



Ecosystem Services Valuation & Willingness to Contribute within the Danish Wadden Sea National Park: A Study of the Financial Sustainability of Nature Protection



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Abstract

The Wadden Sea has one of the world's most valuable intertidal and sand-mud flat areas with a unique ecosystem that attracts many wading birds. In Denmark, it is protected by the Danish Wadden Sea National Park. The National Park institution is responsible for the management of the nature and cultural heritage of the Wadden Sea as described in the National Park Plan, but it has come under financial pressure because the grant allocated through the Finance Act is being reduced. This study seeks to explore alternative sources of income that correspond to the National Park's decentralized management with roots in the local community. In doing so, this study explores the relationship between Ecosystem Service Valuation and Willingness to Contribute of local residents, tourists and National Park partners. The Ecosystem Services Framework and a Contingent Valuation Method is used for this purpose, and multiple methods; quantitative questionnaires, as well as qualitative interviews and participatory observation, are used for data-collection. The underlying hypothesis that individuals' WTC, whether financially or non-financially, correlates with their valuation of Ecosystem Services has not been verified. It is, however, found that, there generally is limited awareness about the designation of the Wadden Sea as a National Park and its certification as a UNESCO World Heritage site, which may contribute to the inconclusive results. As a result of this research, multiple opportunities to supplement the financing gap are suggested, including increased collaboration on specific projects with National Park Partners and initiatives which involve local community members.

Keywords: *National park, Wadden Sea, Ecosystem services, Willingness to Contribute, Financial Sustainability*

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	Literature Review	Eleni	N/A
	Research Aim and Questions	All	-
Background	The Wadden Sea - An Ecosystem of International Importance	Jonas	Julen, Eleni
	The Danish Wadden Sea National Park	Julen, Jonas	N/A
	DWSNP Partnership program	Jonas	Emily
	DWSNP Finances	Jonas	N/A
Conceptual Framework and Hypothesis	Willingness to Pay for Ecosystem Services	All	-
Methodology	Research Design	Jonas, Eleni	N/A
	Questionnaires	Julen, Eleni	Jo
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Results	Which ecosystem services (ES) are valued most by DWSNP stakeholders?	All	-
	Benefits beyond ecosystem services	Jo, Eleni	N/A
	Residents vs. Tourists	Emily, Jo	Julen, Jonas, Eleni
	National Park Partners	Julen	Eleni, Jo, Emily
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	Who Should Pay?	Jo, Emily	Eleni, Jonas, Julen
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	Increasing the Willingness	All	-
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Conclusion	Conclusion	All	-

List of Acronyms

CoC	Code of Conduct
CVM	Contingent Valuation Method
DWSNP	Danish Wadden Sea National Park
ES	Ecosystem Services
ESF	Ecosystem Services Framework
NP	National Park
WHS	World Heritage Site
WSVC	Wadden Sea Visitor Centre
WTC	Willingness to Contribute
WTP	Willingness to Pay

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1.0 Introduction

1.1 National Parks as Landscape Imaginaries of a Changing Rurality.

The term *national park* (NP) appears to be a straightforward concept, meaning the designation of a geographical area as bearing exceptional environmental importance to a nation (4). However, since the establishment of Yellowstone in 1872 the term has acquired shifting connotations, reflecting divergent imaginaries of rural landscapes, worldviews about human-nature relationships, and governance paradigms (4; 58; 59). Resultantly, environmental historians describe them as phenomena that have spread worldwide, entangling “*actors, networks, mechanisms, arenas, and institutions*” (24:p.2).

The 19th-century model for NPs placed a strict boundary between culture and nature: “wilderness”, “natural monuments” and “conservation islands” were protected from destructive humans (4). With colonization-driven, native depopulation (31), North American NPs were interpreted via the “*worthless land hypothesis*”, meaning land void of people and of limited potential for agriculture (4). The protection of “*sacred nature*” from “*that all too human disease of civilization*” (13:p.7) predates biodiversity loss concerns. Elsewhere in the world, this model was challenged by different countryside realities. In places where rural areas were marked by human activity, creating “wilderness” would often require dispossessing people of the land (41). This generated conflicts and protests against the so-called “fortress conservation” (7).

This augmented conservation institutions towards participatory models, with local people turning into partners or guardians in nature protection (6). Local participation was also introduced as a sustainability criterion, aiming to substitute the nature/culture division (26) with a model for “integrated conservation and development” in the late 1980s (8). This would combine conservation with traditional land uses, and thus contribute to sustainable rural development (4).

This model was influenced by economic neoliberalization (8). New imaginaries for rural landscapes emerged, re-calibrated towards new economic functions, whereby the generation of market value would not be solely restricted to productive activities (61; 30). A re-imagined *rural* as a natural spectacle found its expression in tourism, which relies on “*the consumption of rural signifiers*” (61:p.95). In this context, NPs have played a great role in “branding” new

commodities (61). Hence, the neoliberal agenda has impacted conservation by a shift “*from protecting to using nature*” in a tourism-driven economy, whereby “*the market is the salvation of biodiversity*” (8:p.7). Moreover, the neoliberal commitment to minimizing the public sector in combination with market drivers for “green” corporate identities (14; 2), has created a fertile ground for increased corporate involvement in nature conservation, including private funding (21; 15; 2). NPs are, in this respect, key institutional players, integrating rural economies into global economic arenas (60; 61; 30). In addition, the scientific trends in studying human-nature relationships have also taken a utilitarian turn, favoring treatment of nature as commodity (34; 21).

The Danish Wadden Sea National Park (DWSNP) is no exception to these trends. Its establishment was initially met with protest and suspicion by the local population (58; 59), who were guaranteed limited restrictions and local inclusion in decision-making (58; 59). The recognition of the Wadden Sea as a UNESCO World Heritage Site (WHS) has designated the area a tourism destination (16). Meanwhile, the financial sustainability of the DWSNP is threatened by reductions in public funding, which prompt an increased reliance on private funds or support from volunteers (28).

This research project builds on a conceptualization of the DWSNP, first, as a dynamic socio-nature (61; 58; 59) and, second, as an institution that shapes rural imaginaries and contributes to material transformations in both biophysical and economic spheres (61). Given that the DWSNP has followed a participatory model for its management (59), it is worth exploring whether this tradition of participation can be expanded to bolster its financial sustainability.

1.2 Literature Review

To identify relevant literature for the review, key concepts within the topic were used as keywords in combination with Boolean operators¹. Based on the review it is found that the DWSNP as a dynamic, socio-environmental landscape, as well as a key institution in shaping rurality has received only limited attention. The following resources were found most relevant:

¹ See full description of the literature review process in Appendix A

Sijtma et al. (2019) (53) studied the entire Wadden Sea Region as a socio-ecological landscape and mapped its cultural ES. Liburd et al. (2021) (29) explored interpretations of nature by people to contribute towards better management practices. Similarly, Walsh (58; 59) focused on the pluralist management model of the DWSNP, and examined governance practices and the discourse on nature-culture relations. Döring et al. 2021 (15) weaved a Laturian, relational gaze into Wadden Sea's socio-nature. Finally, Kwiatkowski et al. (2020) (28) explored whether volunteers could become more integral to DWSNP management, finding that there was a notable relationship between willingness to volunteer and more active use of DWSNP resources.

1.3 Research Aim and Questions

The aim of this research project is to investigate an important knowledge gap concerning the financial sustainability of the DWSNP. Building on the existing body of knowledge, this research sets out to explore how ES are valued by individual stakeholders, and investigates their WTC financially or otherwise to the DWSNP institution. Given the increased financial pressure, policy might benefit from the identification of alternative income sources that follow the institution's participatory model. Table 1.3. captures the research questions driving this project.

Table 1.3. Research Questions

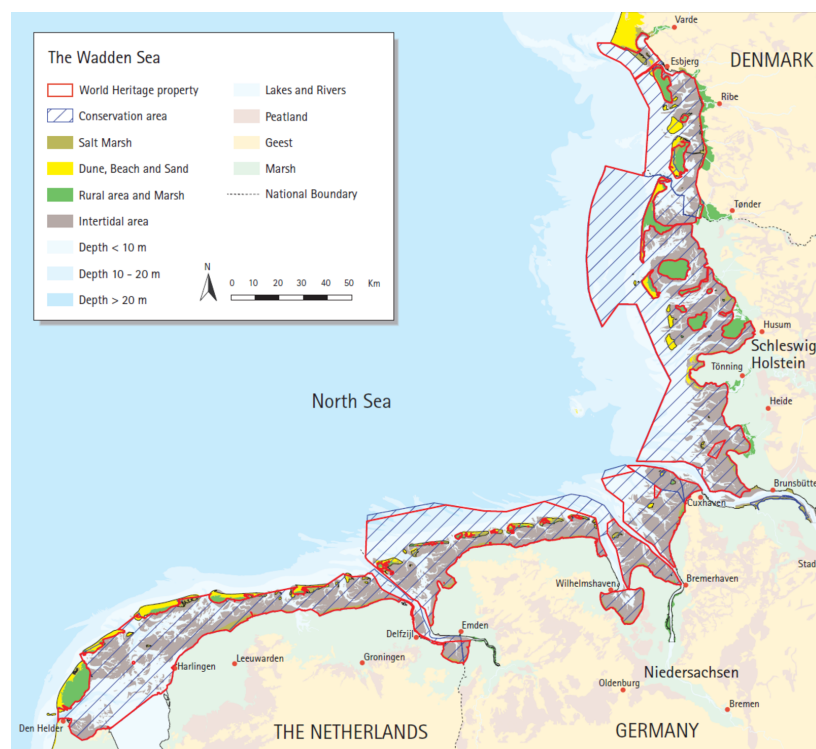
General Research Question:	
<i>How do DWSNP stakeholders value ecosystem services, and how does that valuation impact their WTC to the management and preservation of the DWSNP?</i>	
SQ 1	Which ES – within the provisioning, regulation, cultural, and supportive categories – are valued most by DWSNP stakeholders?
SQ 2	How does this valuation vary between different stakeholders?
SQ 3	What factors influence their valuation?
SQ 4	To what extent are stakeholders willing to contribute, either financially or non-financially, to the preservation of DWSNP and the ES it provides?
SQ 5	What factors influence their WTC?
SQ 6	In what ways are stakeholders more willing to contribute to the DWSNP?

2.0 Background

2.1 The Wadden Sea: An Ecosystem of International Importance

Coastal wetlands are among the most productive ecosystems globally (62). However, the projected degradation of coastal wetlands from human activities and climate change will reduce their capacity to deliver essential ES, making it crucial to conserve, maintain and rehabilitate their biodiversity and the ES they provide (62). The Wadden Sea comprises the world's largest ecosystem of uninterrupted intertidal and sand-mud flats, featuring numerous barrier islands, sand dunes and salt marshes (12; 17). According to the European Environmental Agency classification, 34 different habitat types and 10 species included in the EU Nature Directives are within the area (18).

Figure 2.2 - Map of the Wadden Sea Conservation Areas & World Heritage Sites



Source: Wadden Sea World Heritage (55)

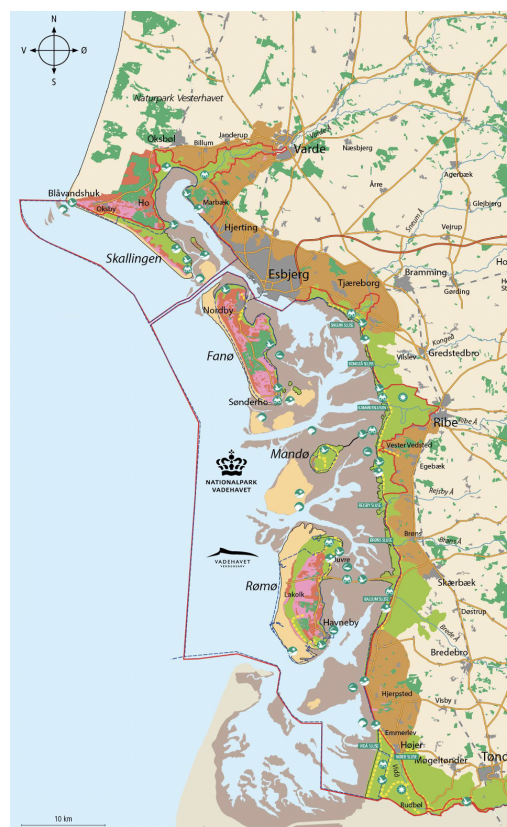
A surface area of 10,000km² stretching for 500km along the coasts of Denmark, Germany, and the Netherlands was recognized as a UNESCO World Heritage Site (WHS) in 2009, following protection efforts beginning in the 1970s, at the launch of the Trilateral Wadden Sea Governmental Conferences (17).

2.3 The Danish Wadden Sea National Park

The DWSNP was established in 2010, following key developments in both national legislation, and interactions among local groups who previously had conflictual interests (58). Danish NPs are framed by the National Park Act of 2007 (Act no. 533), which sets ten objectives for the parks, including: “to strengthen and develop the natural values [...]” of the area (48). The Act strives to meet its objectives through voluntary participation, via a set of agreements with land owners, but does not itself provide any legal protection for the areas, which is applied by other legislation including The Danish Game Act, The Nature Protection Act and the Forest Act (48).

The establishment of the NPs is the task of the Ministry of Environment, which outlines its main objectives through executive orders. The DWSNP Board elaborates the National Park Plan that develops those objectives (48). The current Plan was approved in 2019 for a six-year period (38).

Figure 2.3 - Map of the DWSNP



Source: Mitvadehav.dk (33)

2.4 DWSNP Partnership Program

Supporting both local communities and locally-rooted businesses are key goals of the DWSNP. Therefore, the DWSNP institution has created a Partnership Program, now including over 200 local companies, institutions and actors to support local cooperation and collaboration (33). The purpose of the DWSNP Partnership program is to provide a brand that mutually benefits the partners and the DWSNP by promoting the Wadden Sea's uniqueness and conveying DWSNP values (36).

2.5 DWSNP Finances

The 2022 DWSNP annual budget is set at 19 million DKK, of which almost half (9.5 million DKK) is allocated through the Finance Act (35). The remainder is raised by the DWSNP Secretariat from the EU, funds, and external donors. The Finance Act grant will be reduced to 8.2 million DKK per annum from 2023, while the requirements the DWSNP must fulfill remain unchanged (36). Consequently, the DWSNP secretariat will have to find alternative sources of funding. The DWSNP has never charged entrance-fees for visitors, license fees for private businesses working within the DWSNP, nor its partners, although it spends 225,000 DKK on the program annually (36).

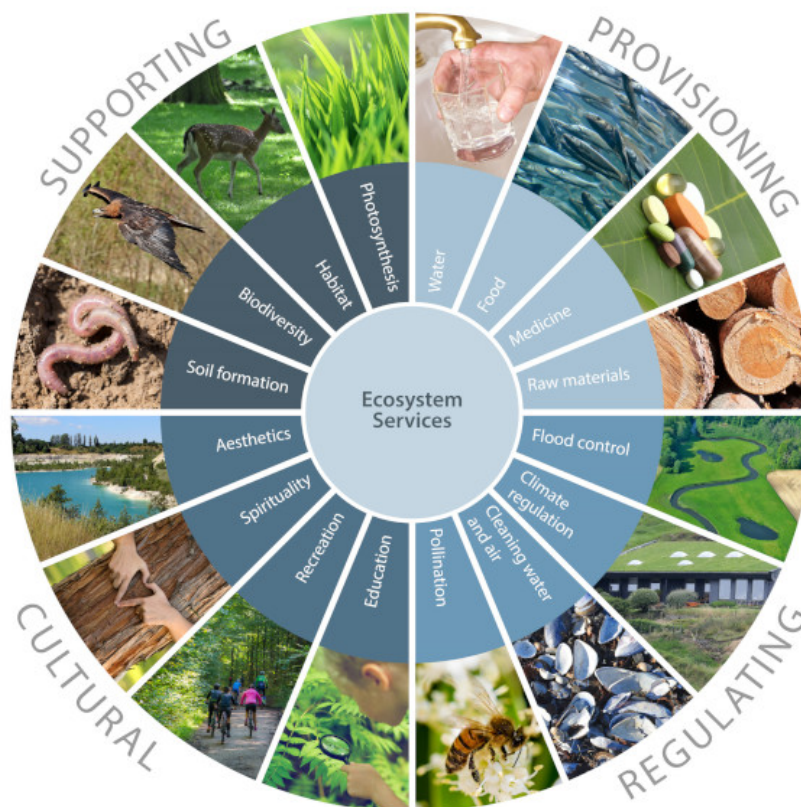
3.0 Conceptual Framework and Hypothesis

ESF connects human well-being to the development of natural processes in different ecosystems (64). ESF was used in the research to analyze how respondents believe they benefit from the DWSNP, which will support the analysis of respondents' WTC to its preservation. The WTC methodology was selected to understand if and how individuals would be willing to support the DWSNP. WTC is adapted from WTP to incorporate both financial and non-financial contributions. This WTC is determined using an adapted CVM, which at its most rudimentary level requires participants to explicitly state their willingness to pay for something. The CVM has been used in existing research to quantify benefits derived from ES, including: estimating the benefits of the Brazilian Serra do Cipó NP by calculating WTP to conserve the park's ecosystems (46); and assigning an economic value to the forest ES of a Heshui watershed through respondents' willingness to pay for hypothetical conservation situations (56).

The concept of ES dates back to the 1990s (10), gaining wider recognition after the launch of the Millennium Ecosystem Assessment (MEA) between 2001 and 2005. The MEA report explicitly focuses on ecosystems that have been heavily modified by human activities, showing how the framework is especially equipped to illustrate the interplay between humans and the environment (25). As Paavola and Hubacek (40) highlight, ESF considers the complexities between “*the structures, processes, and services of an ecosystem across the landscape*” (40:1).

ESF recognizes four types of ES: provisioning, regulating, cultural, and supporting (64). The first three represent direct human benefits; the fourth represents the natural processes enabling other services. With this structure, ESF attempts to recognize the plurality of ES valuation, including biophysical, economic, and socio-cultural (10).

Figure 3.1.A - Schematic Overview of the Four Categories of ES



Source: AU (1)

Special attention was paid to ES considered particularly important to intertidal flats ecosystems (see figure 3.1.B). The typology of the ESF was used to investigate if there is a correlation between how highly an individual values specific ES and this individual's willingness to contribute (WTC) towards the institution protecting/supporting these services. The guiding hypothesis was that an individual who recognises the benefits the environment brings them, would also be motivated to contribute towards its continued existence. This was, in part, informed by a finding of Kwiatkowski et al. (28) that willingness to volunteer is higher for individuals who use the DWSNP's resources more frequently.

Figure 3.1.B - Theoretical Magnitude of Intertidal Flats ES

Provisioning		
Food	Production of fish, wild game, fruits, grains, and so on	Medium
Fresh water	Storage and retention of water; provision of water for irrigation and for drinking	Not applicable to this type of wetland
Fiber and Fuel	production of timber, fuelwood, peat, fodder, aggregates	Not applicable to this type of wetland
Biochemical products	Extraction of materials from biota	Not applicable to this type of wetland
Genetic materials	Medicine; genes for resistance to plant pathogens, ornamental species, and so on	Not applicable to this type of wetland
Regulating		
Climate regulation	Regulation of greenhouse gases, temperature, precipitation, and other climatic processes; chemical composition of the atmosphere	Low
Biological resistance of species invasions	Resistance of species invasions; regulating interactions between different trophic levels; preserving functional diversity and interactions	Low
Hydrological regimes	Groundwater recharge/discharge; storage of water for agriculture or industry	Not applicable to this type of wetland
Pollution control and detoxification	Retention, recovery, and removal of excess nutrients and pollutants	Not applicable to this type of wetland
Erosion protection	Retention of soils and prevention of structural change (such as coastal erosion, bank slumping, and so on)	Not applicable to this type of wetland
Natural hazards	Flood control; storm protection	Low
Cultural		
Spiritual and inspirational	Personal feelings and well-being	High
Recreational	Opportunities for tourism and recreational activities	High
Aesthetic	Appreciation of natural features	Medium
Educational	Opportunities for formal and informal education and training	Low
Supporting		
Biodiversity	Habitats for resident or transient species	High
Soil formation	Sediment retention and accumulation of organic matter	Low
Nutrient cycling	Storage, recycling, processing, and acquisition of nutrients	Low

The information is based on expert opinions for global average patterns for this particular type of ecosystem.

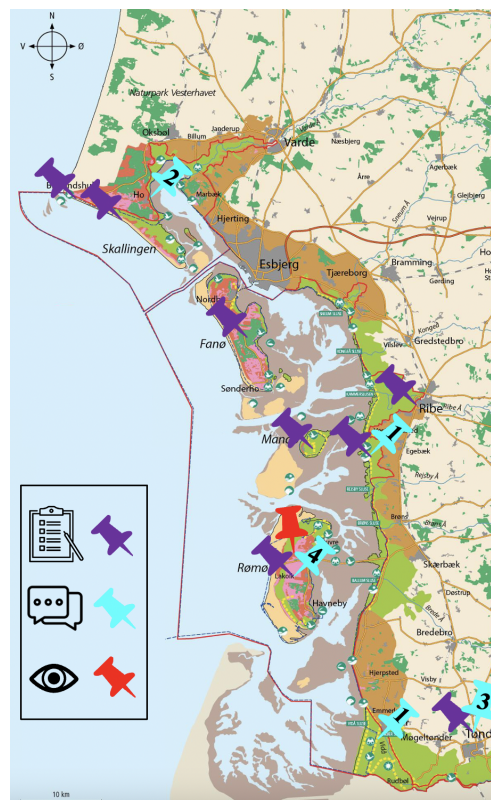
Source: 38: 32-33. Edited and simplified by author

4.0 Methodology

4.1 Research Design

A mixed-methods research strategy was chosen, incorporating both quantitative and qualitative data collection, analysis and interpretation. The use of quantitative methods based on a questionnaire allowed for a large number of respondents to be reached in a limited time period. The statistical analysis was oriented towards the discovery of relations between individuals' ES valuation, their WTC to the DWSNP and their socio-demographic characteristics. Qualitative data collected via semi-structured interviews, participant observations and informal discussions provided broader contextual understanding of the research topic, deeper insights into the interviewees' perspectives and constituted a valuable source of information to triangulate and better-interpret the quantitative data.

Figure 4.1 - Data Collection Map

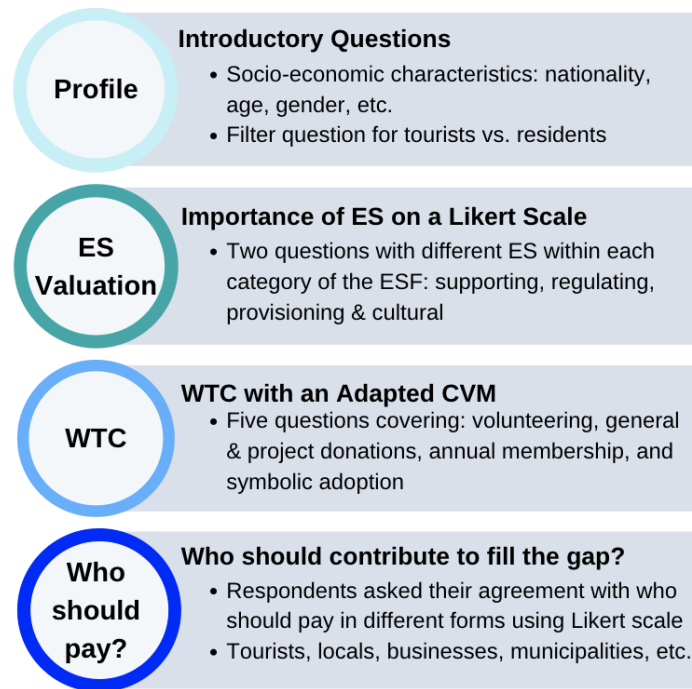


The map provides a visual representation of where primary data was collected during the field work. Purple pins illustrate where questionnaires were distributed, the red pin illustrates where participatory observation was conducted and turquoise pins illustrate where interviews were conducted. The numbers within these pins represent the number of interviews conducted in each area. **Source:** 33- Edited by authors

4.2 Questionnaires

The questionnaire² was designed on SurveyXact and included 56 questions in total, distributed in four broad sections: profile, ES valuation, WTC, and who should pay. Figure 4.2 describes the distribution and methodology used for each section.

Figure 4.2 - Distribution of Questions by Topic



Source: Figure made by authors

36 questions were addressed to all respondents (profile, ES valuation, WTC, and who should pay). Some differentiated questions were posed specifically to tourists or residents following a filtering question to ensure only relevant questions were given to each questionnaire respondent, as well as to capture data specific to each group.

To ensure accessibility, the questionnaire was available online, in Danish, German and English. One respondent gave their answers verbally while interviewers filled in responses.

4.2.1 Questionnaire Sampling Strategy

The main target-respondent strata for the questionnaire were local residents from the four municipalities and tourists. A hybrid sampling strategy was selected, determined by the target

² See Appendix I

groups. It can be defined as a purposive sampling strategy, intentionally aimed at having these two groups represented in the sample, but also fully randomized such that no further selection criteria were implemented with respect to the characteristics of the represented population of the two groups (23).

The distribution strategy followed two paths: Online distribution on Facebook groups related to the DWSNP (targeting local respondents), and physical distribution through leaflets with a QR code and description of the study. The physical distribution included four strategies to reach respondents: leaflets were delivered to mailboxes within the four DWSNP municipalities; leaflets were distributed to visitors in tourism hotspots including beaches, shopping areas, tourist activities, etc.; leaflets were given to local businesses; and individuals were approached on the street. This resulted in a final sample of 78 respondents.

Table 4.2.1 - Socio-Economic Characteristics of Questionnaire Respondents³

Variables	Respondents (n=78)
Residents	46 (59%)
Tourists	28 (35.9%)
Summer House Owners	4 (5.1%)
Age (yrs)	
<i>Average</i>	48.9 ± 16.0
<i>Minimum</i>	17
<i>Maximum</i>	83
Gender	
<i>Female</i>	39 (50%)
<i>Male</i>	38 (48.7%)
<i>Non-binary</i>	0 (0%)
<i>Prefer not to Answer</i>	1 (1.3%)
Nationality	
<i>Danish</i>	60 (76.9%)
<i>German</i>	14 (18%)
<i>Other</i>	4 (5.13%)
Education Level	
<i>No formal education</i>	1 (1.3%)
<i>Primary/secondary school</i>	3 (3.9%)
<i>High school</i>	8 (10.3%)
<i>Vocational education</i>	26 (33.3%)
<i>Undergraduate school (Bachelor's)</i>	22 (28.2%)
<i>Graduate school (Master's)</i>	17 (21.8%)
<i>Prefer not to say</i>	1 (1.3%)
Income	
<12.000 DKK	9 (11.5%)
12.001 - 24.000 DKK	17 (21.8%)
24.001 - 36.000 DKK	24 (30.8%)
36.001 - 48.000 DKK	6 (7.7%)
48.001-60.000 DKK	7 (9%)
>60.000 DKK	7 (9%)

³ Questionnaire Data

4.2.2 Questionnaire Respondent Follow-up Emails

Questionnaire respondents were asked if they were willing to participate in follow-up interviews. Follow-up emails were sent to 10 respondents with 3-4 questions specific to their individual response, with the goal of gaining a deeper understanding into their motivations. Three responses were received.

4.2.3 Questionnaire Data Analysis

The quantitative data obtained from the questionnaire was condensed into relevant descriptive statistics. A Chi-square test was used to evaluate potential relationships between respondents' characteristics, and both their ES valuation and their WTC.

4.3 Qualitative Interviews

Ten semi-structured individual interviews and two semi-structured group interviews were conducted. Additionally, one structured interview was conducted asynchronously via email. The main objective was to gather primary data on the interviewees' perceptions of the DWSNP, the ecosystems within it, their willingness to contribute to it in different ways, and to build a deeper contextual understanding of the DWSNP institution and its partners.

4.3.1 Sampling Strategy - Selection of Interviewees

The overall goal was to interview informants representing different perspectives based on their positions and responsibilities. While the questionnaire targeted tourists and local residents, the interviews were mainly targeting stakeholders involved in DWSNP management and decision-making processes, including employees of the DWSNP secretariat, DWSNP board members, DWSNP partners and donors. A purposive sampling strategy was therefore used in the identification and selection of relevant informants, and snowball sampling was used to supplement the purposively selected sample of informants of relevance to the research questions (23). Seven interviews were conducted with informants recommended by purposively identified participants. The characteristics of the interviewees are illustrated in Table 4.3.1.

Table 4.3.1 - List of Interviewees

Interviewee	Organization	Role in Organization	Location	Interview Type
Informant 1	Danish Wadden Sea National Park Secretariat	Secretariat Director	Rømø	Semi-structured interview
Informant 2	Danish Wadden Sea National Park Secretariat	Communication Consultant	Rømø	Semi-structured interview
Informant 3	Danish Wadden Sea National Park Secretariat	Marine Biologist & Nature Consultant	Rømø	Semi-structured interview
Informant 4	Danish Wadden Sea National Park Secretariat	Game Management Advisor	Rømø	Semi-structured interview + walking interview
Informant 5	Danish Wadden Sea National Park Board	Deputy Chairman & Representative of Varde municipality	Varde	Semi-structured interview
Informant 6	Danish Wadden Sea National Park Board	Representative of the Danish Sports Fisherman Association	Rødding	Semi-structured interview (Online)
Informant 7	Tønning Nature Centre	Manager & Nature Guide	Rømø	Semi-structured group interview
Informant 8	Tønning Nature Centre	Nature Guide	Rømø	Semi-structured group interview
Informant 9	Tønning Nature Centre	Mediator of Nature	Rømø	Semi-structured group interview
Informant 10	Vadehavscentret (Wadden Sea Visitor Centre)	Manager & Nature Guide	Vester Vedsted	Semi-structured group interview

Informant 11	Vadehavscentret (Wadden Sea Visitor Centre)	Deputy Manager	Vester Vedsted	Semi-structured group interview
Informant 12	Westbrew	Owner & Brewer	Billum, Ho Bugt	Semi-structured walking interview
Informant 13	Ho Bugt Oksen	Organic Farmer	Billum, Ho Bugt	Semi-structured walking interview
Informant 14	Marskprodukter	Farmer	Højer	Semi-structured walking interview
Informant 15	Danhostel Tønder	Manager	Tønder	Semi-structured interview
Informant 16	Nordea-foundation	Senior Consultant	Copenhagen	Structured asynchronous email interview

4.3.2 Interview Process

12 of the interviews were semi-structured and followed an interview guide⁴ with a set of predefined, open-ended questions that were developed by the researchers prior to each interview. The guides were used as checklists to ensure all aspects of relevance to the research questions were covered. The guides were used flexibly, and questions were adapted to points raised by the interviewees.

During semi-structured interviews, researchers had different responsibilities: one was the primary interviewer, one was assisting interviewer and the rest took notes. Four interviews were conducted as *participant-driven* walking interviews – a hybrid of qualitative interviewing and participatory observation, such that the interviews took place while walking or driving along a route selected by the participant (27; 20). These interviews were more informal and guided by local settings.

11 interviews were conducted in-person, and one interview was conducted remotely through the online video conferencing platform Zoom. Additionally, one structured interview was conducted via email through four open-ended questions because it was not possible to set-up an in-person or virtual interview with the stakeholder. 11 of the interviews were conducted in

⁴ See Appendix E

English and two interviews were conducted in Danish. All interviewees were asked to sign an informed consent form to declare their willingness to participate.⁵ All audio recordings and transcripts were stored in an online, password-protected, cloud environment accessible only to the researchers.

4.3.3 Interview Data Analysis

Recordings of the interviews were transcribed and summarized⁶ to establish written records for data analysis. The qualitative data analysis followed a deductive approach, where a-priori codes⁷ were developed on the basis of the conceptual framework, the research questions and knowledge obtained continuously throughout the study.⁸ Interviews were grouped into stakeholder categories, and the a-priori codes were applied with different colors to the transcripts. From the color-coded transcripts, quotes were sorted into categories created by the a-priori codes. This illustrated which themes were the most commonly found in the interviews. From these categories, primary findings were abstracted, and quotes providing evidence were selected. Throughout the analysis, thoughts and reflections were written down as memos, which were used to guide the selection of appropriate quotes for the final report.

4.4 Participant Observation

Active participant observation was conducted during a volunteer beach cleaning on Rømø. It was conducted as *overt research* (11), as participants were informed about the purpose of the researchers' presence. Access to the activity was secured through the personnel of Tønninggård. A *complete participant role* (44) was adopted, actively engaging in the cleaning alongside participants. No written notes nor voice recording were taken; all information was collected immediately after the activity through recollection.

⁵ See consent forms in appendix H

⁶ See summaries in Appendix F

⁷ A codebook with the a-priori codes is included in appendix D

⁸ i.e. theory-driven analysis strategy, see 50

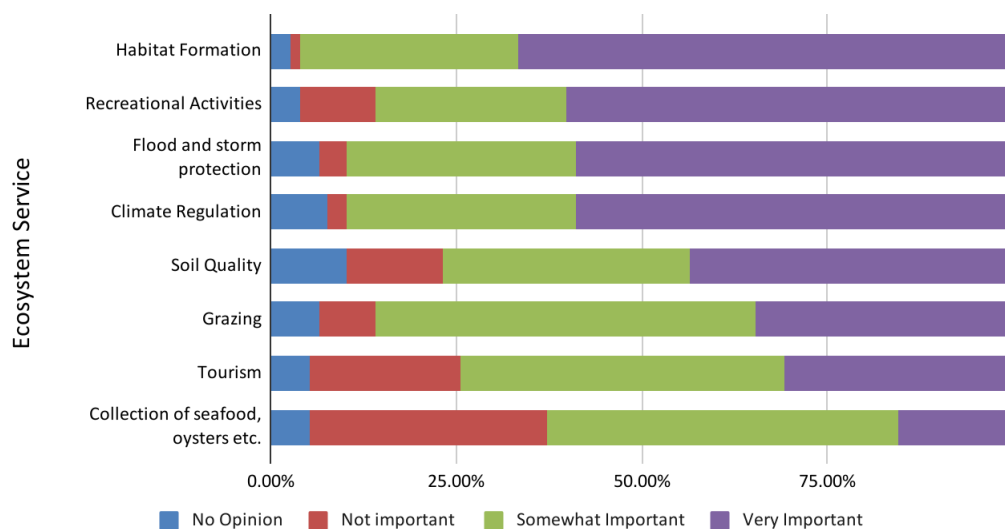
5.0 Results

An underlying assumption driving the choice of the study’s conceptual frameworks, and design of the research questions, was that an individual’s WTC, whether financially or non-financially, would be correlated with the overall importance they assign to the ecosystem. In this section, data is presented from the questionnaire, follow-up emails with questionnaire respondents, and semi-structured interviews to explore whether this assumption is supported.

5.1 Which ES are Valued Most by DWSNP Stakeholders?

The most important ES indicated by respondents is habitat formation, with 67% valuing this service as *very important*. The least important ES indicated is the collection of environmental products with 32% valuing this as *not important*. However, Figure 5.1 shows the answer distribution for all 8 of the ES, each of which are positively skewed. Therefore, though habitat formation has a slight majority, it cannot be concluded which of the ES is the “most important,” as all had positive questionnaire responses.

Figure 5.1 - The Importance of Different ES⁹



In a follow-up email, responding to the question *Can you explain why you answered that the tourism that the National Park creates isn't important to you?*, a respondent revealed they had

⁹ Questionnaire Data

misunderstood the question, and that their opinion was not accurately captured by the available responses:

“The question is clearly incorrectly answered, I want the tourists gone. Therefore tourism has no meaning to me. They disturb the nature a lot [...] So clearly incorrectly answered by me.”¹⁰

This finding’s importance lies in the fact that the ESF employs solely “beneficial” connotations, while the very same aspects are here identified as negative. The wording of the ES valuation questions, and the underlying conceptual framework, is further reflected upon in the *Discussion* section.

In the semi-structured interviews, various ES were identified as important by interviewees. The DWSNP board representative for Danmarks Sportsfiskerforbund (Angler’s Association) highlighted the importance of clean water to ensure salmon populations:

“We're trying to make the rivers as pure and clean as we can and make the natural conditions in the rivers as good as possible because we want to catch salmon and sea trout in the rivers”.¹¹

This response indicates that the interviewee not only values the recreation opportunities offered by the ecosystem in and around the DWSNP, but also the provisioning and regulating ES that make it possible for them to engage in fishing as a recreational activity. In this case, these two ES are not mutually exclusive. The interviewee does not indicate which of these services they value **the most**, or if one is more important than the other. This is the case with many interviewees: while ES are mentioned, none are definitively described as the most highly valued. This demonstrates that the interrelation between ES is complex.

Another example resonating similarly complicated perceptions of benefits is the following: a partner directly associates morphological features of landscape (“borderless”) with their mentality and beneficial risk-taking attitude:

“I think the biggest benefit to work within the National Park...is that if you live in the National Park, you’ll realize it’s borderless... many of these things I’m doing here, no one

¹⁰ Follow-up email response from questionnaire respondent

¹¹ Informant 6

will have done this after three years, but here I say, what the hell? Take my risk...it challenged me. So this philosophy about borderless, it can give you an open mind.”¹²

Consequently, determining which ES are **most** valued, cannot be directly concluded from qualitative results. The interesting finding is that interviewees developed their discourse on “importance of” or “benefits from” the ecosystem in manners that pose challenges to the ESF categorization schema.

5.2.1 Benefits Beyond ES

In semi-structured interviews, an important conceptual distinction between the DWSNP as a biosphere and as an institution emerged. DWSNP partners identified benefits existing beyond the ESF, to the extent that reaping benefits from the environment is conditioned by social processes of enablement.

Specifically, the branding and marketing benefits that they receive from the DWSNP institution were identified. Additionally, there were references to the DWSNP Secretariat’s storytelling role in raising awareness of the ecosystem’s importance.

For example, one partner interviewed is a cattle farmer who produces high-quality beef. In the interview, they mention that the DWSNP Secretariat has been essential for them to secure contracts with a popular restaurant in Copenhagen. A member of the Secretariat helped market the farmer’s products by explaining to a restaurant how their production methods benefit the environment, such as how the farmer’s grazing practices benefit bird populations.

Another DWSNP partner who runs a brewery currently collaborates with the DWSNP on a specific nature project: the conservation of breeding black terns in Tøndermarsken. For each bottle sold of ‘Black Tern Beer’, 5 DKK goes to the project. The DWSNP Secretariat approached the brewer with this idea as a way to raise money for the black tern conservation project. The brewer explained that this collaboration has allowed their products to access a new market of those interested in supporting nature conservation. They also believe that there is an opportunity for the DWSNP to capitalize on the park’s branding potential:

¹² Informant 12

“I have been working in China. If you could make a product where it has a tag: Wadden Sea National Park [Product] ... Oh, there would be water in their eyes! And China is connected to this area here because of the pacific oysters we have here.”¹³

Finally, a partner employed at an accommodation facility made numerous comments on how local people have developed a greater appreciation of the natural environment as a result of the presence of the DWSNP institution. When asked if locals benefit from this institution in ways other than tourism development, they mentioned:

“When I was a child, we appreciated to go out to Hojer and see the water and everything, but we didn't realize how much we had around us. We didn't appreciate it. Now we have been more open-minded and see, well, we would really have something very special [...] I think most of the people [...] like it [the national park], and it has opened their eyes for what a gift we have everyday”.¹⁴

5.3.2 How Does This Valuation Vary Between Different Stakeholders and What Factors Influence Their Valuation?

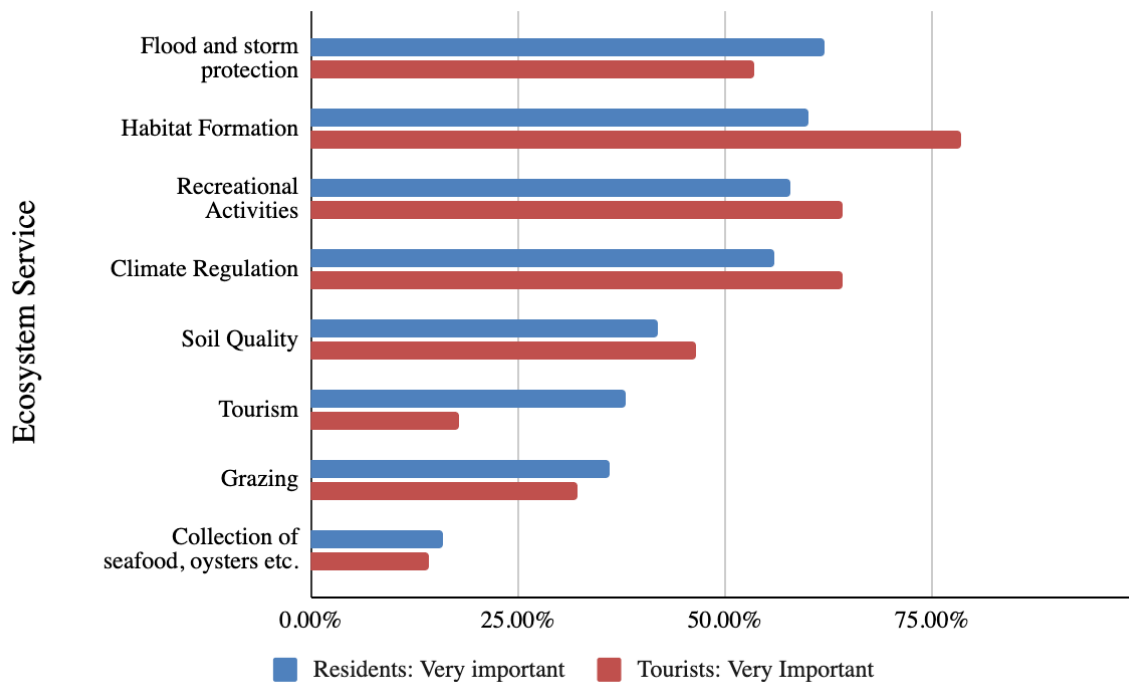
5.3.2.1 Residents vs. Tourists

While residency status was not a statistically significant indicator of valuation for any of the ES, either individually or summatively, resident and tourist questionnaire respondents demonstrated slight differences in their valuation, captured in Figure 5.3.2.1. For example, a higher proportion of resident respondents (38%) responded that tourism generated by the DWSNP is very important, than the proportion of tourist respondents (18%).

¹³ Informant 12

¹⁴ Informant 15

Figure 5.3.2.1 - Percentage of Tourists and Residents Valuing an ES as Very Important¹⁵



There were concerns expressed by residents in follow-up emails about the perceived negative impact tourists can have on the area, which may in part explain the above difference. For example, one respondent, answering the question of *How do you feel that tourists visiting the NP affect the local community?*, explained:

“There are some problematic situations where farming in the area conflicts with the interests of the visitors.”¹⁶

5.3.2.2 DWSNP Partners

Contrasting to residents and tourists who indicated similarly high valuations of the majority of ES, there was more variability among partners. In interviews, partners expressly identified important ES that varied depending on their position or background. A clear trend from these conversations is that the ES partners value highly are linked to the income-generating opportunities for their respective businesses.

¹⁵ Questionnaire data

¹⁶ Follow-up email response from questionnaire respondent

An accommodation facility manager values the cultural ES of viewing the ‘black sun’ phenomenon because it attracts tourists:

“I have a hostel, there is the black sun and I make money out of it. Not directly, but maybe indirectly”.¹⁷

While it is the recreational value of the ‘black sun’ which is explicitly valued, this phenomenon is also intimately related to the supporting ES because Tøndermarsken¹⁸ provides a unique and protected habitat for starlings.

However, bird populations are not equally valued among DWSNP partners. A partner who farms in Tøndermarsken explained how migratory geese pose a considerable challenge to their farming practices, as the geese's presence forces them to reseed their fields, creating substantial economic losses and an increased burden of labor.¹⁹

Cultural ES are highly valued by the WSVC Management and Tønnisgård. The WSVC Management rely upon DWSNP ecosystems to provide environmental education activities:

“...we think there are so many stories in the Wadden Sea [...] And it's the highest tide in Denmark and we have the history. And then nature, of course, with all these birds coming in and off the Eastern Atlantic, the migration route. And this is a very important story in Danish nature telling. Because it is a global story and it is a story where we have to respect the area. [...] So we have a lot of history for getting all the school and high-school classes to educate them.”²⁰

Similarly, Tønnisgård - a non-profit nature center, and partner of the DWSNP also emphasized the educational value of the natural surroundings in the Wadden Sea.²¹

Other partners valued provisioning services. Two of the farmers interviewed mentioned the access to grasslands as an important ES. Their capacity to gather quality grass to be used as fodder was mentioned as a valuable aspect for their production practices.²²

¹⁷ Informant 15

¹⁸ Tøndermarsken is a large marshland area located within the National Park area.

¹⁹ Informant 14

²⁰ Informant 10

²¹ Informant 8

²² Informant 13 & 14

5.4 To What Extent are Stakeholders Willing to Contribute, Either Financially or Non-Financially, to the Preservation of DWSNP and the ES it provides?

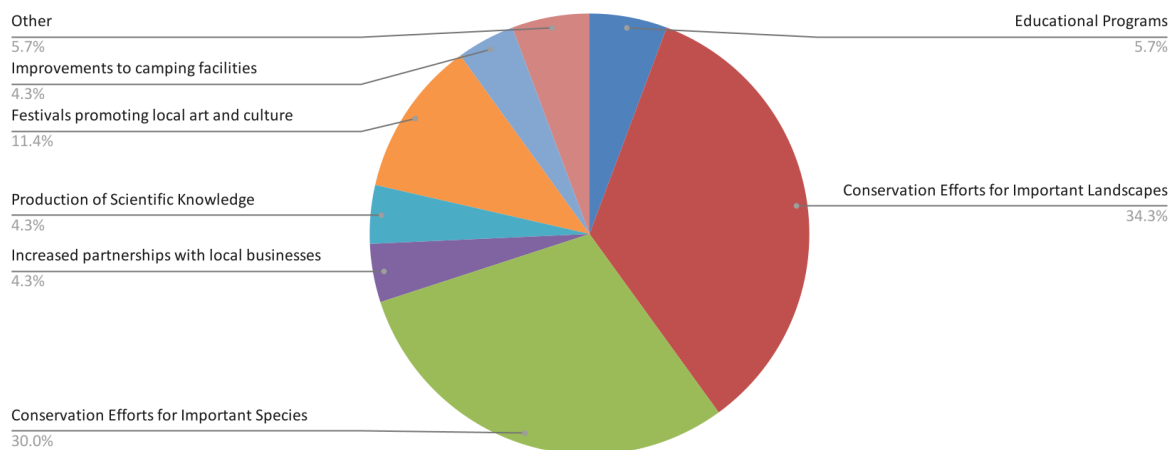
Questionnaire respondents were largely unwilling to contribute to the DWSNP, both financially or by volunteering. However, insights emerged on the ways individuals and partners currently contribute to the DWSNP through management initiatives.

5.4.1 Financial Contributions - Individuals

The majority of questionnaire respondents were unwilling to make an annual donation to the DWSNP (78%) or pay an annual fee for a “symbolic adoption” of a DWSNP animal species (74%). From statistical analysis of questionnaire responses, there were no significant relationships between profile indicators and a WTC financially.

Furthermore, most questionnaire respondents (60%) were unwilling to make a one-time donation to DWSNP. However, 53% of respondents were more willing to make a one-time donation to a specific project within the park, as opposed to a general donation. Figure 5.4.1 represents specific projects respondents would be interested in donating to.

Figure 5.4.1 - Interest in Specific Projects to Donate to²³



Follow-up emails to questionnaire respondents questioning why they reported being unwilling to contribute financially through donations, lead to a range of motivations being revealed, including: *“I have used a lot of time on volunteer work at the National Park,” “my*

²³ Questionnaire Data

*current financial situation” and “It’s not only the National Park I don’t donate to, I generally don’t donate.”*²⁴

While Figure 5.4.1 indicates a high interest in projects focusing on ‘Conservation Efforts for Important Species’, a member of the DWSNP Secretariat argued that the choice of species is often essential; lacking a “*cuteness factor*” can make it difficult to fundraise for specific projects:

*“How can we explain to the people living here that this [migratory fish] is important to protect when they can’t see it. And, a fish, I’m sorry to say - they’re beautiful - but they are just not as cute as a bird. So, it is a big issue.”*²⁵

The idea that people are unlikely to be motivated to protect what they cannot see highlights another surprising questionnaire finding: there is generally very little awareness among questionnaire respondents that the Wadden Sea is protected by an NP, as well as its UNESCO WHS status. In fact, only 6% of the local respondents know that the Wadden Sea is protected by an NP. Similarly, only 8% are aware that the Wadden Sea is a UNESCO WHS. Inversely, tourist respondents seem to be considerably more aware: 48% know it is an NP, and 41% that it is a WHS. While the unawareness among particularly local respondents could be a potential explanation for their limited WTC financially to the DWSNP, the relationship is not statistically significant.

5.4.2 Financial Contributions - DWSNP Partners

In interviews with DWSNP partners, half of them expressed their WTC financially to be a partner. A local brewer explained that partners would likely be willing to contribute to the DWSNP, considering the benefits they derive from the partnership, such as publicity from the annual magazine. When asked what they would think if they were asked to pay for the partnership, they said: “*For me it doesn’t matter.*”²⁶ They also felt that other partners who benefit from the DWSNP had a duty to financially contribute:

*“We should also think like this because we have a social responsibility. Also the companies, right? So I see a big potential in this. And use the National Park...”*²⁷

²⁴ Follow-up email response from questionnaire respondent

²⁵ Informant 3

²⁶ Informant 12

²⁷ Informant 12

Other interviewees put forward concerns about partners paying to be part of the program. For example, a DWSNP Board member and local politician said:

*“Should you say: if you want to be a partner of the national park, we demand that you pay 1,000 DKK each year? I think we would lose a lot of partners; and I think the partners would see us as a money machine; and I think that will reduce the very good reputation we have, our name. So I don't think that it will be a good idea, but that is a possibility”.*²⁸

Another farmer who produces cattle and sheep in Tøndermarsken, is not willing to contribute financially to the DWSNP, as they do not think the partnership program benefits their economic performance significantly. Instead they suggest that tourism enterprises that benefit from the DWSNP should contribute more financially.²⁹

Three examples of such partners were interviewed, including an accommodation facility in Tønder, which houses thousands of tourists every year, as well as the WSVC and Tønninggård, which have exhibitions and guided tours. The manager of the accommodation facility agrees that partners should make a financial contribution to the DWSNP, saying:

*“We are all a part of it. So we also all have to contribute a little bit.”*³⁰

In the group discussion with the manager and guides from Tønninggård, the partnership with the DWSNP is described as a mutually beneficial relationship, such that paying to be part of the partnership program might compromise their collaboration.³¹

Similarly, the WSVC currently collaborates with the DWSNP on creating a CoC specifically focusing on seals, to which they contribute financially. The Center's manager explains:

*“We pay the most. No, the Environment Ministry pays the most money. [...] And then we pay nearly 400,000 for three years. And the National Park is paying 100,000 and the Fishery Museum also pays 100,000.”*³²

Because the WSVC is already partially funding this project, they felt they were already contributing enough to the preservation of the Wadden Sea.

²⁸ Informant 5

²⁹ Informant 13

³⁰ Informant 15

³¹ Informant 8

³² Informant 10 & 11

5.4.3 Who Should Pay?

Questionnaire respondents were also asked who they believe should contribute to fill the gap created by the reduction in public funding.

5.4.3.1 Individuals - Donations, Fees, Taxes

The majority of respondents do not agree with local individuals making voluntary donations to the DWSNP (50% disagreeing, 15% agreeing). When asked if local individuals should instead pay fees or taxes, respondents' views were more mixed with 32% disagreeing and 36% agreeing. However, the distribution between tourists and residents is more stratified: 41% of tourists sampled disagree, while only 26% of residents disagree. On the other hand, 44% of residents agree, while only 21% of tourists agree. These results indicate that residents are more inclined to agree that they themselves should pay fees or taxes, while tourists are more inclined to disagree.

Many respondents do believe that tourists should pay in some way to use and/or enter certain areas of the DWSNP. For example, 50% of respondents agree that tourists should pay a tax while visiting the park, and 42% of respondents agree that tourists should pay fees to use the park. Of the 33 respondents (42%) who agreed that tourists should pay fees, more than half of them were tourists themselves. There is no significant predictor variable for respondents' belief in who should fill the funding gap, with statistically insignificant differences in responses dependent on income, residency status, age and nationality.

In a follow-up email to one of the questionnaire respondents, they were asked: *Can you explain why you believe tourists should pay fees or taxes when visiting the National Park?* Their response provided insight on why some may believe that tourists should pay while visiting the DWSNP:

“They shouldn’t just have free access to the nature; it’s fragile. I want nature to be able to look after itself and not be taken over by everybody.”³³

Also, in the interviews and discussions with key stakeholders, it was mentioned that paying to enter nature is not always culturally accepted in Denmark. This custom may be a reason for

³³ Follow-up email response from questionnaire respondent

why questionnaire respondents were largely unwilling to financially contribute to the DWSNP, even voluntarily. The WSVC Management said:

“In Germany, you have to pay to go down to the beach. We don't do that. But I have also suggested, oh, perhaps you could take 10 kroners for each car driving on the beach on Rømø. But no.”³⁴

Informant 10 went on to add: *“Then we lose culture.”*

5.4.3.2 Municipalities and the Danish “State”

In addition to believing that tourists should fill the funding gap, respondents also indicated that the local municipalities of Tønder, Varde, Esbjerg and Fanø should provide funding for the DWSNP. In fact, 53.9% of respondents agree that the municipalities should provide funding. However, the majority of respondents (62.8%) disagree that the municipalities should make donations to the park. Currently, municipalities collaborate with the DWSNP institution and the Nature Agency (Naturstyrelsen) on specific initiatives and facilitate various administrative processes, but they do not contribute directly to the DWSNP budget (36).

Beyond the municipalities, two questionnaire respondents in follow-up emails stated their belief that it is the Danish “State’s” responsibility to fund the DWSNP, using money from income taxes. In response to *How do you think the NP ought to be financed?*, they explained:

“My understanding of the National Park is that it’s a community project, established by the State, that’s why I believe that funding should come from the same place.”³⁵

Another respondent expressed a similar idea but added the motivation that if the “State” were the primary financial contributor, it could allow them to avoid a *“German approach”*³⁶ to nature access. This sentiment was echoed in some of the semi-structured interviews as well. For example, commenting on the difficulty to raise money from small voluntary contributions, a member of the DWSNP Secretariat mentioned:

³⁴ Informant 11

³⁵ Follow-up email response from questionnaire respondent

³⁶ Follow-up email response from questionnaire respondent

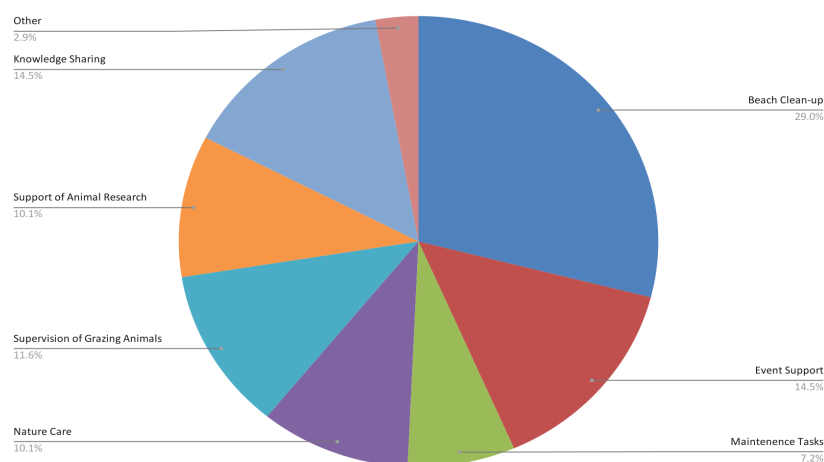
*“We have been so used to this welfare system, but now it’s decreasing because we don’t have the money.. It’s the mentality, the Danish mentality”.*³⁷

5.4.4 Volunteering

The majority (58%) of questionnaire respondents were unwilling to volunteer within the DWSNP. Of that 58%, the divide between visitors and residents is almost equal (51% and 49% respectively). In contrast, of the 33 respondents that were willing to volunteer within the DWSNP, the vast majority (85%) of them were residents. There are two statistically significant indicators of an individual’s willingness to volunteer, residency status ($p=.001$) and whether the respondent lives inside the DWSNP ($p=.045$). Combined with the descriptive statistics presented, it can be concluded that residents living within the DWSNP have the highest willingness to volunteer, which is logical considering that they have no additional travel costs or inconveniences when engaging in volunteer activities.

Currently, 67% of questionnaire respondents *never* volunteer within the park, implying that there is a small group of the sample population who are willing to volunteer but are not currently doing so. The respondents who were willing to volunteer were, on average, interested in contributing 3 hours/week, with a minimum of 1 hour and a maximum of 5 (although respondents indicated this would be dependent on factors such as the season). Figure 5.4.4 shows respondents’ preference towards volunteer activities, if they were to volunteer.

Figure 5.4.4 - Preference of Volunteer Activities³⁸



³⁷ Informant 1

³⁸ Questionnaire Data

The participatory observation of a group of volunteers who took part in a beach-cleaning provided insights into the volunteers' motivations. Informal discussion revealed that appreciation of nature and willingness to protect it was shared among volunteers. Also, a volunteer explained that they participated to socialize and meet new people. Of the participants, two out of five were in fact tourists, which brings into question the questionnaire results and indicates that for some, the inconvenience posed by travel and cost is not an important deterrent.

The interviews with members of the DWSNP Secretariat contributed some findings concerning their perceptions on volunteerism. First, volunteerism was identified as an important aspect of the DWSNP's functioning (*"it is such an essential part of our being"*³⁹), covering various activities (regulation of predators' population, ringing birds, sailing a boat, driving vans, fencing, participating in advisory boards and meetings etc.). Furthermore, the development of tourism was identified as a potential gate to more volunteers, who would also be willing to pay to participate in volunteer activities, motivated by their desire to *"feel good"* or *"save the world and pay for it."*⁴⁰

Regarding factors that may limit the DWSNP's ability to recruit more volunteers, it was mentioned that certain DWSNP partners also have volunteers, and this may result in unwanted competition with these partners.⁴¹

5.4.5 Other Non-financial Contributions

Interviews have revealed that there are indeed other non-financial avenues through which local individuals and partners make essential contributions, beyond volunteering.

For example, Code of Conduct (CoC) projects was a topic raised by various partners in the interviews. The WSVC Management explained how they were interested in contributing to the development of CoCs, documents that will outline a set of "best practices" for those visiting, living and working within the DWSNP.⁴² They were currently working with the DWSNP and other stakeholders to develop a specific CoC for seal watching tourist enterprises. Rather than making a general financial donation to the DWSNP, they preferred to

³⁹ Informant 3

⁴⁰ Informant 1

⁴¹ Informant 1

⁴² Informant 10 & 11

be directly involved in this project that would have a positive impact on the natural environment within the DWSNP. Another partner agreed that the CoC was an important initiative because it is an opportunity to educate visitors about how to better care for nature, demonstrating their interest in contributing to the environmental protection of the DWSNP.⁴³

Also, an accommodation facility manager expressed their desire to be more actively involved in communication and marketing projects by “*telling the good stories*,”⁴⁴ while a board member and local politician mentioned that their municipality also provides administrative support and “*facilitates the paperwork*.”⁴⁵

Another key document is the National Park Plan, which, according to one of the DWSNP Board members, has been informed by 800 ideas provided by local residents. The board member notes how this involvement of local people has been essential:

*“That local engagement is very, very important. And we...of course you have the plan, but the process whereby this plan is developed is really important because you involve lots of local people and interests...[...]. All of the activities are made based on local ideas.”*⁴⁶

6.0 Discussion

The results obtained throughout the research process raise several elements worth further discussion. As presented, it was not possible to support the initial hypothesis that an individual’s valuation of different ES is directly correlated with their WTC to that landscape. Neither the questionnaire results, nor the interviews with the partners, showed any direct correlation between the valuation of ES and their WTC, whether financially or otherwise, to the DWSNP. It is noteworthy that a majority of the questionnaire respondents acknowledge a lack of awareness of the existence of the DWSNP. Generally, individuals are also unaware of the actual source of funding for the DWSNP, overestimating the role public funding currently has in its financing. It will be discussed how this general lack of knowledge may be a determining factor affecting the WTC of questionnaire respondents. However, it is also argued in the following sections that there is some potential for increasing the WTC if the

⁴³ Informant 13

⁴⁴ Informant 15

⁴⁵ Informant 5

⁴⁶ Informant 6

general awareness of the DWSNP is raised. Finally, based on the information obtained through the interviews, it has been observed that there is potential to engage partners in closer cooperation with the DWSNP institutions, including financial contributions, if the cooperation is based on the development of specific, collaborative projects.

6.1 Research Design, Methodology & Conceptual Framework Challenges

The research project used the ESF to explore individual *perceptions* of the value of the environment to investigate which ES are most valued by individuals, tangential to an adapted CVM used to ascertain their WTC. These conceptual frameworks were applied in combination to attempt an interdisciplinary analysis of a complex problem. As such, a set of concepts derived from utilitarian environmentalism (34) were used as a compass for interpretive methodology. In the field of economics, concepts are arrived at via reductionist approaches precisely because the aim is often quantification and value measurement, which require simplifications and rigid categorizations (9). Inversely, interpretive methodology relies heavily on meaning formation, social context and its transformation, which usually lead to the use of concepts and categories that are broader and open to interpretation via the process of scientific investigation (63). It proved unfruitful that questionnaire respondents were invited to provide answers about their *perceived* value of the different ES, in part because this presumed that they would answer questions about the benefits they derive from the environment as if they considered themselves utility-maximizers. The same flawed presumption of rational utility-maximization infiltrates the WTC questions: when asking respondents to indicate a preference for contributing in both financial and non-financial forms to the DWSNP, this required them to make an abstract commitment. This pitfall of the CVM has been identified in literature as a problem of “*scope*” and “*embedding*”, “*demonstrated by the non-existence of preferences*” (25). Further the hypothesis requires the stated WTC to be interpreted as indicative of perceived benefits, in spite of the respondents not themselves explicitly making this connection. The results show that complexity exists in the perceptions of environmental benefits. Indeed, questionnaire respondents did not indicate explicit “preferences” for specific ES, highlighting to a certain extent why the combined application of the ESF and CVM was ineffective at eliciting ES valuation. This reveals that more reflection on epistemology, interdisciplinarity and methodological choices would have been beneficial at the outset. This said, the simplicity of the ESF and CVM provided an initial

guide which was further calibrated through conceptual transgressions beyond their basic categories and guiding assumptions. In particular, the notion of *landscape imaginaries* (58) seems to better fit some findings conceptually, and also illustrate perceptual complexities.

Moreover, the questionnaire design for the ES valuation questions may have been insufficient for accurately capturing respondents' valuation of different ES. As presented in the *Results* section, the questionnaire responses yielded inconclusive results for determining which ES are valued most by the respondents. The majority of respondents answered that each of the eight ES listed were at least somewhat important.⁴⁷ This may be because the questions asked respondents to value the ES in an *absolute*, rather than ranking them *relative* to the other services. Instead, questions could have been structured as a relative ranking system, as was done by Castillo-Eguskiza et al (10) who utilized explicit, relative valuation questions in their questionnaire to capture respondents' valuation of ES. This might have captured a more differentiated valuation between the ES in this research, as respondents would have had to choose one service as more important than another.

Some respondents also found the wording of the ES questions to be confusing. For example, in a follow-up email, a questionnaire respondent explained that their response was not accurately captured⁴⁸. Also, when administered face-to-face by an interviewer, the questionnaire required further elaboration and explanations in the ES valuation section. This may have also contributed to why the results on the ES valuation were inconclusive, and resonates with literature warning of the limitations inherent to online surveys investigating complex ES (51).

Semi-structured interviews yielded findings that attest to the complexity of individual perceptions of the benefits derived from the environment of the DWSNP. Analyzing the qualitative data brought forth many challenges regarding the categorization of different ES: there was difficulty in accurately capturing how interviewees value these services. Many interviewees described certain ES as important, despite not necessarily directly benefiting from these, including a marine biologist who referred to tourism and agriculture as important services⁴⁹. Others provided accounts of interdependent ES that can hardly be disentangled from one another, such as the sports fisherman representative on the DWSNP board, who

⁴⁷ See *Figure 5.1*

⁴⁸ Follow-up email response from questionnaire respondent

⁴⁹ Informant 3

explained how the water quality, a provisioning ES, is important for the fish populations that are, in turn, important for fishing, a cultural ES⁵⁰. This resonates with the idea of *bundles of ES*, services that cannot be easily dissociated from one another (53), which has been used remedially in literature to overcome such conceptual challenges.

Apart from bundles, findings in this project point to *trade-offs* between different ES (56). For example, one of the farmers explained how the increase in the population of geese has contributed to increases in the farmer's costs of production due to necessary reseedling. Although the healthy status of geese populations, protected by the EU Birds Directive (19), can provide certain cultural services, according to the farmer, they also harm food provisioning services⁵¹. Similarly, the opinions against tourism gathered in the follow-up emails from certain respondents highlight how they perceive that the recreational potential of the area can compromise other ES due to the degradation of nature⁵².

Overall, the intuitive answers of the interviewees do not necessarily reflect the “tidiness” and clear-cut categorization inherent to ESF. While the questions could have been structured to better capture a relative valuation, it is unclear whether this would be meaningful to interviewees. Moreover, this would not have allowed for these conceptual and perceptual complexities to emerge. The difficulties in using the ESF to examine real-life processes, as well as the conceptual inconsistencies and confusion with the framework, are issues that have already been raised by researchers applying the ESF (10; 49: 666). In particular, Root-Bernstein and Jaksic (49) found that the ESF is more policy-oriented and academic, rather than reflective of how people relate to their natural environments in reality.

Finally, as has been indicated⁵³, interviewees recognized benefits derived by the DWSNP as an *institution*. These benefits go beyond the ESF categorization, but are still intimately linked to the natural processes taking place in the ecosystems. In this case, the benefits are socially regulated, as it is the DWSNP institution which mediates their access. The examples mentioned, such as “*storytelling*” or “*branding*” opportunities, as well as the greater appreciation for the special character of local nature, are direct consequences of the existence and work of the DWSNP as an institutional entity. Even though these are not services

⁵⁰ Informant 6

⁵¹ Informant 14

⁵² Follow-up email response from questionnaire respondent

⁵³ See section 5.2.1. *Benefits beyond Ecosystem Services*

provided by natural processes, the benefits identified by the interviewees are inextricable from the preservation of healthy ecosystems. Those benefits are, however, not captured by the ESF, demonstrating the limitation of this framework in capturing benefits derived from crafting new representations of the natural environment. Moreover, interviewees' references to the NP designation changing the way local people view their surrounding environment, and the effect it has had on branding the area as a destination for tourism resonate with literature arguing that protected areas play a major role in crafting landscape imaginaries by generating new representations of nature and rurality (61).

Apart from *nature* being socially constructed via these narratives, it is also the case that novel perceptions impact the environment's biophysical features through landscape management and conservation choices. For example, the fact that increasing tourism finds its potential in bird populations (which become a key signifier and symbol of a rural area) also translates into these species being prioritized over others and, in a way, "*made live*" (22; 47). This is indicative of the dynamics and continuous feedback between perceptions and materiality in human-nature interactions and their inextricable bio-social exchanges: far from "nature" being portrayed here solely as a social construct, the findings point to processes of interdependent and deeply entangled transformations of lives of birds and people. In summary, the ESF, although a useful tool, was incapable of capturing the complexity of human-nature relations in reality within the DWSNP.

6.2 Implementation of the Method

There were some limitations that restricted the questionnaire's success at effectively gathering data. Although the initial goal for respondents was 100, the final sample was 78 complete responses (12 partially completed were discarded from the analysis). Among these, there has been an uneven distribution of response rates between the two target groups. The number of visitors that responded to the questionnaire is significantly lower (28.2%) than the number of locals, generating a slight bias on the results analysis. The reason behind this is likely due to the different distribution methods employed. Questionnaires were distributed in local mailboxes and on a Facebook page that mostly catered to local people, while tourists were reached solely through physical distribution in 'tourist hotspots'. The reach of the Facebook page was significantly higher (up to 4345 individuals) than the physical distribution (a total of around 300-350 leaflets distributed to both target groups), potentially

altering the balance of responses. Because of the time of year, it was more difficult to find tourists, and the low tourist response rate means results may not accurately reflect tourists' WTC.

Regarding qualitative approaches, a flaw in the implementation was that in interviews DWSNP partners were not all explicitly asked if they would be willing to pay for the partnership. For example, Tønninggård and the WSVC were asked only about their general perceptions on funding. To have consistent findings, each partner should have been asked the same set of questions.

6.3 Behind the WTC

6.3.1 Individual Motivations and Guiding Perceptions

Throughout this research, different motivations and guiding perceptions emerged for why the majority of respondents were not willing to contribute to the DWSNP, either through compulsory or voluntary financial contributions, or through volunteering. Firstly, the majority of questionnaire respondents were unaware that the Danish Wadden Sea is in fact protected by an NP. It follows that many would not be willing to contribute to an institution they did not previously know existed. From the interviews, it has become clear that even among those who are intimately related to the DWSNP, such as partners, there lacks clear knowledge about the role and practical application of the DWSNP institution.

Another motivation for this lack of willingness are Danish cultural customs related to natural resources management and appreciation of nature. Two of our questionnaire respondents in follow-up emails explained that they were not willing to contribute financially to the DWSNP because they believed that the Danish “state” has the ability and the responsibility to pay for the management and maintenance of the DWSNP⁵⁴. The grant from the Finance Act is, however, only constituting 50% of the current DWSNP annual budget, whereas the remaining is raised from the EU and private funds (39). As a member of the DWSNP Secretariat explained, it is the so-called “Danish mentality” to rely on the welfare state to support projects such as the DWSNP.⁵⁵ This mentality may then be a contributing factor as to why Danes are unwilling to financially contribute to the DWSNP.

⁵⁴ Follow-up email response from questionnaire respondent

⁵⁵ Informant 1

The DWSNP's reliance upon private funds resonates with literature highlighting the increasingly important role the corporate world and free market are playing in conservation and nature management (21; 3). The need to establish "green" corporate identities finds in protected areas and NPs a key vehicle. In the example encountered in this study, the donor foundation had pre-defined the purpose of the project they would fund, which was tourism development⁵⁶. Financing environmental protection through market mechanisms raises the question of whether protected areas run the risk of eventually restructuring their agenda and adjusting their priorities in accordance with the funding opportunities available on the market, which are often governed by market priorities. This has been described as "*nudging*" in related literature and implies that, otherwise participatory or community-based conservation institutions follow agendas designed by "*choice architects*" (54 cited in 3). This means that overreliance on the free market as a source for funding may randomize the priorities selected by beneficiary institutions within the wide spectrum of activities they can engage in as required by regulatory laws. For this reason, it is important that alternative sources of incoming financial inputs be pursued.

Another fundraising strategy considered feasible by 43% of questionnaire respondents, is to impose fees for tourists and restrict free access to certain areas of the DWSNP. Interviewees supported this idea to varying degrees. One interviewee identified this option not only as a suitable way to fill the gap created by the reductions in public funding, but also as an effective regulatory and protective measure to decrease access to areas that receive high numbers of tourists⁵⁷. Other interviewees focused more on the importance of balancing uses, for example, allowing tourists to collect oysters, but encouraging them to only take as many as they can eat, and supported regulating tourist numbers through fees not only for the sake of nature protection, but to reduce the disturbance experienced by local inhabitants.

An indication of prevalent neoliberal ideology can be identified in the idea that there is unexploited funding potential in commercializing conservation activities. For example, tourists would pay fees to collect trash, design fences etc. This seems to correspond with Polanyi's concept of (43; referenced in 42) "*fictitious commodities*". Peluso (42) supports the notion that ES has facilitated a market-based framing of nature as something to buy and sell.

⁵⁶ Informant 16

⁵⁷ Informant 15

Also, other literature (21; 3) point to the fact that neoliberal ideology advocates for nature to be saved solely through its commodification.

That said, the results also point to traditional and cultural elements hampering commodification processes and restrictions on access. For instance, the WSVC Management explained in their interview that they would like to avoid enacting entrance-fees for the DWSNP so as to not lose the culture.⁵⁸ Similarly, a follow-up questionnaire respondent argued that the “state” should fund the DWSNP, partly so that they can avoid the so-called “German” approach to nature management.⁵⁹ Comparisons between the “Danish” and the “German” models was a recurring theme in both interviews and questionnaire follow-up responses: the notion that nature should be free to access and void of large imposing signs in Denmark. This contrast between the traditions and environmental management models of these two Wadden Sea countries is also reflected in Walsh (59), who presents the Danish example as bottom-up and the German example as top-down. Could this tradition of wide social engagement and participation form the basis of an equally bottom-up scheme for contribution to the financial sustainability of the DWSNP institution? Below is a discussion on various aspects related to motivations and perceptions about contributions with references to broader socio-economic processes.

6.3.2 Partner Motivations and Guiding Perceptions

Of the stakeholders consulted, the DWSNP partners seemed the most willing to financially contribute to the DWSNP. The results show the motivations behind this contribution were primarily a consequence of the opportunity to capitalize on the marketing and story-telling opportunities, but may have also been based on a sense of responsibility for the natural environment. One example is the brewer’s statement that it is the responsibility of the partners to financially contribute to the DWSNP because of how they benefit financially from the marketing offered by the DWSNP institution. Specifically, this brewer explained how they have financially gained from a collaborative project proposed to them by the DWSNP Secretariat⁶⁰. The use of the DWSNP brand together with the “black tern” featuring as a product name served in framing both *green-ness* and *local-ness*. This example illustrates another form of commodification that relates to the consumption of signifiers of nature and

⁵⁸ Informant 10 & 11

⁵⁹ Follow-up email response from questionnaire respondent

⁶⁰ Informant 12

rurality (61). Again, there emerges a neoliberal pattern of nature being *protected* via consumption and market processes (21; 3).

However, some of the motivation behind these business owners joining the DWSNP partnership program does not seem to be based solely on economic interests, but also on social and environmental interests. In the 2020 partner survey conducted by the DWSNP Secretariat, the motivations behind these business owners joining the partnership program were revealed to be predominantly community- and responsibility-based. In the survey, when asked what their motivations were for joining the partnership program, the majority (72.5%) of respondents chose ‘to be part of the partner community’ and 47.95% chose ‘to take care of the Wadden Sea’ (37). Meanwhile, only 15% chose ‘to make an economic profit’ as their motivation for joining the partnership program (37). These data suggest that partners may also feel an environmental and social responsibility to the Wadden Sea, which could contribute to their motivations to both become a partner, and potentially pay for that partnership. This sentiment was not explicitly reflected in the interviews, although the interviewers often had the sense that partners had a personal connection to their environment as there were frequent references to *beauty* and *uniqueness*.

Because partners’ motivations are likely based both in economic and environmental sensitivities, it follows that the DWSNP should capitalize on these motivations with project-based, collaborative initiatives with their partners. Project-based initiatives, such as the Black Tern Beer project, have the dual benefit of providing economic return for partners through branding and marketing opportunities, while also appealing to the partners’ sense of environmental and social responsibility.

6.4 Increasing the Willingness

Based on our research, a few opportunities emerged that the DWSNP could explore to expand their funding opportunities. Firstly, a key result of this study is that there is generally limited awareness of the DWSNP and its UNESCO World Heritage status. This is surprising, as the DWSNP and its partners have clearly worked diligently to disseminate information about the uniqueness of the cultural and natural landscape within the park - particularly to students in the four Wadden Sea municipalities. In spite of this, the questionnaire result indicating a low awareness, particularly among local residents, highlights a need for creating

broadier awareness. By increasing knowledge about the institution that preserves and protects the natural environment in the Wadden Sea, it is likely that locals as well as tourists are more likely to support the DWSNP.

Although some of the interviewed DWSNP partners indicated that it may be a feasible option to charge some kind of fee for the partnership, many also cautioned that doing so would alienate some partners. Therefore, charging compulsory fees for the partnership is likely not a feasible option.

Furthermore, based on questionnaire responses, individuals are also more willing to donate to specific projects, rather than making a general donation to the park. Therefore, focusing fundraising on specific projects, both for donations and for partner contributions, would likely be a successful pathway to increase funding.

Individuals and partners are also interested in continuing to contribute to the management of the DWSNP through initiatives such as the National Park Plan and CoCs. The DWSNP already allows for significant community involvement, as shown by the more than 800 ideas contributed by local people to the National Park Plan.⁶¹ This large participation indicates that the community appreciates their inclusion. This is especially true for individuals when they can achieve some tangible result of their efforts, exemplified in the popularity of beach clean-ups as the most preferred volunteer activity among questionnaire respondents.⁶² Similarly, interview discussions with DWSNP Secretariat members stressed the importance of the “feel good” factor when engaging individuals in volunteer activities and citizen science.⁶³ There remains a valid concern for the DWSNP institution to avoid direct competition with their valuable partners, preventing them from establishing their own independent volunteer program. However, there is certainly potential for the DWSNP to collaborate with partners to create initiatives that engage community members and visitors in ways that maximize their participation, especially by allowing them to exercise tangible change.

⁶¹ Informant 6

⁶² See *Figure 5.4.4*

⁶³ See *section 5.4.4: Volunteering*

6.5 Group Reflections

Overall, our group process was effective for accomplishing our goals and the requirements of the report. Our group had minimal cultural divide, as all of us come from either European or American backgrounds. However, we did have some differences to overcome in terms of our disciplinary backgrounds. This resulted in our group splitting up on some aspects of the project, such as when deciding on a theoretical framework and analyzing the data. Ultimately, our process of dividing on some portions and collaborating on others allowed us to complete tasks and research in a timely and effective manner. However, the project did push each of us to rely upon our existing disciplinary backgrounds, rather than pushing us outside of our comfort-zone.

7.0. Conclusion

This study has sought to understand the extent to which various stakeholders might be willing and able to fill the impending financial gap created by reductions in public funding for the DWSNP, with the tangential aim of uncovering whether different stakeholders assign contrasting values to ES. The intersection of these aims was the – eventually unsupported – hypothesis that individuals indicating a higher valuation of ES would be more willing to contribute in some way to the maintenance of this ecosystem availing these services. In exploring this relationship, interesting findings have surfaced regarding: the limitations of the ESF and adapted CVM in both capturing wider environmental benefits as well as reflecting the nuances in human-nature interactions; the potential for the DWSNP Partnership program to be further developed and mobilized by focusing on specific joint projects; and the importance of increasing awareness of the DWSNP and its UNESCO World Heritage status. Finally, these findings, although specific to the DWSNP, have prompted important reflection on wider trends of reduced funding for nature protection, alongside increasingly neoliberal practices within nature management.

Allowing for the limitations of the ESF and the CVM, it can be safely concluded that there *are* in fact ways to ‘fill the gap’, at least partially. However, there is no **one** way to ‘fill the gap.’ Although there are some solutions available, it is likely inevitable that the DWSNP

institution will be forced to cut spending as a result of the reductions in the grant allocated by the Finance Act.

A finding that should not be understated is the limited knowledge among locals and visitors alike, both of the park's status as a UNESCO World Heritage site and the designation of the area as an NP. How can one contribute to something one is unaware of? While concerted efforts exist to increase awareness, this finding suggests the need for other avenues of communication and marketing which are perhaps more immediate and frequent.

The situation of the DWSNP is not an exception to broader trends of neoliberalization in both nature protection as well as rural development. In fact, findings in this report support the perception that nature protection is enabled by its commodification, especially through tourism and consumption of rural signifiers. Accordingly, it is concluded that the reliance upon private funds as a core source of financing for the DWSNP poses important challenges for its sustainability, both financial and environmental. There is a question of whether this necessity to utilize the support of these funds may potentially condition the behavior of the DWSNP institution in ways other sources of funding do not. Consequently, it is argued that the continuous and sustained funding provided by individual and partner contributions would add security and flexibility to the DWSNP institution operations. As it has been suggested, the DWSNP institution has an array of options that could potentially generate such opportunities. Finally, these options also align with the culture and tradition of bottom-up governance and participatory approaches in nature management, which are fundamental to the DWSNP.

Wordcount: 10,786 words

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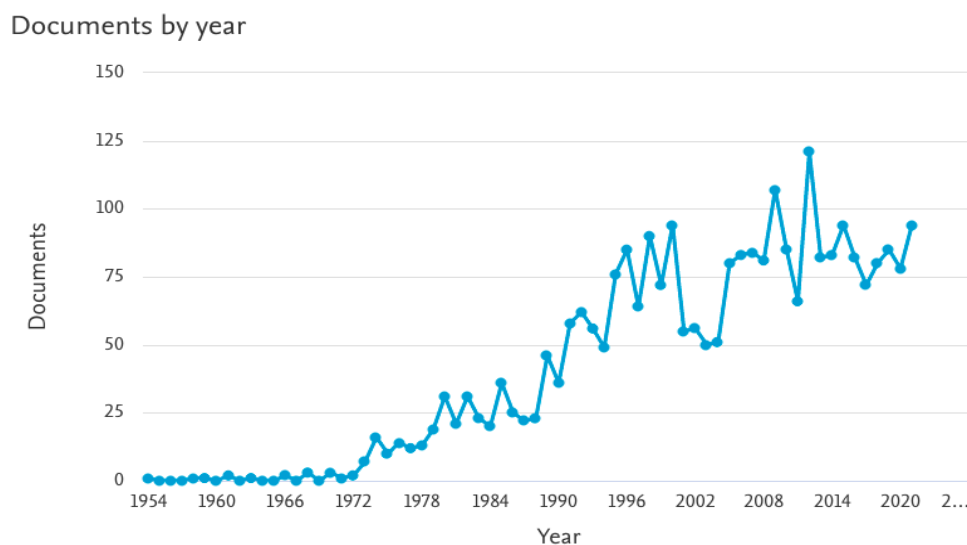
Appendices

Appendix A - Literature Review Process

The literature review was conducted on the database Scopus, which returned 2,819 items for the following search: Wadden AND Sea -> Title OR Key Words OR Abstract. For cross-reference purposes, the same search was performed on the databases Web of Science and Jstor, both of which yielded equally high numbers of research output items.

Scientific research about the Wadden Sea appears to have increased relatively steadily since the mid-70s while it gained greater momentum after the early '90s, with 2012 being the year with the highest number of relevant research publications (121 items).

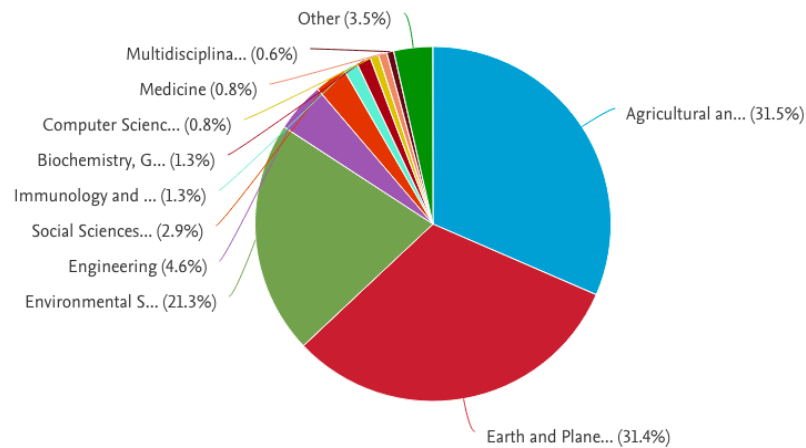
Scientific Outputs about the Wadden Sea over Time⁶⁴



⁶⁴ Graph designed by authors on Scopus

*Scientific Outputs about the Wadden Sea by Subject Areas*⁶⁵

Documents by subject area



The most rigorous scientific interest has been demonstrated by the fields of *Agricultural and Biological Sciences*, *Earth and Planetary Sciences* and, finally, *Environmental Sciences*. Only 138 research output items originate from Social Sciences, while an additional 23 and 12 come from *Arts & Humanities* and *Economics*, respectively (see figure 1.2.X).

Out of the 2,809, only 902 make a reference to “Denmark” or “Danish”, while the number shrinks to 52 if the criterion “National Park” is added in the search formula.

*Scientific Output on DWSNP by Scientific Fields*⁶⁶

Scopus Results by scientific field for search formula: (TITLE-ABS-KEY (Wadden AND Sea) AND ((Danish) OR (Denmark)) AND (National AND Park))	
Scientific Field	Number of items
Environmental Sciences	28
Agricultural & Biological Sciences	25
Earth and Planetary Sciences	18
Social Sciences	12
Business, Management & Accounting	5
Engineering	3
Immunology & Microbiology	3
Energy	2
Arts & Humanities	2
Multidisciplinary	2
Total	52

⁶⁵ Graph designed by authors on Scopus

⁶⁶ Graph designed by authors on Scopus

Appendix B - Data Matrix

General Research Question	How do National Park stakeholders value ES, and how does that valuation impact their willingness to contribute to the management and preservation of the Wadden Sea National Park?				
Overall Objective	Research Question	Outputs	Methods & Activities	Inputs	Data Analysis
To assess how Wadden Sea national park stakeholders value ecosystem services.	I. Which ES – within the provisioning, regulation, cultural, and supportive categories (ex: conservation efforts, recreation, etc.) – are valued most by DWSNP stakeholders?	An understanding of which ecosystem service(s) is/are valued most highly.	Questionnaire - focus on ES valuation	Final sample of 78 individuals that represent tourists and residents	Descriptive statistics - which ES are valued the most?
			10 Qualitative follow-up e-mails	Final replies from 3 respondents	Content Analysis
			12 Semi-structured interviews - focus on ES valuation - 10 individual interviews (4 walking interviews) - 2 Group interviews	- 4 DWSNP Secretariat members - 6 local farmers (NP Partners) - 2 DWSNP Board representatives	Content Analysis (Deductive coding).
			Participatory mapping of relevant DWSNP areas	Designation of relevant DWSNP areas by 2 Secretariat nature experts	Used for background knowledge and information (not included as part of the data analysis in the report)
			Participatory observation	Active Observation and informal conversations with 5 volunteers	Collection of notes
	II. How does this valuation vary between different stakeholders, such as visitors, local people and others?	Overview of the different stakeholders of the Wadden Sea.	Stakeholder identification through a brainstorming process informed by relevant grey literature	Secondary data from relevant grey literature.	Create a stakeholder mind map and a structured table where stakeholders are grouped.

			1 Preliminary interview with DWSNP secretariat	3 key informants from the DWSNP Secretariat participated in the identification process.	
		Understanding of potentially different stakeholder-specific priorities.	Questionnaire with questions on ES valuations	Final sample of 78 individuals that represent tourists and residents	Statistical analysis from questionnaire responses - how does ES valuation vary between different stakeholder groups (residents vs. visitors, etc.)
			12 Semi-structured interviews - 10 individual interviews (4 walking interviews) - 2 Group interviews	- 4 DWSNP Secretariat members - 6 local farmers (NP Partners) - 2 DWSNP Board representatives	Content Analysis (Deductive coding).
			Participatory observation	Active Observation and informal conversations with 5 volunteers	Collection of notes and content analysis
	III. What factors influence their valuation? Such as demographics, socio-economic status, etc.	Overview of the background factors that influence the values they assign to ES	Questionnaire with questions on ES valuations	Final sample of 78 individuals that represent tourists and residents	Statistical analysis from questionnaire responses - how does ES valuation vary between different stakeholder groups (residents vs. visitors, etc.)
			12 Semi-structured interviews - 10 individual interviews (4 walking interviews) - 2 Group interviews	- 4 DWSNP Secretariat members - 6 local farmers (NP Partners) - 2 DWSNP Board representatives	Content Analysis (Deductive coding).
To assess how different stakeholders are willing to contribute to the management and preservation of the national park	IV. To what extent are stakeholders willing to contribute, either financially or in non-financial ways, to the preservation of DWSNP and the ES it provides?	Comparison of the willingness to pay/contribute of different stakeholders.	Questionnaire - with questions using the contingent valuation method	Final sample of 78 individuals that represent tourists and residents	Descriptive statistics and Statistical analysis from questionnaire responses

			12 Semi-structured interviews - 10 individual interviews (4 walking interviews) - 2 Group interviews	- 4 DWSNP Secretariat members - 6 local farmers (NP Partners) - 2 DWSNP Board representatives	Content Analysis (Deductive coding).
			1 structured asynchronous e-mail-based interview	1 qualitative response from private fund	Content analysis
	V. What factors influence their WTC financially?	Understanding of what factors, (age, profession, etc.,) impacts stakeholder's WTC	12 Semi-structured interviews - 10 individual interviews (4 walking interviews) - 2 Group interviews	- 4 DWSNP Secretariat members - 6 local farmers (NP Partners) - 2 DWSNP Board representatives	Content Analysis (Deductive coding).
			10 Qualitative follow-up e-mails	Final replies from 3 respondents	Content Analysis
	VI. In what ways are stakeholders more willing to contribute to the national park? Such as through volunteering, voluntary financial questions, annual memberships, etc.	Insight into the extent to which stakeholders prefer to make non-financial contributions.	Questionnaire - with questions using the contingent valuation method	Final sample of 78 individuals that represent tourists and residents	Descriptive statistics and Statistical analysis from questionnaire responses
			12 Semi-structured interviews - 10 individual interviews (4 walking interviews) - 2 Group interviews	- 4 DWSNP Secretariat members - 6 local farmers (NP Partners) - 2 DWSNP Board representatives	Content Analysis (Deductive coding).
			10 Qualitative follow-up e-mails	Final replies from 3 respondents	Content Analysis
			Participatory observation	Active Observation and informal conversations with 5 volunteers	Collection of notes and content analysis

Appendix C - Final Synopsis

Wadden Sea National Park Group

Introduction

The term *national park* may appear an uncomplicated concept: the designation of a geographical area as bearing exceptional environmental importance to a nation (Bell & Stockdale, 2019). Since its ceremonial use in 1872 in the USA, the term has acquired shifting connotations, reflecting diverse landscape imaginaries and worldviews about human-nature relations and governance paradigms (Walsh, 2020). For this reason, national parks have been understood by environmental historians as dynamic phenomena, entangling “*actors, networks, mechanisms, arenas, and institutions*” (Gissibl et al., 2012:2) in diverse, context-specific, politico-ecological configurations (Frost & Hall, 2009). Historically, there has been a shift from the so-called “fortress conservation” towards a “participatory” model of national park management (Bell & Stockdale, 2019). The former emphasised the conservation of untouched “wilderness” (Cronon, 1996) and has been criticised for dispossessing rural livelihoods, generating conflict, and hampering rural development in the name of conservation (Peluso, 1993).

The Danish Wadden Sea National Park (DWSNP) does not escape this history of conflict. Following a more democratic governance model, it exemplifies an attempt to strike a balance between conservation and rural development imperatives (Walsh, 2020). In this context, a limited regulatory authority to impose changes, translates into a trade-off between wider participation in its management and unhampered sustainable distribution of benefits from its ecosystem services (ES) (Walsh, 2020). Although aspects of stakeholder participation, including decision-making (Walsh, 2021 & 2022) and volunteerism (Kwiatkowski et al. 2020), have been studied, the park’s financial sustainability has received little attention. Our study sets out to fill this knowledge gap.

Research Questions:

How do national park stakeholders value ES, and how does that valuation impact their willingness to contribute to the management and preservation of the Wadden Sea National Park?

- Which ES – within the provisioning, regulation, cultural, and supportive categories (ex: conservation efforts, recreation, etc.) – are valued most by DWSNP stakeholders?
 - How does this valuation vary between different stakeholders? Such as visitors, local people and others.
 - What factors influence their valuation? Such as demographics, socio-economic status, etc.

- To what extent are stakeholders willing to contribute, either financially or in non-financial ways, to the preservation of DWSNP and the ES it provides?
 - What factors influence their willingness to contribute? Such as demographics, socio-economic status, etc.
 - In what ways are stakeholders more willing to contribute to the national park? Such as through volunteering, voluntary financial questions, annual memberships, etc.

Background

Coastal Wetland Loss: Global and Regional Trends.

Coastal wetlands are among the most productive types of ecosystems globally (WRI, 2005). They provide habitats for innumerable species of animals and plants, and produce more ES of importance for human well-being than other natural systems (ibid). Coastal wetlands are at risk of global degradation due to human activities and climate change (Secretariat of the Convention on Wetlands, 2021). The Wadden Sea ecosystem is no exception. Sea-level change, temperature increase, and changing wind patterns may lead to distribution shifts for plankton, fish, and birds, and populations of non-native species are expected to grow with adverse impacts upon species like black terns and grey seals (Philippart et al. 2017). The projected degradation of coastal wetlands, including the Wadden Sea, will reduce their capacity to deliver essential ES. It is therefore essential to conserve, maintain and rehabilitate their biodiversity and the ES they provide (WRI 2005).

The Wadden Sea: An Ecosystem of International Importance.

The Wadden Sea comprises the world's largest ecosystem of uninterrupted intertidal and sand-mud flats, featuring numerous barrier islands, sand dunes and salt marshes (Claudino-Sales, 2019; Enemark, 2015). It hosts nearly 10,000 species, ranging from one-celled organisms and fungi, to plants and animals, such as marine mammals and migratory birds (WSWH, 2022). According to the European Environmental Agency classification, 34 different habitat types and 10 species included in the EU Nature Directives are present within the park (EUNIS, 2022). Human populations have shaped its morpho-dynamics with the construction of the first dikes during the 10th and 11th centuries, and a major expansion of agriculture in the surrounding area during the 15th and 16th centuries (Alberts, 2015).



Image 1. Wadden Sea UNESCO site map (Claudino-Sales, 2019).

A surface area of 10,000km² stretching for 500km along the coasts of Denmark, Germany, and the Netherlands was recognized as a UNESCO World Heritage Site in 2009, following protection efforts beginning in the 1970s, when the three governments launched the Trilateral Wadden Sea Governmental Conferences. This coalition created a basis of collaboration, leading to a series of landmark acts in following decades including: a 1982 Joint Declaration for protection in accordance with EU directives, the 1987 establishment of the Common Wadden Sea Secretariat, the 1997 adoption of the Wadden Sea Plan and the 2002 designation of the Wadden Sea as a Particularly Sensitive Area by the International Maritime Organisation (Enemark, 2015).

The Danish Wadden Sea National Park

The DWSNP was established in 2010, following key developments in both national legislation and local-level osmosis among groups of land-users whose interests had previously been conflictual (Walsh, 2020). The DWSNP has never charged entrance fees for visitors, nor licensing fees for private business operations, such as tour guides, that operate within the park. Currently, about half of the funding for DWSNP comes from the national government, with the remainder raised by the Secretariat, which is concerned with identifying alternative sources of funding.

Danish National Parks are frameworked by the National Park Act (Act no. 533), approved on June 6, 2007 by the Folketinget (Rigsrevisionen, 2013). This sets 10 objectives for the parks, highlighting the goal “to strengthen and develop the natural values [...]” (ibid., 1) of the area. The Act strives to meet its objectives by voluntary participation, through a set of agreements with land owners. However, it does not itself provide any legal protection for the areas, which are instead protected by other legislation including The Danish Game Act, The Nature Protection Act (NPA) and the Forest Act (FA) (Rigsrevisionen, 2013).

The establishment of the Parks is the task of the Ministry of Environment, which outlines its main objectives through executive orders; however, the Board of the DWSNP is in charge of elaborating the NP plan that develops those objectives (Rigsrevisionen, 2013). The current

Plan is the second one in the existence of the park and was approved in 2019 for a six-year period (Nationalpark Vadehavet, 2019).

Denmark is also responsible for the implementation and integration into national legislation of the EU Habitat and Bird Directives. These Directives are integrated through the NPA and FA. The DWSNP is also recognized as a Ramsar Convention Site (Ramsar, 2012) and part of the Danish Natura 2000 Network sites (EUNIS, 2022), under which Denmark has specific commitments for conservation.

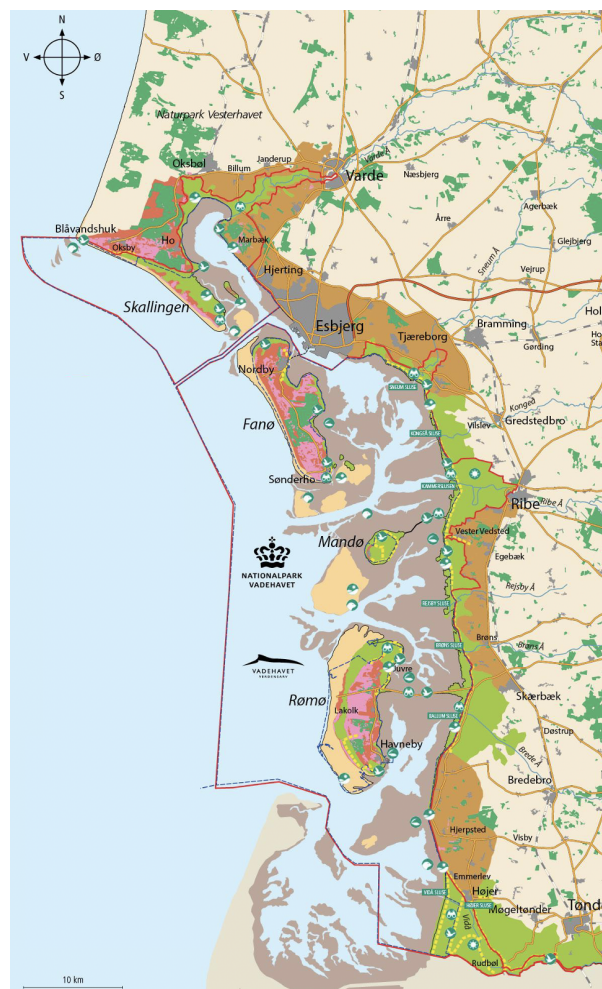


Image 2. Map of the Danish part of the Wadden Sea (mitvadehav, n.d.)

Volunteerism in the DWSNP

Present volunteerism in the DWSNP holds the potential to become a more integral part of the park's management and improve financial sustainability. Kwiatkowski et al. 2020 explores locals' and tourists' willingness, motivations and sociodemographics to volunteer. The survey results indicate a recruitment pool of 250,000 volunteers and that willingness to volunteer was not impacted by socioeconomic differences. The paper gives no recommendations for strengthening the volunteer scheme, nor explores the potential for volunteers to be financial contributors. The paper inspires us to analyse the profiles of other key stakeholders, and understand which ES they value most, allowing for an exploration into their willingness to contribute to DWSNP preservation.

Analytical Framework

Ecosystem Services Framework

The Ecosystem Services Framework (ESF) connects the development of natural processes in different ecosystems to human well-being (WRI 2003). It will be used in our research to analyse how respondents believe they benefit from the DWSNP, which will support our analysis of respondents' willingness to contribute to the preservation of the park.

The concept of ES dates back to the 1990s (Castillo-Eguskitza et al. 2018) and gained momentum after the launch of the Millennium Ecosystem Assessment (MEA) between 2001 and 2005. The MEA report explicitly focuses on ecosystems that have been heavily modified by human activities, showing how the framework is especially equipped to illustrate the interplay between humans and the environment. As Paavola and Hubacek (2013) highlight, ESF considers the complexities between "the structures, processes, and services of an ecosystem across the landscape" (ibid. 1).

ESF recognizes four types of ES: provisioning, regulating, cultural, and supporting services (WRI, 2003). The first three represent direct benefits for humans, the latter represents the natural processes that sustain the dynamics enabling other services. With this structure, ESF recognizes the plurality of values of ES, including biophysical, economic, and socio-cultural (Castillo-Eguskitza et al. 2018). In our research, the comprehensive analysis of preferences, willingness to contribute and the basic mapping of services can be identified with a modified application of the supply-demand analysis model developed by Castillo-Eguskitza et al (2018).

Methods

We will use mixed research methods in order to explore our research questions multangularly. Following Leech & Onwuegbuzie's (2009) typology, our research design is based on conducting a combination of quantitative and qualitative methods concurrently. The

quantitative research is aimed at collecting data about locals and visitors from a differentiated questionnaire. The rationale for this differentiation is that local residents and visitors relate differently to DWSNP. Additionally, we will conduct semi-structured interviews with individuals representing institutional stakeholders, including the municipality, local trade partners of the national park etc.. The integration of the data derived will be the final stage of our analysis, with a primary focus on visitors and local stakeholders and a secondary focus on the institutional stakeholders. Therefore, our method strategy is a mix of quantitative & qualitative, concurrently used and partially integrated with a dominant status for the quantitative element (Leech & Onwuegbuzie, 2009).

Questionnaire - Structured Interviews

The questionnaire will be distributed both virtually and in-person. It will be made available in English, Danish (see appendices) and German (not yet finalised). It will gather data on how visiting and local stakeholders related to the DWSNP value ES and their willingness to contribute to the national park. We have structured the questionnaire in SurveyXact such that tourists and residents answer slightly different questions.

Semi-structured Interviews

Our aim is to conduct a small number of semi-structured interviews with individual questionnaire respondents to derive more nuanced understandings of their context, *as well as* with institutional stakeholders (i.e. the Tønder municipality, DWSNP management etc.). From these conversations, we aim to gather the perspectives of stakeholder groups on the need for contributions for the management of the park, and how the ES offered by the DWSNP benefits or hinders them. To conduct these interviews, we will use an interview guide including questions and keywords, but we will allow for the conversation to develop organically. Discussions will be recorded, transcribed and coded in accordance with key themes relevant to our framework.

1. Valuation of Ecosystem Services

In the questionnaire, we would like to understand which ES offered by DWSNP are most important to the various stakeholders/respondents. We do this by directly asking respondents how important certain aspects are to them, with a Likert scale of fixed responses. For example, *“The establishment of the national park contributes to the prevention of floods and storm protection. How important is this aspect of the national park to you?”* We have selected 8 ES offered by the DWSNP, based on the (WRI, 2015). In our analysis, we will be able to identify which ES are most important to respondents, and evaluate how this relates to their willingness to contribute determined from responses to other questions. We will ask respondents to provide other examples of DWSNP ES or benefits. Finally, we explicitly ask respondents how much they would be willing to donate, and which projects they would more likely donate to.

2. Willingness to Pay (WTP) Methods

a. *Travel Cost Method*

The Travel Cost Method (TCM) relies on the key assumption that costs sustained when visiting a national park, such as entrance fees and travel costs, are indicative of the benefits they gain from the use and non-use values of that park. In our questionnaire, a section of questions aimed at tourists allows us to measure a WTP using the TCM, including: the distance travelled by the visitor combined with average petrol costs to reveal the likely cost of travel; and the price range of their accommodation. The TCM is best suited at valuing recreational and tourist activities, which have obvious markets and prices, and is mostly unable to assess other non-marketed ES like climate regulation and habitat conservation (Folmer, van der Veen & van der Heide, 2010).

b. *Contingent Valuation Method*

A disadvantage of the TCM is that it relies on revealed preference: the calculated WTP is achieved by exploring proxies and relying on data from external markets. In our research context, it also has the methodological flaw of automatically excluding the stakeholders who are not tourists, thereby potentially inflating their ‘stake’ in the preservation of the DWSNP and assuming them to be the more invested party.

The contingent valuation method (CVM) allows all stakeholders to participate and requires them to explicitly state their WTP, thus avoiding the methodological pitfalls of the TCM. The CVM has been used extensively to quantify benefits derived from ES, including: estimating the benefits of the Serra do Cipó National Park in Brazil through calculating visitor’s WTP to conserve the park’s ecosystems (Resende et al., 2017); and assigning an economic value to the forest ES of Heshui watershed through respondents WTP for hypothetical situations of improved conservation (Tao et al., 2012).

Schasfoort & van Duinen, 2014 adopt the TCM and a choice experiment, a form of CVM, to uncover tourists’ valuation of climate change impacts on the Dutch portion of the Wadden Sea, finding the highest WTP for maintaining bird populations. They argue quantifying tourists’ WTP in this way can inform marine and coastal policy development. No similar analysis has been conducted in the Danish part of the Wadden Sea.

Sampling Strategy

Our goal is to make a targeted sampling (purposively selected sample) to reach the different stakeholders identified. The attempted size of sampling is approximately 100 respondents, equally distributed among different stakeholder groups to reduce bias and result imbalances. We will do a preliminary stakeholder list that will be confirmed in the field through semi-structured interviews with key informants. Through interviews we aim to identify the stakeholders most relevant to the study’s purpose.

The group will visit key spots to access different respondent groups, including visitor centres, specific businesses and tourism hotspots. We will consider different strategies, including

snowballing and web-based questionnaire dissemination to reach the highest possible numbers of respondents, while being consistent with the targeted nature of our sampling.

We have identified the following list of stakeholders based on the Interreg IVC project “PROWAD Protect & Prosper - Sustainable Tourism in the Wadden Sea”, in 2012⁶⁷.

- Local residents (from the 4 municipalities, including farmers and residents from town)
- Tourists (Danish, summer house visitors, and international)
- Wadden Sea Municipalities (prioritizing Tønder)
- Business owners (tourist and non-tourist enterprises, focus on national park partners)

Wordcount: 2495 words

⁶⁷

<https://www.waddensea-worldheritage.org/resources/stakeholder-survey-german-wadden-sea-region-excl-hamburg>

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Appendix D - Codebook for the Analysis of Interviews

Code	Description	Importance	Subcodes		Origin
Location	The <i>location</i> code was used to organize related subcodes.	Coding for <i>location</i> allowed the researchers to assess and compare the different ecosystems and areas that are valued the most in the NP.	Subcode	Description	<i>A priori</i>
			Rømø	-	
			Mandø	-	<i>A priori</i>
			Fanø	-	<i>A priori</i>
			Tøndermarsken	-	<i>A priori</i>
			Skallingen	-	<i>A priori</i>
			Ho Bugt	-	<i>A priori</i>
			Blåvandshuk	-	<i>A priori</i>
			Other locations	Code for locations within or outside the national park aside from those mentioned above.	<i>A priori</i>

Code	Description	Importance	Subcodes		Origin
Time	The <i>time</i> code was used to organize related subcodes.	Coding for <i>time</i> allowed the researchers to compare and assess how the situation in the Wadden Sea has evolved with the establishment of the NP.	Subcode	Description	<i>A priori</i>
			Before NP	Before the establishment of the NP	
			After NP	After the establishment of the NP	<i>A priori</i>

Code	Description	Importance	Subcodes		Origin
Money	The <i>money</i> code was used as an umbrella code to	The aim of the <i>money</i> code was to assess the	Subcode	Description	<i>A priori</i>
			Willingness to Pay	Willingness to pay for environmental services and/or	

	organize related subcodes.	importance of the economic aspects related to the NP.		partnering with the national park	
			Economic benefits	E.g., the economic benefits of partnering with the national park in terms of marketing, branding etc.	<i>A priori</i>
			Budget	E.g., reductions in grants from the Finance Act	<i>A priori</i>

Code	Description	Importance	Subcodes		Origin
Ecosystem Services & Nature	The <i>Ecosystem Services & Nature</i> code was used as an umbrella code to organize related subcodes.	The aim of the <i>Ecosystem Services</i> code is to assess the interviewees' perceptions of the different ecosystems and ES within the NP.	Subcode	Description	<i>A priori</i>
			Provisioning	Goods produced by the ecosystems within the national park	
			Regulating	Advantages from regulation of the physical, chemical, and biological processes in the Wadden Sea ecosystems.	<i>A priori</i>
			Cultural	Non-material advantages obtained from the ecosystems within the Wadden Sea national park.	<i>A priori</i>
			Supporting	The ecosystem services that form the basis of life on Earth.	<i>A priori</i>
			Wadden Sea Nature	Aspects of nature that are not covered by the ESF	<i>A priori</i>

Code	Description	Importance	Subcodes		Origin
Development	The <i>development</i> code was used as an umbrella code to organize related subcodes.	The aim of the <i>Development</i> code was to assess the interviewees' perceptions on the importance of the development aspect due to the	Subcode	Description	<i>A priori</i>
			Local /region development	E.g., infrastructure	
			Economic development	E.g., job creation, population retention etc.	<i>A priori</i>
			Environmental development	E.g., more sustainable farming, water treatment, increased biomass production	<i>A priori</i>

		establishment of the NP and activities within it.			
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Code	Description	Importance	Subcodes		Origin
Management	The <i>management</i> code was used as an umbrella code to organize related subcodes.	The aim of the <i>management</i> code was to assess interviewees' perspectives on how the nature within the NP area is governed.	Subcode	Description	<i>A priori</i>
			Bottom-up	Participatory decision making	
			Top-down	Decisions made at the highest levels	<i>A priori</i>
			Level of governance	E.g., ministry-level, municipality-level etc.	<i>A priori</i>
			Authority	E.g., secretariat, board, Nature Agency	<i>A priori</i>

Code	Description	Importance	Subcodes		Origin
Danishness	The <i>Danishness</i> code was used as an umbrella code to organize related subcodes.	The aim of the <i>Danishness</i> code was to assess how the interviewees think Danish culture and governance practices affect people's perceptions about- and use of nature.	Subcode	Description	<i>A priori</i>
			Welfare state	E.g., tax burden, expectations of roles of the state etc.	
			Social trust	E.g., voluntary cooperation	<i>A priori</i>
			Participation	Local initiatives etc.	<i>A priori</i>
			Availability of nature	E.g., unlimited access to nature	<i>A priori</i>

Code	Description	Importance	Subcodes		Origin
Partnership	The <i>Partnership</i> code was used as an umbrella code to organize	The aim of the <i>Partnership</i> code was to reveal benefits and		Description	<i>A priori</i>
			Perceptions about	E.g., motivations of becoming partners,	

	related subcodes.	disadvantages of the partnership program	partnership program	satisfaction, dissatisfaction etc.	
			Partnership obligations	E.g., obligations partners have to fulfill to be partners, obligations National Park Products have to fulfill etc.	<i>A priori</i>

Code	Description	Importance	Subcodes		Origin
Marketing & branding	The <i>marketing & branding</i> code was used as an umbrella code to organize related subcodes.	The aim of the <i>marketing & branding</i> code was to assess the importance of the marketing opportunities due to the NP and to assess how the NP is benefitting from marketing by NP- partners.		Description	<i>A priori</i>
			Branding of NP-Partners and NP-Products	E.g., branding of national park products due to the partnership program	
			Branding of the DWSNP	E.g., branding of the institution of the DWSNP due to partner activities	<i>A priori</i>

Code	Description	Importance	Subcodes		Origin
Non-financial Contributions	The <i>non-financial contributions</i> code was used as an umbrella code to organize related subcodes.	The aim of the <i>non-financial contributions</i> code was to explore how the interviewees support the NP and the ecosystems within it in non-financial ways.		Description	<i>A priori</i>
			Volunteering	E.g., beach clean up, hunting predators etc.	
			Management contributions	E.g., creation of code of conduct, being a board-member etc.	<i>A priori</i>
			Other non-financial contributions	Other types of non-financial contributions	<i>A priori</i>

Appendix E - Interview Plan for Semi-structured Interviews

1. Target group: National Park Partners - Include both tourist and non-tourist businesses

Aim: to understand the potential for DWSNP Partners to collaborate with the national park and contribute towards its financial sustainability.

Keywords: benefit, tourism, profits, donations, volunteering, community engagement

Practicalities

- Introduction of the research group members, aim of the research and general objectives of the interview.
- Introduction and background of the partners and their activities.

Questions on areas of interest

- **Ecosystem Services**
 - How do you benefit from the DWSNP?
 - Tourism - do you have increased business as a result of tourists coming to visit the national park?
 - Cultural life
 - Positive environment - enjoyable natural place to have a business
 - Environmental regulation
 - Benefits for production - Has the establishment of the DWSNP improved your productive activities?
 - What is the interaction between the ecosystems in the area and your activities?
- **Willingness to contribute**
 - Does your business make any kind of contribution to the national park - donations, volunteering, etc.? Why or why not?
 - Do you think the partners should contribute financially to the partner program? Why or why not?
 - To what extent would you be willing to contribute financially to the DWSNP?
 - Would you be willing to contribute in ways other than financially? (e.g. support to DWSNP projects, volunteering, etc.)

- **Management of the DWSNP**

- Has the establishment of the DWSNP put any restrictions to your activity or made you change your practices?
- What is your general opinion on the DWSNP institution activity?
- What do you think should be the priorities of the DWSNP institution?
- What activities do you consider are important for the DWSNP institution to develop?

- **Partnership program**

- What were your main motivations to become a DWSNP Partner?
- What is your general opinion on the Partner Program?
- What aspects of the Partner Program could be improved?

- **Debriefing** - Expression of appreciation and enquiry on interest to receive updates on the evolution of the research and the final report.

2. Target Group: Members of the DWSNP Secretariat

Aim: To understand the goals of and financial barriers experienced by the national park management. Better understand the ecosystems of the national park, and what services they provide. Also, to understand what conservation and environmental projects that are currently organizing, and what else they hope to accomplish. Finally, their perspective on the budget and how people can and should contribute to the park.

Keywords: goals of the national park, struggles of the national park, who should contribute, who benefits, improvements, future, contribution, funding

Practicalities

- Introduction of the research group members, aim of the research and general objectives of the interview.
- Introduction and background of the partners and their activities.

Questions on areas of interest

- **Ecosystem Services**

- Overview of the important ecosystems of the park
- How do they feel about Ecosystem Services related to the park?
- Have they worked with the framework before?

- Are people - tourists, visitors - aware of the important ES within the park? Or are they more aware of the general benefits that ecosystems provide? Do they reflect on or share their feelings on the ES?
- What are the main benefits for people of these ecosystem services? Who benefits from these ecosystem services?
- What are the main ES the park provides (Use mapping exercise)
- **Finances and Management**
 - Does the current budget allow for effective conservation and environmental protection?
 - Are they struggling to accomplish any of their goals because of lack of funding?
 - If the budget was increased, what would this allow for from a conservation perspective?
 - Which social groups are mostly/the least engaged in the management of the DWSNP?
- **Contributions**
 - Which stakeholders are already contributing to the management of the park? How impactful are these contributions?
 - How can these contributions be improved?
 - What is currently the role of volunteering for the DWSNP?
 - Which stakeholders should contribute more to the park? In what ways?
 - Are there specific ways for stakeholders to contribute to certain projects? If so, how can they do that? If not, should there be opportunities to do so and in what ways?
 - What forms of contribution would be most welcome by the national park?
- **Debriefing** - Expression of appreciation and enquiry on interest to receive updates on the evolution of the research and the final report. Request of further contact details of Partners and relevant stakeholders.

3. Target Group: DWSNP Board representatives

Aim: To understand the role of the Board in the governance of the DWSNP and its priorities. Evaluate the contributions and interests of the stakeholder represented by the Board member and their relations with the DWSNP.

Keywords: management, efficacy, efficiency, prioritization, goals, struggles, contribution, interests.

Practicalities

- Introduction of the research group members, aim of the research and general objectives of the interview.
- Introduction and background of the partners and their activities.

Questions on areas of interest

- **Ecosystem Services**
 - Which ES are prioritized by the Board?
- **Management and role of the Board**
 - How does the Board impact the management of the park?
 - How does the Board decide on the priorities of the DWSNP?
 - What is their opinion on the management system of the DWSNP?
 - Which stakeholders are already contributing to the management of the park?
 - Which stakeholders should contribute more to the park? In what ways?
 - How do they balance the interests of the Board and those of the stakeholder they represent?
 - What are the main challenges for the Board currently?
- **Contributions**
 - How should the funding gap be filled?
 - Beyond monetary contributions, are there other ways can contribute to the national park?
 - How do municipalities contribute to the DWSNP?
- **Debriefing** - Expression of appreciation and enquiry on interest to receive updates on the evolution of the research and the final report.

Appendix F - Summaries of Interviews

Informant 1: DWSNP Secretariat Director

Informant 1 is the Director of the National Park Secretariat. The extensive interview covered a range of topics including: an overview of the park's management including: its bottom-up approach, the role of the board and the role of the secretariat; the park's history including the early opposition and gradual acceptance from the local community; the informant's opinions on different potential forms of contribution including volunteering (for which they stressed the importance of the 'feel good' factor); an overview of the source of current funding which is primarily from private funds and the State; and an explanation of the current needs and wants in regards to further funding.

On the point of the park's management and its bottom-up participatory approach, the informant stressed the importance that board members are local individuals rather than people from, for example, Copenhagen. They also note how the new Social Democrats government has replaced some board members with individuals with greener profiles. They explain that decisions are made through consensus and that there is a good level of trust, which is necessary as all board members other than the chairman are not paid for their time.

The informant explained the different aspects of the Partnership program and emphasized the importance that the National Park does not compete with partners by for example taking from their pool of volunteers. However, the informant maintained that it is vital for the National Park to establish itself as an independent entity, as the informant believes there is currently little knowledge of what the National Park actually does (referring to their 10 objectives). This led to the informant stressing the need for branding and marketing.

When providing an overview of current funding sources, the informant explained the upcoming changes: that the park will lose around 15% of their budget as the contribution from the Finance law will decrease from 9.5 million DKK to 8.2 million DKK. The informant explained that most of the money comes from private funds, and these finances are dedicated to specific projects. The next large contributors are EU funds, Interreg programs and Life projects, but the informant mentioned that applying for these involves a lot of administrative costs and time and resources. The informant also explains how fund objectives have changed to become more specific and objective-oriented. For example, Nordea fund is, according to

the informant, very focused on nature-culture activities. The result is that the National Park must fulfill those demands in a market in which they face high competition.

The informant also raised some points about how, in their opinion, the Danish State is changing, while people's expectations of what the State can provide them with remains the same. The informant related this to the relationships with and perceptions people have of nature and nature management in Denmark. In the informant's opinion, it is time to "shake the cages" and have a change in this mentality.

Informant 2: DWSNP Secretariat Communication Consultant

The National Park Secretariat Communication Consultant was interviewed about the background of the DWSNP and the local perceptions on it, given that he had been a resident in the area for more than a decade. The informant described the evolution of the perceptions of the local people on the DWSNP since the initial steps for its establishment. Informant 2 highlighted how these perceptions have changed from general skepticism to a current positive public opinion on the DWSNP. The reasons presented as the backdrop of the initial skepticism were, firstly, the fear farmers and producers had of getting their activities and practices restricted; secondly, the strong sense of identity of the region, which challenged plans originating in the central government.

The informant commented on how these feelings of distress changed as locals, including politicians, experienced how the DWSNP did not impose any restrictions; what is more, it generated benefits for some farmers and created a sentiment of pride. They acknowledged the important role of the recognition of the area as a WHS as a big boost to these processes.

Besides, the informant assigned big value to the education opportunities and efforts opened after the establishment of the DWSNP. They considered that the DWSNP has become an integral part of the school system, at least in the municipality where he resides. For instance, the schools work on thematic areas about the DWSNP alongside the museums, nature centers, etc.

The informant was key in contacting different stakeholders and partners. We were provided with a list of partners of the DWSNP, some of which were afterwards invited to participate in interviews.

Informant 3: DWSNP Secretariat Marine Biologist & Nature Consultant

One of the National Park Secretariat members with a background in marine biology was interviewed mostly about the different biodiversity hotspots and ecosystem services within the National Park. They identified a range of areas that could be considered important ecosystems (including the unregulated river Varde Å which is the habitat for the houting; Skallingen and Langli which have protected areas and the KU lab for sediment testing; Hjerting because of the butterfly population; and Blåvand as an area important for bird migration; and a protected area outside of Rømø) but noted that their knowledge is biased by their experiences mostly being in the Northern part of the National Park.

The informant also discussed their hesitance to use the term ‘ecosystem service’ as it is an overtly academic term and one which typically involves the monetisation of nature. They explicitly identified agriculture and tourism as two important ecosystem services. When asked about the conservation model adopted by the National Park, they referred primarily to how the board is the ultimate decision-maker, and while the secretariat can present suggestions and findings based on scientific knowledge, priorities are determined by the board who typically align with wider political trends and have to reach a consensus. Also mentioned was the different priorities and concerns of the four communes inside the National Park, with Esbjerg being an energy Metropol, while Varde focuses on tourism and agriculture and Tønder has fisheries and concerns with a decreasing workforce (no information on Fanø).

In discussing how the National Park could raise funds, the informant stressed the importance of being specific with projects and ensuring people experience a tangible outcome. They referred multiple times to the difficulty of raising funds and focusing projects on species which lack the ‘cuteness factor,’ or typically create ‘disaster stories’ such as those elicited from focusing on climate change. In this, they highlighted the importance of communicating knowledge to individuals to motivate their involvement. They mention the high amount of competition for funds from for example the EU, and the importance of being able to sell the project in a way which can be understood.

Finally, they acknowledged the importance of voluntary non-financial contributions to the management of the park, such as the volunteer hunters who regulate predator populations; the board members who are not paid; and the knowledge provided by scientists.

Informant 4: DWSNP Secretariat Game Management Advisor

Informant 4 works twice a week at the national park and is responsible for the training and management of the group of 45 volunteer hunters who regulate the population of predator animals. They have a background in nature management and they also provide counseling to landowners concerning practices to achieve a balance between protected species and their predators, namely foxes, raccoon dogs, mink, and crows. They explained that before the establishment of the national park hunting was allowed for private individuals but this is no longer the case. Moreover, they highlighted that it is the Nature Agency (Naturstyrelsen) that sets the goals for target species and population levels. The areas where their activities take place are Tøndermarsken, Rømø Syd, Rømø Nord, Mandø, Sneum Engsø, Fanø Syd, Fanø Nord and Skallingen/Ho Bugt.

Moreover, they indicated that there are different species prioritized by different Wadden Sea countries: in Denmark conservation has focused a lot on the protection of meadow birds and migratory birds, breeding birds such as lapwings, Eurasian oystercatchers, and redshanks, while in the Netherlands seals are more highly prioritized. They also explain that despite the fact that seals and cormorants pose a threat to certain fish species protected in Denmark, they are regulated only very mildly and in specific locations.

Finally, they pinpoint that they expect the upcoming reduction to the DWSNP budget to impact their activities and are planning on resorting to fundraising and support from the municipalities. They also oppose the idea of commercializing hunting activities for raising money from tourism as this would be dangerous in a flat area, while they mention that “accessible” nature has been a tradition in Denmark, unlike Germany or Eastern Europe.

Informant 5: DWSNP Board Deputy Chairman and Representative of Varde Municipality

Informant 5 is a politician and a member of the DWSNP board since 2014. They are also a member of the Danish Wadden Sea advisory board, which is organized by the municipalities. They have participated in trilateral cooperation bodies like the Wadden Sea forum.

The interview started with explanations on protective action at a trilateral level. Further, they elaborated on the board of the DWSNP, its role in decision-making, budget management and financial resource allocation. They highlighted that the secretariat approaches different potential partners (i.e. “bird people”, farmers etc.) to make projects collaboratively, following the decisions of the board on how the budget should be allocated. While the municipality provides administrative support, concluding that projects are an outcome of wide collaborations.

They believe there has been more focus on nature projects in the last 4 years. They pointed to the green NGOs as key players in this shift of orientation, remarking that initially they were not very open to dialogue, but this has improved. Also, the national conservation agency is described as “*watching*” for the implementation of the law during board meetings. Concerning the municipalities, they mentioned an “*unspoken agreement not to intervene in other municipalities’ interests*”. However, conflicts may arise (i.e Fano residents are not happy with the industrialized area of Esbjerg’s harbor, and Tonder municipality’s plan to create a helicopter port is questioned by the green NGOs). They talked of the need to balance nature protection and rural development to stop the population moving to Copenhagen. They also reminded that the national park cannot be used as a “*negative tool*” which hampers development. Other challenges to nature protection are traditional agricultural land use and building of summer houses. Concerning tourism, they acknowledged that the beach areas and breeding sites for birds need some control as numbers of tourists are increasing.

Concerning the financial situation, he speaks of a “*frustration period*” due to the upcoming reductions. They mentioned that the ministry wants this portion of money invested in “nature national parks”, which equate to fenced areas with large animals. They highlighted that green NGOs welcome the idea while the municipalities reject the “fenced nature” idea. They believe the lack of financial resources should be addressed politically by convincing the minister not to implement reductions. They see no potential for taxes on tourists or fees by the municipalities. Neither do they think partners will be willing to pay. Large funds, however, are very interested in paying for nature, the informant remarks.

Informant 6: DWSNP Board Representative of the Danish Sports Fisherman

Association

Informant 6 was born in Billum, in the Varde A area. As a result, they have a strong attachment to the National Park area, which they considers their home. As a matter of fact, that is one of their motivations to be a member of the Board, where they also acts as the Chairman of the Nature Committee. The informant's background in biology, and thus, their knowledge and interest in nature and the ecosystems, are other reasons that motivate them.

They hold that the perceptions of the population and the farmers on the National Park have changed in the last decade and nowadays they are mostly positive. According to them, the focus of the National Park institutions itself has shifted, increasing the focus on nature protection.

One of the reasons they consider behind that positive attitude is the management model of the Park. They value very positively the work of the Board as a consensus-based institution with local representation, as well as the role of the Secretariat as a facilitator of projects. Regarding the Board, they highlight the capacity to harmonize interests and work towards common goals. They consider the lack of authority of these institutions positive because these aren't viewed as dangerous by the population, and that has created widespread local engagement - for instance through the proposals to the National Park Plan - in the development of the projects of the National Park, which the informant considers very important. They also have a positive opinion on the partnership program, as they think that the partners develop a lot of good activities but according to them, under good coordination.

Regarding the financial aspects, they admit the challenge that reduced public funding can be, but they consider something good the presence of big funds ready to finance nature projects in Denmark. However, they question the sustainability of relying only on these funds. They thus propose fostering the attractiveness of the area for visitors as a source of revenue, viewing raising taxes and fees as something negative. On the other hand, they advocate for a sustainable model, where the numbers of tourists are controlled to avoid disturbances to nature.

In this regard, nature protection is very important for the informant, and they view the high levels of biodiversity, the dynamism, the high production of biomass and the carbon capturing capacity of the ecosystems of the area as highly valuable. They are particularly concerned about the good quality of marine and riverine areas for the welfare of the fishes and the sustainability of sport-fishing activities. However, they are concerned about long-term effects that global changes can have in these ecosystems and the challenge that could pose to certain projects of the National Park.

Informants 7, 8 and 9: Naturecentre Tønninggård - Manager & Nature Guide, Nature Guide and Mediator of Nature

On Wednesday the 2nd of March we interviewed the national park partner Naturcenter Tønninggård that organizes tours in the national park area in Rømø. The interview was a semi-structured group interview with informant 7 the Manager, informant 8 the Nature Guide and informant 9 the Mediator of Nature..

During the interview we talked about how the establishment of the national park has led to development in the region and created new opportunities. Informant 7, who grew up in Rømø, explained how the number of tourists has increased substantially over the years and Informant 9, who finished their studies in biology recently talked about how important the national park was for them personally when they decided to move to the rural and remote town of Tønder.

The nature center was established in 1992 but the number and type of visitors has changed since the establishment of the national park in 2010. Prior to the establishment, Rømø was mainly attracting tourists because of its beach, but now visitors are also coming because they care for the unique nature and environment.

Tønninggård is a national park partner and has a very close relationship to the institution of the national park. They are located in the same building as the secretariat, and collaborate in many ways through knowledge sharing, marketing, networking etc. The nature center sells guided nature tours and organizes free tours such as garbage collection tours where locals and tourists can help protect the unique ecosystem. The nature center cares a lot about educating

their customers as well as local residents in general. They collaborate with Tønder municipality in educating the students about the Wadden Sea, and teach their guests about the fragile ecosystem within the national park.

Tønnisgård is not highlighting any specific ecosystem services of importance to them. In terms of willingness to pay, they emphasize that they are a non-profit organization and that surplus money earned from the tours they offer are spent on information and education of visitors and locals; e.g., through waste collection tours.

Informant 10 and 11: Wadden Sea Visitor Centre Manager and Deputy Manager

After having an informal conversation with them the day before, the two individuals in charge of the management of the WSVC were interviewed. They consider the WSVC as the Gateway to the UNESCO Heritage area, and by extension, to the DWSNP. As they say, the path to have the current Visitor Centre has been long. They have been acting as a visitor centre for the area since 1989. They recall the tensions and discussions that arose with the establishment of the DWSNP to decide the status of the different exhibitions, visitor centres and nature centres that were already operating in the area. Their close cooperation with the municipality of Esbjerg (source of half of their funding) helped them arrange their current status with the ministry. Apart from the exhibition, they also carry out tours, education programs and research through their team of rangers.

Their view on the Wadden Sea is that it is a very special area, of great natural importance but also a key area in the Danish natural heritage. The opportunities it offers for school environmental education and its history make them value both the natural and cultural preciousness of the area.

According to them, the role of the DWSNP Secretariat should be that of intermediary between the partners and other authorities and they question generally the need to increase the funding of this institution. Instead, they advocate for a reorganization of its functions and activities. They themselves have a strong sense of being an important actor in the protection of the ecosystems and the dissemination of knowledge about the Wadden Sea. As a result, they consider that their relation to the Secretariat should be of cooperation but with the

flexibility to develop their projects without overlaps. Among other aspects, they highlight the importance of good communication between the partners and the Secretariat.

Even though for them the protection of nature should be the priority of the DWSNP, they acknowledge the importance of fostering local development. Although they consider themselves a tourism actor and they recognize the value generated by tourism in the region, they advocate for a controlled and balanced model. As far as they are concerned the main means to regulate this is the creation of a CoC for partners and private actors, so that they don't harm nature with their activities. They themselves already finance partly a CoC for activities involving seal watching. They prioritize this method to the establishment of fees or taxes for tourism as they consider access to nature should be free, something considered as a trait of the Danish way of approaching nature.

Informant 12: WestBrew Owner and Brewer

The brewery owner's collaboration with the National Park has been motivated both by their background in forestry, and by the opportunity it provides them to reach a different market (the ornithologists and 'fans' of the National Park who buy the black tern beer). The informant speaks positively about their experience as a National Park partner, referring to it as mostly loose agreements: "handshake agreements." They believe the park does well to connect partners with one-another at partner days. A more abstract benefit they derive from the National Park is a view of the world as 'borderless' which they explain inspires them to take risks and innovate.

The criticism they mention is brief and about the lack of clear instruction in what the requirements are to be a National Park product - another brewery has the same stamp but does not source products locally in the way the interviewee does, but according to the interviewee was able to have the official stamp as their product is majority water.

The informant sees the potential for similar collaborations, as the black tern conservation project, to be made between the park and other partners. They believe companies have a "social responsibility" and note there is no tradition in Denmark of initiatives like parks and museums being funded by the private individual. They see great value in the brand of the

National Park and believe businesses can get a lot out of selling a National Park branded product (especially overseas, referring to the Chinese market).

However, the informant also thinks the National Park needs to protect their brand, claiming they need to have a few lawyers and a technician to protect the brand, and collaborate closely with affiliated products so that these companies follow the park's values. They argue that in order for them to be able to do this, the National Park need to have more authority but the informant notes that the strong ownership of land in Denmark means it is unlikely they would be able to have more authority.

When asked about paying to be part of the partnership, they said it wouldn't make any difference for them so they would do it and that for other partners to feel the same way they would need to see exactly what they are gaining. They like the idea of making a clear investment in the National Park.

The informant believes the National Park could be better at their marketing, by releasing articles from the magazine monthly, rather than having the annual magazine. They stress the importance of telling a good story and the emotions and interest this can awaken within people.

Informant 13: Ho Bugt Oksen Organic Farmer

This interview took place as a walking interview around the farm of the interviewee. The informant showed us the most important parts of the farm, especially the cowsheds where the cattle were still being guarded from the late winter. The informant bought the farm in 2005 although it was a family business (belonged to their father previously). Nowadays the informant owns 300 calves, bought from farms where they had been discarded for any production. The cattle is fed mainly with natural fodder obtained from the collection of grass during the summer; only very small amounts of grain is added.

The informant's main activity is meat production, Copenhagen being their main market. The particularity of their meat is that, as they say, they employ low-intensity grazing, leaving the cattle free in the grassland, which is very beneficial for the breeding of birds as the cattle protects them from predators. This farmer sells part of their production to the Noma

restaurant. The informant stated that the National Park Secretariat played a very important role in this, especially the man in charge of nature projects, as the National Park helped them adapt their practices and also sell the story of sustainable grazing to the restaurant. Indeed, the informant recognizes the branding opportunities as the main benefit they get from the National Park. Besides, they value the Secretariat's role as a know-how collector. However, they consider that "selling the story" is a challenge, as it is necessary to put the right people together and to connect narrative through the whole value chain, which is often complicated.

Regarding the Secretariat, the informant sees its lack of authority as a challenge. Their view is that nature protection is important, but that the National Park institutions should also make sure that people have enough to live in the area. When speaking about financing the National Park, although they themselves wouldn't mind making small financial contributions, they think that applying that strategy would be negative for the National Park, as only the big and business-oriented partners would remain. On the other hand, they see very positively the creation of a CoC to educate people in how to take care of nature.

The informant states that there are still some tensions among farmers against modification of their practices. They argue that it is important to find a balance between the natural protection of the area and the capacity of farmers to develop their activities. In fact, they hold that their main motivation to apply sustainable practices is to prove that harmonizing nature protection and profitable agricultural production is possible.

Informant 14: Marskprodukter farmer

The interview with informant 14 was conducted as a walking interview where we drove around in the local area to see their land and particular areas of interest in Tøndermarsken. The informant is a farmer who produces sheep and cattle on their 350 hectares of land. They own 400 sheep and 150 cows and decided to become a national park partner because of the branding and marketing opportunities. Initially, they used the national park logo without being a national park partner in the branding of their products, but when they became aware of the partnership program and realized that it didn't require a lot of them, they decided to be part of it. Before the establishment of the national park they could sell a lamb for 1500 DKK but now the price has increased to 5000 DKK. The informant is not sure about whether that is due to the national park and its branding opportunities, but they concede that it has paved the

way for new markets in Northern Zealand and Sweden, where the WTP for high quality meat in general is higher than in the Southern part of Jutland and Germany. They are, however, not willing to pay anything for being a partner and using the national park logo in their marketing.

The Wadden Sea ecosystem is an important factor in how fertile the informant's land is, but they have reached an agreement with Tønder municipality and Naturfonden, so that they will give away a significant part of their land so it can be rewetted to reduce emissions of carbon dioxide and so that a nature reserve for migratory birds can be created. In compensation, they will be financially compensated and given new, but less fertile, land outside Tøndermarsken. They are very satisfied with the agreement since they have serious problems with barnacle geese eating the crops on their land.

Informant 15: Manager at Danhostel

Informant 15 is the manager of Danhostel in Tønder municipality. They have worked in the tourism industry for a decade and their business is a partner of the national park.

In general, the informant referred many times to the concept of branding as a positive and important aspect of the national park. They identified a direct relation between the presence of the national park and the increase in tourism. They identified this fact as the incentive for their business becoming a partner. They also referred to the positive impact the national park has had on local people's perception of their locality; *"It opened our eyes"*, they remarked characteristically.

On the other hand, they also named negative implications related to tourism development like pollution and overcrowding at the beach of Romo during summer as well as over-building of summer houses; and more generally the risk of *"ruining the environment"*.

Concerning contributions to the national park, they expressed willingness to be more involved in projects related to *"telling the good story about the area"* and stated that they would be happy to make financial contributions. In fact, they expressly highlighted that businesses like Danhostel, which benefits from tourism, should contribute financially to the

national park. Similarly, they believe that tourists should also be charged small fees to access certain areas.

Apart from the financial benefit for their business, the informant also highlighted the personal importance the landscape plays in their well-being since they enjoy the outdoors, where they spend quality time with their partner.

Informant 16: Nordea-Foundation Senior Consultant

The interview with informant 16, Senior Consultant of the Nordea Foundation, was conducted asynchronously through email. Four questions about the foundation's commitment and contributions to the nature project 'Velkommen til Nationalpark Vadehavet' and the national park in general.

The informant emphasized that the foundation is targeting outdoor activities and projects that contribute to enhanced quality of life and contribute to local development. In recent years, the foundation has focussed more and more on nature protection projects and in addition to the project in the Wadden Sea, they have also sponsored projects in National Park Thy and in several Danish nature parks. The main task of the foundation is to provide funding, but they are also facilitating knowledge sharing and providing contacts to other projects.

The informant emphasizes that the foundation doesn't have any preferences for specific ecosystems when they distribute funds, but it is the cultural ecosystem services they value the most.

Appendix G - Questionnaire Invitation



Spørgeskemaundersøgelse om Vadehavet

Du inviteres hermed til at deltage i et studie, der undersøger **den økonomiske bæredygtighed af Nationalpark Vadehavet**.

Vi er en gruppe kandidatstuderende fra Københavns Universitet, der deltager i et tværfagligt undervisningsforløb som en del af vores uddannelse i Naturressourcer og Udvikling. I den forbindelse vil vi gerne invitere dig til at deltage i en kort spørgeskemaundersøgelse. Besvarelsen af spørgeskemaet tager cirka **10-15 minutter**, og du kan deltage helt **anonymt**.

Spørgeskemaet udfyldes ved at scanne QR-koden forneden med kameraet på din telefon – du vil herefter få adgang til et link til spørgeskemaet, der udfyldes online. Hvis du har spørgsmål eller ønsker yderligere information, er du meget velkommen til at kontakte os på e-mail: bfz734@alumni.ku.dk

Vi håber, at du vil deltage i vores studie – det vil være en **stor hjælp!**
De bedste hilsener,

Eleni, Emily, Jo, Jonas & Julen



Fragebogen zum Wattenmeer

Sie sind hiermit eingeladen, an einer Studie teilzunehmen, die **die wirtschaftliche Nachhaltigkeit des Nationalparks Wattenmeer untersucht**.

Wir sind eine Gruppe von Masterstudenten der Universität Kopenhagen, die im Rahmen ihres Studiums in natürlichen Ressourcen und Entwicklung an einem interdisziplinären Lehrgang teilnimmt. In diesem Zusammenhang möchten wir Sie einladen, an einer kurzen Umfrage teilzunehmen. Die Beantwortung des Fragebogens dauert ca. **10-15 Minuten** und Sie können völlig **anonym** teilnehmen.

Der Fragebogen wird ausgefüllt, indem Sie den QR-Code unten mit der Kamera Ihres Telefons scannen - Sie haben dann Zugriff auf einen Link zum Fragebogen, der online ausgefüllt wird. Wenn Sie Fragen haben oder weitere Informationen wünschen, können Sie uns gerne per E-Mail kontaktieren: bfz734@alumni.ku.dk

Wir wünschen Ihnen viel Spaß bei der Teilnahme an unserer Studie - es wird uns eine **große Hilfe sein!**
Vielen Dank,

Eleni, Emily, Jo, Jonas & Julen



Questionnaire about the Wadden Sea

You are hereby invited to participate in a study examining **the economic sustainability of the Wadden Sea National Park**.

We are a group of graduate students from the University of Copenhagen who are participating in an interdisciplinary course as part of our education in the Environment and Development program. As a part of our research project, we would like to invite you to participate in a short questionnaire. It takes approximately **10-15 minutes** to fill out the questionnaire, and you can participate completely **anonymously**.

To participate, please scan the QR code with the camera on your phone - you will then be able to access a link for the online questionnaire. If you have questions or want further information, you are very welcome to contact us by e-mail: bfz734@alumni.ku.dk

We hope you will participate in our study - it will be a great help!
Best regards,
Eleni, Emily, Jo, Jonas & Julen



Appendix H - Interview Consent Form

UNIVERSITY OF COPENHAGEN
FACULTY OF SCIENCE



Declaration of Consent

Description of Project

This interview is conducted as part of a research project about the Danish Wadden Sea National Park by five master students from the University of Copenhagen. The study aims to examine how different stakeholders of the Danish Wadden Sea National Park value ecosystem services, and to assess how that valuation impacts their willingness to contribute to the management and preservation of the Danish Wadden Sea National Park.

Declaration of Consent

If you are happy to participate in this study, please tick the following boxes to confirm that you agree with each statement and sign the form below:

*Please tick
box:*

I agree to participate in the interview in the context of the research project's purpose as outlined above:

☐

I understand that my participation is completely voluntary and that I can withdraw from my commitment to participating in the project at any time:

☐

I understand that the information I provide in this interview will be treated confidentially:

☐

I understand that this interview is tape-recorded. The audio recording will only be used for analysis and only the research team will be allowed to access it:

☐

I understand that excerpt from my interview may be quoted in the final report:

☐

I understand that I can always contact any of the students involved in the research project to seek further information:

☐

I prefer to remain anonymous in any report on the results of this study:

<i>Yes:</i>	<i>No:</i>
<input type="checkbox"/>	<input type="checkbox"/>

Participant's Name:

Interview Date:

Signature:

Principal Interviewer:

Interview Date:

Signature:

Appendix I - Questionnaire

UNIVERSITY OF COPENHAGEN
FACULTY OF SCIENCE



This questionnaire is a part of a research project by masters students from the University of Copenhagen. The goal of the research project is to understand **how visitors and local residents view the benefits provided by the Wadden Sea National Park, and how visitors and local residents may contribute to the preservation of the park**. Your participation is voluntary and your response will be anonymous. Your contribution is extremely helpful to our research project. For any questions, you are welcome to contact Eleni on (+45)55245510.

Best regards,
Emily Christiansen, Jo Annin, Julen Ugartetxea, Jonas Bork Bosak, and Eleni Pappa University of Copenhagen

Profile Questions

How old are you?

What gender do you identify with?

- (1) ☐ Female
- (2) ☐ Male
- (3) ☐ Non-binary
- (4) ☐ Prefer not to say

What is your nationality?

- (1) ☐ Danish
- (2) ☐ German
- (3) ☐ Dutch
- (4) ☐ Swedish
- (5) ☐ Norwegian
- (6) ☐ Other _____

What is the highest educational level you have attained?

- (1) ☐ No formal education
- (2) ☐ Primary/secondary school
- (3) ☐ High school
- (4) ☐ Vocational education
- (5) ☐ Undergraduate school (Bachelor's)
- (6) ☐ Graduate school (Master's)
- (7) ☐ Prefer not to say
- (8) ☐ Other, please specify: _____

What is your occupation status?

- (1) ☐ Full-time employee
- (2) ☐ Part-time employee
- (4) ☐ Self-employed
- (7) ☐ Unemployed
- (6) ☐ Student
- (9) ☐ Pensioner
- (8) ☐ Other, please specify: _____

What is your occupation title (ex: teacher, farm manager) ?

What is your average monthly individual income (before tax)?

- (1) ☐ Less than 12.000 DKK (approx. 1.600 Euro)
- (3) ☐ 12.000 - 24.000 DKK (approx. 1.601 - 3.200 Euro)
- (4) ☐ 24.001 - 36.000 DKK (approx. 3.201 - 4.800 Euro)
- (5) ☐ 36.001 - 48.000 DKK (approx. 4.801 - 6.400 Euro Euro)
- (6) ☐ 48.001 - 62.000 DKK (approx. 6.401 Euro - 8.300 Euro)
- (7) ☐ Above 62.001 DKK (approx. 8.301 Euro)
- (2) ☐ Prefer not to say

Which applies to you?

- (1) ☐ I am a permanent resident or I own a summer house in Tønder, Esbjerg, Fanø or Varde municipalities.
- (2) ☐ I am a tourist/visitor.

Which applies to you?

- (1) ☐ I am a permanent resident in Tønder, Esbjerg, Fanø or Varde municipalities.
- (2) ☐ I am summer house owner

Did you know that the Wadden Sea in Denmark is protected by a national park?

- (2) ☐ Yes, I knew there is a national park.
- (1) ☐ No, I did not know there was a national park.

Did you know that the Wadden Sea in Denmark is an UNESCO World Heritage site?

- (2) ☐ Yes, I knew that the the Wadden Sea in Denmark is a UNESCO World Heritage site.
 (1) ☐ No, I did not know it is an UNESCO World Heritage site

Do you live inside the National Park?

- (1) ☐ Yes
 (2) ☐ No

Do you work inside the National Park?

- (1) ☐ Yes
 (3) ☐ No

How many times have you visited the Danish Wadden Sea national park?

- (1) ☐ I have never been to the national park
 (2) ☐ This is my first time
 (3) ☐ 2-5 times
 (4) ☐ 6-10 times
 (5) ☐ more than 10 times

How often do you participate in these activities within the the protected area of the national park?

	Never	Rarely	Sometimes	Often	Very often
Hiking, walking or jogging	(2) <input type="radio"/>	(6) <input type="radio"/>	(9) <input type="radio"/>	(11) <input type="radio"/>	(12) <input type="radio"/>
Volunteering (e.g. Danmarks Naturfredningsforening /The Danish society for Nature Conservation)	(2) <input type="radio"/>	(6) <input type="radio"/>	(9) <input type="radio"/>	(11) <input type="radio"/>	(12) <input type="radio"/>
Appreciating nature (enjoying landscapes, fresh air, relaxing sounds etc.)	(2) <input type="radio"/>	(6) <input type="radio"/>	(9) <input type="radio"/>	(11) <input type="radio"/>	(12) <input type="radio"/>
Hunting	(2) <input type="radio"/>	(6) <input type="radio"/>	(9) <input type="radio"/>	(11) <input type="radio"/>	(12) <input type="radio"/>
Angling (fishing)	(2) <input type="radio"/>	(6) <input type="radio"/>	(9) <input type="radio"/>	(11) <input type="radio"/>	(12) <input type="radio"/>

Bird-watching	(2) <input type="radio"/>	(6) <input type="radio"/>	(9) <input type="radio"/>	(11) <input type="radio"/>	(12) <input type="radio"/>
Spiritual activities	(2) <input type="radio"/>	(6) <input type="radio"/>	(9) <input type="radio"/>	(11) <input type="radio"/>	(12) <input type="radio"/>
Collecting environmental products (oysters, shells, flowers, seaweed, herbs etc.)	(2) <input type="radio"/>	(6) <input type="radio"/>	(9) <input type="radio"/>	(11) <input type="radio"/>	(12) <input type="radio"/>
Beach and water activities (swimming, sunbathing, picnic, water sports).	(2) <input type="radio"/>	(6) <input type="radio"/>	(9) <input type="radio"/>	(11) <input type="radio"/>	(12) <input type="radio"/>

What type of work do you do inside the protected area national park?

Which of the following do you do within the protected area of the national park?

	Never	Rarely	Sometimes	Often	Very often
Hiking, walking or jogging	(9) <input type="radio"/>	(10) <input type="radio"/>	(11) <input type="radio"/>	(12) <input type="radio"/>	(13) <input type="radio"/>
Volunteering (e.g. Danmarks Naturfredningsforening /The Danish society for Nature Conservation)	(9) <input type="radio"/>	(10) <input type="radio"/>	(11) <input type="radio"/>	(12) <input type="radio"/>	(13) <input type="radio"/>
Appreciating nature (enjoying landscapes, fresh air, relaxing sounds etc.)	(9) <input type="radio"/>	(10) <input type="radio"/>	(11) <input type="radio"/>	(12) <input type="radio"/>	(13) <input type="radio"/>
Hunting	(9) <input type="radio"/>	(10) <input type="radio"/>	(11) <input type="radio"/>	(12) <input type="radio"/>	(13) <input type="radio"/>
Angling (fishing)	(9) <input type="radio"/>	(10) <input type="radio"/>	(11) <input type="radio"/>	(12) <input type="radio"/>	(13) <input type="radio"/>

Bird-watching	(9) <input type="radio"/>	(10) <input type="radio"/>	(11) <input type="radio"/>	(12) <input type="radio"/>	(13) <input type="radio"/>
Spiritual activities	(9) <input type="radio"/>	(10) <input type="radio"/>	(11) <input type="radio"/>	(12) <input type="radio"/>	(13) <input type="radio"/>
Collecting environmental products (oysters, shells, flowers, seaweed, herbs etc.)	(9) <input type="radio"/>	(10) <input type="radio"/>	(11) <input type="radio"/>	(12) <input type="radio"/>	(13) <input type="radio"/>

How did you get to the area of the national park? (Select all that apply)

- (2) ☐ By car
 (3) ☐ By public transport
 (4) ☐ By bike
 (5) ☐ By foot (walking)
 (7) ☐ Other, please specify: _____

How far did you travel?

- (1) ☐ Less than 50 km
 (2) ☐ 51-150 km
 (3) ☐ 151-300 km
 (4) ☐ Over 300 km

Are you staying overnight in or near the national park?

- (1) ☐ Yes
 (2) ☐ No

How many days are you staying in or near the national park?

How much are you paying for your accommodation?

- (1) ☐ I am not paying for my accommodation
 (2) ☐ Less than 500 DKK per night
 (3) ☐ 501-1.000 DKK per night
 (4) ☐ 1.001-1.500 DKK per night
 (6) ☐ 1.501-2.000 DKK per night
 (7) ☐ More than 2.000 DKK per night
 (5) ☐ Prefer not to say

Ecosystems provide benefits, directly and indirectly, to people. Coastal wetlands are some of the most productive types of ecosystems globally. This section seeks to understand **how important the different ecosystem benefits provided by the Wadden Sea national park are to you.**

The ecosystems protected by the national park creates a habitat for many species, such as seals, birds and plants. How important is this aspect of the national park to you?

- (1) ☐ I have no opinion
- (2) ☐ This aspect of the national park is not important to me
- (3) ☐ This aspect of the national park is somewhat important to me
- (4) ☐ This aspect of the national park is very important to me

The ecosystems protected by the national park contributes to tourism development in the surrounding area. How important is this aspect of the national park to you?

- (1) ☐ I have no opinion
- (2) ☐ This aspect of the national park is not important to me
- (3) ☐ This aspect of the national park is somewhat important to me
- (4) ☐ This aspect of the national park is very important to me

The ecosystems protected by the national park allows for recreational activities, such as hiking and a place for people to enjoy the outdoors. How important is this aspect of the national park to you?

- (1) ☐ I have no opinion
- (2) ☐ This aspect of the national park is not important to me
- (3) ☐ This aspect of the national park is somewhat important to me
- (4) ☐ This aspect of the national park is very important to me

The ecosystems protected by the national park allows for the collection of seafood, such as oysters, and other environmental products. How important is this aspect of the national park to you?

- (1) ☐ I have no opinion
- (2) ☐ This aspect of the national park is not important to me
- (3) ☐ This aspect of the national park is somewhat important to me
- (4) ☐ This aspect of the national park is very important to me

The ecosystems protected by the national park indirectly plays a role in flood and storm protection. How important is this aspect of the national park to you?

- (1) ☐ I have no opinion
- (2) ☐ This aspect of the national park is not important to me
- (3) ☐ This aspect of the national park is somewhat important to me
- (4) ☐ This aspect of the national park is very important to me

The ecosystems protected by the national park contributes to climate regulation, such as moderating temperature and precipitation. How important is this aspect of the national park to you?

- (1) ☐ I have no opinion
- (2) ☐ This aspect of the national park is not important to me
- (3) ☐ This aspect of the national park is somewhat important to me
- (4) ☐ This aspect of the national park is very important to me

The ecosystems protected by the Danish Wadden Sea national park allows for the continued grazing of sheep and other animals. How important is this aspect of the national park to you?

- (1) ☐ I have no opinion
- (2) ☐ This aspect of the national park is not important to me
- (3) ☐ This aspect of the national park is somewhat important to me
- (4) ☐ This aspect of the national park is very important to me

The ecosystems protected by the national park contributes to the quality of soil which supports agriculture and plant growth in the area. How important is this aspect of the national park to you?

- (1) ☐ I have no opinion
- (2) ☐ This aspect of the national park is not important to me
- (3) ☐ This aspect of the national park is somewhat important to me
- (4) ☐ This aspect of the national park is very important to me

Are there any other benefits that you feel the Danish Wadden Sea national park provides? Please specify.

What is your general opinion on the Danish Wadden Sea national park?

- (5) ☐ Very Negative
- (4) ☐ Negative
- (3) ☐ Neutral
- (2) ☐ Positive
- (1) ☐ Very positive

I am proud to live near the Danish Wadden Sea National Park.

- (1) ☐ I disagree strongly with this statement
- (2) ☐ I disagree with this statement
- (3) ☐ I neither disagree nor agree with this statement
- (4) ☐ I agree with this statement
- (5) ☐ I strongly agree with this statement

I feel emotionally attached to the environment and the landscapes protected by the national park.

- (1) ☐ I disagree strongly with this statement

- (2) ☐ I disagree with this statement
- (3) ☐ I neither disagree nor agree with this statement
- (4) ☐ I agree with this statement
- (5) ☐ I strongly agree with this statement

Would you be willing to volunteer at the national park?

- (1) ☐ Yes
- (2) ☐ No
- (3) ☐ I already volunteer at the national park

How would you volunteer your time and labor? Choose maximum 3.

- (1) ☐ Beach clean-up/ waste collection
- (3) ☐ Event support (ex: festivals)
- (4) ☐ Maintenance tasks (ex: repairing fences)
- (5) ☐ Nature Care (ex: removing invasive species)
- (6) ☐ Supervision of grazing animals, like sheep
- (7) ☐ Support of animal research (ex: recording bird species seen during visit)
- (9) ☐ Knowledge sharing (about animals, local environment, local culture etc.)
- (8) ☐ Other _____

How much time would you volunteer per week?

- (1) ☐ Less than 1 hour
- (2) ☐ 1 hour
- (3) ☐ 2 hours
- (4) ☐ 3 hours
- (5) ☐ Other _____

Would you be willing to make a one-time donation to the national park?

- (1) ☐ Yes
- (2) ☐ No

How much would you be willing to donate as a one-time donation (in dkk)?

Would you be more willing to make a one-time donation for a specific project within the national park?

- (1) ☐ Yes
- (2) ☐ No

If yes, what kind of project would you donate to (choose 2)?

- (1) ☐ Educational programs e.g. summer courses
- (2) ☐ Conservation efforts for important species
- (3) ☐ Efforts to preserve important landscapes
- (4) ☐ Increased partnerships with local businesses
- (5) ☐ Production of scientific knowledge e.g. workshops and conferences
- (6) ☐ Festivals promoting local art and culture

- (7) ☐ Specific park improvement projects, e.g. improvements to camping facilities
 (8) ☐ Other, please specify: _____

Would you be willing to make an annual donation to the national park?

- (1) ☐ Yes
 (2) ☐ No

How much would you be willing to donate annually (in dkk)?

Would you be willing to symbolically “adopt” a seal or bird from the national park? This adoption would require you to pay an annual fee that would go directly to supporting that species within the national park, through projects such as habitat restoration.

- (1) ☐ Yes
 (2) ☐ No

How much would you be willing to pay annually for a symbolic adoption? (in dkk)

What is your interest in environmental issues?

- (1) ☐ Not interested
 (2) ☐ Somewhat interested
 (5) ☐ Very interested

The Danish Wadden Sea National Park secures 50% of its budget from the Danish Finance Act. There are plans for reductions to this contribution. How should this gap be filled?

	I strongly disagree	I somewhat disagree	I neither agree nor disagree	I somewhat agree	I strongly agree
Tourists/visitors should make voluntary donations.	(1) <input type="radio"/>	(2) <input type="radio"/>	(3) <input type="radio"/>	(4) <input type="radio"/>	(5) <input type="radio"/>
Tourists should pay fees (e.g. to access certain areas of the national park).	(1) <input type="radio"/>	(2) <input type="radio"/>	(3) <input type="radio"/>	(4) <input type="radio"/>	(5) <input type="radio"/>

Tourists should pay taxes (e.g. through the accommodation facilities).	(1) <input type="radio"/>	(2) <input type="radio"/>	(3) <input type="radio"/>	(4) <input type="radio"/>	(5) <input type="radio"/>
Local businesses should make voluntary donations.	(1) <input type="radio"/>	(2) <input type="radio"/>	(3) <input type="radio"/>	(4) <input type="radio"/>	(5) <input type="radio"/>
Local businesses benefiting from the national park (e.g. tour operators) should pay for licences/fees.	(1) <input type="radio"/>	(2) <input type="radio"/>	(3) <input type="radio"/>	(4) <input type="radio"/>	(5) <input type="radio"/>
Local individuals should make voluntary donations.	(1) <input type="radio"/>	(2) <input type="radio"/>	(3) <input type="radio"/>	(4) <input type="radio"/>	(5) <input type="radio"/>
Local municipalities should make voluntary donations.	(1) <input type="radio"/>	(2) <input type="radio"/>	(3) <input type="radio"/>	(4) <input type="radio"/>	(5) <input type="radio"/>
Local individuals should pay some fees or taxes.	(1) <input type="radio"/>	(2) <input type="radio"/>	(3) <input type="radio"/>	(4) <input type="radio"/>	(5) <input type="radio"/>
Local municipalities should commit to provide funding.	(1) <input type="radio"/>	(2) <input type="radio"/>	(3) <input type="radio"/>	(4) <input type="radio"/>	(5) <input type="radio"/>

Do you own or work for a business that benefits from tourism?

- (1) ☐ Yes
 (2) ☐ No

What kind of business do you own or work for?

- (1) ☐ Accommodation facilities (hostel/ holiday house etc.)
 (2) ☐ Shop
 (3) ☐ Farm
 (4) ☐ Restaurant, cafe, bar
 (5) ☐ Outdoor activities services (i.e. tour guiding)
 (6) ☐ Other, please specify _____

Did you find this questionnaire easy or difficult to understand?

- (1) ☐ Very Easy
- (2) ☐ Easy
- (3) ☐ Moderate
- (4) ☐ Difficult
- (5) ☐ Very Difficult

Would you be willing to support this research project through a short interview in the following weeks if needed? It will be extremely helpful to know more about your views.

- (1) ☐ Yes
- (2) ☐ No

Thank you! Please, provide your email and/or phone number so that the research team can get in touch with you to arrange an interview if needed.

Thank you for completing this questionnaire - we appreciate your time!