The Functioning of Natura 2000 Areas in the Opinion of Different Groups From the Local Community: A Case Study From Poland

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ABSTRACT
This article examines the perceptions of 420 residents living, working, or running their own business in Puszcza Notecka, one of the largest Special Protection Areas (SPAs) in Poland. The questionnaire survey shows differences in ecological awareness among three different groups in the local community: residents, administrators, and entrepreneurs. According to participants in the questionnaire, the community has not become familiar with or fully understood the objectives for which this form of nature protection, Natura 2000, was created. They would like to familiarize themselves with the protected area (PA) development strategy and the meaning of actions relating to the protection of such areas, but the lack of clear information and transparent decision making has amplified the misunderstanding and conflict around environmental conservation. Understanding the benefits and losses to people who live in and around PAs is fundamental to balancing conservation goals with the needs of local human populations.

The last three decades have changed people’s perception of the role of protected areas (PAs) worldwide (Phillips 2003; Berkes 2004; Wells and McShane 2004). The 2003 International Union for Conservation of Nature (IUCN) World Park Congress acknowledged the new paradigm by recommending “empowering all stakeholders to fulfill their role in PA management” and adopting “mechanisms to enable representation and participation of all PA stakeholders at national, regional and local levels” (IUCN 2003). Additionally, conservation requires understanding both ecological and social complexity. Therefore, research increasingly calls both for greater involvement of the social sciences in conservation and for better integration of social and natural sciences (Welch-Devine et al. 2014).

The key task for PAs, evident from an examination of current practices (above all in the EU-25 countries, which were the first to introduce the new nature conservation policy), is persuading the widest possible group of actors (nongovernmental organizations, community members, etc.) to become involved, particularly at the local level (Paavola 2004). According to the documents commonly known as the Conventions of Aarhus (Koester 2007), public participation should manifest itself in society’s access to information about
the natural environment and its involvement in successive stages of the implementation of protective measures: from planning to making decisions in management. Participatory conservation is currently the most acceptable model of PA management in the world. Active citizen participation is considered to play a key role in this conservation model. In many European Union (EU) countries the level of acceptance of new environmental protection programs has been and, particularly in new member states, still is quite low (Safford et al. 2014). Harmonizing with the social context is a crucial factor in successfully introducing participatory conservation, and therefore special concern is given to how the local population views PA management (Sladonja et al. 2012; Safford et al. 2014). There is an emerging body of literature that analyzes participatory conservation and debates its benefits and possible dangers (Kellert et al. 2000; Kapoor 2001; Campbell and Vainio-Matilla 2003; Adams and Thomas 2006; Koehler and Koontz 2008). Studies of perceptions and attitudes are being widely used in evaluating public understanding and acceptance and the overall impact of conservation interventions (Pretty 2003; Pretty and Smith 2004; Wells and McShane 2004; Alibeli and Johnson 2009; Niedzialkowski, Paavola, and Jędrzejewska 2012; 2013; Pietrzyk-Kaszyńska et al. 2012; Metzner et al. 2013; Welch-Devine et al. 2014). On the other hand, critics suggest that ignoring the social, political, and economic challenges that engulf PAs is not realistic or viable (e.g., West, Igor, and Brockington 2006).

For Central and Eastern European (CEE) countries, with their history of socialist central planning and top-down policymaking, implementation of the new paradigm of PAs is particularly challenging (Niedzialkowski et al. 2014). Public perception of this initiative has been negative in most countries (Pietrzyk-Kaszyńska et al. 2012). Protected area governance during socialism followed centralized, hierarchical, and expert-based patterns of industrial production (Tickle and Clarke 2000), while local land management practices were ignored (Lawrence 2008). According to Tickle and Clarke (2000) and Kluvánková-Oravská et al. (2009), these arrangements largely survived the transition period, and decision making concerning PAs is still dominated by central authorities, with local consultations, accountability, and conflict resolution mechanisms often lacking. At the same time, democratization makes communities living in the vicinity of PAs increasingly interested in having their voice heard (Lawrence 2008). The EU accession of the CEE countries in 2004 and 2007 contributed to increased interest in nature conservation policymaking. However, cooperative relationships in the policy domain seem unsustainable due to the still insufficient capacity of both state and nonstate actors and the top-down, nonparticipatory way that EU rules, especially those related to the Natura 2000 network of PAs, have been implemented (Kluvánková-Oravská et al. 2009).

The general aim of this study was, using the example of Puszcza Notecka (PLB 300015), part of the Natura 2000 network in Poland, to assess public acceptance of existing forms of protection. This article presents data from a survey that attempted to collect and analyze individual preferences of different groups in the local community; it also aims to show the internal conditions of environmental management in the area. An additional goal of this research was to define the level of knowledge and attitude of local communities toward both new and previously existing forms of nature and landscape protection. Our results should help managers and policymakers improve conservation management for the benefit of biodiversity protection.
Study Area

A protected area is a clearly defined and designated space designed to “achieve the long-term conservation of nature with associated ecosystem services and cultural values” (Dudley, Shadie, and Stolton 2008). The Puszcza Notecka Special Bird Protection Area (PLB 300015), one of the biggest Natura 2000 areas in Poland, was selected for our research project. It is located in the northwest part of Wielkopolskie Voivodeship, approximately 70 km northwest of Poznań—the capital city of the Wielkopolska region (Figure 1). It was established in 2007, with an area of 178,255.80 ha (according to Ministry of the Environment regulations), on the basis of the Bird Directive. Located in the Warta River and lower Noteć River area, and belonging to the largest domestic forest complexes, it constitutes one of the most important habitats of predator and forest birds among broadleaved forest habitats in Poland. There are at least 30 bird species from Appendix I to the Bird Directive and 7 species from The Polish Red Book of Animals (Głowaciński 2001) living in the area. In the breeding period the area is inhabited by more than 2% of the domestic population of the white-tailed eagle (Haliaeetus albicilla), black kite (Milvus migrans), and red kite (Milvus milvus) and at least 1% of the domestic population of the following species: bittern (Botaurus botaurs), ferruginous duck (Aythya nyroca), Eurasian eagle-owl (Bubo bubo), osprey (Pandion haliaetus), European honey buzzard (Pernis apivorus), common goldeneye (Bucephala clangula), common merganser (Mergus merganser), black stork (Ciconia nigra), western marsh harrier (Circus aeruginosus), ortolan bunting (Emberiza hortulana), and crane (Grus grus) (Ministry of the Environment Poland [MEP] 2015).

However, due to Puszcza Notecka’s considerable size, the research area for this project was narrowed down to the boundaries of Sieraków Landscape Park, which is entirely located within the area of Puszcza Notecka and which has higher population density than the rest of Natura 2000, where forest areas dominated. An additional aim of our research was to show how Natura 2000 has improved the effectiveness of PAs’ environmental

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Figure 1. Geographical position of testing area.
protection. It was established in 1991, with an area of 30.413 ha, for the purpose of protecting the postglacial landscape of Międzychód-Sieraków Lake District, which contains moraine hills, dunes, river valleys, and lake troughs. In Sieraków Landscape Park, agricultural land occupies 53.1% of the area and most of the land is arable (86.4%). On the other hand, more than 35% of the park’s area consists of forest areas, 8.6% of the area is occupied by lentic waters and flowing waters, and only 2.7% is urbanized. This land use is typical for PAs in Poland where human activity is allowed. However, the management of the land is subject to some restrictions in order to ensure maintenance of the natural and landscape value of PAs. The average number of citizens in a test area in 2013 amounted to approximately 13,000 (Central Statistical Office Poland [CSOP] 2015); thus, the population density is much lower (approximately 43 inhabitants/km²) than the average for Poland (approximately 123 inhabitants/km²). Country dwellers account for 74% of the total population (61% in Poland). Administratively, the area belongs to three municipalities: Sieraków, Kwiłcz, and Chrzypsko Wielkie.

Research Method

A questionnaire survey was selected as the method for collecting data on participatory conservation. Questionnaires directed at experienced personnel on the ground can be effective in measuring PAs’ conservation trends, threats, and levels of success (e.g., Hockings 2003; McCallum, Vasilijević, and Cuthill 2015). Between 2013 and 2014 we carried out a questionnaire survey among three different groups in the local community: administrative employees (policymakers in different branches of local government, forestry, and environmental management), entrepreneurs (owners of small and medium-size enterprises), and other residents (farmers, foresters, landowners, and local residents). They were selected on the basis of possible differences in perception of participatory conservation that arise from their professional experiences. The information was collected through household visits and an online questionnaire (Table 1), designed to assess the ecological knowledge and attitude of participating households toward environmental management at a local scale. In total, 565 questionnaires were distributed personally (in a face-to-face manner by door-to-door visits, or sent via e-mail to administrators and entrepreneurs) (Table 1). The biggest group of respondents was residents whose households were selected randomly on the basis of address lists obtained from individual municipal offices. The rest of the respondents were selected from the list of entrepreneurs and from the address book of public employees available on the home page of each municipality. The questionnaire was anonymous and it consisted of 26 questions, among which multiple-choice questions (requiring the selection of only one answer out of many) dominated (see the Supplemental Data for a full list of questions). In formulating the questions in the questionnaire, the author tried to obtain

| Group of respondents | Total number of distributed questionnaires | Total number of returned questionnaires and response rate | Type of questionnaire distribution | Total number of returned questionnaires in each type of distribution and response rate |
|----------------------|------------------------------------------|---------------------------------------------------------|-----------------------------------|-------------------------------------------------------------------------------------|
| Inhabitants          | 383                                      | 302 (78.9%)                                             | In person                         | 302 (71.9%)                                                                          |
| Administrators       | 84                                       | 67 (79.8%)                                              | Sent via e-mail                   | 118 (28.1%)                                                                          |
| Entrepreneurs        | 98                                       | 51 (52.0%)                                              | Sent via e-mail                   | 51 (52.0%)                                                                           |
| Total:               | 565                                      | 420 (74.3%)                                             |                                    | 420 (74.3%)                                                                         |
information regarding research problems that can be ranked in the following thematic
groups: environmental protection (14% of questions), the current condition of the
environment (20%), PA administration and management (20%), and the level of ecologi-
cal awareness (23%). The rest of the questions gave basic information about respondents
(e.g., age, sex, education). The biggest group of respondents were persons in the age group
of 18–35 years old (48.3%) and having completed higher education (47.4%). The survey
response rate obtained was 74.3% (Table 1), which amounted to 3.2% of the total popu-
lation in the area studied. The highest level of participation was found among administra-
tive employees, the next highest among park residents, and the lowest level among the
group of entrepreneurs (Table 1), which may be explained by the fact that a significant
number of the entrepreneurs simply were not interested in this subject.

The results of the questionnaire were analysed using R software (version 3.2.2). Groups
of respondents were compared using Pearson’s chi-squared test (Table 2), and basic
descriptions were made using averages and frequencies to questionnaire questions.

**Results and Discussion**

The attitude of the local stakeholders toward PAs, their ecological awareness, and their
support for such areas are conditioned by many factors. While generally all groups of
respondents endorsed the need to have environmental protection (e.g., Schenk, Hunziker,
and Kienast 2007; Dimitrakopoulos et al. 2010), the level of knowledge and awareness of
the existence of PAs was usually low (e.g., Booth, Gaston, and Armsworth 2009). Our
results show that although the majority of respondents assess the level of their ecological
awareness (Figure 2) as average and low, a large number of persons participating in the
questionnaire survey are interested in the conditions of the environment (Figure 3) and
consider it important to protect environmental resources and assets, especially among
the groups of administrators and entrepreneurs. Furthermore, the differences observed
among the groups of respondents are statistically significant ($\chi^2=14.47, p<.05$) (Table 2).
In addition to the results of our work, we agree with Kati et al. (2014) and Křenová and
Kindlmann (2015) that providing environmental education is an important tool for
increasing public awareness of Natura 2000 and nature conservation in general.

One of the major goals of the Natura 2000 network in Poland, besides maintaining
conditions favorable to wildlife species and habitats, is the acceptance of PAs by their

| Variables                                                                 | Pearson’s chi-squared test (p value) | Asymptotic significance |
|--------------------------------------------------------------------------|-------------------------------------|-------------------------|
| How do you assess your level of ecological awareness?                    | 30.54                               | 0.0034**                |
| Do you consider the protection of natural environment at the area falling under the ecological network Natura 2000 Puszcza Notecka significant? | 14.47                               | 0.0059*                 |
| Have you heard of the ecological network Natura 2000?                    | 163.03                              | 0.0000**                |
| How do you assess the level of information flow concerning environmental management at the area Natura 2000 Puszcza Notecka? | 41.79                               | 0.0072**                |
| Will the establishment of protected areas Natura 2000 in Sieraków Landscape Park increase the effectiveness of environmental protection? | 30.51                               | 0.0003**                |
| Please mark what impact the occurrence of protected areas, including the landscape park and Natura 2000, has on the development of particular zones in the municipality | 213.88                              | 0.0000**                |

* $p < .05$; ** $p < .005$. 

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M. KUBACKA AND A. MACIAS
residents, and this entails convincing them, with the use of appropriate economic and educational tools, to actively participate in this project. According to Bolromiuk (2010), Natura 2000 areas should constitute primarily an opportunity for, and not a barrier to, local development. Familiarity with the Natura 2000 program and awareness of Natura 2000 site(s) designated in the neighborhood were different in each group in the local community (Figure 4) and the difference was statistically very significant ($\chi^2 = 163.03, p < .005$). The lowest

*Figure 2.* Level of ecological awareness.

*Figure 3.* The need for PA environmental protection.

*Figure 4.* Knowledge of the Natura 2000 ecological network.
percentage (22%) of respondents that had heard about the Natura 2000 program was found in the group of local residents. Statistically significant (Table 2), differences were also noted among all groups of respondents in their assessment of environmental management and its flow ($\chi^2 = 41.79, p < .05$). The ineffective judicial systems in different countries have sometimes led to conflicts, resulting in delayed implementation of Natura 2000 directives and undermining their effectiveness (Paavola 2004). The post-Communist countries in Eastern Europe provide good examples of these obstacles (Křenová and Kindlmann 2015). Of the persons participating in our research, 41% assess the flow of information regarding environmental management in the analyzed area as insufficient and 26% assess it negatively (Figure 5).

According to 69% of respondents from the group of residents, social consultations during the planning process should be organized in the community and in the PAs. An even larger percentage was found to hold this view among the group of administrators and entrepreneurs. This is comprehensible due to the need for rational shaping of the environment, with consideration given to business activity. On the other hand, only a small percentage of the respondents concerned participate in social consultations organized by community authorities and only every fifth person in the group of local residents and entrepreneurs. Organizing social consultations and encouraging the local community to participate is not just an obligation of community authorities but also affirms residents’ sense of local identity. It is especially important in countries in transition, such as Poland, which are primarily oriented toward avoiding or resolving existing conflicts related to the introduction of new forms of nature conservation (e.g., Beltran 2000; Pujadas and Castillo 2007).

Opposition to PAs by residents usually arises from a result of a lack of knowledge and information (e.g., Schenk, Hunziker, and Kienast 2007; Dimitrakopoulos et al. 2010) or lack of trust in the managing institutions (Stern 2008). Nearly half of the survey respondents had a problem defining the impact of Natura 2000 areas on improvement in the effectiveness of environmental protection provided by PAs (Figure 6). The largest percentage of respondents who identified Natura as having a negative impact on nature conservation was in the group of administrators and entrepreneurs ($\chi^2 = 30.51, p < .005$). This opposition was usually a result of restrictions, especially economic ones, imposed on private landowners and the local community, and a lack of economic alternatives (Bonaiuto et al. 2002; Hiedenpää 2002). The results of research by Boltromiuk (2010) showed that in the opinion of the local community, Natura 2000 areas create nothing more than problems, though in reality relatively little time has passed since the inclusion of Poland’s areas

![Figure 5. The assessment of the flow of information concerning environmental management.](image-url)
into the ecological network and they have not yet had a clear impact on the economic situation in local communities. This is confirmed by the results presented by Grodzińska-Jurczak and Cent (2011), which also show that Natura 2000 is perceived by Polish people as an unnecessary additional conservation tool.

Although 62% theoretically understand the principles according to which Natura 2000 ecological networks function, as many as half of respondents (including a large number of administrators and entrepreneurs) indicated having problems operating businesses in the Natura 2000 area (Figure 7). Thus, it seems plausible that the fears result from other economic, social, and environmental conditions previously existing in these areas. In the opinion of persons participating in the questionnaire survey, PAs largely have a positive impact only on the promotion of the region and the development of tourism (Figure 7).

Figure 6. The impact of Natura 2000 areas on the improvement of environmental protection effectiveness.

Please mark what impact the occurrence of protected areas, including the landscape park and NATURA 2000, has on the development of particular zones in the municipality:

Personal income (Entrepreneurs)
Personal income (Administrators)
Personal income (Residents)
Enterprise development (Entrepreneurs)
Enterprise development (Administrators)
Enterprise development (Residents)
Industrial activity (Entrepreneurs)
Industrial activity (Administrators)
Industrial activity (Residents)
Agricultural activity (Entrepreneurs)
Agricultural activity (Administrators)
Agricultural activity (Residents)
Communal infrastructure (Entrepreneurs)
Communal infrastructure (Administrators)
Communal infrastructure (Residents)
Promotion and tourism (Entrepreneurs)
Promotion and tourism (Administrators)
Promotion and tourism (Residents)

Figure 7. The impact of Natura 2000 areas on development of particular areas of local economy.
In the respondents’ opinion, naturally valuable areas should develop in the direction of new investments into communal infrastructure (e.g., sewerage system and gas system) because the lack of such infrastructure constitutes a serious hazard to the quality of the natural environment. Unfortunately, only 9% of the respondents see such a possibility and the other 32% have a negative attitude. More than 30% of respondents (including a large percentage from the group of entrepreneurs) defined the negative impact of the creation of PAs on the amount of their personal income. According to Cullen-Unsworth, Pretty, and Smith (2011), environmental management should therefore aim to improve the economic status of local people. Also, the local community must learn to see the opportunities available for obtaining profits from economic actions combined with environmental protection (e.g., financial benefits from the implementation of agricultural and environmental programs at farms). The role of advisors should be taken over by nongovernmental organizations (NGOs), regional branches of agricultural and environmental consulting, or community authorities.

**Conclusion**

The results of our survey reveal statistically significant differences between the three studied groups of respondents from the local community—residents, administrators, and entrepreneurs (Table 2)—and confirm that there is growing criticism of the legal system of nature protection that has functioned in Poland in recent decades, mainly from administrative authorities and local communities but also in scientific circles. In their opinion this system is “incohesive and ineffective” because of legal, organizational, sociological, and financial obstacles that cause gradual weakening of the protection regime, and thus slow degradation of the natural environment. Thus, local communities, whose concerns have for years been neglected in the management of these spaces, should be encouraged to actively participate in the shaping of their local environment. This task is the responsibility of local authorities and PAs. Negotiations should be treated as a priority and not a marginal development, as has been the case so far, and any decisions concerning the shaping of park spaces should be taken after social consultations.

Furthermore, it is very important to generalize the obtained results and to demonstrate how the integration with societal requirements can take place in order to facilitate and mainstream the implementation of the Natura 2000 Directive. The main advantage of this type of research, at the local scale, is direct provision of useful knowledge that can be easily used at the stage of a decision support system.

In this respect science has to strive for transparent information and propose comprehensible and financially feasible solutions capable of generating management information that can be used in different regions and at different scale (Pullin et al. 2004; Lagacé, Holmes, and McDonnel 2008; de Jonge, Pinto, and Turner 2012; Louette et al. 2015).

Much more attention should be paid to promoting environmental education in post-Communist countries where participatory conservation has a definite negative connotation due to a weak history of participatory governance, including the absence of a collective choice mechanism, lack of a conflict management system, poorly defined responsibility for the coordination of resources, and very limited experience in acquiring EU funding for implementation of environmental programs funds, which were simply not available at the national level.
Moreover, to improve Natura 2000 implementation not only do we need to increase public awareness but, as the results of our research show, we must direct participatory conservation toward the needs and expectations of different groups that constitute local communities. Furthermore, we strongly agree with Fox et al. (2006) that it is becoming increasingly clear that the management of PAs in the 21st century is necessarily the management of people. Thus, we need to mobilize the full potential of Natura 2000 to increase communication with the public and key stakeholders. To sum up, our test results show the importance of understanding social context in the process of establishing nature conservation systems. There also remains much work to be done to ensure finding the best solution that will involve the widest possible group of local actors in participatory conservation and effectively coordinate their activities, especially at the local scale.

**Supplemental Data**

Supplemental data related to this article can be found at https://uam-my.sharepoint.com/personal/mdryjer_o365_amu_edu_pl/_layouts/15/guestaccess.aspx?guestaccesstoken=fe9f7b0f4e140mXPqhwUzDLTedGXfcsSz794yf%2fIg%3d&docid=0e27d3c52fc0c418b9fd91fa5e554217f

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