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# Analysing the impact of communication and public participation on the acceptability of Germany's Black Forest National Park



Melina Fienitz<sup>a</sup>, Maria Busse<sup>b,\*</sup>, Meike Fienitz<sup>b</sup>, Stefan Heiland<sup>a</sup>

<sup>a</sup> Technische Universität Berlin, Department of Landscape Planning and Development, Sekr. EB 5, Straße des 17. Juni 145, 10623 Berlin, Germany <sup>b</sup> Leibniz Centre for Agricultural Landscape Research (ZALF), Eberswalder Str. 84, 15374 Müncheberg, Germany

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# ABSTRACT

For successful management and development of protected areas in general, and national parks (NPs) more specifically, a high acceptance by local residents, interest groups, and policy makers is needed. Communication and participation as influencing factors of acceptability have mostly been analysed for already established NPs. Until today, there is little evidence as to whether communication and participation are relevant factors for gaining acceptance of NPs in their establishing phase. Using survey data regarding Black Forest NP (Germany), our aim is to ascertain how the NP administration's communication and the participatory opportunities it provided affected the NP's acceptability before its establishment in 2014, and how acceptability changed thereafter. The main results are: In 2014, half of the local population accepted Black Forest NP; and over the course of five years, this number increased only slightly. Regarding the information provided by the NP administration through different means of communication, almost half of the respondents felt (very) well-informed at both queried times. The public participation process accompanying the NP's establishing phase was rated as good or very good by roughly one third of the respondents; while another third evaluated it as bad or very bad. The general participation efforts by the NP administration were evaluated mostly critically. However, respondents who showed a positive attitude towards the NP in 2019 were those who felt well-informed, rated the material as informative, the NP's communication as honest, and the participation process as positive. Respondents were more likely to report a positive change within acceptability if they felt well-informed, had a positive impression of the NP rangers, and rated the general participation efforts as positive. These results are an important step toward better understanding the complexity of attitude formation, and they provide statistical evidence that communication and participation can influence the acceptability of protected areas from their early beginnings. Beyond our results regarding Black Forest NP, we also draw conclusions and recommendation of broader relevance.

#### 1. Introduction

National parks (NPs) are an important pillar of nature conservation. As they protect large areas, they are especially valuable for the preservation of natural dynamics (Böhn, 2021; Hirschnitz-Garbers & Stoll-Kleemann, 2011). However, to ensure successful management and development of NPs, a high acceptance by local residents, interest groups (hunters, farmers, tourist associations, etc.), and policy makers is crucial (Europarc Deutschland, 2013; von Ruschkowski & Nienaber, 2016). Non-acceptance and opposition can lead to costly conflicts that may undermine conservation efforts (Harrison & Loring, 2020). As in

many other countries, plans to establish or expand NPs in Germany have not always met the approval of regional actors. For instance in 1997, local residents of affected communities protested vigorously against the expansion of the Bavarian Forest NP – Germany's oldest NP (Gerner et al., 2011). Nonetheless, the Bavarian authorities enforced the expansion, but latent conflicts continued, at least until 2012 (Europarc Deutschland, 2013). In some cases, protests can even prevent the establishment of NPs: Due to interests of private owners and conflicts about the park zoning, plans to establish a NP in the region Senne in Germany (Teutoburg Forest / Egge mountains) were discarded (von Ruschkowski & Nienaber, 2016).

\* Corresponding author. *E-mail address:* maria.busse@zalf.de (M. Busse).

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Taking into account the importance of local acceptance for the success of NPs, it becomes obvious why survey-based studies regarding the acceptability<sup>1</sup> of NPs are a common research topic, both globally (e.g., Himes, 2003; Leitinger et al., 2010) and in Germany (Hillebrand & Erdmann, 2015; Sieberath, 2007; von Ruschkowski, 2009). Some influencing factors are well known: According to a variety of authors (Cheng et al., 2020; Heiland, 1999; Hirschnitz-Garbers & Stoll-Kleemann, 2011; Mannigel, 2008; Schenk et al., 2007; Trakolis, 2001), important reasons for non-acceptance of protected areas are insufficient participation of regional actors in decision-making processes and shortcomings in communication. It is widely assumed that adequate communication and participatory processes have a positive impact on the acceptability of protected areas. However, the effect of communication and participation on acceptability has mainly been analysed and discussed in the context of already existing parks or protected areas (Buono et al., 2012; Cheng et al., 2020; Dovers et al., 2015; Gerner et al., 2011; Mannigel, 2008). There is less statistical evidence whether communication and participation during the establishing phase of protected areas are equally crucial factors influencing the acceptability. Studies which provide information on public participation in planned or recently established NPs are rather descriptive (Depraz & Laslaz, 2017; Héritier, 2010; Stringer et al., 2006). Other studies have examined public participation during the selection process for Natura 2000 sites but without analysing correlations between acceptability and participation (Brescancin et al., 2018; Eben, 2006; Grodzinska-Jurczak & Cent, 2011).

Considering these research gaps, the objective of this paper is to statistically analyse if communication with local residents and their participation in decision-making processes during the start-up phase of a recently designated NP indeed positively affect acceptability. The survey data collection was conducted in Black Forest NP, in Germany, in the context of a master thesis (Fienitz, 2019). Black Forest NP is a suitable case study region because its establishment in 2014 was preceded by a public debate that was both controversial and well-covered by the media. Furthermore, a previous study on its acceptability (Blinkert 2015) was conducted in 2014, making comparison of our results possible. Whereas Blinkert (2015) surveyed inhabitants from the whole state of Baden-Wuerttemberg, this study focusses on the municipalities that directly border the NP. This allows analysing if there is an "acceptance crater", meaning lower acceptance by locals from the most affected municipalities and higher acceptance by locals from more distant communities (Rentsch, 1988; von Ruschkowski & Nienaber, 2016).

Using data from the survey carried out in 2018/19, our aim is to answer the following overall research question: How was Black Forest NP's acceptability affected a) by the communication of the authorities that were responsible for its establishment and, lateron, of the NP administration, and b) by the participatory process that accompanied the park's establishment?

More specifically, we ask:

1. What are locals' attitudes towards Black Forest NP and did attitudes change over time (between 2014 and 2018/19)? What are the reasons?

2. How do locals use and evaluate the communication of the authorities that were responsible for the establishment of the NP and, lateron, of the NP administration<sup>2</sup>?

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- 3. How do locals evaluate the public participation process during the establishing phase of the NP and in general?
- 4. Are there any correlations between locals' evaluation of information and public participation and their attitudes towards the NP?

We first introduce the central terms of this study, the case study region, and the methods that were applied. Afterwards we describe our results according to the above mentioned research questions. Finally, we discuss our results in relation to national and international studies and draw conclusions, including recommendations.

# 2. Central terms, case study region, methods

# 2.1. Acceptability, communication, public participation

The term acceptability does not have a coherent definition. Here it is understood "... as a process of collective assessment of a given project [...], integrating plurality of actors and spatial scales as well as involving the specific trajectory (past and future) of a political group or policy (community/society)" (Fournis & Fortin, 2017). Acceptability studies can examine attitudes (value-oriented assessments without taking actions) or actions resulting from attitudes (such as visiting the NP or activities in the NP) (Blinkert, 2015; Busse & Siebert, 2018). This study surveyed the attitudes of the local population towards Black Forest NP. Attitudes can range from opposition and non-acceptance via tolerance and conditional acceptance to high acceptance or intended active engagement (Busse & Siebert, 2018; Sauer et al., 2005). Consequently, unlike other studies (e. g., Leitinger et al., 2010; Schenk et al., 2007) we understand "acceptance" only as a (more or less) positive attitude that does not describe the entire range of possible decisions, which are all included in the term acceptability as used in our paper. When we talk about changes within acceptability in the following, we actually mean shifts between the different attitudes covered by acceptability, ranging from opposition or rejection to acceptance or active engagement. Moreover, acceptability has a temporal dimension by being an ongoing process. Therefore attitudes, such as acceptance, may change over time if important conditions change or social learning processes take place (Busse et al., 2019; Hitzeroth & Megerle, 2013; Wolsink, 2010). To analyse such a change of attitudes, this study asked not only about locals' attitudes in 2014 (when the NP was established) but also about attitudes at the time of the survey (2018/2019).

In line with different studies (Schenk et al. 2007, Busse et al. 2019, and Hirschnitz-Garbers & Stoll-Kleemann 2011), we assume that *communication* and *public participation* are important factors that positively or negatively influence the acceptability of protected areas or nature conservation measures. The term *communication* includes oneway communication, that is information dissemination to a passive recipient, and two-way communication with mutual information exchange (Brulle, 2010; Rowe & Frewer, 2000). In this study, we mainly focussed on one-way communication by surveying how locals assess information about Black Forest NP that was provided by the NP administration, the issues about which locals would have liked to be informed, and the information sources that they used. *Communication* is closely connected to many typologies of *public participation* (Mannigel,

<sup>&</sup>lt;sup>1</sup> For explanations regarding the terms "acceptance" and "acceptability" see section "Acceptability, communication, public participation".

 $<sup>^2\,</sup>$  The NP administration was established along with the NP; thus, before 2014 communication with the local population and implementation of the participatory process were conducted by the Ministery for Rural Areas and Consumer Protection of the Federal State Baden-Württemberg (Ministerium für Ländlichen Raum und Verbraucherschutz - MLR). To simplify, we use the term NP administration throughout the remaining paper to refer to both the NP administration and the authorities that were responsible before 2014.

2008; Reed et al., 2018). For instance, in the wheel of participation by Reed et al. (2018), one-way communication is one of four possible modes of participation. All of these modes - communication, consultation, deliberation and co-production - can be performed top-down or bottom-up as depicted in Fig. 1. Rather than always seeking for coproduced decisions in bottom-up initiatives, the selection of an appropriate mode of participation or of a participatory strategy highly depends on the context (including legal settings, power relations between actors, available resources) and the purpose for which it is needed (Reed et al., 2018). For instance, the enlargement of the Carpathian Biosphere Reserve was organized as a top-down process in which stakeholders received information and were consulted. The ultimate decision on the enlargement lay with the national government while local stakeholders were not represented in the management board (Wallner et al., 2007). An example of a top-down approach including deliberative elements and co-production is the case of decentralizing the management of Norwegian NPs (Fedreheim & Blanco, 2017; Reed et al., 2018). To reduce conservation conflicts and ensure that local knowledge and interests were considered the decision-making authority was transmitted to a NP board which involves regionally elected politicians, Sami representatives, and also property owners. These "NP boards hold management responsibilities but lack power to change conservation regulations" (Fedreheim & Blanco, 2017). Different modes of participation can be found also in bottom-up processes: Grassroots initiatives on biodiversity

protection (e.g. savethebee.com) apply bottom-up one-way communication by carrying out political campaigns to raise public awareness. In contrast, bottom-up deliberation and co-production was pursued in the introductory process of charters in the three French Alp NPs. The charter defines common general orientations for the NPs and was developed in intensive co-operation with the adherent municipalities (Depraz & Laslaz, 2017). While each approach has different strengths, there is no universal set of advantages and disadvantages of each approach, as what is seen as beneficial and what as detrimental again depends on one's perspective and goals (Reed et al., 2018, see also "Discussion"). However, the choice of applying a certain participation mode can rely either on conscious decisions or on nonreflective assumptions why people should be involved. From a theoretical point of view, the objectives of involving people are categorized into a) participation as a means for legitimizing actions, gaining high acceptance or resolving existing conflicts and b) participation as an end for empowering people, promoting democratic decision-making, and social learning (Mannigel, 2008). In this study, public participation is operationalized by asking local people if they knew about and took part in the public participation process during the establishing phase of Black Forest NP and how they evaluate that.



Fig. 1. The wheel of participation shows that the four modes of participation (inner wheel) can be combined either with top-down or bottom-up agency (outer wheel): top-down one-way communication or consultation; top-down deliberation or co-production, bottom-up one-way communication or consultation; bottom-up deliberation or co-production (). adapted from Reed et al. 2018

# 2.2. Case study region - Black Forest NP

Black Forest NP was established at the beginning of the year 2014. It is located in southwestern Germany, in the federal state of Baden-Wuerttemberg (Fig. 2). Black Forest NP is divided into two parts – a smaller northern part, named "Hoher Ochsenkopf" (2,477 ha) and a larger southern part, "Ruhestein" (7,615 ha) (Böhr, 2014). The whole Black Forest region is widely known for its vast forest areas. The aim of Black Forest NP is to protect and develop the natural mixed mountain forests dominated by spruce (*Picea abies*), beech (*Fargus sylvatica*), and fir (*Abies alba*) trees, growing on nutrient-poor red sandstone soils (Fig. 3). Additionally, highly valuable habitats and typical cultural landscape elements are the mountain heaths and pastures ("Grinden"), plateau mires, and high-mountain lakes ("Karseen").

A highly controversial discussion and public involvement process of several years took place during the NP's establishing phase, before its official designation. In 2011, more than 200 information and dialogue

events where held, but also guided tours and a "citizen forum" with 350 participants took place. In 2012 and 2013, local residents as well as civic, business, and political actors were invited to participate via an online platform. Their contributions were included in the deliberative meetings of regional working groups, which took place in 2012. These groups dealt (among others) with the following topics related to the NP: Territorial zoning, pathway concept, traffic concept, and wildlife management. The results of the group meetings were included in an independent expert-based evaluation report. This evaluation report was presented to a public audience in 2013, who could comment on it via the online platform (Beteiligung zum Nationalpark Schwarzwald, o. J.; Böhr, 2014). On the basis of all these results, the Council of Ministers (State of Baden-Württemberg) released a draft law on the setting, legal framework and administrative structure of the NP which then underwent a two-month public consultation process. The draft law was adapted accordingly and the State Parliament passed the law for the establishment of Black Forest NP on November 28th, 2013. In 2014, the



Fig. 2. Location of Black Forest NP in Germany.



Fig. 3. A panoramic view of Black Forest NP and crossed out "NLP" (=National Park), written on a road to denote local rejection of the NP. (Photos: Fienitz, left; Heiland, right).

NP administration, the NP council (mainly consisting of political representatives from the Federal Ministery for Environment, Climate and Energy and from adjacent municipalities and counties), and the NP advisory board started their work and initiated the development of the NP plan, consisting of 14 modules. Especially the modules zoning, trail concept, traffic concept, and wildlife management were subject to an intensive participation process involving experts and citizens. The results of the above mentioned regional working groups were included in this process. In 2018, the NP plan was completed and adopted by the National Park Council.

The public participation process and the whole debate about the establishment of the NP raised considerable attention in the media and the wider regional public. Thus, the topic had become highly relevant in the region: some people saw the NP as a "great opportunity", but others as a "major risk" (Blinkert, 2015). Although Blinkert does not specify these opportunities and risks, the following can be assumed from the experience of the authors on site: Opportunities are especially seen by nature conservationists and the tourism sector. The danger of bark beetle infestation in spruce forests is associated with negative consequences for the wood processing industry and tourism. Generally, the restrictions for the local population and new prohibitions and rules for land users and tourists can be perceived as risks.

# 2.3. Methods

# Questionnaire and data collection

As data collection method, a quantitative survey using a standardized questionnaire was conducted. This method is suitable to gather a large quantity of information in a short period of time, whereas respondents remain anonymous. It is deductively oriented and aims at identifying generalizable patterns within the data sample (Engel, 2015). To enable comparability, the questionnaire is roughly based on the questions and categories from other studies on the acceptance of German NPs (Blinkert 2015, Sieberath 2007, Hillebrand und Erdmann 2015, Ruschkowski 2009). Additionally, the questionnaire design was adjusted to the specific context conditions of Black Forest NP to match the research questions. The NP administration gave feedback on an earlier version of the questionnaire, and a pre-test was conducted. The final questionnaire consisted of 19 content-related and seven demographic questions (Annex 1). The content-related questions comprised the following aspects, in line with the research questions presented in the introduction:

- a) Acceptability of Black Forest NP at the time of its establishment in 2014 (the participants' individual memories of their attitudes in 2014)
- b) Acceptability (also in terms of attitudes) of Black Forest NP at the time of the survey in 2018/19
- c) Respondents' evaluation of the NP administration's communication

d) Respondents' evaluation of the public participation process during the establishing phase of the NP

Acceptability of the NP was retrieved through ordinal scaled and closed questions; evaluation of the NP administration's communication and of the public participation processes was additionally retrieved through respondent's evaluation of pre-defined statements. For the ordinal-scaled and closed questions, a five-point Likert scale was used. A middle category was included to allow respondents to express neutral attitudes (Engel, 2015). Two open-ended questions with text boxes gave participants the opportunity to add personal statements that could not be covered by closed questions (e.g., regarding reasons for attitude change).

As the aim of this study was to analyse the acceptability among the most affected local population, the survey was conducted in six municipalities located near the NP. They were chosen after consultation with the NP administration and represented communities on different sides of the NP (see Fig. 4). To facilitate the recruiting process (see also below), the accessibility of the communities was a further selection criterion.

Responses were collected through a doorstep survey at different day times on working days as well as weekends, which ensured a random selection of the survey participants. Several streets in each community were selected randomly, and in these streets every third house was contacted. In addition to completing the questionnaire on the spot, respondents had the opportunity to complete it later on paper or via an online link. Additionally, questionnaires were placed in the following public spaces: six medical offices, two parishes, two stores, one hair salon. These locations were chosen because they are frequented mainly by local residents. Furthermore, none of the places was expected to create a bias in respondents, as would have been the case if questionnaire sheets had been distributed in the NP's visitor centre. The doorstep data was gathered within roughly three weeks in November 2018. Any additional response sheets that were transmitted in person, via mail, or online until February 3rd, 2019, were also included in the analysis.

Data analysis

A total of 115 completed questionnaire sheets could be analysed. The content of these questionnaires was digitalized, and data curation was performed afterwards. Descriptive statistical analyses were conducted in Excel; statistical tests were performed in R. The Kruskal-Wallis test was used for nominally scaled data and the Spearman's rank correlation for ordinally scaled data. To test for statistical significance an  $\alpha$  value of 0.05 was defined, meaning that statistical significance was assumed at a significance level of p < 0.05.

Characteristics of the dataset

Table 1 depicts gender, age, education, and origin of the 115 respondents. Compared to the total population of the study region (the surveyed communities) younger respondents are underrepresented in the sample, while older respondents are overrepresented (Table 2). Due



Fig. 4. Map showing the communities where the survey was conducted. Copyright by Nationalpark Schwarzwald 2013, modified.

to the relatively small size of the sample, no weighting of the sample was conducted.

The majority of the respondents live in the selected municipalities, however, due to the data collection method some individuals from other communities also participated in the survey (Fig. 5). Thirty of the 115 respondents (26.1%) work in forestry, agriculture, the wood industry, tourism, or nature conservation (Table 3). These occupational fields are of special interest for our analysis because they are particularly affected by the NP.

#### Methodological limits

As in any survey, some methodological challenges need to be mentioned. The selection of participants has an impact on the validity of results: A) Although the doorstep recruiting process ensured a random selection it probably led to an overrepresentation of older people because the survey could only be conducted at different day times, but not very early or late. B) The public spaces to distribute the additional questionnaires were carefully selected, but unintended effects of preselection could not be completely avoided. However, comparing the responses that were obtained through the distribution in public spaces to those acquired through the doorstep survey did not reveal significant differences regarding attitudes or changes in attitudes toward the NP. The same applies to the demographic data. This supports the assumption that the public distribution did not lead to unintended effects.

A certain selection bias may have been introduced by the topic of the

study. After the heated and lengthy debates about the NP prior to its establishment, some residents may have been tired of the topic. Residents with a negative attitude towards the NP may have been particularly likely to decline participation as they may not have wanted to be confronted with an unpleasant topic. Indeed, this effect was observed during the doorstep survey, when some potential respondents refused to answer the questionnaire as soon as they heard the topic would be the NP. Moreover, a bias can be introduced if respondents reply in line with social desirability (Engel, 2015). Such effects were minimized by ensuring respondents' anonymity and conducting a written instead of an oral survey. Furthermore, the interviewer emphasized that the survey was conducted independently from the NP administration.

Regarding the question about attitudes in 2014, it has to be kept in mind that respondents were asked to recall their assessment of the NP five years earlier. Such retrospective statements might include distortions of memories of how a situation was perceived or assessed at an earlier time. This effect is comparable to the hindsight bias described by Fischhoff (1975). To definitely avoid such an effect, a longitudinal study between 2014 and 2018 would have been preferable but was not possible. However, a similar study to ours on the NP Eifel in Germany (Hillebrand and Erdmann 2015) showed that respondents' perception of their attitude changes was reliable since it was consistent with data from 2006 (Sieberath, 2007) and 2013 (Hillebrand und Erdmann, 2015).

#### Table 1

Composition of sample (n = 115) regarding gender, age, education, and origin (own data).

Male         52.           Female         43.           No response         4.           Age         -           < 20 years         0.           20–29 years         4.4	2 % 5 % 3 %
Female         43.           No response         4.           Age         -           < 20 years	5 % 3 %
No response         4.:           Age         -           < 20 years	3 %
Age         0.7           < 20 years	
< 20 years 0. 20–29 years 4.0	
20–29 years 4.6	7 %
•	6 %
30–39 years 8.2	2 %
40–49 years 12.7	7 %
50–59 years 32.7	7 %
$\geq$ 60 years 39.1	1 %
No response 4.3	3 %
Education	
"Hauptschule" or "Volksschule" graduation certificate (graduated after grade 9)	1 %
"Mittlere Reife" or "Realschule" graduation certificate (graduated after 34.8 grade 10)	8 %
"Abitur" or "Hochschulreife" (general or subject-specific higher education 10.4 entrance qualification, graduated after grade 12 or 13)	4 %
College or university degree 24.5	3 %
Ph.D. 3.5	5 %
No response 7.8	8 %
Origin	
Born / raised in the region 78.3	3 %
Moved there more than 20 years ago 13.0	0 %
Moved there<20 years ago 7.0	0 %
No response 1.7	7 %

# 3. Results

The results section is structured according to the research questions. Firstly, we report on the acceptability of the NP among the local population, and its change. Secondly, we present results on the respondents' evaluation of the NP administration's communication and the participatory process. These three subsections include descriptive statistical results. Lastly, we show the influence of communication and the participatory process on the acceptability of the NP using statistical tests and descriptive statistics.

#### 3.1. Acceptability of Black Forest NP among the local population

The acceptability of Black Forest NP was operationalized through the questions about a) the respondents' evaluation of the NP in 2014 and at the time of the survey and b) the extent of changes in acceptability, with reasons. Furthermore, the influence of demographic data on both was analysed.

In 2014, half of the local population accepted Black Forest NP, whereas about a quarter rejected the NP (Fig. 6). In 2018/19 more respondents showed a high acceptance of the NP while fewer respondents had a neutral or negative attitude. The majority did not change their attitude over time. However, a total of 41 respondents (35.65%) evaluated the NP differently in 2014 than in 2018/19. Table 4 shows the change within acceptability (sorted by the direction of change and the

#### Table 3

Occupational field. Own data (n = 115, including multiple answers).

Occupational field	Percentage (%)	Absolute numbers
Tourism	13.0	15
Forestry	8.7	10
Agriculture	7.0	8
Nature conservation	2.6	3
Wood industry	2.6	3
Politics	0.9	1
Occupation not connected with local land	67.0	77
use		

#### Table 2

Comparison of composition of the sample and the population regarding age. Data from: Statistisches Landesamt Baden-Württemberg (2018) and own data (n = 110). \* The survey only adressed respondents who were at least 18 years old.

Age	0-20 years	20–29 y.	30–39 y.	40–49 y.	50–59 y.	$\geq$ 60 y.
Average in the study region (Population N) Sample n	18.68 % 2.73 % * (under-represented)	10.96 % 4.55 % (under-represented)	10.65 % 8.18 %	13.09 % 12.73 %	17.35 % 32.73 % (over-represented)	29.29 % 39.09 % (over-represented)



Fig. 5. Place of residence of the respondents. Own data, absolute numbers, n = 115.



Fig. 6. Acceptability of the NP, operationalized in the survey questions: "In the year 2014: How did you evaluate the NP's establishment?" and "How do you evaluate the NP's establishment today?" Own data (n = 115).

number of category steps) and the reasons for it.

Gender, age, education, origin, number of visits to the NP, or being acquainted with NP employees showed no statistically significant correlation with the acceptability of the NP or change within acceptability (Annex 2). But, as a Kruskal-Wallis test revealed, respondents living in communities near the NP (Mitteltal, Kniebis, Seebach) evaluated the NP more negatively (p = 0.001) and were more likely to describe a negative change of attitude (p = 0.026, Fig. 7) than those living somewhat further away (in Bad Rippoldsau-Schapbach, Bad Peterstal-Griesbach, Bühl-Neusatz).

Regarding the occupation of respondents, employees in tourism evaluated the NP more positively in comparison to the total sample, while respondents from agriculture and forestry were more sceptical (Fig. 8). However, this correlation only appeared as statistically significant for forestry employees (p = 0.030). Concerning the change within acceptability, only respondents working in tourism showed a significant positive change within acceptability (p = 0.050, Fig. 8). Remarkably, the three occupational groups of special interest for this study all show different results regarding change of attitude compared to the total sample (Fig. 9).

In addition to the direct questions, respondents were asked to evaluate the NP by evaluating a set of pre-defined statements (Fig. 10). The highest agreement was received by the statement "The NP administration does a good job". The NP staff and rangers also got positive ratings. The statements related to communication and participation are described in the respective subsections.

# 3.2. Evaluation of the NP administration's communication

Respondents' evaluation of the NP administration's communication was compiled through questions regarding information sources, the level of information provided by the NP administration, the quality of communication, and topics about which the respondents would like to be informed. The results show that local people mostly obtained information regarding the NP through the media and through material distributed by the NP (Fig. 11). The NP's website, the visitor centre, and relatives, friends, and co-workers were also frequent sources of information. Other information sources were named less frequently.

Slightly less than half of all respondents (44 %) felt very well or well informed by the NP administration, both before the NP's establishment and at the time of the survey (2018/19) (Fig. 12). Just under a quarter

(22.7 %) stated they felt badly or very badly informed in 2014. The most significant change is the increase of the category "neither well nor badly informed" by roughly 12 %.

The information provided by the NP administration was perceived as informative and the corresponding pre-defined statement was positively evaluated by 80 % of the respondents (Fig. 10). However, only half of the respondents agreed or mostly agreed with the statement "I feel well-informed about the activities of the NP administration." Similarly, only 44 % agreed or mostly agreed that the NP administration communicates honestly.

Recalling the situation in 2014, 22.6 % of the respondents reported they had felt badly or very badly informed. Respondents would mostly have liked more information about restrictions caused by the planned NP (45.2 %). Fewer respondents mentioned lacking information regarding effects on nature (27.8 %), the landscape (24.4 %), the regional economy (23.5 %), and tourism (21.7 %). A few people distrusted the provided information: Four respondents remarked that they would not have liked more, but more honest information regarding restrictions, effects on nature, costs, and numbers of visitors. Two people criticized that the information had been one-sided and/or ideologically influenced. Additionally, one respondent stated that questions from citizens had been ignored.

Regarding the situation at the time of the survey, more respondents chose the neutral category and fewer reported feeling badly or well informed (Fig. 12). About half of all participants (49.6%) stated there were no topics about which they lacked information. 18.3% of respondents did not reply to the question, but just under a third of all respondents (31.3%) desired more information. Recurrent topics were the costs of the NP (11 respondents), the traffic concept (7 respondents), bark beetles (4 respondents), and the tasks of NP employees (2 respondents).

#### 3.3. Evaluation of public participation

In preparation of the NP's establishment, a local public participation process was conducted between 2011 and 2013, as described in detail in the section "Acceptability, communication, public participation". Here, we first summarize the survey respondents' familiarity with this process and their restrospective evaluation of it and then present their evaluation of the public participation more generally.

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#### Table 4

Change within acceptability of Black Forest NP for all respondents who reported such a change over time, with reported reasons. Own data (n = 41).

	Change within acceptability (2014 $ ightarrow$ 2018/19)	Number of respondents	Sum per category	Sum of positive / negative changes of attitude	Percentage of the total sample (n= 115)	Reported reasons for change (including multiple answers)
	Very bad $\rightarrow$ good	1	1			No reasons (n= 10);
	Neither good nor bad $\rightarrow$ very	1	6			added benefits (n=
	good	1				4); better provision
Positive change of attitude	$Bad \rightarrow good$	3	0			of information and
	Very bad $\rightarrow$ Neither good nor bad	2				discussion with
	Good → very good	6		25	21 74 %	others (n= 4);
	Neither good nor bad $ ightarrow$ good	6		25	21,74 /0	original sceptisism
	Bad $\rightarrow$ Neither good nor bad	3				and perception of
	Very bad → bad 3	3	18			top-down approach
						reduced (n= 4);
						increased attention
				for the region (n= 3)		
	Very good $ ightarrow$ good	3	. 12			Costs for building
	Good $ ightarrow$ neither good nor bad	3				and personnel (n=
	Neither good nor bad $ ightarrow$ bad	2		12		
	Bad → very bad	4				(trail closures, more
e	Very good $\rightarrow$ neither good nor		3			garbage & traffic)
tituo	bad	1				(n= 6); no reasons (n
of at	$Good \rightarrow bad$	2			13,91 %	= 4); misplanning /
ange	Good → very bad	1		16		misconception (n =
e chi						3); no truthful
gativ						communication
Neg			4			(n=2); top-down
			1			approach (n= 1);
						bark beetle (n= 1)
						lacking identification
						with NP (n=1)



**Fig. 7.** Change within acceptability of the NP by location of place of residence ("Further away from NP" = Bad Rippoldau-Schapbach, Bad Peterstal-Griesbach, and Bühl-Neusatz; "Very near to NP" = Mitteltal, Kniebis, and Seebach). The colour scale shows by how many steps on the five-point scale the acceptability deteriorated (-3 to -1) or improved (1 to 3), with 0 indicating no change, between 2014 and the time of the survey. Own data (n = 105).

Roughly a third of respondents rated the public participation process as good or very good while another third evaluated it as bad or very bad (Fig. 13). Over one third, or 45 respondents (39.1%), knew of at least one of the four thematic blocks for participation (territorial zoning, pathway concept, traffic concept, wildlife management). Best-known was the option to participate in the development of the pathway



Fig. 8. Evaluation of Black Forest NP at the time of the survey by occupation. Own data (n = 110, without "no answer / don't know" responses).



**Fig. 9.** Change within acceptability of the NP by occupation. The colour scale shows by how many steps on the five-point scale the attitude deteriorated (-3 to -1) or improved (1 to 3), with 0 indicating no change, between 2014 and the time of the survey. Own data, (n = 108, excluding "no answer / don't know" responses).



Fig. 10. Evaluation of pre-defined statements. Excluding "no answer / don't know" responses. Own data.

concept, closely followed by the traffic concept (Fig. 14). Eighteen respondents stated they had participated in the development of the pathway concept; the highest number of all thematic blocks. In total, 27 respondents (23.5%) had participated in at least one of the thematic blocks.

Two thirds of those who had taken part in at least one thematic block (n = 27) were very satisfied or satisfied with it. Six respondents (22.2%)

were rather or very dissatisfied. The most frequent reason for discontent was that participants were unhappy with the results (nine respondents). Six respondents stated that their points had not been included as much as they had hoped, and three respondents felt their interests had been ignored. The pre-defined statements show a similar picture: The highest share of disagreement (fully disagree or partly disagree) was identified for "The population is sufficiently included in the NP administration's



Fig. 11. Responses to question: "Which information sources did you already use to learn about the NP?" Own data (n = 115, including multiple answers).



Fig. 12. Perceived level of information in 2014 and at the time of the survey. Responses to questions: "How well informed did you feel about the planned NP before its establishment in 2014?"; "How well informed do you currently feel about the NP, through the NP's channels (e.g. homepage, visitor centre)?" Own data (n = 115).

decisions" (56 %) and "The NP administration takes citizens' opinions and needs seriously" (49 %, Fig. 10).

# 3.4. Communication and public participation as factors influencing the acceptability of the NP

In addition to the previous descriptive statistics, statistical tests were conducted to examine the extent to which the acceptability of the NP and the change within acceptability correlate with the respondents' evaluation of communication and public participation.

Statistically significant correlations appeared for the following items

#### (Table 5):

1)Respondents who felt better informed in 2014 and/or in 2018/19 also had a more positive attitude towards the NP at the time of the survey (each p < 0.001).

2)Respondents who perceived the information provided by the NP as informative, who felt well-informed about the activities of the NP administration, and who perceived the administration's communication as honest demonstrated a more positive attitude towards the NP (p < 0.001).

3)Respondents who evaluated the thematic block for participation in which they took part more positively were also more likely to display a



Fig. 13. Evaluation of the public participation process during the establishing phase of the NP. Own data, n = 115.



Fig. 14. Familiarity with and participation in thematic blocks for participation. Own data, n = 45 for familiarity and n = 27 for participation, multiple answers were possible.

positive attitude towards the NP at the time of the survey (p < 0.001).

4)Respondents giving a positive evaluation of any pre-defined statements (about the NP administration's work performance, the communication, or public participation) showed a positive attitude towards the NP (p < 0.001 for all statements).

Neither knowing about nor taking part in a participatory process were significantly correlated with attitudes towards the NP, but there is a correlation between the evaluation of the participatory process and the attitudes. This indicates that it is not the participatory process itself which forms the attitude, but how respondents evaluated it (see also "Discussion").

Regarding change within acceptability, a slightly different picture emerged and only a few statistically significant correlations were identified (Table 6). Respondents were more likely to report a positive change within acceptability if they 1) felt well-informed through the NP administration (p = 0.007); 2) had a positive impression of the NP rangers (p = 0.040); 3) felt that the NP administration takes citizens seriously (p = 0.007); and 4) held the opinion that the NP administration sufficiently includes the local population (p = 0.033).

#### 4. Discussion

In this section, we discuss our main results and compare them with previous studies on the acceptability of Black Forest NP and with studies on other NPs. The section is structured according to our research questions. At the beginning of each paragraph we provide a short summary of the results that will be discussed and we also derive practical recommendations. 4.1. Acceptability of NPs and change within acceptability over time (first research question)

According to our study, more respondents were in favour of the establishment of the NP than against it. This attitude improved slightly between 2014 and the time of the survey (2018/2019). Only a few respondents provided reasons for the positive change. Generally, the respondents stated that the NP administration does a good job. In line with our results, two previous studies (Black Forest National Park 2019, Blinkert 2015) also showed growing support for Black Forest NP. Although these studies' methods differ from ours, the general tendencies of the results are quite similar. Furthermore, our study revealed that respondents who live very near the NP have a more negative attitude towards it. This matches Rentsch's (1988) description of a "crater of acceptance" that displays lower acceptance with increasing proximity to a NP. In contrast, Blinkert (2015) could not clearly identify a crater of acceptance for Black Forest NP. He even disproved the "acceptance crater" hypothesis for the variables "level of attention for the NP" and "use of the NP (visits)", which he used to measure the acceptance. In conclusion, the "acceptance crater" can be seen as a simplified hypothesis. The reality seems to be more complex which calls for further detailed analyses.

Demographic data (gender, age, education, origin) did not significantly correlate with the acceptability of Black Forest NP. In contrast to this, the study of Black Forest NP (2018) found that people with a high educational degree evaluated the NP much more positively than respondents with a lower educational degree. Considering the occupation of respondents, only forestry was significantly correlated with a more negative evaluation of the NP. This matches results of Hillebrand and Erdmann's study on the Eifel NP in Germany. However, they discovered even stronger rejection among farmers, a finding that did not emerge in

#### Table 5

Results of statistical tests of the correlation between the acceptability of the NP in 2018/2019 and respondents' opinions regarding information and participation. p-values < 0.05 are marked by \*, p-values < 0.01 by \*\* and p-values < 0.001 by \*\*\*.

Variable 2	Test	<i>p</i> -value	
Information in 2014	Spearman	<	***
	-	0.001	
Information provided by the NP in 2018/2019	Spearman	<	***
		0.001	
Evaluation of public involvement before the	Spearman	<	***
establishment of the NP		0.001	
Knew of at least one participatory process	Kruskal-	0.095	
	Wallis		
Took part in at least one participatory process	Kruskal-	0.675	
	Wallis		
Evaluation of the participatory process in which	Spearman	<	***
the respondent took part		0.001	
Evaluation of pre-defined statements:			
"The information provided by Black Forest NP is	Spearman	<	***
informative."		0.001	
"The staff of the NP seems competent."	Spearman	<	***
		0.001	
"I have a positive impression of the NP rangers."	Spearman	<	***
		0.001	
"I feel well-informed about the NP	Spearman	<	***
administration's activities."		0.001	
"I perceive the NP administration's	Spearman	<	***
communication as honest."		0.001	
"The NP administration takes citizens' opinions	Spearman	<	***
and needs seriously."		0.001	
"The population is sufficiently included in the NP	Spearman	<	***
administration's decisions."		0.001	
"The NP administration does a good job."	Spearman	<	***
		0.001	

#### Table 6

Results of statistical tests of the correlation between change within acceptability of the NP since its establishment and evaluation of statements about communication and participation. p-values < 0.05 are marked by \*, p-values < 0.01 by \*\* and p-values < 0.001 by \*\*\*.

Variable 1: change within acceptability

variable 1. change within acceptability			
Variable 2	Test	<i>p</i> -value	
Information in 2014	Spearman	0.175	
Information provided by the NP in 2018/2019	Spearman	0.007 **	
Evaluation of public involvement before the establishment of the NP	Spearman	0.484	
Knew of at least one participatory process	Kruskal- Wallis	0.616	
Took part in at least one participatory process	Kruskal- Wallis	0.095	
Evaluation of the participatory process in which the respondent took part	Spearman	0.463	
Evaluation of pre-defined statements:			
"The information provided by Black Forest NP is informative."	Spearman	0.910	
"The staff of the NP seems competent."	Spearman	0.081	
"I have a positive impression of the NP rangers."	Spearman	0.040 *	
"I feel well-informed about the NP administration's activities."	Spearman	0.253	
"I perceive the NP administration's communication as honest."	Spearman	0.068	
"The NP administration takes citizens' opinions and needs seriously."	Spearman	0.007 **	
"The population is sufficiently included in the NP administration's decisions."	Spearman	0.033 *	
"The NP administration does a good job."	Spearman	0.027	

our study. One reason for this could be that agriculture plays a smaller role in the Black Forest region than it does in the Eifel region. Regarding tourism, our study revealed that people working in this field were more

likely to accept the NP (already in 2014) and also to experience stronger positive changes of acceptability than the total sample. However, surveys in the Eifel NP in 2006 and 2013 did not detect similar effects (Hillebrand and Erdmann 2015). Based on literature (Alkan et al., 2009; Boumaour et al., 2018; Hirschnitz-Garbers & Stoll-Kleemann, 2011; Nastran, 2015; Schenk et al., 2007), we hypothesise that land users such as farmers and foresters who fear to experience a loss of economic and other benefits due to the NP's restrictions on land use are more likely to reject this protected area than others. Schenk et al. (2007) observed similar reactions in their study on acceptance of conservation measures, explaining that people show negative attitudes when their behavioural freedom is reduced due to the elimination of land use options and when at the same time the perceived importance of the threatened option is high. In contrast, locals who perceive benefits from the NP (such as people working in the tourism sector) tend to have a more positive attitude towards the protected area. Thus, providing benefits for locals and communicating these benefits is a crucial factor for the long-term acceptability of protected areas (Leitinger et al., 2010).

# 4.2. The role of communication (second and fourth research questions)

Our study revealed that respondents who felt well-informed, who rated the material provided by the NP administration as informative and the NP's communication as honest were more likely to accept the NP at the time of the survey. Furthermore, taking part in information events, guided tours, and debates with others contributed to a more positive evaluation of the NP over time. Schenk et al. (2007) confirm that direct communication between the administrative staff of protected areas and locals (in their case, farmers) in form of site visits are a good way to gain acceptance and trust. However, acceptance is not easy to change and socalled "acceptance gaps" (Hillebrand & Erdmann, 2015) can emerge: A study on the Eifel NP showed that communities with higher acceptance experienced a growth in acceptance rates while communities with low acceptance experienced a further decline (Hillebrand & Erdmann, 2015). Our finding that respondents in the communities where acceptance of the NP was lowest in 2014 were more likely to report a negative change of opinion supports this idea. Moreover, the feeling that the NP administration held back information or that its communication was not honest had a negative effect on respondents' acceptability of the NP. Some respondents also commented that they perceived the financial costs of the NP as too high and did not understand why so much money and staff were needed. Hence, providing information on the funding of the NP, what the money is spent on, and the tasks of the staff could raise acceptance. Similarly, more information might also help to counterbalance other factors that respondents named as reasons for a negative change within acceptability, such as road closures (Hillebrand & Erdmann, 2015). However, Schenk et al. (2007) emphasise that it is important to provide not only more but well-targeted information at the right moment. In our study, some respondents felt misinformed, as requests for more honest information (not merely for more information) demonstrated. Such an impression can directly decrease acceptance, but also indirectly through its effect on the perception and evaluation of future communication. Nastran (2015) states that poor communication can even nullify previous positive achievements. In conclusion, how and which information is provided plays an important role. Similar to other studies (Boumaour et al., 2018; Busse et al., 2019; Eben, 2006; Nastran, 2015; Schenk et al., 2007), our results show that transparency, perceived truthfulness of communication, and trust in information providers have an impact on the acceptability. These aspects should be considered when communication strategies for protected areas are developed.

# 4.3. The role of public participation (third and fourth research questions)

Our results show that opinions about the establishing process of Black Forest NP varied; this, in turn, influences its acceptability. The correlation between rating the participation process in the establishing phase as positive and higher acceptance of the NP at the time of the survey was statistically significant. Also Blinkert (2015), Eben (2006), and Hirschnitz-Garbers & Stoll-Kleemann (2011) regard the satisfaction with public participation as a strong predictor for acceptance of NPs or protected areas. Further literature on acceptance and acceptability assumes that participation can increase acceptance even when the decisions are not in line with participants' preferences, as long as the process is perceived as adequate and fair (Busse et al., 2019; Tyler, 2000). This argument is confirmed by our study's results, too: Respondents who appreciated the NP administration's efforts to facilitate participation (see Fig. 10: pre-defined statements) evaluated the NP more positively. Nonetheless, public participation per se (even if it is extensive) does not automatically guarantee acceptance (von Ruschkowski & Nienaber, 2016), as the more negative ratings regarding the participation process indicate. Thus, the mode of participation and the objective of engagement are also crucial (Mannigel, 2008; Reed et al., 2018). If participatory processes start too late, are too formal and topdown, or merely aim at informing people and gathering local knowledge, they can lead to opposition and negative attitudes (Eben, 2006; Hirschnitz-Garbers & Stoll-Kleemann, 2011; Schenk et al., 2007; Wang, 2019). Although our pre-defined statements asked about the general participatory aspects without specifying particular events, we assume that the respondents' experiences in the participatory process during the establishing phase had an influence on their evaluation of the NP. Another reason for low satisfaction with the participatory process might be limited possibilities to participate actively during the establishing phase, since only few respondents believed that the local population is sufficiently included (22%) and that their opinions and needs are taken seriously (29%). As mentioned in the case study description, local residents only had the opportunity to submit their opinions and contributions to the regional group meetings via an online platform but were not able to directly discuss them with the regional group. Furthermore, locals could only comment the final expert-based evaluation report of 2013 (Böhr, 2014, see "Case study region - Black Forest NP") online, but not in a face-to-face dialogue format. This participatory process during the establishing phase of the NP can be summarized as "consultation" (cf. Reed et al., 2018). We follow Böhr's view (2014) that locals were mainly asked about their opinion but not involved in decisions. Although the state authorities and coordinators of the NP's establishment openly communicated that the State Parliament ("Landtag") has the exclusive mandate about the designation of the NP, as is common in representative democratic procedures, some locals demanded having a more active part in the decision-making. This mismatch between public expectations and reality can result in frustration or the feeling of not being sufficiently considered; and thus it might be a reason for negative evaluations of the participatory process (Böhr, 2014).

# 5. Conclusion

In this study, we analysed the effect of public participation and communication during the establishing phase of Black Forest NP on its acceptability. Our study and the discussion of the results shows that appropriate and thoughtful communication and participation strategies that take people's needs into account can help to increase the acceptance of NPs: In particular, local engagement that involves a broad diversity of stakeholders, integrates local knowledge in decision-making, and aims at empowering people promotes a positive public perception and ownership of protected areas (Hirschnitz-Garbers & Stoll-Kleemann, 2011; Mannigel, 2008; Schenk et al., 2007; von Ruschkowski & Nienaber, 2016). Regarding the case of the newly established Black Forest NP, our results showed that both communication by the NP administration and the participatory process affected the NP's acceptability. Thus, the positive effects of communication and participation that previous studies have found for more established protected areas could also be observed during the start-up phase of a NP. This study is therfore an important step towards better understanding the complexity of how attitudes regarding NPs are formed. Further research that includes other factors beyond communication and participation and that tests how these factors influence each other could complement our results.

#### **Declaration of Competing Interest**

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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