	△Annaka 8views(Annaka C.)	△Gokan 8views(Annaka C.)	○Akima 8views(Annaka C.)	△Isobe 8views(Annaka C.)
	○Yazaki 8views(Kitatachibana V.)	△Murota 8views(Haruna T.)	○Hongo 8views(Haruna T.)	Kaneko 8views(Gunmma T.)	Shinsen Ikaho 8view(Ikaho T.)
	Ikaho 8places(Ikaho T.)	Ikaho 8views(Ikaho T.)	New Ikaho 8views(Ikaho T.)	Yasu 8views(Yoshioka T.)	Kouen 12views(Yoshioka T.)
	Azumakyo no 10places(Naganohara T.)	Shiritaka 8views(Takayama V.)	Kurotwa 8views(Tsukiyono T.)	Akahori 10views(Akahori T.)	Nakayama 8views(Takayama V.)
	Obokatano 3views(Azuma V.)	○Nishioka 8views(Itakura T.)			
Saitama	△Sanguine 8views(prefecture)	○Kumagaya 8views(Kumagaya C.)	Koshigaya 8views(Koshigaya C.)	Satte 8views(Satte C.)	Nagatoro 8views(Nagatoro T.)
Chiba	○Inba 8views(Inba V.)	○Kounodai 8views(Ichikawa C.)	○Nanso 8views(Sodegaura C.)	Kisarazu 8views(Kisarazu C.)	Boso 8views(Togane C.)
	Ichimiya 8views(Ichimiya T.)	Anegasaki 8views(Ichihara C.)			
Tokyo	Investigating				
Kanagawa	○Kanazawa 8views(Yokohama C.)	Tsurumi 8views(Yokohama C.)	Yokohama 8views(Yokohama C.)	○Byobugaura 8views(Yokohama C.)	○Kitazato 8views(Yokosuka C.)
	○Yokosuka 8views(Yokosuka C.)	○Uraga 8views(Yokosuka C.)	△Yoshi 8views(Yokosuka C.)	○Miyata 8views(Misaki C.)	○Hiratsuka 8views(Hiratsuka C.)
	Enoshima 8views(Fujisawa C.)	○Tagoshi 8views(Zushi C.)	○Zushi 8views(Zushi C.)	○Misaki 8views(Miura C.)	△Ryuhouji 8views(Ebina C.)
	Daishouji Seijo 8views(Ebina C.)				
Niigata					
Toyama	none				
Ishikawa	Kanazawa 8views(Kanazawa C.)	Kanazawa 10 views(Kanazawa C.)	○Daijoujisan 8views(Kanazawa C.)	Ueno 8views(Kanazawa C.)	Yuwaku 10views(Kanazawa C.)
	△Nanao 8views(Nanao C.)	○Wakuura 8places1(Nanao C.)	Wakuura 8places2(Nanao C.)	Wakuura 8places3(Nanao C.)	Noto 8views(Nanao C.)
	○Kashu 8views(Komatsu C.)	○Noumi 8views(Komatsu C.)	△Wajima 8views(Wajima C.)	○Misaki 8views(Suzu C.)	○Nagahama 8views(Suzu C.)
	△Yamashiro 8views(Kaga C.)	○Kashima 8views(Kaga C.)	○Ouchi 8views(Hakui C.)	Yamanaka 8views(Yamanaka T.)	Nakaya 10views(Nakayama T.)
	Nakayama 12views(Nakayama T.)	Tsuruki 12places(Tsuruki T.)	Tsuruki 8views(Tsuruki T.)	Yoshino 10views(Yoshinodani V.)	○Togi 8views(Togi T.)
	○Kakumi 8views(Shiga T.)	○Shiga 8views(Shiga T.)	○Nakai 8views(Anamizu T.)	○Kuroshima 8views(Monzen T.)	Sojiji 10places1(Monzen T.)
	Sojiji 10places2(Monzen T.)	△Minaduki 8views(Monzen T.)	Ukawa 12views(Noto T.)	○Ukawa 8views(Noto T.)	
Fukui	○Tsuruga 8views(Tsuruga C.)	○Katsuyama 8poetry(Katsuyama C.)	Reiouzan 12views(Katsuyama C. Heisenji)		
Yamanashi	△Kai 8views(prefecture)	Yamanashi 10 places(prefecture)	Yamanashi new 10views(prefecture)	Enzan 8views(Enzan C.)	Enzan 10 places(Enzan C.)
	Yamanashi 8views(Yamanashi C.)	Fugaku 12views(Otsuki C.)			
Nagano	△Kiso 8views(prefecture)				
Gifu	Gifu new 8views(prefecture)				
Shizuoka	○8views(prefecture)				
Aichi	none				
Mie	none				
Shiga	○Ohmi 8views(prefecture)	Biwako 8views(prefecture)	Rakurakuen 10views(Hikone C.)	Ohmi 10 views(prefecture)	Takashima 8views(Takashima T.)
Kyoto	none				
Osaka	Naniwa 8views(Osaka C.)	Naniwa 8places(Osaka C.)	Naniwa 12 views(Osaka C.)	Naniwa 10views(Osaka C.)	Sumiyoshi 8views(Osaka C.)
	Sakai 8views(Sakai C.)	△Sayama 8views(Osakasayama C.)			
Hyogo	△Arima 6views(Kobe C.)	Arima 12views(Kobe C.)	○Suma 8views(Kobe C.)	△Shikamakoutei 8views(Himeji C.)	Fuchuyuutokuzan 8views(Himeji C.)
	Yatsusirobetsuno 8views(Himeji C.)	△Shikamadu 8views(Himeji C.)	Aoyama 8view(Himeji C.)	○Matogata 8views(Himeji C.)	Akashi 8views1(Akashi C.)
	Akashi 8views2(Akashi C.)	New Akashi 8views(Akashi C.)	Akashijo 10views(Akashi C.)	○Nishinomiya 8views(Nishinomiya C.)	Yura 12views(Sumoto C.)
	△Seido 10views(Ashiya C.)	Ashiya 10views(Ashiya C.)	Naba 10views(Aioi C.)	Nabaura 10views(Aioi C.)	△Sone 12views(Takasago C.)
	Oshiko 4views(Takasago C.)	Bosi 10views(Sanda C.)	Hokkezan 12views(Kasai C.)	Tojoko 8views(Tojo T.)	Kako 8views(Inami T.)
	Ieshima 11views(Ieshima T.)	△Mikaduki 8views(Mikaduki T.)	○Kinosaki 8views(Kinosaki T.)	Iwama 10views(Awaji T.)	Kokufu 10views(Mihara T.)
Nara	Nango 8views(Nara C.)				
Wakayama	none				
Tottori	○Innba 8views(Tottori C.)	△Yonago 8views1(Yonago C.)	Yonago 8views2(Yonago C.)	Yonago 8views3(Yonago C.)	△Kinkai 8views(Yonago C.)
Shimane	none				
Okayama					
Hiroshima	Shukukeien 8places(Hiroshima C.)	Kanzaki 8views(Hiroshima C.)	Itsukushima 8views(Miyajima T.)		
Yamaguchi	Shjmonoseki 12views(Shimonoseki C.)	Chofu 12views(Shimonoseki C.)	Yamaguchi 10views(Yamaguchi C.)	○Hagi 8views(Hagi C.)	Daineiji 10views(Nagato C.)
	Senzaki 8views(Nagato C.)				
Tokushima	none				
Kagawa	none				
Ehime	Iyo 12views(prefecture)	Ehime 8views(prefecture)	Ehime 12Views(prefecture)	○Matsuyama 8views(Matsuyama C.)	Dogo 8views(Matsuyama C.)
	Dogo 12views(Matsuyama C.)	Gunnaka 8views(Matsuyama C.)	Takahama 10views(Matsuyama C.)	Iyo Tetsudouensen 12views(Matsuyama C.)	Futaiwa 8views(Yahatahama C.)
	○Himi 8views(Seijo C.)	Ishigami 14views(Saijo C.)	Teizui 8views(Seijo C.)	Agawa 12views(Iyo C.)	△Nishimyouijn Konpira 10views(Kuma T.)
	○Ohi 8views1(Onishi T.)	○Ohi 8views2(Onishi T.)	○Kikuma 8views(Kikuma T.)	Noma 8views(Kikuma T.)	Ohmishima 6views(Ohmishima T.)
	△Tobe 10views(Tobe T.)	Nagahama 8views(Nagahama T.)	Mishou 8views(Mishou T.)		
Kochi	Look Kamitosa(prefecture)				
Fukuoka	Kojusan 16views(Kitakyushu C.)	Hikosan 8views(Soeda T.)	Hikosan 12views(Soeda T.)		
Saga	Mise 8views(Mise V.)				
Nagasaki	Kitamatsu 8views(Saseho C.)				
Kumamoto	○Kawajiri 8views(Kumamoto C.)	Rinryu 8views(Kumamoto C.)	Jojuen 10views(Kumamoto C.)	Yakuinken 10views(Kumamoto C.)	Yatsusiro 8views(Yatsusiro C.)
	○Rinkaan 8views(Yatsusiro C.)	Kikuchi 8views(Kikuchi C.)	Misumi 8views(Misumi T.)	○Matsuhashi 8views(Matsuhashi T.)	Kunmuan 15views(Matsuhashi T.)
	Toge 8views(Choyou V.)	Ashikita 8places(Ashikita T.)	Nosakaura 10views(Ashikita T.)		
Oita	Beppu 8views(Beppu C.)				
Miyazaki	○Fukushima 8views(Kusima C.)	Tabaru 8views(Takachiho T.)	Kawachisasino 8views(Takachiho T.)	Kawachi 8views(Takachiho T.)	△Simono 8views(Takachiho T.)
Kagosima	Amami 10views(Ohshima branch)				
Okinawa	**Ryukyu 8views**(Naha C.)	Chuuzanben 8views(Naha C.)	Shuri 8views(Naha C.)	Dorakuen 8views(Naha C.)	

bold was famous 8views

()location of 8views

○Xiaoxiang type (84), △Modified type (48), Others (176)

Table 2 Establishment of 8 views in Era (223 locations)

Name of Era	Term(years)	Number of 8view	Xiaoxiang type	Modified type	Others	Frequency (place/year)
Muromachi(1336-1573)	237	3	1	0	2	0.01
Azuti/Momoyama(1573-1600)	27	0	0	0	0	0
Edo(1600-1868)	268	114	31	22	61	0.42
Meiji(1868-1911)	43	50	15	9	26	1.2
Taisho(1911-1926)	15	12	5	1	6	0.8
Showa(1926-1989)	63	37	3	5	29	0.59
Heisei(1989-)	10	7	0	1	6	0.7

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Outdoor recreation in forest areas and related management challenges during COVID-19 pandemic in Latvia (2020-2021)

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Abstract

Outdoor recreation is beneficial for physical and mental well-being of people, and in Northern Europe especially forests play an important role in providing recreational venues and opportunities. Globally, green spaces of various types became increasingly important during the COVID-19 pandemic, resulting in yet unprecedented rise in visitor numbers, followed by associated damages to natural environment and habitats and so far unknown management challenges. With an emergency declared twice and including strict social distancing measures and suspension of indoor events and group activities, nature trails in Latvia were subject to so far unprecedented recreational pressure, so that several of them had to be temporarily closed.

In 2021 we carried out several studies to determine the pattern of outdoor recreation habits and their changes during the pandemic, as well as to better understand the main challenges encountered by managers of nature areas due to the increased visitor numbers. We conducted two inhabitant surveys, each containing a nationally representative respondent pool, as well as interviews with nature area managers. The first survey inquired about general outdoor recreation preferences, including reasons for visiting, preferred types of natural environment, preferred activities, desired level of maintenance and infrastructure, visiting frequency, as well as shift in recreational habits due to the COVID-19 pandemic. The second survey was more specifically concerned with outdoor activities during the winter holidays 2020/2021 when especially strict social distancing rules were in force. Interviews with nature area managers included open-ended questions distributed to forest management enterprises, managers of nature areas and representatives of municipalities.

The most popular reason for visiting nature areas – to relax and to conduct recreational activities. Further, forest areas with and without amenities were the most popular areas highlighted in our study. Walking, nature observation and foraging were most often mentioned as popular activities conducted in nature for recreation. During the Christmas season of 2020/2021, our results showcased no emerging trends or major shifts in traditional activities of gathering Christmas trees and related activities. Main issues raised by forest and municipal managers included pre-pandemic issues such as littering and increased visitor rates leading to difficulties in sustaining infrastructure.

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Threatened plants in nature conservation areas with visitor load and nature tourism infrastructure: is a compromise possible?

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Abstract

Introduction and objectives

Protected nature areas are often attractive to visitors with outstanding landscapes, many ways to explore the natural environment, and sometimes special infrastructure (e.g., trails, observation towers). In many cases, such areas host large ecosystem and species diversity, including threatened plant species. Often a high concentration of rare, threatened plant species overlap with areas that attract visitors. Thus, species conservation and tourism conflicts may arise that can result in the decline or even local extinction of threatened species populations.

The objective of this presentation is to provide an overview of the actual and potential conflicts between the visitor infrastructure in nature conservation areas with visitor load and the potential solutions using selected examples from Latvia. The study focuses on threatened plant species and attempts to answer two major questions:

1. Does the visitor pressure and infrastructure, such as trails and observation towers, cause a significant impact on threatened plant species?
2. Is the impact always deteriorating, or can the impact be neutral or even positive regarding threatened plants? What makes the difference?

Methodology

The situation was explored by:

(1) Analysing selected sample areas by comparing the known history of the presence and vitality of threatened plant populations and the observed visitor impacts,

(2) Short questionnaires were disseminated among the conservation area managers and nature conservation experts.

Results & Discussion

The insight into the Latvian nature conservation areas suggests that the visitor-caused impacts on threatened plant species are not unidirectional. The visitor pressure in nature conservation areas may affect threatened plant species both unfavourably and favourably, and the impact may be neutral, i.e., the threatened plant species may be able to co-exist with the visitor pressure. The impact and its character depend on the visitor load, the particular species and

its ecology, soil properties, and the type of visitor infrastructure. Always long- and short-term effects should be distinguished, i.e., in short term the intensity of visitor pressure may be underestimated, while the actual impact can be understood only in longer term.

The analysed sample areas show that the development of boardwalks, staircases and similar "elevated" constructions does not necessarily mean that the visitor pressure on soil, vegetation and threatened plant species may always be successfully prevented. Boardwalks are usually successful in wetlands, while they may partly fail in dry habitats with mineral soils, such as dunes and dry forests. Most visitors avoid stepping off boardwalks on wet soils causing less damage to the ground and vegetation including threatened plants occurring near the trails. The behaviour is different in drier habitats, especially with a high visitor load and insufficient infrastructure or lack of strict visitor rules and related surveillance of the visitor behaviour. As observed in some selected sites with high visitor pressure, the absence of boardwalks does not necessarily mean damage to the threatened plant populations occurring there. It primarily depends on the species and its ecology, and the intensity of pressure. In trails that cross different habitats, the impact may vary in intensity and character in different sections of the route.

The major unfavourable visitor-caused impacts detected in this study were:

(1) Trampling of the ground and scratching of outcrops causing damage to the vegetation including threatened plants, increase in nutrients leading to vegetation change, establishment of highly competitive weedy species,

(2) Management of the infrastructure without respecting the presence of rare plants (or mismanagement due to lack of knowledge on the presence of species), e.g., regular mowing may cause local extinction of forest plant species that have not adapted to this type of disturbance,

(3) plucking of flowers that may be detrimental in longer term, especially to species with small populations in the site. That usually affects the "beautiful" plants.

However, the visitor infrastructure, related trampling and management (e.g., mowing along the trails) can sometimes have positive effect on some threatened plant species, especially those which depend on soil disturbance and suffer from tall vegetation as stronger competitors for light and nutrients. In short term, some orchid species, for example, may prefer the mowed, trampled trails, where the trampling intensity is similar to moderate grazing impact in the pasture to which the species have to some extent adapted. However, in longer term they may disappear due to continuous or increasing trampling pressure, and the limits of trampling intensity remain unknown and may be different in each area.

In cases of well-planned and well-managed visitor infrastructure or low visitor load, the impacts on threatened species may be neutral. Such situations are mostly related to species that can tolerate moderate disturbance and are not highly specialised to narrow ecological niches. Also, visitor trails or objects that exist for a long time or are associated with a strict

protection regime, either in the past or in the present time, which has deeply rooted in the visitors' minds may allow successful co-existence of nature tourism and species conservation.

There are several aspects that should be taken into account when planning and managing the nature tourism infrastructure. All threatened species should be considered as potentially affected by the new infrastructure objects, and always alternative routes and visitor destinations with lower potential impact should be chosen whenever possible. Some species can co-exist; however, it is impossible to precisely predict and maintain the acceptable limits of visitor load.

It is important how to display the information on rare plants and other species along the trails and other visitor destinations. The information on the presence of rare species near the trails or other visitor destinations may not necessarily be hidden; however, the information on their exact localities should not be displayed on maps. It is more valuable to provide attractive in-depth information on the species including the conservation aspects than to increase the risk of local extinction.

Acknowledgements

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Landscape Diversity of Krka National Park as a Prerequisite for the Development of Specific Forms of Tourism in the Protected Areas

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Abstract

Krka National Park is one of the most beautiful and captivating national parks in Croatia, visited by over 1,700,000 visitors per year. It stands out for its exceptional landscape and biodiversity, where stone, water, travertine structures and plants merge into one. When it comes to biodiversity, geodiversity and hydrological abundance, the years of coevolution have resulted in numerous lakes, ponds, cascades and enchanting waterfalls. Its diverse mosaic landscape constitutes an excellent prerequisite for special forms of tourism in the protected areas, which do not seem to be sufficiently implemented in the Park.

The aim of the research and the methodology

The aim of the research was to test the visitors' views on the implementation of special forms of tourism in protected areas, with special emphasis on landscape diversity and with the following hypotheses in mind:

H1. Landscape diversity is a prerequisite for diversification and development of special forms of tourism such as 'Nature based tourism' and 'Ecotourism';

H2. Sustainable landscape and biological diversity constitutes a long-term perspective of other sustainable forms of tourism such as 'Wildlife tourism' and 'Adventure tourism'.

Our primary research instrument was a questionnaire conducted directly in person with the visitors of the park; the questionnaire was semi-structured and it was administered on a sample of 303 visitors (N = 303). The survey included 12 questions about visitors' socio-demographic characteristics, 10 questions about their stay in the park and related experiences, as well as 20 statements regarding visitors' attitudes regarding landscape diversity as a paradigm of specific form/type tourism development (Likert scale 1-7).

Landscape diversity as a particularity of the Park

Krka National Park is one of the 8 national parks in Croatia, located in the heart of Dalmatia, with the most beautiful flows of the river Krka and the lower part of the river Čikola, covering an area of 109 km². The river passes through various relief forms, among which is the northern part and its mountain wall that stands out as the Krka's main water supply. Resembling a morphogenetic enigma that includes numerous waterfalls and tufa barriers within them, the park is surrounded by a limestone plateau and canyons that are the youngest part of the river's basin relief. With 7 larger waterfalls/cascades with a total drop of 242 m and abundance

of water, Krka's rich flora and fauna represent a unique natural karst phenomenon that is of great scientific importance.

Survey on the landscape diversity of the Park

The social profile of the visitors. The sample consisted largely of women (67%), younger population (87% of participants were aged between 18 and 50 years old), foreign guests (58%) and a more educated population (65% had a university degree or higher). With regards to primary motivation for the visit, the participants pointed out landscape diversity (31%), nature observation and the opportunity to enjoy fresh air (30%), rest and recreation (21%), whereas flora and fauna were less of a factor.

These results indicate that the visitors' motivation was triggered by the Park's landscape diversity, with their focus being primarily on the Nature based tourism (43%) and Ecotourism (26%), and less so on the Wildlife tourism (21%) and Adventure tourism (10%).

Regarding the educational programs that the visitors would like to experience in the Krka National Park, they chose the educational program on the aquatic richness in the Park (25%), the program on the landscape diversity of the Park (24%), the program on the cultural riches of the Park (19%), while only 16% of them were interested in a potential educational program on flora and fauna. The vast majority of visitors visited other national parks in either Croatia, or their own countries. This data further corroborates the claim that the sample is relatively representative.

Landscape diversity in the eyes of visitors. The survey contained 20 claims concerning the Park's landscape diversity, and the answers ranged from 1 (strongly agree) to 7 (strongly disagree). The answers are expressed in percentages (Table 1). The Table clearly shows that the visitors' answers were mostly affirmative, i.e., 75% of the total answers ranged from 'somewhat agree' to 'strongly agree'. In particular, they tended to agree most with the statement 'The landscape diversity of the Park represents the foundation of the biological variety and should be protected, preserved and improved'; 47% of research visitors strongly agreed, 31% agreed and 15% somewhat agreed with the statement. On average, the ratings were 6.06 ± 1.09 with small variability. Furthermore, they tended to largely agree with the statement 'The park stands out with its exceptional landscape diversity'. Similarly, the visitors highly rated the statement 'Nature Based Tourism shows a long-term perspective for the Park' (6.09±1.16). Although with greater dispersion, their results were once again high (5.95 and 5.59) when it comes to statements relating to Ecotourism, such as 'Ecotourism shows both present and future potential of the park' and 'The park is ideal for practicing Ecotourism and the main motive of my visit'. Although the visitors agree that landscape diversity can be easily observed in the Park (4.96 ± 1.03), the fact that the tourist offer focused on landscape diversity corresponds to the purchasing power of tourists indicates that there is room for improvement. They also pointed out that the promotion of landscape diversity, as well as local agricultural products the Park has to offer, should be promoted more intensively. Among other things, their answers indicate several aspects with room for improvement: the tourist offer in terms of landscape needs to diversify; traditional building architecture should be valued more;

tourists need to be familiarized with the specific habitats when it comes to certain plants or animal species and finally, further efforts should be devoted to designing and promoting landscape tours. The results unequivocally confirm both hypotheses, i.e., an adequate evaluation of landscape and biodiversity could serve to create an astounding image of the Krka National Park as a tourist destination.

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Transformation of visitor behavior in coastal areas in Finland, Estonia and Latvia during the Covid-19 pandemic.

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Abstract

Introduction

Coastal and marine tourism play an important socio-economic role in many regions. In most coastal and marine destinations, tourism is an important part of the local economy and provides employment for the local community (Usher et al., 2020). In these destinations, private sector enterprises are the key players, and the resilience of these enterprises is critical for the future of the coastal tourism sector (Biggs et al., 2015). Consumers have been affected by pandemics in several ways: decreased income affected quality of life, lack of information, misinformation, and conflicting information threatened consumers' ability to understand, plan, and cope with the health, economic, informational, environmental, and social threats, in turn, shifting consumers' marketplace and socio-cultural behavior (Campbell et al, 2020: 311–322). The tourism industry needed to work together to create a plan on how to manage the crisis during and after the pandemic, not forgetting environmental gains caused by COVID-19 and acting sustainably towards social and economic recovery (Vărzaru et al., 2021). Thus, the aim of the study is to explore the changes in the behavior of visitors in coastal areas during pandemic from the perspective of tourism SMEs in Estonia, Finland, and Latvia.

Methods

The semi-structured interview as the main data collection method was chosen to learn about the in-depth experience of tourism professionals while considering the specifics of the different organizations. Interviews took place in spring 2021 in Estonia, Finland, and Latvia. All three countries share similarities – the significance of natural resources in tourism and recreation, partially overlapping target markets, challenges of seasonality. The informants were selected to represent all three sectors – private, non-governmental, and state/municipal. There are few informants representing more than one sector. The sample of informants in each country included: (1) micro, small and medium-sized enterprises located in coastal areas; (2) municipal and state institutions responsible for the recreation and tourism development in the specific coastal area; (3) NGOs related to tourism development in coastal areas. The enterprises represent a wide spectrum of tourism business activity: different types of accommodations, including camping sites; different inland water and sea water-related active tourism products, tours, transportation services, and cruises, restaurants, heritage sites, seminar services, theme parks, camp organizers, etc. The total sample had 25 participants.

Results and discussion

Interviewees report that coastal tourism in all three countries shares similarities during Covid-19. Nature tourism and outdoor recreation demand have grown to the levels where the carrying capacity of the relevant sites and routes have been at risk, especially with developed infrastructure and signage system, closer to densely populated centers. National and regional level campaigns aimed to transfer visitor flows from the popular destinations to less known and valuable and reduce crowding risks. Restricted international travel and free time preferences, increased local visitor flows outside the traditional tourism season. Local destinations previously unfamiliar to visitors became exotic and trendy. According to accommodation demand, camping sites, vacation cottages, and rural tourism accommodation establishments comfortable for one household were fully booked even during wintertime, especially during weekends and vacations. The tourism business reacted to changes by offering new outdoor products mostly for local people – games, competitions, applications, nature tourist-oriented niche products.

In the case of Finland, nature tourism demand increased in more remote, sparsely populated areas. In particular, the Finnish coast and archipelago hit records in domestic tourist arrivals and there was significant growth in the number of visitors. SMEs mentioned the cancellation of bigger festivals influenced their business positively since the visitors shifted from events to SMEs. The number of recreational boaters increased and boating regained its popularity in Finland.

Overall the business owners have not observed significant changes in visitor motivation. Some organizational aspects of travel were transformed, such as shorter booking time, demand for individual services (e.g. kayak rental), events, and pre-prepared programs that could be experienced individually or within a household, outdoor recreation. The restrictions of the State of Emergency had been slightly different in each country. For example, in Latvia, they were the strictest at some periods denying access to nature, where developed infrastructure has limited capacity and crowding could be a risk (e.g. birdwatching towers, sightseeing platforms, wooden trails in wetlands, hiking routes with specific trail configuration, etc.).

Increasing visitor flow to very popular nature objects during the COVID-19 pandemic has revealed systemic issues regarding nature protection at the municipal level in Latvia. For example, a local community needed to intervene to bring the case of an over-used nature trail along sandstone cliffs to the municipal agenda and to search for a solution. On one hand, the pandemic also showed that tourism entrepreneurs do not always react and provide services if the municipality establishes a new infrastructure in nature. On the other hand, it has enabled creative solutions that have enhanced the accessibility of cultural and natural heritage - for instance, temporary outdoor expositions, digital tours, and expositions. Thus, although most of the factors mentioned above had a negative impact, some of them worked as catalysts for positive effects. Overall, the pandemic created diverse impacts in different spheres: legal restrictions were followed by the “domino effect” causing changes in the industry, and in the behavior of various groups of society and mindset of industry actors.

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Evaluating effectiveness of Artisanal Trail Maintenance in Protected Areas: A Case of Hong Kong

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Abstract

Introduction and objectives

Trail maintenance is a common and important management action in protected areas. Effective trail maintenance can minimize the impacts of trail infrastructure and its use on the environment while providing durable and functional trail treads to users. With the growing trend of nature-based tourism and recreation, demands of trail use are expected to increase in many protected areas, likely resulting in expanding trail maintenance needs (Ballantyne & Pickering, 2015).

Artisanal trail maintenance utilizes natural materials and traditional handmade methods to restore degraded trails. This approach has been increasingly advocated for and applied to protected areas in different countries as it preserves the trail corridor with a natural tread surface while promoting the local knowledge and traditional trail-building skills (Marion et al., 2011). However, there is a lack of research providing scientific evidence on the effectiveness of the artisanal approach, hindering its wider applications and improvements in supporting sustainable trail management in protected areas. This study was intended to evaluate the effectiveness of artisanal trail maintenance from the biophysical, behavioral and social aspects.

Methodology

This study was conducted in Shing Mun Country Park (SMCP), a popular protected area in Hong Kong managed by the Agriculture, Fisheries and Conservation Department (AFCD) of the Hong Kong SAR Government. This agency has adopted artisanal trail maintenance methods to restore degraded trails in Hong Kong's country parks. We conducted trail assessment, visitors' behavioral observations and survey before and after artisanal trail maintenance was implemented on two study trails, namely Pineapple Dam Nature Trail (PDNT) and Needle Hill Trail (NHT). The maintenance of PDNT was mainly replaced the concrete staircases with wooden staircases, while NHT was restored degraded trail surface by building stony stairs.

An integrated approach of sampling-based systematic point assessment and census-based feature/event assessment was utilized in order to evaluate and characterize general conditions and capture all features or problems along the trail (Leung and Marion, 1999). Trail condition indicators (i.e., tread width, maximum incision depth, cross section, composition of tread materials, and soil compaction) and topographic attributes (i.e., trail grade/aspect and terrain grade/aspect) were measured at 22 sampling points with the sampling intervals of

three meters. Census-based approach mainly captured the trail features and events, such as trail drainage features, erosion, excessive width, excessive muddiness, multiple treading, and informal trail offshoot points along the study trails. A parallel set of measurements was conducted in the control trails that are adjacent and environmentally similar to the study trails in order to control the effects of climatic variations and natural processes. We also conducted behavioral observations and survey to examine visitors' behaviors of hiking on-trail and off-trail, perception on observed trail impacts, and satisfaction of trail conditions before and after artisanal trail maintenance.

Results and Discussion

The results revealed that the artisanal trail maintenance improved biophysical conditions of both study trails. The full trail width, trail tread width, and maximum incision depth of PDNT decreased significantly after the artisanal trail maintenance is implemented, while NHT had substantial reduction on the trail variables of maximum incision depth and cross-section area (Table 1). It aligned with the findings of the census-based feature/event assessment, in which the number of erosion features and multiple trail tread observed on the study trails were eliminated entirely. Therefore, artisanal trail maintenance has significant positive effects on restoring the eroded trails.

Results from the behavioral and social aspects were less consistent. As trail conditions improve, visitors are expected to stay on improved trail treads. In this study, however, the results of the behavior observation indicated that over 70% of the visitors hiked off-trail after the NHT trail had been restored, while only less than 1% of PDNT visitors hiked off-trail after maintenance. The differences of visitors' behaviors performed on the two study trails can be further explained by the results of survey. More visitors expressed dissatisfaction on the trail design and hiking experience on NHT than PDNT after the trails were restored. For instance, 25.8% of the NHT visitors did not feel safe to walk on the trail before maintenance, and it reduced to 18.1% of the visitors after maintenance. In contrast, PDNT has significant decreased in visitors' disagreement with safety to walk, from 10.3% before maintenance to 1.3% after maintenance. Past research suggests that visitors intend to hike off-trail or trample trailside vegetation when they do not feel safe or comfortable to walk on the designed trail (Tomczyk et al., 2017).

Table 1 Results of the sampling-based point assessment conducted on Pineapple Dam Nature Trail and Needle Hill Trail before and after the implementation of artisanal trail maintenance.

	PDNT Study Trail Section					NHT Study Trail Section				
	Before Trail Maintenance		After Trail Maintenance			Before Trail Maintenance		After Trail Maintenance		
Assessment Indicators	Mean	Standard Deviation	Mean	Standard Deviation	Z [a]	Mean	Standard Deviation	Mean	Standard Deviation	Z [a]
Full Trail Width (cm)	299.84	29.30	237.64	20.06	-2.521*	341.4	68.25	331.3	74.47	-1.601
Trail Tread Width (cm)	294.73	33.84	211.18	26.67	-2.521*	267.65	65.73	275.75	59.97	-1.005
Designed Trail Width (cm)	161.63	81.50	211.18	26.67	-0.730	-	-	-	-	-
Maximum Incision Depth (cm)	10.61	9.64	4.20	2.60	-2.527*	25.34	9.14	7.69	4.26	-3.234**
Cross-section Area (cm^2)	2,022.23	2,191.26	536.52	502.74	-1.540	3,418.38	1,729.75	793.55	1,556.75	-3.107**
Trail Grade (%)	22.75	11.39	22.75	9.62	-0.135	19.00	5.02	17.82	4.81	-1.655
Trail Slope Alignment (degree)	84.75	8.60	89.00	8.16	-2.201*	17.64	24.78	19.14	23.58	-1.582

[a] : Wilcoxon Signed Ranks Test
*$p<0.05$ **$p<0.01$

Conclusions

The findings of this study demonstrate the effectiveness of the artisanal trail maintenance on enhancing the biophysical conditions of the trails and reducing the number of trail problems, at least in the short term. If the long-term effectiveness of these methods can be confirmed, they should be considered as a viable approach for restoring degraded trails in protected areas. However, protected area managers should also consider trail layout and designs (e.g., designed trail width and surfacing materials) before the implementation of artisanal trail maintenance so as to minimize the visitors' off-trail behaviors and enhance their recreation experience, both of which will affect how sustain the trails are in serving their functions.

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Are the protected areas the best venues for nature-based outdoor sports activities?

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Abstract

Keywords: Outdoor, sports, recreation, protected natural areas, tourism

Introduction and objectives

The key motives for visiting a national park, namely nature experiences, landscapes, relaxation, mental well-being and escape from noise and pollution have been traditionally there, but increasingly important motives among others include active exercising with increased variety of different activities pursued in the parks (Konu et al., 2021). According comprehensive European-wide survey on the perceptions of outdoor sports by protected area managers hiking (88.3%), mountain biking (57.5%), cycling (53.2%), running/orienteering (50%) and horse riding (39,2%) were indicated as the top 5 most practised outdoor sports in most protected areas (EUROPARC, 2022). Despite overall, 66% of respondents of that research stated that outdoor sports in their protected area are linked to better awareness of nature and environmental issues (EUROPARC, 2022), an assumption follows, that good part of these activities are more connected to nature and outdoors generally without ultimate need for such a valuable and scenic venue as protected areas are. The objective of this study is to analyse alternatives for outdoor recreation in protected areas according to the visitor perception, activity type and outdoor venue associated with it.

Methodology

Quantitative part of the data used for the research includes comprehensive spatial analysis of the supply and demand for nature-based outdoor sports activities (used similarly in other researches e.g. Beeco & Brown, 2013) of entire national state – Latvia. Tourism and recreation categorization is implemented according McKercher's (2016) taxonomy of tourism products, structuring it in GIS data basis. Recreational resources and potential demand was analysed using ROS approach (Brabyn & Sutton, 2013). Additionally, data from completed survey of visitors of the protected areas (n=1923) and local inhabitants (n=1017) living there have been used. Both surveys were conducted between July 2021 and May 2022 partly having remote online survey procedure combined with on-site face-to-face interviews.

Results

Similarly, to Finnish national park visitor monitoring (Konu et al., 2021) hiking is the most popular activity for local inhabitants (67% practice it frequently: daily or on weekends) followed by recreational activities at the waters. In total, 74,9% of visitors of protected areas stated that concrete location is the best for the specific outdoor activity in the surrounding

region, 37,7% admitted that this is the nearest suitable location for the specific outdoor activity to their place of residence and only 16% argued that the site in question is the only one for the specific outdoor activity in the surrounding region. Even alternatives exist, there is a clear gap between the nearest and the most attractive site to exercise certain activities, offering more segment-based inside from the data. Results of spatial analysis demonstrate that there is a lack of appropriate alternatives to the recreational opportunities offered by specially protected nature territories in certain activity groups and segments, e.g. for these activities connected with the older forest lands. Most alternatives for nature-based outdoor sports practiced in protected areas are available for water recreation. For majority of visitors (79%) attractive landscape is very important factor for visiting protected area what is chosen in combination with wild nature surroundings, less other people, good accessibility and appropriate infrastructure. Very few protected natural areas remain rarely visited because of their peripheral location in sparsely populated areas or their low degree of accessibility. For some of them the restricted rules don't provide access. Most intensively visited ones are not only because of their outstanding natural beauty, but although because of their location next to the densely populated areas and their well-maintained infrastructure for different outdoor recreational activities (See Fig.1.)

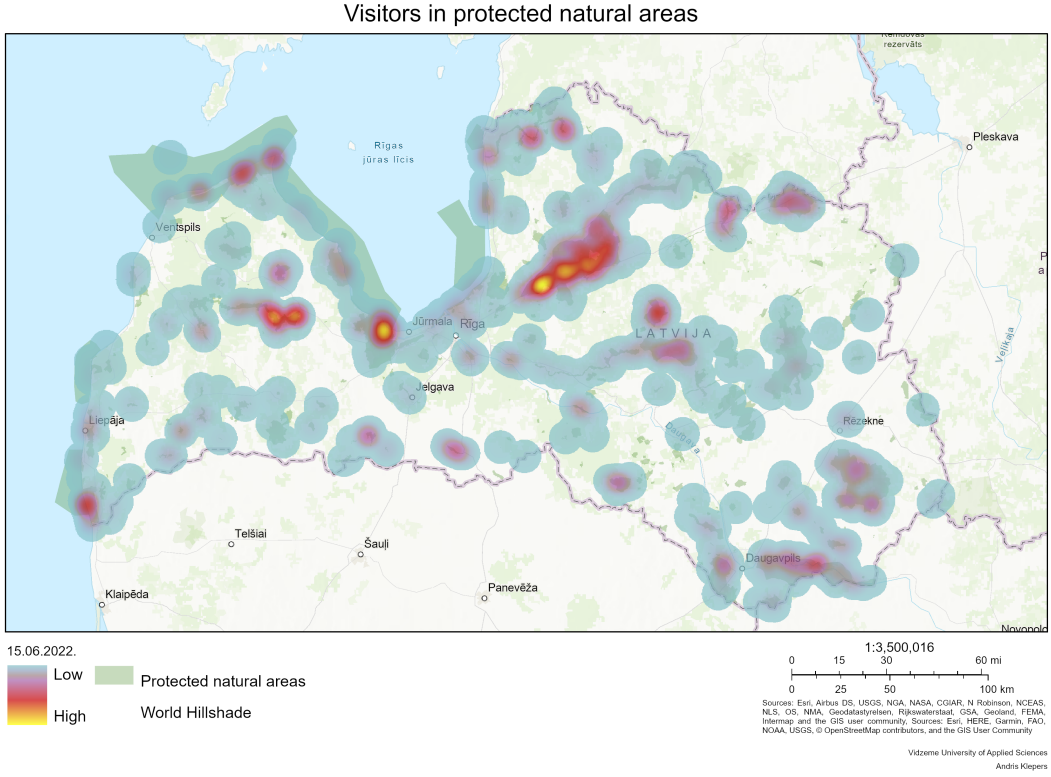

Figure 1. *Intensity of visits in protected natural areas based on yearly accumulated data.*

Source: Vidzeme University of Applied Sciences, Institute of Social, Economic and Humanities Research, Spatial Research Laboratory, 2022

Discussion & Conclusions

Results in the Figure 1 are representing both – recreational and tourism activities and for management purposes it is meaningful to split them. Many of the facilities including nature trails of protected natural areas have been established to reduce the negative impact from anthropogenic load. However, visitor data counting demonstrate significant increase of the visitor flow in some of the sites. Especially close to the cities and densely populated areas alternative public forest lands lack a targeted recreation and tourism strategy implementation. Partly because of available funding some of alternative public facility developments although occur in protected natural areas avoiding alternative developments in other suitable public lands with less pressure on biodiversity. The findings of the study initiate further discussion in the public on priorities of public forest land management and strategic view to reduce negative impact of some outdoor sports activities occurring in protected natural areas by providing adequate alternatives outside them.

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Collaborative monitoring of marine mammal tourism: A high-trust and high-tech solution for gathering evidence to inform conservation policy.

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Abstract

Introduction

The commercial swim-with-dolphin industry began in New Zealand in 1989. Today, the activity is managed by the Department of Conservation (DOC) using a permitting system. While the permits are intended to control the quantum of marine mammal-based tourism, they present a fundamental challenge for policy-makers: how to determine what the appropriate quantum should be? Given the relative youth of the activity, there was a near total absence of evidence on which to establish 'safe' levels of interaction between dolphins and tourism vessels and swimmers. To address this knowledge gap, a condition is written into the permits requiring operators to monitor the degree and nature of their tourism-related activity, and routinely report it to DOC.

The original tourism activity monitoring and reporting system (MRS) has performed poorly for both operators and DOC. Due to a paper-based format, data are highly variable in quality and currency, and reporting imposes a significant administrative burden on operators. Similarly, analysis of the reports by DOC marine ecologists has proven so time-consuming that it has not been undertaken for many years.

Given these limitations, the knowledge gap that prompted the inclusion of the reporting condition in permits remains, leaving policy-makers still with no understanding of the consequences of the current quantum of activity on dolphin wellbeing. Therefore, a new activity MRS that minimises operator burden, addresses data quality and completeness, and facilitates analysis was requested. Development of a new MRS was undertaken in close collaboration with local DOC rangers and marine mammal tourism operators in Akaroa Harbour, home to the endemic Hectors dolphins, the world's smallest and rarest dolphin species.

Method

The solution to the monitoring element of the MRS required the development of two technological components to gather each of the two primary data sets: one to record four-dimensional tourism vessel location and velocity, and one to record tourism-related activity.

To record location and velocity, a proprietary encrypting GNSS tracking unit developed for monitoring aircraft operating in PNAs was 'marinised' and paired with a high-gain marine GNSS antenna and permanently installed in each marine mammal tourism vessel.

To record activity, an MRS app was co-developed with operators to record in real-time ambient environmental conditions and a wide range of animal and human variables. The app interface is presented on dedicated tablets mounted in vessel cockpits. To provide further benefit to operators and improve industry acceptance of the new system, a separate operations app module was co-developed that allows operators to monitor a range of crew and vessel parameters. Confidential customer feedback on satisfaction with trip experience can also be captured.

The solution to the reporting element of the MRS comprises automatic uploading via Bluetooth of track and activity files to cloud-based storage at the end of each trip when the vessel returns to port. Track files are accessed by DOC GIS technicians to generate a range of four-dimensional graphic representations of the distribution and concentration of activity. An API is used to access activity files for immediate display on an interactive dashboard. Operators review and confirm their on-water entries on the dashboard, as well as having exclusive access to their confidential operations records.

Results

Reflecting the differing maturity of the two technological components, the GNSS tracking has performed to specification from the outset, automatically capturing four-dimensional data of very high fidelity.

In contrast, the activity app has benefitted from an extended period of use by, and feedback from, operators both on the water and in training labs. As anticipated, operator uptake of the app has varied, with some embracing the full value it offers while others reluctant to migrate from paper recording. When used, the app has enabled skippers and crew of tourism vessels to instantly and accurately record their interactions with Hectors dolphins and other marine mammals, capturing more detailed and higher quality data.

The API dashboard has presented activity data in almost real-time. DOC marine rangers and ecologists routinely access the dashboard to view and analyse individual trip records and the longitudinal data set. Operators are also able to see the aggregated activity data for the entire marine mammal tourism fleet, as well as benefitting from reduced compliance and administrative costs.

Track and activity files can be combined to generate further reporting products for a range of purposes, including policy-making.

Discussion

Monitoring of operators' compliance with marine mammal tourism permit conditions is complex and beyond the capacity of DOC to undertake on a trip-by-trip basis. Monitoring must therefore adopt a high-trust model, where operators monitor - and report – on their own operations. Furthermore, operators are invariably far more skilled and experienced than DOC staff when it comes to accurately capturing the large number of marine mammal variables of interest to marine ecologists, and fundamental to managing the activity.

Operators are aware that in the absence of robust, comprehensive data on their marine mammal interactions, DOC must take a highly precautionary approach to managing the quantum of activity. Operators therefore have a strong interest in ensuring that DOC policy settings are based on robust, comprehensive longitudinal data sets. While uptake of the MRS during the development phase was voluntary, additional conditions have since been appended to the permits making its use mandatory.

Collaborating with operators on development of the marine mammal tourism MRS has been essential to delivering a solution that is fit for operators to use, and one in which they have trust and confidence in the data collected and reported. Collaborative development has also led to the incorporation of operator-specific elements to support their business operations, as well as inclusion of additional conservation-related features such as a monitoring module for pelagic birds.

Subsequently, the app has been adapted to enable DOC marine rangers to capture real-time data on all aspects of their work, including comprehensive records of non-commercial on-water recreational activity and marine mammal conservation advocacy. DOC now has a marine conservation MRS that fully integrates the day-to-day conservation work of the department with commercial and non-commercial use and enjoyment of marine PNAs and wildlife.

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A Resolution to Facilitate Tourism's Role in Biodiversity Conservation and Community Resilience in the Post-pandemic World

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Abstract

The Context

Demand for nature-based tourism has been increasing around the world. Prior to the COVID-19 pandemic, protected areas received roughly 8 billion visits annually, generating US$ 600 billion in direct in-country expenditures and US$ 250 billion in consumer surplus per year (Balmford et al., 2015). Many iconic protected areas and World Heritage Sites were struggling with "overtourism". The COVID-19 pandemic resulted in an abrupt halt of the nature-based tourism industry in many parts of the world, disrupting essential funding streams for protected areas where biodiversity and human vulnerability are highest, and leading to devastating income loss with major repercussions to local communities (Spenceley et al., 2021). With nature-based tourism operations suspended, greater illegal wildlife trade and poaching has emerged while "extractive industries seize opportunities to encroach on the conservation estate" (Buckley, 2020; Newsome, 2020). The reduction of conservation actions, coupled with increased poverty around protected areas, can "create a feedback loop where intensified reliance on natural resources spurs further human encroachment into natural habitats, increases exposure to and consumption of wild animals, and amplifies future pandemic risks" (Lindsey et al., 2020).

This crisis has highlighted the importance of nature-based tourism to human health, community wellbeing, and ecosystem health (Spenceley, 2021). The pandemic awakened us to a realization that "long-term resilience for protected areas also means strengthening the local economy, securing the financial viability of enterprises, and considering the need for long-term investment" (Spenceley et al., 2021), It underscores the need to build more political capital and public will for wildlife and biodiversity conservation (Lindsey et al., 2021), to outsource tourism enterprises through concessions where appropriate (World Bank, 2021; Spenceley et al., 2017). It demonstrates that the need for diversifying revenues in tourism-dependent communities. It is also evident that emergency budgets, contributed partly by tourism revenue sharing, must be established to assist wildlife authorities, conservation management, and communities reliant on subsistence from protected areas (Hockings et al., 2021; Lindsey et al., 2021 Spenceley, 2021; Spenceley et al., 2021; Lehmann et al., 2021).

IUCN Resolution 130

Although many institutions have developed rapid responses to address the consequences of COVID-19, the needs of wildlife and protected areas, and communities that rely on them, cannot be overlooked. On September 2, 2021, an urgent motion, entitled “Strengthening Sustainable Tourism's Role in Biodiversity Conservation and Community Resilience”, was approved as Resolution 130 at the 2021 IUCN World Conservation Congress in Marseille, thanks to a host of partners and supporters, as well as the membership of IUCN World Commission on Protected Areas, Tourism and Protected Areas Specialist (TAPAS) Group (IUCN, 2022). This motion brings together dozens of organizations with global reach and local impact to facilitate more equitable benefit sharing and access to natural heritage experiences for local communities, more private sector partnerships and funding for conservation development in protected areas and beyond, and a stronger support system within IUCN to help this industry achieve its maximum potential as a tool for biodiversity conservation and human welfare.

Implementing the Resolution

Shortly following the approval of Resolution 130, a draft four-year implementation plan was developed with implementation actions for short, intermediate and long terms. Short-term actions are being carried out, including disseminating the resolution, engaging academic and professional community, and establishing an Annual Reporting Tool. Intermediate actions focus on integrating sustainable tourism as a distinct thematic area into IUCN programs and initiatives, while the long-term actions aim at facilitating sharing and collaborative learning on effective mechanisms and practices in management, development and financing.

This presentation aims at engaging the MMV community in the discourse of sustainable tourism in the post-pandemic era in relation to Resolution 130. Specific objectives include: 1) providing a concise introduction of the Resolution and its implementation plan, 2) reporting preliminary results on implementation ideas from the first community engagement event at the 2022 National Environment and Recreation Research Symposium (April 2022), and 3) soliciting input from the MMV audience on implementation ideas and good practices based on their expertise and experience. Participants’ input will be shared in a later date, and an open invitation to participate in other Resolution 130 implementation activities will be extended to the audience.

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Challenges and opportunities: Developing regenerative tourism on the Llŷn Peninsula, Wales, and Iveragh Peninsula, Ireland – A mixed methods approach

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Abstract

LIVE (Llŷn IVeragh Eco-museums) is a collaboration between Welsh and Irish community organisations, academic departments, and local governments. *LIVE* aims to enable coastal communities to promote their natural and cultural assets, creating opportunities for sustainable/ regenerative tourism, especially outside of traditional peak tourist seasons. The project is based on the ecomuseum model of community-based co-operative marketing to create a powerful suite of digital and non-digital resources for eco- and educational tourism. These resources are underpinned by knowledge of the local environments of the Llŷn Peninsula (Gwynedd, North Wales) and the Iveragh Peninsula (County Kerry, southwest Ireland). The project also facilitates upskilling workshops and ambassador programmes to enable local residents to actively participate in the digital marketing strategy and to engage more deeply with their local environment and culture.

While the traditional tourism model seeks to increase visitor numbers for economic benefits, sustainable tourism respects and balances socio-cultural, environmental as well as economic values in order to avoid the depletion of natural and socio-cultural resources. Regenerative tourism goes a step further in that the aim is to not only preserve resources at the same level, but to restore and enhance socio-cultural, environmental, and economic systems by working collaboratively, focussing on local needs, and distributing tourism benefits fairly (Becken & Kaur, 2022). Accordingly, *LIVE* aims to identify the barriers and opportunities for 1) enhancing collaborative tourism, 2) spreading economic benefits geographically, across the year, and between communities, 3) focussing on the types of tourism activities that benefit the whole system, and for 4) tourism to contribute to the natural and cultural regeneration of the area. We are exploring the various challenges and opportunities by adopting a mixed-methods research approach:

1. **Engagement with natural and cultural heritage on the Llŷn and Iveragh peninsulas**. With the help of geotagged social media (Twitter, Flickr) and GPS tracked routes (Strava, Alltrails, Wikiloc, Komoot), we are exploring spatiotemporal visitor patterns across the landscape. As part of this analysis, we are comparing the different types and patterns of visitor activities during the Covid-19 pandemic (2020-2021), before (2019), and after (2022), as well as seasonal differences to identify activities outside of traditional peak tourist seasons.
2. **Changes, challenges, and opportunities that have occurred as a direct and indirect result of the Covid-19 pandemic in the tourism and hospitality sector**. We are inviting tourism and hospitality businesses to participate in a business survey to identify how Covid-19 has affected business opening hours, seasonality, revenues, sustainability,

business challenges, and future opportunities. The business survey will be carried out both face-to-face (interviewer-completed) and online (respondent-completed). The online survey will be distributed to all tourism and hospitality businesses in the two areas. Businesses will have the option to opt-in to participate in a face-to-face, in-depth interview with the intention of complementing the quantitative survey data with qualitative experiences, and personal views and meanings. The results will be presented to and discussed with the participants to generate ideas on how potential future drawbacks can be minimised, and a more regenerative tourism business model can be created.

3. **Creating regenerative visitor experiences**. With the help of an extensive visitor survey, we aim to identify visitor interests in and awareness of the areas' natural and cultural assets. The objectives are to 1) identify visitor segments during the main peak tourism season (July/August) and shoulder season (September/October); 2) to assess the cultural and natural interest and awareness of the different visitor segments, and cultural and natural regenerative tourism opportunities; 3) to identify awareness and interest of sustainability issues of different types of visitors; and 4) to map itineraries and experiences of different types of visitors across the landscape. The overall aim is to identify opportunities for developing regenerative visitor experiences.
4. **Key performance indicators - Identifying sustainable and regenerative tourism opportunities**. Stakeholder workshops will be carried out to identify the most important key performance indicators (KPIs) for developing regenerative tourism in the area. The intended outcome is a collaborative destination management plan that seeks to maximise socio-cultural, environmental, and economic benefits, while minimising the negative impacts on the two peninsulas.

In this presentation, we will discuss the ecomuseum model, *LIVE* project work, outputs and methods, and present several preliminary research results that will feed into the regenerative tourism plan/s.

Acknowledgements

LIVE has been co-funded by the European Regional Development fund under the Ireland Wales Cooperation Programme 2014 – 2020. We would also like to acknowledge our 6 partners in Ireland and Wales: University College Cork, Kerry County Council, South Kerry Development Partnership, Bangor University, Gwynedd Council, and the National Trust.

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Empowering people involvement in the greening and modernisation of public lighting in touristic sites: Case of Jurmala Resort

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Abstract

Introduction

This research is based on the case study of Jurmala city in Latvia, a seaside resort and a grateful sustainable tourism destination to rest at the coast of the Baltic Sea and the nearby nature (JPD, 2010).

Jurmala city highlights the role of citizens in the co-creating of the tourism environment. It aims at the greater involvement of the society in development of the resort, cultural experiences, the sustainable development (JPD, 2010).

Societal involvement has received an increasing attention from policymakers in the European green transition (Uvarova et al., 2021). Researchers are interested in applying citizen science to sustainable development (Quinlivan et al., 2020).

Yet, it is a challenge requiring efforts to encourage the societal involvement in the development of public services and infrastructure. This research contributes to this gap, aiming to identify theoretical approaches and analyse practices of the societal involvement in relation to the development of the energy-efficient public lightening.

Methodology

The qualitative research methods were used, such as, the literature review, interviews with representatives of municipality, survey of inhabitants of Jurmala, public consulations and discussions with the citizens and entrepreneurs (as part of the city development planning), the action research (observations on a site) and a pilot examination based on a case study - the public lighting modernisation project of the pedestrian Jomas street as one of the main touristic sites of the Jurmala resort.

There were three tasks of this project:

1) To improve the energy efficiency of the public lighting of Jomas street.
2) To introduce smart and multifunctional solutions into public lighting.
3) To enhance the attractiveness of Jomas street for tourists and citizens and involve local people in this process.

The project idea is based on the "smart city" concept, learning through practice and adapting solutions to local conditions.

Results and discussion

Jurmala's green seaside resort is one of the most widely recognised tourism destinations around the Baltic Sea and in northern Europe. Recreation and tourism are essential priorities set within the development strategy of Jurmala city. The beach and promenade are among Jurmala's most important tourism offers (JPD, 2010).

The pedestrian Jomas street is a famous touristic site in the city centre. It is used by inhabitants and tourists for various purposes. This street attracts a significant flow of people (~ 3 million persons per year). The flow of visitors increases significantly during the tourist season. An intense flow of people can be observed on Jomas street not only during daylight hours, but also during dark hours of the day; the public lighting and its appropriate control and management are essential on this street. During the public lighting modernization project, counters were set-up on the light poles that will allow the collection of precise data about the visitors' flow on Jomas street.

Research has highlighted the need for interactions with communities and society, as sustainable development often requires social behaviour changes to be successful (Geissdoerfer et al., 2017).

The analyses show that the business sector can adapt quickly to such collaboration and value co-creation models, using design thinking methods or other user-participatory approaches (Marco-Stefan Kleber & Volkova, 2017).

From the public sector, it requires changes in the overall thinking perspective from the supervision, servicing and controls to the user engagement and the value co-creation perspective. Undeniably, the people's participation in public activities may have legal circumstances related to the ownership, responsibility and other partnership aspects (Torvinen & Ulkuniemi, 2016).

The design thinking approach was used to identify four stages for people involvement (Fig.1).

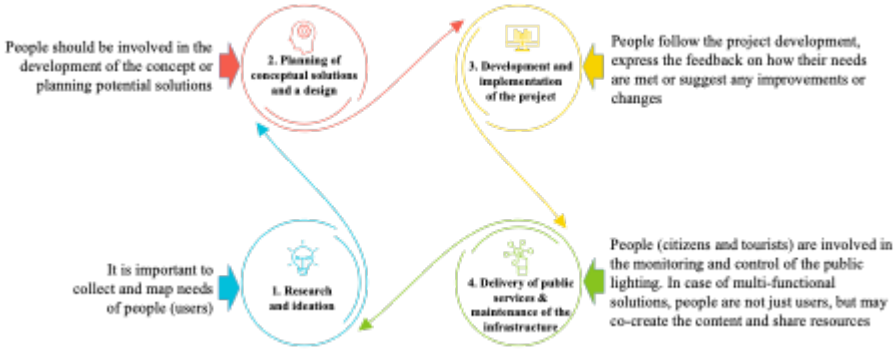

Figure 1. Societal involvement in the development of the public lighting modernization project

The case study showed applied practices of the people's involvement in the first two stages. The people's involvement during the research and planning stages is mainly used through the public hearing procedures organised by municipalities. It was recognised that people's involvement is less ensured in last two stages. The societal involvement in the delivery of public services is unusual.

Multi-functional solutions integrated within public lighting provide various solutions enabling people to co-create the content. If the lighting as the design element is integrated within the public lighting pole, people can choose the most favourite lighting texture. People may change the music within the playlist integrated within the lighting pole.

Tourists may share their feedback about the tourist site, supplement the information provided to tourists, if a display with the tourist information is integrated in a lighting pole.

The integration of counters in public lighting poles, will provide big data on the flow and behaviour of tourists. Entrepreneurs can analyse and use this data to forecast the demand.

Conclusions

The people's involvement in maintaining the public infrastructure is an important further research area. Approaches for empowering the societal involvement can be examined.

The design thinking methods provide creative solutions for user engagement. This is also an attractive way to entertain and inform citizens and tourists.

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Proposed methodology for estimating the carrying capacity for visitation of natural assets on the case of the Vintgar gorge in Triglav National Park, Slovenia

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Abstract

Introduction

The Vintgar Gorge, 1,600 metres long and 250 metres deep, lies at the eastern edge of the Triglav National Park.

The gorge was first opened to the public in 1893. The infrastructure consists of a well-made and carefully maintained trail running through the gorge, wooden galleries and bridges, security systems, entrance and exit points with additional facilities.

In recent years the tourism boom in Slovenia has led to a rapid and dramatic rise in visitor numbers. In 2011, the Vintgar Gorge received approximately 77,000 visitors, in 2016 the figures rose to 220,000 and in 2019 they totaled over 400,000 visitors (max 5000 per day). In the space of eight years, visitation increased more than five-fold, which has created a number of environmental, nature conservation and sociological issues.

According to the Triglav National Park Act, the Triglav National Park Public Institute (hereinafter: TNPPI), which manages the national park and its territory and is also responsible for the Vintgar Gorge, has the right and the obligation to restrict access to natural assets or individual parts of the national park provided an expert evaluation of the threats is carried out which shows that further visitation or viewing of that particular part of the national park could pose a threat to the preservation of natural assets. For the purpose of preparing the risk evaluation analysis and propose a visitation limit for the Vintgar Gorge, the TNPPI has prepared an evaluation of the carrying capacity of the Vintgar Gorge.

Methodology and results

The carrying capacity of a natural asset considers three levels:

- the physical carrying capacity (PCC),
- the real carrying capacity (RCC), and
- the effective carrying capacity (ECC).

The relationship between them can be represented as follows:

PCC > RCC >= ECC

The PCC is the maximum number of visitors that can be present in an area over a certain period of time.

The RCC is the maximum number of visitors that can be present in an area over a certain period of time after applying a series of correction factors linked the specific characteristics of the site, and taking into account their impact on the PCC.

The ECC is the maximum number of visitors that the site manager can manage sustainably in compliance with the PCC and the existing management capacity (e.g. number of staff, infrastructure, parking, toilets).

Assumptions

The key variables to be considered when assessing the carrying capacity of a natural asset are the physical geographical features of the site, the length of the walking trail, trail safety, management practices, opening hours, etc. In the first phase, it is necessary to collect as much input data as possible (length of trail, time of walking, opening hours, …)

Calculating the PCC

The PCC considers the following components:
Length of trail
Distance between visitors
Time needed

PCC = l/sp*no
l = length of trail
sp = space needed for walking
no = number of possible visits per day

no = h/t
h = open hours (on average 10 hours)
t = time needed to walk the trail (40 minutes or 0.66 hours)

l = 1600m
sp = space needed for walking 1m2

no = 10/0.66 = 15,15
PCC = l/sp*no = 1600/1*15,15 = 24240 visits/day
The physical carrying capacity of the Vintgar Gorge is 24240 visitors/day.

Calculating the RCC

The RCC is calculated using the following equation:
RCC = PCC*cf1*cf2*cf3* …
where
cf = correction factor (limiting factor)

The correction factors are different for every site. In the case of Vintgar, the following correction factors carry the highest weight:

- Weather
- Security (falling rocks, slippage)
- Nature protection (early and late hours – high impact on birds and the riparian habitat)
- Social factor (experience, relationship between visitors, and the relationship between visitors and local people)

Each correction factor was calculated applying the following equation:

cf = 1-S1/Sc
Where
S1 = Limiting magnitude of variable 1
Sc = Total magnitude of variable 1
RCC = 24240*0.98*0.7*0.75*0.875*0.2 = 2185/day
The real carrying capacity of the Vintgar Gorge is approximately 2185 visitors/day.

Calculating the ECC

The ECC is the maximum number of visitors that the site manager can manage sustainably in compliance with the RCC and the existing management capacity (e.g. number of staff, infrastructure, parking, toilets). The management capacity can change rather quickly (e.g. by hiring additional staff, putting up an extra chemical toilet), but this is not always an option. The main issue in this regard is the provision of sufficient number of parking places (if needed) or provision of public transport.

ECC = RCC * Uz
where
Mc = management capacity, which consists of the number of staff, number and capacity of toilets, number of parking places, …
Mc = 1-n1 (staff) + n2 (parking) + n3 (toilets) + … / n

To define the management capacity, we needed to compare the number of available parking spaces, toilets and staff with the calculated RCC. Any relevant standards are considered and observed. When the assessment indicates that the available parking capacity is sufficient to

accommodate the visitation volumes defined in the RCC, then the Mc (management capacity) is 1. However, if 25% of the parking spaces are needed to ensure the defined RCC, the Mc value should be 0.75.

The calculation of the effective carrying capacity for the Vingar Gorge is not needed because we believe that for the calculated RCC (i.e. approximately 2185 visitors per day), the existing management capacity, parking spaces and toilets are sufficient to ensure sustainable site visitation management.

Discussion & Conclusions

TNPPI is now trying to implement calculated carrying capacity with number of actions. In 2021 we carried out a field survey and also gathered information from visitors. On the basis of their opinions, we have concluded that the calculated carrying capacity is approximately correct.

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Opportunities and challenges of recreation in Latvia's State Forests

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Abstract

Joint Stock Company "Latvia's State Forests" (Latvijas valsts meži – LVM), which manages ~1/2 of the total forest area of Latvia, i.e. 1.60 million hectares of forest land, since the establishment of the company in 2000, develops, improves and maintains recreation areas, trails and parks, improving opportunities of residents and tourists to relax in state forests. The restrictions imposed by the Covid-19 pandemic encouraged more and more people to go out into nature, thus the interest of various groups in arranging organized hikes also grew, which creates certain challenges for the state forest manager in order to reduce the impact on environmental values, balance the wishes of various stakeholders regarding the use of the forest environment, to ensure forest management processes, including wood production. Therefore, it is important to work purposefully on informing the public about the principles of good behavior in the forest, by providing the necessary information in modern form.

Opportunities of recreation

When developing the functional zoning of the LVM territory, 5% of the managed territory was determined as recreation territories, the main purpose of management of which is recreation and environmental awareness. More than 75 thousand hectares of the total area of all LVM lands are allocated for recreation. Almost 300 recreational areas, 134 footbridges, 90 nature trails 220 km long, including footbridges in the marshes, 7 large and 9 small lookout towers have been created in Latvian state forests, which are available free of charge to every visitor, as also 10 bicycle paths 125 km long.

Every year, recreation opportunities in state forests are improved by upgrading existing ones and discovering new recreation places.

In order to ensure the highest quality services available to the citizens of Latvia, a number of paid tourist facilities - accommodation and parks - have been created and are being maintained and improved.

Challenges and solutions

As the interest in the organization of various activities in the forest grows, LVM is more and more regularly faced with situations where various measures are simultaneously applied for in a specific area, which in essence compete with each other, as well as directly affect forestry processes (forest management works, hunting). In situations where an event is organized about which the company is not informed, the organizer risks the high-quality and smooth running of the planned event, as well as significant safety risks for its participants. Already in

the planning phase of the event, it is necessary to agree on the territory, time and evaluate the possible effects. Therefore, it is essential to exchange information in a timely manner in order to be able to adapt flexibly, for example by changing the configuration of the territory, the time of the event, etc.

The impact of people on the forest environment largely depends on the intensity of the visit and the number of visitors. Walking through the forest by a single individual, such as a mushroom picker, is not comparable to, say, a group of 50 people hiking through the same area. Therefore, it is important for LVM, as the largest forest manager, to know about organized "massive" measures in order to control and reduce the impact as much as possible. LVM has defined in which cases mandatory tuning is required, in which cases only notification. In each specific case, various social, environmental and economic aspects are evaluated and conditions are created to balance all interests as far as possible. LVM informs about the environmental values at the disposal of the company, planned activities, provides the contact information of the tenants of hunting rights, as well as other useful information, so that the planned event can proceed successfully.

LVM cooperates with municipalities and associations on the creation and maintenance of individual tourism or recreation territories and places, the creation of which is planned in the territory of LVM. Upon receiving proposals from interested parties, LVM evaluates them from the environmental, social and economic aspects and provides instructions, as well as agrees on the form of cooperation - cooperation agreement, lease, etc. In this way, the development of recreation and tourism is supported, as well as formalized long-term responsibilities.

From 2021 to 2028 LVM implements a joint project "Optimization of management and management of Natura 2000 protected areas" or "LIFE-IP LatViaNature". Smart management of natural capital is the basis not only for the development of a sustainable economy, but also for the existence of a quality living environment and a healthy society, including recreation opportunities.

In the future, it is expected that the number of forest visitors will increase, including the areas without well-organized tourist infrastructure, because of peoples' desire to relax undisturbed, without seeing other people. One of the biggest challenges is and will be the overlapping of different events at the same time in the same territory, which are mutually incompatible, incl. implementation of forest management processes.

Communication

LVM uses various communication channels for the extensive recreation in nature at free and paid tourist sites. One of the most important is the website www.mammadaba.lv. It contains information about LVM tourism and leisure facilities, related news and advice from LVM experts for a safe and informative rest in nature.

The company has established and develops a set of geospatial information technology products and services - LVM GEO. One of the products is the free app LVM GEO Mobile, which

allows residents to easily find various objects related to nature tourism, orient themselves in nature.

In order to appeal to a younger audience and invite them to go out into nature and do it wisely and meaningfully, LVM started a new project at the beginning of 2022 - created its podcast "Nature walker". In the episodes the hosts meet with experts in the forest industry, promoting the understanding of processes in nature and stimulating a respectful attitude towards nature's values; also the hosts are visited by true nature walkers and adventure seekers, discovering the wide possibilities of the forest for healthy active recreation and bright adventures. LVM's experience can be useful other managers of forest areas who face similar cases.

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Social impact of the river marathon on the local community. A case from Võhandu river, Estonia

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Abstract

Social carrying capacity and sports events' impact on the local community has been a widely studied topic for several decades (Etiosa, 2012; Manning & Valliere, 2001; Nowak, 2012; Reverte & Perez, 2017). Võhandu river is one of the most attractive rivers for water recreation in Estonia, because of the well meandering river bed, well-moving current, and picturesque sandstone canyons in the middle course of the river. The 100 km long Võhandu marathon is one of the biggest paddling marathons in Europe attracting 2000-3000 participants every year from all over the world. Most paddlers have support teams which mean 4000-5000 people in total passing remote rural villages in one day on the water by boats (canoes, kayaks, rafts) and on the shore by cars. This means in most places more visitors in one day than locals see during the rest of the year. The event takes place annually since 2005 in April during the spring flood time but in tourism off-season. The present study investigates the social impact of the Võhandu Marathon on the local communities along the banks of the Võhandu River. Main research question was how do representatives of the local community perceive the main aspects of the social carrying capacity: crowding, visitor experience, general well-being, benefits from the event, conflicts, and problems

Sample included local community leaders (village elders, entrepreneur's representatives of village associations) and landowners of the main marathon landing spots. Semi-structured interviews were conducted with 16 respondents aged 21-74.

Results show that representatives of the local community evaluate Võhandu Marathon in a similarly positive way. Local community feels involved because organizers communicate with community representatives and locals have the opportunity to contribute as volunteers during the event. Locals are also selling souvenirs and homemade food products in different spots along the marathon route. All but one respondent thought that the number of participants at the event is appropriate at the moment but reaching its limits and more people could not be accommodated. All the interviewees stated that the benefits arising from the event far outweigh the harm event creates. Moreover, watching and supporting the event has become a tradition among the locals. To paddle 100 km sounds unbelievable for many locals and this creates respect for participants. Locals are also treated with respect by participants and this allows unproportionately big crowds to fit within the limits of social carrying capacity

Five respondents did not perceive personal benefits from the event, but the rest of the respondents mentioned their benefits. One respondent pointed out that the event kept the Leevaku shop alive and avoided it from closing. Another respondent said that the event did not decide the fate of another village Leevi shop, but the turnover was four to five times higher

during the event. Accommodations were sold out and marathon participants are returning to the area and contributing to the tourism business. The positive emotion gained from the event and the expansion of the social network were also mentioned as benefits. Respondents mentioned that the organizer built a boat bridge in Leevaku for the event, but the rest of the time local community can benefit from it. Respondents talked that the area by the river in Leevaku was made more spacious and beautiful, also local park was cleaned in Leevi.

The main bottleneck associated with the event was traffic which was complicated because of the crowds. There was no parking space for support teams, and local residents were not able to get out of their homes in several cases because cars blocked the roads. Respondents suggested that locals could arrange their schedule in a way that there was no need to leave home during the rush hours of marathon which are around 4 hours in every village when the main crowds of paddlers are passing.

Littering was also a remarkable concern by locals, many participants who were in a hurry did not find the time for the trash can and throw garbage wherever it happened. Litter also fell into the river when participants capsized with boats. Similar problems had been found in the impact of event tourism on the local community studied in Pietarisaari: littering and traffic jams. The same study pointed out that the positive effects of organizing events were greater than the negative ones, and negative aspects were constantly improved (Etiosa, 2012). Two respondents suggested that there could be a joint river cleaning event. Several respondents have been cleaning the river themselves. However, those interviewees who pointed out the problem of littering said that it was not a very big problem and that everything was always cleaned.

In three cases, private land was used without permission. This was well accepted by one respondent, but two respondents were upset of their property violation. The interviewees took measures to prevent this by installing the necessary signs and it had been less of a problem since then. Muddy landing points and the finish were also pointed out.

Local community involvement in common event organizations strengthens social identity, cohesion, and a sense of well-being, which can increase the attractiveness of the area as a tourist destination (Nowak (2012; Reverte & Perez, 2017). Despite some complications, Võhandu marathon has a positive influence on locals well being and operates within the social carrying capacity of the local community, because of good communication by the organizers, off-seasonal activities, participants' heroic image among the locals and local community benefits.

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Landscapes of national importance and recreation: GIS-based analysis

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Abstract

Introduction

Marc Antrop and Veerle van Eetvelde (2017) used historical narratives to illustrate the holistic nature of landscape closely linking the physical world with related experiences in the eyes of the visitor. The landscape is like a repository that stores events important to the society on the one hand, and inspires providing experience within the connection to the past on the other. People share personal stories and place histories without particularly influencing others, however, both locals and visitors from outside (tourists) recognize that in their perception exist something special and characteristic of the specific places, denoted by the concept Genius loci (Alumäe et al., 2003). Stobbelaar and Pedroli (2011), linked "perceived uniqueness of a place" with landscape identity, additionally Egoz (2013) emphasizes the "basic need to belong". Several authors have worked to develop conceptual model of the interaction between identity and landscape (e.g. Ramos et al., 2016). The recognition and (unconscious) assignment of meaning of heritage values, when emphasized by outsiders (strangers), increases attachment to a place by locals.

One of the aims recognizing landscapes of national importance is to encourage public authorities to adopt policies and measures at local, regional and national level for protecting, managing and planning landscapes throughout national states. It covers unique and outstanding landscapes among the ordinary ones, that not only determine the quality of people's living environment, but have its contribution to the national identity and are significant resource of tourism and recreation. Different approaches have been used so far internationally identifying the landscapes of national importance, assessing their characteristics, structure and landscape elements recognizing that both – quantitative assessment and expert judgment should be involved for this task. Involvement of society in this process becomes increasingly important not only to validate the results, but also to raise awareness and increase participation in active initiatives.

Objective

To assess significance of tourism and recreation aspects for the identification of landscapes with national value.

Methodology

Landscape and tourism intersect in matters of national identity, as both parties ("us" as a community and "them" as travellers) have a genuine interest in discovering and highlighting the uniqueness of a place and regional differences (Knudsen, Metro-Roland & Soper, 2008). Using that frame, we made spatial analysis of tourism and recreational activities using GIS platform. We collected and structured quantitative data on the values of the natural and cultural heritage, recognition of uniqueness, outstanding identity and data from previous researches how society has perceived different places with higher aesthetic quality of landscapes or these with special meaning to them. Therefore, tourism and recreational activities (demand) related to the culture and nature of international or national scale becomes an important criteria distinguishing places with higher landscape importance. GIS-based mapping was used to determine landscape areas of national importance including values listed above, using a hexagon grid (100 ha each, 68,407 items), which covers entire territory of Latvia. The criteria for the research part to be quantified include five thematic sections: natural heritage, cultural heritage and historical evidence, appreciation of identity and community involvement (where tourism data have been used), uniqueness and just partly the landscape quality, which can be quantified from the infrastructure created to highlight the visual aspects and aesthetics of landscape granting it with wider accessibility.

Results and discussions

The analysis of GIS-based mapping showed a clear linkage between landscapes of national importance and tourism and recreation outdoor activities. Territories recognized with higher landscape values were highly visited. Visitor survey performed in 11 tourism destinations of Latvia as part of that study (involving over 2000 respondents) highlighted landscape aesthetics among TOP motivating factors of visiting these places. Specific infrastructure to ensure accessibility and better perception of the surrounding (including viewing platforms, towers, designated trails etc.) make them even more visited. Many researchers integrated society opinions identifying landscapes of national importance using surveys, voting or participatory GIS having various advantages of these methods. Spatial patterns of tourism and recreational mobility of the same society could be perceived as an active voting about these places – the same opinion demonstrated in action. That could be done just in automatized way by picking out most popular places, rather it should be matched to the objective of this identification process of highly valuated landscapes and in relation to the other criteria. E.g. one type of unique landscape of national importance couldn't be recognized by visitor data: areas with the highest degree of wilderness e.g. largest raised bog areas without accessibility. Tourists as strangers with their curiosity about certain places are not only strengthening sense of belonging and identity of local communities, but also provoking the locals to get more involved in outdoor recreational activities increasing the local consumption of places.

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