



Conflicts in Ecosystem Services Management: Analysis of stakeholder participation in *Natura 2000* in Poland

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ABSTRACT

The relationship between specific ecosystem services (ES) and different types of conflicts are explored to aid understanding of the barriers to effective biodiversity conservation management. Drawing from conflict theory, content analysis is undertaken of public documents generated during consultations about *Natura 2000* management that were conducted in Poland between 2010–2015. Results show the links between conflict over conservation planning and stakeholders' perceptions of potential threats to their access to, and use of, particular ecosystem types. Cultural and provisioning ES generate more conflict, with conflict over cultural ES dominating. Conflict over the value of conservation itself was less prevalent, indicating a general agreement about the need for conservation planning. The lack of standardized procedures for reporting on public consultation process negatively affected institutional memory and limited the opportunities for learning lessons from past mistakes and from good practices.

1. Introduction

Stakeholder participation is widely applied in biodiversity conservation management (Reed, 2008). Although some (Fink and Ruffing, 2019; Schroeter et al., 2016) recognise the challenging nature of participation, and query whether policy making is more appropriately formulated or implemented by expert bureaucrats, many researchers and policy actors romanticize participation (Hurlbert and Gupta, 2015), describing benefits in an idealized fashion. This makes it difficult to learn lessons for the future from existing participatory practices.

This paper examines participatory processes, using the lens of conservation planning, focusing on the management of *Natura 2000* areas in Poland. The European Union's (EU) *Natura 2000* network is the world's largest network of protected areas. Alongside their value in biodiversity conservation (Nelson et al., 2009), such areas provide different ecosystem services (ES) that contribute to society's well-being. This includes, for example, delivering provisioning (e.g. wood, fruits), regulating and maintenance (e.g. habitats), and cultural (e.g., beauty) services (Costanza et al., 2017; Haines-Young and Potschin, 2013).

However, the variety of services that *Natura 2000* areas offer can, in turn, lead to conflicts that play out in disputes over how such sites are managed and in the interest of whom.

This paper investigates the relation between specific ES and different types of conflicts that arise between various stakeholder groups in relation to *Natura 2000* management plans. On the one hand, previous studies have shown that relying mainly on expertise is insufficient when devising and implementing nature protection policies and that conflict avoidance requires public participation and that this needs to occur at an early stage in planning (Bryan, 2012). On the other hand, the use of participatory mechanisms requires considerable effort, with carefully consider procedural mechanisms put in place, alongside standardization of organisational and reporting protocols. High attendance rates are not always a marker of success (Goodin and Dryzek, 2006), and choosing the right participatory method to galvanise high levels of stakeholder engagement in specific context is difficult (Voinov et al., 2018). Reporting on the participatory processes, and in ways that enable their future use for the purposes of lesson learning, is also demanding (Schroeter et al., 2016). This research explores participatory practices in

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biodiversity conservation management planning in *Natura 2000* areas in Poland, examining the interests of, and conflicts between, various stakeholder groups through the lens of ES delivery. Stakeholders involved included farmers, landowners, local entrepreneurs, area managers, scientists, non-governmental organizations (NGOs), and officers from the local municipality. The paper also examines the accompanying participatory mechanisms and reporting procedures. Building on previous research on stakeholder participation (Bockstael et al., 2016; Hurlbert and Gupta, 2015) and the application of ES to conservation planning (Maczka et al., 2019; Steger et al., 2018), the paper analyses multi-stakeholder participation in biodiversity conservation management of *Natura 2000* areas. The paper presents a critical assessment of participatory processes that links types of conflict in conservation planning and management with stakeholder concerns about the delivery of specific ES.

The paper begins with a discussion of the theoretical framework that was used to guide the research. This is followed by a review of the literature on *Natura 2000* areas and their management challenges. Methods of data collection and analysis are then detailed before empirical results are presented. Following a Discussion of findings, the paper's Conclusion examines the significance of the research for our understanding of the use of participatory practices for nature conservation management.

2. Theoretical framework

Recent research (Maczka et al., 2019) has shown that the ES concept has a potential to act as a “boundary object”, that is, it can serve as a tool to promote collaboration and dialogue that is both adaptable to local needs yet robust enough to maintain a common identity or meaning among a wider set of users (Steger et al., 2018). As a boundary object the concept of ES can support improvements in communication between different interests involved in biodiversity conservation management, especially when management plans extend over a range of land cover categories, such as cropland, forest land etc. bringing an associated array of stakeholder interests. As a boundary object, the concept can also assist the integration of knowledge across different stakeholder groups with various professional backgrounds e.g. environmental, economic (Steger et al., 2018). The term can also provide a common language for bringing theory into practice within interdisciplinary teams (Baggio et al., 2015). Having a boundary object in play, as it were, is particularly important when conservation efforts butt up against different interests and where tensions arise as one group seeks to assert its interests at the expense of another (Redpath et al., 2015). Stakeholders, anticipating that conservation efforts could potentially harm their interests through, for example, blocking access to wood, forest fruits, or recreation opportunities, can effectively undermine conservation initiatives (Niedzialkowski et al., 2014). Investigating the links between the emergence of conflict between groups and the type of ES prioritised in conservation planning and thus examining how and in what ways the concept of ES can act as a boundary object, is therefore important. This may also help to reveal the importance of specific sources of conflicts, such as values, interests, or mutual relations, as they play out between different stakeholder interests.

Theoretically, this paper draws upon typologies of conflict developed in the literature and subsequently apply to biodiversity conservation (Moore, 2003; Sidaway, 2013; Young et al., 2010). These typologies make a distinction between various sources of conflicts and, in this paper, these are then linked to particular landscapes and ES. The literature has identified several types of conflict, including in relation to a) data – concerning access to information, different views on which information is relevant, and different interpretations of data; b) interests – resulting in perceived or actual competitive, substantive, procedural, or psychological issues; c) structural – dealing with matters of unequal control, ownership or legal position, power and authority, which in turn can hinder cooperation, d) values – such as different criteria for

evaluating ideas or behaviours, or goals, different worldviews, ways of life, ideologies, and religion; e) relationships – which can result in strong emotions, misinterpretations or stereotyping of others, poor communication or repetitive negative behaviour (Redpath et al., 2015).

Stakeholder participation is seen as a key tool for conflict resolution (Fisher et al., 2020; Lawer, 2019; Schroeter et al., 2016). Participation can be understood as a process whereby individuals, groups and organisations play an active role in planning and management decisions that affect them (Rowe et al., 2004). Although various functions of stakeholder participation are discussed in the literature, here it is considered as a platform for exchanging concerns related to biodiversity conservation within a land use planning and management context. In view of the conflict that has arisen in relation to conservation – a critical assessment of participatory practices is necessary (Anggraeni et al., 2019; Bockstael et al., 2016). According to Bockstael et al. (2016) such an assessment requires an analysis that focuses at least on the following aspects of a participatory process: communication, capacity to participate, representation and decision-making, and how conflict is managed. Poor communication may lead to manipulation and tokenism (Arnstein, 1969; Sidaway, 2013), which coincide with the “announce and defend” model (Yosie and Herbst, 1998), wherein participatory processes are limited to *post-facto* provision of information after key decisions have already been taken. Stakeholder groups are characterized by different capacity to take part in participatory processes, so both the procedures themselves and the final outcomes might be biased in favour of one interest over another (Bockstael et al., 2016). These problems increase the risk of conflict in the management of protected areas, especially when decisions entails restrictions on the activities of some groups (García-Frapolli et al., 2018). Such inter-group conflicts may arise due to clash of interests, values, or power, including when one group perceives that its interests have been sacrificed to those of others (García-Frapolli et al., 2018; Redpath et al., 2015).

A critical element of a participatory process is the need to adjust to local contexts (Bull et al., 2010; Maczka et al., 2019) and, at the same time, maintain procedural standardization. Adjustment is needed to account for differences in the capacity of communities to engage, while at the same time paying attention to the social, economic and environmental conditions operating at the local, place based scales (Sanoff, 2000). As Blondet et al. (2017) have shown, maintaining procedural standardization can promote top-down approaches that are insensitive to already developing local contestation. Finding the balance between, on the one hand, standardization, which secures conformity of procedures and planning decisions, and thus procedural fairness across scale, and, on the other, flexibility to ensure that processes and outcomes are tailored to local circumstances, is a demanding task

3. Management challenges in *Natura 2000* areas in Poland

The aim of *Natura 2000* is to assure the long-term sustainability of Europe's most valuable and threatened species of fauna and flora and natural habitats (Council of the European Union, 2007; Winkel et al., 2015). The EU Member States are responsible for designating conservation authorities to manage these areas. The primary instruments to govern *Natura 2000* areas are the management plans, which formally require stakeholder participation (Bouwma et al., 2016; EUROPARC, 2020). Site identification and designation also requires stakeholder participation. In this context, cooperation between local authorities charged with *Natura 2000* tasks and local stakeholder groups, such as environmental groups, private landowners and area users, is crucial for providing effective nature conservation (Borrass et al., 2015; O'Donnell and Stokowski, 2016).

The Polish case can offer insights into the use of participation practices in *Natura 2000* policy and planning. Firstly, Poland is a country characterized by rich biodiversity and retains landscape with natural habitats that are critical for rare species at Europe-wide scale (EEA, 2015). A total of 32.5% of the Polish territory is protected in various

ways (including *Natura 2000*, which covers 20% of the country). Secondly, because of its territorial scope, *Natura 2000* influences the everyday lives of a significant number of people living in Poland. Moreover, the establishment of *Natura 2000* in Poland following EU accession in 2004 resulted in controversies between NGOs and local stakeholders, amidst concerns about weak financial incentive mechanisms and poor communication between government officials and local groups, similar to the situation found in several other EU member states (Bołtromiuk, 2011; Grodzinska-Jurczak and Cent, 2011). The analysis of the current situation in Poland provides lessons on how participatory practices continue to look after more than a decade since the requirement of EU membership to establish and maintain *Natura 2000* areas in Poland. Thirdly, these results may be relevant for other countries, in particular those in Central and Eastern European (CEE), by providing new insights that may support the much needed strengthening of their governance of *Natura 2000* areas (European Commission, 2019). Poland, like other CEE countries, has a legacy of centralized planning and rigid top-down policy making inherited from the period of Communist rule, a policy style that has historically excluded stakeholder participation. After the fall of Communism in 1989, and in anticipation of the EU membership, the system of environmental governance underwent radical changes (Klůvánková-Oravská et al., 2009). In Poland, the Nature Conservation Act (1991) legally underpinned the requirement to establish channels of cooperation between the administration and non-governmental organizations. Nevertheless, the central administrative authorities continue to maintain a dominant position in decision-making and hierarchical thinking prevails among policymakers and nature conservation professionals. This continues to have a negative effect on participatory planning practices (Niedziałkowski et al., 2015).

In Poland, *Natura 2000* regulations were enacted in 2004 as one of the requirements under Poland's accession to the EU (GDEP, 2016). The legal basis in the EU law consists of two EU Directives:

- 1 Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds ("the Birds Directive").
- 2 Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora ("the Habitats Directive").

Both EU Directives were enacted into Polish legislation through the Nature Conservation Act 2004 – whose Art. 5 par. 2b defines a *Natura 2000* area as "An area of special bird protection, a special area of habitat protection and an area significant for the EU, created to protect wild birds, or natural habitats, or species that the EU is interested in".

Natura 2000 areas in Poland are supervised by *Regionalna Dyrekcja Ochrony Środowiska* (Regional Directors of Environmental Protection, abbrev. RDEP), which are held responsible for terrestrial areas; while the Director of the Maritime Office retains responsible for marine areas (Nature Conservation Act 2004, Art. 28 par. 1). Management plans are formulated by RDEP by means of local ordinances.

Establishing a management plan is mandatory, except for marine areas or areas that already have a pre-existing protection plan, for example designated national parks (Journal of Laws of the Republic of Poland, 2020, item 55). The method and scope of management plans for *Natura 2000* were defined in the Ordinance of the Minister of Environment, 17th February 2010 (Journal of Laws of the Republic of Poland, 2010, Number 34, item 186). Management plans must include descriptions and boundary maps, a list of actual and potential threats to plant and animal species and their habitats, planning objectives and protective measures, and monitoring protocols. Plans must also specify institutional responsibility, that is, they must designate which conservation actions should be carried out by which specific bodies or authorities.

Stakeholder participation, mandated for the formulation of management plans, must consist of three main steps: First, a proposed

management plan is opened to a 21-day public consultation; second, consultation feedback is reviewed and either accepted or rejected; and third, open meetings with stakeholders are organized to consult on the plans. The third step was added in 2009 as a way to enhance the participation of local stakeholders (GDEP, 2016, 2012).

The challenges facing *Natura 2000* management have been researched within the literature, with the following issues identified: a) competing interests among stakeholders concerning the use of resources within the designated areas (Bielecka and Różyński, 2014; Blondet et al., 2017); b) struggles over which authority has final, decision-making power (Blicharska et al., 2016; Brandt et al., 2013); c) divergent perceptions on the purpose and use of protected area, typically involving conflict over recreation versus resource use (Alphandery and Fortier, 2001; Blicharska et al., 2016); d) problems with the involvement of stakeholders, for example due to lack of trust in the process (Baker, 2005; Hiedanpää, 2005; Young et al., 2013). These factors combine to lead to stakeholder conflicts (De Meo et al., 2016; Geitzenauer et al., 2016). Conflict between conservation and economic interests are typical. This can be seen for example in a study of a *Natura 2000* area in Slovakia, which showed how a participatory process gave rise to conflict because designation was seen as a potential threat to existing local agricultural and forestry activities (Brescancin et al., 2017). Similarly, conflict between nature conservation authorities and environmental NGOs, on the one hand, and landowners and their representatives, on the other hand, was reported in Italy (De Meo et al., 2016). In contrast, for some stakeholders an area designation under *Natura 2000* is perceived as having potential economic benefits, enabling, for example, it to be used as a marketing tool to promote eco-tourism. Research has showed that resolution of such conflict requires strong interventions especially by the public authorities in charge (Geitzenauer et al., 2016). Compromise requires that these authorities acknowledge the diversity of perspectives and their conflicting interests, alongside a willingness to seek ways in which different views can be reconciled and thus integrated into planning (Paloniemi et al., 2015).

4. Data and methods

4.1. Data

The research drew upon existing data, in the form of notes, taken during the participatory meetings that were held between 2010 to 2015 as part of the preparation of management plans for *Natura 2000* areas in Poland. The preparation meetings were called to discuss the local actions that needed to be carried out by specific bodies or authorities within areas. Such actions included meadow mowing, allowing the grazing of animals in designated places, leaving dead wood in forested areas, and the removal of invasive plants species. Meetings also dealt with plans for the monitoring of habitats. The meeting notes were taken by the organizers of the consultation meetings – either the RDEP or an outsourced organization and each recorded a description of the proceedings [see Appendix A]. Organizers invited (usually by e-mail or phone) various groups of stakeholders to these meetings, including, for example, representatives of municipalities in which the particular *Natura 2000* area was located, environmental NGOs, representatives of the National Forest Holding, local entrepreneurs, village representatives, landowners and local farmers (GDEP, 2012). The meetings were also open to the general public. Each meeting lasted for approximately 4 h and was attended by 21 participants on average (Me = 18, SE = 0.5). Meetings were held in various locations, such as local culture centres, headquarters of the local department of the National Forest Holding, or in the offices of national parks authorities.

The notes constitute a unique data set, enabling an analysis of a participatory process that operated on a large scale and over an extended period of time (5 years). In total, access was granted to 1077 notes (comprising 4475 pages) from 15 out of a total of 16 Polish provinces (the Mazowieckie Province denied access). Notes were on

average 4.2 standard pages (A4) in length. The details in these notes varied, though most of the records had a similar structure, including the date, title, list of participants, and notes from the discussion. To analyse this, qualitative and quantitative content analysis (CA) was undertaken (Hsieh and Shannon, 2005; Krippendorff, 2004; Paloniemi et al., 2015), as discussed below.

In addition to the notes, further data was gathered through participant observation at three of the consultation meetings. Data was recorded via an observation sheet focusing on the technical aspect of the meetings (number of participants, room, meeting structure) as well as detailing the agenda and discussion. This participatory observation served both as a method of data collection and as a reconnaissance exercise that was used for preparing subsequent procedural steps, such as coding scheme development, content analysis (CA), and preparation of a Focus Group.

4.2. Data analysis

An initial CA of 1077 notes was undertaken in order to gain basic information about the meetings: the number of participants per meeting and the type of land found in the *Natura 2000* area in question. For the latter, the land cover types specified in the Mapping and Assessment of Ecosystems and their Services (MAES, 2018) was assigned to each note. The analysis concerned only *Natura 2000* areas situated on land, so we included nine land cover types from the MAES categories: 1) urban, 2) cropland, 3) grassland, 4) woodland and forested land, 5) heathland and scrub, 6) sparsely vegetated habitats, 7) mires, bogs, and fens (wetlands), 8) lakes and rivers, 9) mixed. This helped lay out a clearer picture of the range of ES available in the locale, which was subsequently used to support subsequent investigation of stakeholder interests.

This initial analysis was followed by a more comprehensive CA. Notes that met the criteria of relevance and quality were selected. Firstly, a document needed to have a narrative part representing a discussion held during a meeting, to allow for interpretation in the first place (relevance). Out of the 1077 documents, 154 were excluded as they did not meet this criterion. Secondly, the narration needed to be attributable to a particular stakeholder (quality). As several documents failed to attribute narratives to specific stakeholders or groups, a further 712 documents were excluded. Eventually 211 notes were selected for analysis, and these ranged across 14 Provinces, amounting to 969 pages of text [Appendix B].

A coding scheme was developed, based on Asah et al.'s (2014) approach. For this coding the five sources of conflicts (Moore, 2003) as discussed above, were used. In addition, the coding drew upon the Common International Classification of Ecosystem Services V4.3 (CICES V4.3), comprising three categories: 1) provisioning, 2) regulating and maintenance 3) cultural services (Haines-Young and Potschin, 2013). Using these two sources, a coding scheme was developed, which included codes for conflict types and codes for both direct and indirect references to ES made by stakeholders. Direct use required a stakeholder to name an ES term, while the code for indirect use was deployed when related terms were encountered, such as flood prevention, fishing economies, and recreation.

While coding, the texts were searched iteratively for the categories related to sources of conflicts and then these coded passages were searched for references to benefits that were derived from the ES, as outlined in the CICES V4.3 [see Appendix C]. For this purpose, the computer software packages, NVivo 10, was used. A coding unit was taken to be the shortest part of a text where the basic meaning could be understood without reading a longer part of the text. This process of pattern coding (Saldaña, 2015) involved identifying, segregating, grouping, regrouping, and linking parts of the texts and codes in relation to the categories specified in the CICES V4.3 and those linked to sources of conflicts. This procedure identified the context in which the ES concept and sources of conflicts appeared in the meetings. A specific stakeholder was assigned as to each appearance. Data was coded

cooperatively by two researchers, one with a background in social sciences and the other in natural sciences. They coded independently and later discussed their interpretations and concerns (Ahuvia, 2001; Denzin and Lincoln, 2005). Moreover, the researchers translated, with the help of a native English language speaker, illustrative quotes used in this article and the coded material (Section 5 and Appendix C).

To supplement the interpretation of the data gathered through the CA, a Focus Group with experts from the General Directorate for Environmental Protection (GDEP), the a body responsible for consultations on the national level, was held in June 2016. The purpose of the Focus Group was to explore the issue of standardization of the participatory process. The Focus Group discussed the type of consultation meetings that were held, including why a hybrid approach to meetings was taken, given that organisers invited specific stakeholders to the meeting and also left meetings open to additional, public participation on the day; how stakeholders to be invited were identified; and whether there were any lessons learned from the participatory process. In addition, the Focus Group served as a form of triangulation, enabling the results of the CA to be cross-examined against the views of the national authorities in charge of consultation.

5. Results

5.1. Ecosystem types in *Natura 2000* areas and standardization of participatory processes

The initial CA showed that information on the number of participants per meeting was provided in 52% of the notes (558 of 1077). The number of participants differed depending on the type of ecosystem present within the *Natura 2000* area in question. For instance, for cropland, on average 21 participants took part, while for lakes there were 12 participants on average (Fig. 1). The difference is statistically significant (Kruskal-Wallis H test: $p < 0,001$, $df = 8$). The coefficient of variation concerning the average number of participants is strong: $CV = 52\%$. This means that the level of interest in the consultation meeting (measured by the number of participants) varied depending on the type of ecosystem that was to be regulated under new conservation plans. Moreover, the participatory observations of selected meetings also showed a link between the type and number of stakeholders attending and the specific ecosystem type dominant in the *Natura 2000* area. For example, meetings held in relation to woodland areas were not only characterized by a relatively higher number of participants per meeting, but also by a significant share of foresters.

Consultation meetings were open to the public, but the relevant authorities also extended invitations to an array of what they deemed as relevant, local stakeholders. In this sense, meetings were of a hybrid nature, having both an invited and open component. The purpose of the consultation meetings was to introduce the participants to the *Natura*

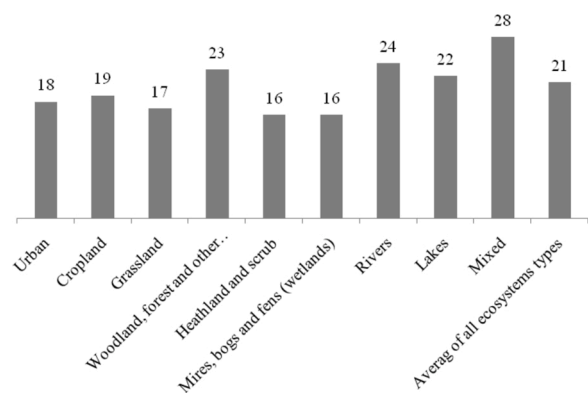


Fig. 1. The average number of participants per meeting in relation to particular ecosystem type, $N = 558$ notes.

2000 management plans and to get feedback on proposed conservation actions. According to experts from the GDEP who took part in the Focus Group, there were three main reasons for this meeting format (a) the need to ensure that key stakeholders were targeted; (b) uncertainty concerning the number of stakeholders that would attend a meeting, and where a hybrid system would support better attendance; (b) low costs of organizing the open component of the meetings; (c) familiarity with open meetings among both local people and the organizers.

5.2. Sources of conflicts in participatory meetings

The fuller CA focused on the identification of sources of conflicts. The analysis revealed 154 references to various sources of conflicts, which were expressed in 95 (out of 211) notes from the meetings. In 124 references, an expressed source of conflict could be attributed to a particular group of stakeholders. Plan managers and scientists were the groups most vocal in this regard (Table 1).

Relationship source of conflict, for example, holding illegal barbecues in a forest or driving quad bikes in sand dunes, dominated in meetings. Meeting, however, focused mostly on administrative arrangements and management plan details, which we refer to as structure or data sources of conflicts. This included, for example, discussion about allocation of responsibility for particular actions within a Natura 2000 area or the provision of financial incentives for nature conservation. Source of conflict pertaining to values, for example controversies over what is more important in a particular situation: human well-being or nature conservation, were the least numerous.

5.3. The relationship between sources of conflicts and ecosystem services

There were 88 references in 79 notes (out of 95) concerning sources of conflicts where an ES category could be identified (Table 2). Conflicts occurred most often in relation to provisioning ES (49%), followed by cultural (26%), and then regulating and maintenance (25%) ES.

Most sources of conflicts were of a relationship nature (45%), followed by structure (20%) and interests (19%). Sources of conflicts were unequally distributed between the ES categories. For 15 records representing the cross-tabulation of ES categories and types of sources of conflicts, five were notably more represented (bolded records in Table 2). These were: relationship sources of conflicts across all three ES categories; sources of conflicts connected to interests and the provisioning ES category; sources of conflicts connected to structure and the provisioning ES category. The other 10 records were comparatively less important.

Provisioning ES entailed conflicts relatively often, twice as often as the two others. Three out of five relatively frequently represented sources of conflicts concerning provisioning ES were: structure (15%), followed by interests (14%) and relationships (13%). Sample statements from each of these types illustrate the beliefs held by stakeholders about the factors responsible for this conflict:

Table 1

Sources of conflicts identified in particular groups of stakeholders, N = 154 references.

Sources of conflicts	Plan managers, scientists ^a (N = 27)	Municipality officers (N = 12)	National foresters (N = 16)	Environmental NGOs (N = 15)	Farmers and entrepreneurs ^b (N = 11)	Village heads (N = 10)	Other public administration bodies (N = 20)	Others (N = 13)	Not assigned (N = 30)	Total (N = 154)
Data	1%	0%	2%	1%	3%	1%	1%	1%	3%	12%
Interests	1%	2%	2%	3%	1%	2%	1%	2%	2%	16%
Relationship	12%	3%	5%	5%	0%	2%	6%	4%	8%	44%
Structure	3%	3%	2%	1%	3%	1%	5%	1%	6%	25%
Values	1%	0%	0%	1%	0%	1%	1%	1%	0%	3%
Total	18%	8%	10%	10%	7%	6%	13%	8%	19%	100%

^a Plan managers and scientists form one group because scientists usually have a function of experts who support plan managers in explaining characteristics of a particular area, referring to the observations from monitoring of different species etc.

^b Farmers and entrepreneurs form one group because they are private owners who get profits from their activities.

Table 2

Statements representing conflicts ecosystem service types as particular sources of conflicts, N = 88 references. Most populated records are bolded.

ES types/ Sources of conflicts	Provisioning (N = 43)	Regulating and maintenance (N = 22)	Cultural (N = 23)	Total
Data	6%	2%	1%	9%
Interests	14%	3%	2%	19%
Relationship	13%	13%	20%	45%
Structure	15%	6%	0%	20%
Values	2%	1%	2%	6%
Total	49%	25%	26%	100%

[...] the main issue discussed was the implementation of protective tasks on meadow habitats – the problem of collecting hay, its disposal, and the sense of conducting this type of work in the absence of adequate financing. [provisioning ES, source of conflict related to structure, note 2].

This sample statement specifies what type of ES is the source of conflict and identifies the “absence of adequate financing”, including compensation mechanisms, as a core issue, particularly for farmers. Financial issues also raised other concerns:

Presenting proposals for protective measures caused much controversy among farmers’ representatives. They complained about charging them with the costs of nature protection in the Natura 2000 area [provisioning ES, source of conflict related to interests, note 195].

Relationship conflicts brought cognitive and communication aspects to the fore. This is illustrated below in relation to a conflict between foresters and the local community over the management of dead wood:

The Forest District believes that if there is dead wood [to be left in the forest], there will also be social protests because the inhabitants of the neighbouring towns need firewood. The Forest District does not agree to leave the dead wood in the forests as there is a need to first change the social awareness [provisioning ES, source of conflict related to relationships – strong emotions, note 211].

Regulating ES saw the dominance of relationship conflicts, while other sources of conflicts were relatively less represented, for example:

A representative of an NGO expressed his understanding of the need to conduct flood prevention activities but stressed the scale of the impact, which would be harmful for the environment. [regulating and maintenance ES, source of conflict related to relationships – poor communication, note 162].

Cultural ES saw clear dominance of relationship conflicts (20%), compared with other sources of conflicts, with one note clearly revealing the strength of the feelings involved:

Anglers destroy the fence, clogging the tank. Angling also threatens eutrophication [cultural ES, source of conflict related to relationships – stereotypes and repetitive negative behaviour, note 180]

Here it can be assumed that the behaviour of anglers exploiting recreational ES may evoke conflict with the pond owner/administrator.

To sum up, relationship source of conflict was shown to be the dominant type in relation to regulating and maintenance and cultural ES. The provisioning ES were found to be almost equally distributed among structure, interests, and relationships sources of conflicts. Altogether, relationships are the most frequent source of conflict, while data and values are the least important ones (for more examples see Appendix C).

6. Discussion

6.1. Sources of conflicts

The dominance of sources of conflicts originating from relationship and structure can be attributed to several factors. First, negative experiences with *Natura 2000* implementation in Poland in the past, often top-down in style and characterized by lack of transparency and public dialogue, have marred *Natura 2000* policy. This reflects similar experiences in other EU member states, including France and Germany (Alphandery and Fortier, 2001; Stollkleemann and Welp, 2006). Second, previous *Natura 2000* implementation efforts in the period before 2004 saw limited incentive mechanisms and the use of an “announce and defend” approach to participatory process, both of which undermined stakeholder support for *Natura 2000* plans (Boitromiuk, 2011). Third, and more generally, the post-communist legacy of centralization, combined with weak participatory traditions, continues to hamper efforts at realising strong participatory practices. Our study shows that there are reasons to assume that the legacy of distrust between society and the state persists. The dominance of relationship - and structure-related conflicts - could also stem from poor communication and lack of financial incentives. Participatory process could be instrumental in resolving these types of conflicts. Such conflicts are easier to resolve, at least in principle, when compared to conflicts based on values and interests, which are more deeply rooted. Conflict resolution in matters relating to relationship and structure often require changes that are relatively easy to introduce, such as making modifying participant invitation lists to make them more inclusive and to ensure wider representation at consultation meetings. This can increase the acceptance of the consultation process by stakeholders, (in terms of stakeholders’ positive judgment of stakeholders about desired scope and limitations of the participatory process) (Schroeter et al., 2016). Another change would be to provide better financial mechanisms, such as compensation payments. Interestingly, the data found that value conflicts were the least likely to occur, conflict which are, as mentioned, more difficult to resolve. This finding bodes well for the future, pointing authorities in the direction of making changes to consultation procedures as a fruitful route to support the resolution of stakeholder conflicts. Organizing a participatory process always requires attention to potential conflict and to the identification of appropriately designed tools for addressing them (Crowley et al., 2017; Thielmann and Böhm, 2016). The analysis presented here helps with these tasks by differentiating between types of conflict, thus signalling what forms of response are most appropriate for addressing them.

The research also shows that there is a strong link between sources of conflicts and ES types. This can be partially explained by the differences in how different ecosystem types are managed in given areas. For instance, agricultural areas, which provide more provisioning services, require specific management, compared to forest or lake-lands that also provide regulating and maintenance, as well as cultural ES. Also, organizationally significant differences can be observed, especially concerning forest areas, which are almost entirely managed by special

administration, in this case by the National Forests Holding, a governmental organization charged with the management of state-owned forests in Poland. Organizers of participatory processes, by being mindful of the different ES types and the specific sources of conflicts that each generates, can take pre-emptive actions. Targeted actions to mitigate conflicts could include fuller explanations of the planned conservative actions, clearer demarcation of responsibilities between those charged with conservative actions, and the utilisation of selective compensation mechanisms.

As the relationship source of conflict are mostly connected with cultural ES, while the other sources of conflicts are mostly related to provisioning ES, it appears that the cultural ES have a higher potential to generate relationship conflicts than other ES types. Conflicts over values are often place-based, and relate to how a place is used, whether this be for economic, recreational or spiritual purposes (Hicks et al., 2015; Vallecillo et al., 2019). Thus, conflicts are to some extent inevitable. This study suggests that in managing the trade-offs and conflicts between different values of sites, relationship issues prevail. Strong emotions can be expressed, but so too can misinterpretations, and stereotyping, making dialogue and clear communication of critical importance. Knowing how central relationship issues are in conflict generation and resolution could help *Natura 2000* managers not only to anticipate likely problems better but also to prepare some potential remedies, such as, for example, zoning areas where behaviour likely to give rise to considerable conflict, such as quad bike use (cultural ES), can be corralled (Vallecillo et al., 2019).

6.2. The role of public consultations

As far as the link between attendance and stakeholder composition is concerned, the ecosystem type found in a *Natura 2000* area proved to be a differentiating element in our analysis. Some professional groups, such as foresters from the National Forest Holding, were shown to be strongly engaged. However, attendance at consultation meetings is part of their work obligations. In contrast, farmers were shown to be less mobilized. For them, participation in public consultation is an additional activity, which can compete with the daily demands of farming. The composition of stakeholder attendance at the meetings coincides with ecosystem type: with forests bringing foresters and croplands seeing farmers in attendance. Knowing this can help with the planning and organisation of meetings, so as to best prepare for the specific perspectives that more likely to come to the fore (Paloniemi et al., 2015). This study suggests that some stakeholders, for example farmers, can be systematically underrepresented at meetings. In such cases, recruitment activities should be intensified and targeted (Kurtinaitienė et al., 2016). Moreover, the groups can be incentivized by offering measurable benefits to participants, such as giving them access to targeted, technical advice as a reward for participation (Rydin and Pennington, 2000; Trakuldit and Faysse, 2019). Utilising alternative methods of participation, that minimizes the costs of attendance, could also be considered. These could include, for example, conducting individual interviews (Schroeter et al., 2016).

The use of open meetings poses some risks, particular in relation to ensuring representative attendance. While open meetings provide flexibility, scoping in advance to ensure the recruitment of the full range of relevant stakeholders is also important (Newton and Elliott, 2016). This hybrid form, which seems preferred by consultation organisers, could be supported further by the use of stakeholder mapping to ensure that meetings are attended by the full range of relevant stakeholders (Schroeter et al., 2016; Simonofski et al., 2019) and that attendance is not over representation by any one group. In this respect it would be helpful to limit the number of places available to each group, based on the size of the area, the number of identified stakeholder groups and their capacity to participate. This could potentially bring a risk that during some meetings not all the stakeholders willing to participate would be able to attend, but at the same time, it would reduce the risk of

over-representation of those groups with higher capacity to participate (for example foresters) and would allow for a better selection of consultation techniques. Meeting organisers also need to be aware that open meetings that are attended by large numbers of participants can become unruly, making the more formal, public hearing format more appropriate.

The research also revealed that there was a lack of standardized procedures for taking notes at meetings, with differences found in the structure of notes, the presence of photo documentation, page length, and whether or not information about area trips was provided. The provision of a consultation process that is rolled out a large, national scale, but with poorly standardized and not well reported process echoes the era of bureaucratic but inefficient socialist central planning (Blicharska et al., 2016; Bouwma et al., 2016; Niedziałkowski et al., 2015; Sotirov et al., 2015). This can undermine the benefits that can come from reporting. Here, the ability of such notes to support institutional memory, and to enable lessons to be learned from the experience of conducting participatory practices, can be lost (Ackerman and Halverson, 1999). Institutional memory is particularly important for planning future actions and in enabling learning from past mistakes. Standardization of reporting has the potential to improve the channels that provide feedback from stakeholder participation to environmental managers and decision makers.

7. Conclusion

It is widely acknowledged that biodiversity conservation planning entail conflicts, which can undermine the expected outcomes of conservation actions. Despite the expectations that stakeholders' participation in biodiversity conservation could resolve conflicts, such conflicts continue to arise in many countries. This study scrutinized the types of conflicts involved in *Natura 2000* area management, showing how they arise in the context of concerns over access to and use of, specific ES types.

Conflicts are an inevitable part of policy making (Bockstael et al., 2016). It is here that participation can play a key role - exposing groups to different arguments and offering the potential to learn more about the interests of others (Schroeter et al., 2016). Understanding what drives conflict is also critical. In this respect, the ES lens has proved particularly useful in offering a reference point for conflict identification. Understanding the links between conflict type and ES can also support efforts to manage protected areas. This can help sensitize public consultation organizers to specific conflicts that are typically linked to ES, which can, in turn, support the identification of potential solutions. Furthermore, such knowledge can help address the urgent need to build management capacity for handling stakeholder relations, in particular in concerning communication with stakeholders and developing skills in dealing with opposing values and interests. It could help organisers to support more informed deliberations between all parties involved, helping them identify the synergies and address the trade-offs between biodiversity conservation and human welfare. Thus the research supports the claim that the ES concept can act as a boundary object (Maczka et al., 2019), helping to bring different groups of stakeholders (with different interests, expertise, experiences etc.) together to mutually understand problems in biodiversity conservation and management.

CRediT authorship contribution statement

Krzysztof Maczka: Conceptualization, Methodology, Software, Validation, Formal analysis, Investigation, Resources, Data curation, Writing - original draft, Writing - review & editing, Visualization, Project administration, Funding acquisition. **Piotr Matczak:** Conceptualization, Writing - review & editing, Supervision, Funding acquisition. **Agnieszka Jeran:** Methodology, Writing - review & editing, Supervision. **Piotr Jerzy Chmielewski:** Data curation, Validation, Writing - review & editing. **Susan Baker:** Writing - review & editing.

Declaration of Competing Interest

The authors report no declarations of interest.

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Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.envsci.2021.01.001>.

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