127 Changing visitor influx during the covid-19 pandemic. The case of Serra de Collserola Natural Park, Barcelona.

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Introduction

Proper and effective management of public use in protected natural areas (PNA) is closely linked to having an updated diagnosis of their state. The duty to conserve, implicit in these kinds of areas, requires having sufficient information to justify decision-making.

According to Leung et al. (2015), Cessford & Muhar (2003), between a long list of authors, three basic kinds of data need to be considered: 1) the influx of visitors, understood as the total number of users who visit the PNA annually; 2) the recreational, sports and tourist use of the area, which summarizes the number and distribution of user-visits, including the characterization of the different activities carried out during visits; and 3) the profile of the user-visitors.

In the case of peri-urban PNAs, such as the Serra de Collserola Natural Park (SCNP), which is also a Natura 2000 Special Area for Conservation (SAC), this kind of information is even more necessary and relevant due to the intense pressure these sites tend to experience, not only in terms of visitor influx but also in terms of the diversity of uses that occur there and also considering their importance from a nature conservation perspective.

The SCNP occupies an area of about 8,259 hectares (seventeen kilometers long and six kilometers wide) and is located in the middle of one of the densest urban areas on the Mediterranean coast. It was declared as Natural Park in 2010. More than 350 km make up the main trail network, including large and small forest tracks. Unlike other natural parks in the environment, SCNP includes Natural Reserves within its territory, which increases the level of complexity in the management of public use in such highly populated environments. According to data available, during 2019 SCNP received almost 5.000.000 visits (Farías & Morera, 2020).

In this context, during 2017, 2018, and 2019 the SCNP Consortium carried out the first diagnosis related to the influx, frequentation, and characterization of the users-visitors of this Natural Park-SAC, including the development of a robust and effective monitoring protocol based on the use of eco counters.

One year later, this monitoring system was especially relevant when the COVID-19 pandemic led to the majority of the countries imposing lockdown measures and limiting people's movement throughout 2020, changing their usual behavior and generating some overcrowding in specific areas. The purpose of this paper is to examine the utility of this monitoring protocol for measuring changes in visitor use that emerged due to COVID-19.

Methodology

The design of the influx protocol system was based on the consideration of three main steps: 1) identification of the main entry or exit points of the Park; 2) typification of the main movement flows and 3) installation and calibration of the eco counters.

As a result of the implementation of 120 fieldwork units carried out in three phases. The final protocol system was based on, as shown in Figure 1, the consideration of 46 main entry or exit points (park gateways), grouped visitor flux in 10 main unit sectors (drive units), and the installation of 13 eco counters.
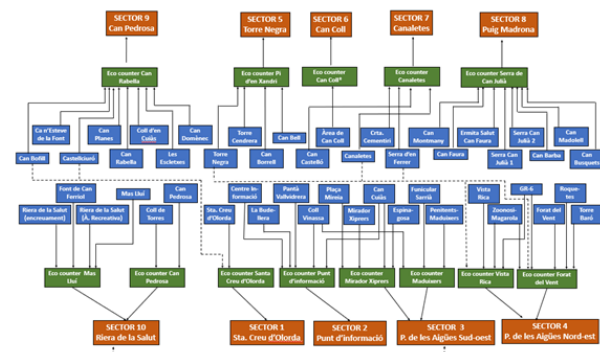
Figure 1. General flow chart between sampling points and eco counters

The following equation was used to calibrate data obtained from the eco counters.

$$Calculation\ formula = \frac{VDC - VDT}{2} + VDT + VND + VNA + VL$$

VDC: Visitors Detected by the Counter
VDT: Visitors Detected by the counter that only cross it once
VND: Visitors Not Detected by the counter
VNA: Visitors accessing to the park by Nearby accesses
VL: Visitors with Local activities (extraction of products)

Results

The comparison of the results obtained during the 2019-20 period showed important changes in terms of influx, distribution, and uses. According to eco counter data, the SCNP showed a record number of visits during 2020, calculated at 6.276.322 visits. This figure is more than 1.200.000 visits higher than during the previous year, which represents an overall increase in visitors of 26%. This increase is even more significant if we consider that during March and April, as a result of the initial COVID-19 lockdown, the influx into the Parc territory was substantially reduced, with a peak decrease in April of 70%. Table 1.

Month	Number of visits		% variation 2019-20		
	2019	2020	Global influx	MTB activity	Foot activity
January	351933	397705	13%	9%	3%
February	378996	466143	23%	13%	6%
March	485830	275705	-43%	-51%	10%
April	426354	126763	-70%	-78%	20%
May	498737	908956	82%	105%	-2%
June	450134	714603	59%	71%	0%
July	369363	526104	42%	38%	2%
August	322028	385176	20%	28%	-4%
September	494565	603951	22%	21%	2%
October	453508	684164	51%	54%	2%
November	376415	630187	67%	108%	-11%
December	380917	577997	52%	69%	-6%
Total	4988781	6297454	26%	32%	20%

Table 1. Comparison 2019-20 influx in SCNP

A more detailed analysis of the variations in influx over the year shows other substantially relevant alterations linked to the mobility restrictions experienced during 2020. An unprecedented increase during May, just after the end of lockdown measures, of almost half a million visits, made it clear that the overall behavior of use of the Park had been altered in response to a cumulative need for outdoor recreation and nature.

During May the Natural Park registered a total of 908.956 visits, which represents an increase of about 82% over the previous year, followed by another peak located in November, with a 67% increase, which matches with the first month of county-level perimeter closure. It is also worth highlight that mountain biking was the visitor activity which increased most during this year, with an overall increase of 32%, while visits on foot increased by only 19%.

The Park entry points located close to the city of Barcelona: Puig Madrona, Can Rabella, and Riera de la Salut, were the ones which registered the highest increases in visits, thus confirming, the importance of these kinds of PA as important places for recreation and contact with nature, and especially for the inhabitants of urban environments.

Conclusion

The ever-increasing number of visitors raises significant challenges for nature conservation in peri-urban PNAs. In consequence, there is an urgent need for suitably managed monitoring of visitors to Natural Parks, which must be replicable year by year, using a simple system with correct calibration.

The results shown in this paper demonstrate the possibility for achieving three different kinds of data: number of visits, territorial distribution, and changes in visitor use, thanks to a very simple system based on a relatively low number of eco counters (13 in total), providing these are correctly interconnected.

References

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