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Short communication

Changes in attitudes toward wolves in Croatia

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ABSTRACT

Against a background of an evolving wolf policy process we carried out personal structured interviews with residents of three regions within Croatian wolf range in 1999 (n = 1209) and repeated the study, using the same methodology in 2003 (n = 1172). We documented a change in public support for wolf conservation and support for control of wolves. The change was a result of a real change in attitudes and not of a change in the age structure of the sampled population. The changes were documented in the two southern regions, Lika and Dalmatia, with attitudes shifting towards a more neutral viewpoint, as there was a decrease in support for wolf conservation and a decrease in support to control wolves. It seems that different birth cohorts react differently to conservation activities. In 1999, the younger cohort groups may have been influenced more by the legal protection campaign. The older cohorts reacted more sympathetically to livestock concerns and thus held stronger negative attitudes toward wolves. Using human dimensions research as an evaluative tool can help large carnivore managers be more adaptive and thus effective in their management solutions.

1. Introduction

Most human dimensions in wildlife management research are case studies reporting results from only one point in time. Human dimensions research on large carnivores is no exception. As an applied and still relatively recent field of study, often driven by crisis management (Bath, 1998), this is not surprising. Due to this traditional focus of human dimensions research, studies have rarely explored the subject of attitude change and rarely have been able to capture changes in attitudes over time (Williams et al., 2002). Many researchers (e.g. Manfredo et al., 1998; McComas and Scherer, 1999; Kaczensky et al., 2001) have called for the need to conduct longitudinal research and to begin attitudinal and belief monitoring.

Today in many places large carnivores are increasing in numbers and range and returning to previous areas where they were once exterminated. In those areas opportunities exist for scientists to document existing attitudes and subsequent attitude change. Changes are likely to occur as carnivore-livestock conflicts increase, policy changes occur, awareness campaigns are delivered, and carnivore-livestock damage prevention programs are implemented. For example, Zimmermann et al. (2001) found by reviewing attitude surveys in Norway that the proportion of people with negative attitudes continues to increase to its maximum with the arrival of large carnivores, and then decreases with experience of living with large carnivores over time. Similarly, they found that the proportion of people afraid of large carnivores was relatively high before carnivore arrival but also decreased with experience. It appears that people can learn to coexist with large carnivores and change their views.

Few human dimension research studies have been completed in Croatia. The first attempts to investigate public opinion about wolves in Croatia (Gyorgy, 1984; Morić and Huber, 1989; Huber et al., 1992; Radišić et al., 1994) came as a response to a shrinking wolf population. These studies suffered from small sample sizes and non-random sampling. This being said, the results from those few studies implied that there had been a change in public attitudes during the 1980s. The overall percentage of Croatians considering the wolf a harmful species dropped from 42% in 1983 (Gyorgy, 1984) to 25% in 1993 (Radišić et al., 1994). In addition, 21% of respondents in 1983 wanted to exterminate wolves (Gyorgy, 1984), while only 8% of the respondents expressed the same view in 1993 (Radišić et al., 1994). As the number of wolves decreased (Frković and Huber, 1992) over time, the attitude toward the species seemed to become more positive (Radišić et al., 1994). This would support the traditional view of natural resources where as a resource becomes scarce, it gains value. It was in the early 1990s, a campaign to completely protect the wolf began in Croatia, and full protection nationwide was declared for the wolf in 1995 (Parliament of the Republic of Croatia, 1995).

With a decrease in rural population and an increase in abandoned agricultural land, wolf numbers began to increase throughout the country and return to areas in Dalmatia, where they were

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exterminated after the Second World War (Frković and Huber, 1992). An increase in illegal killings was also documented during this period (Štrbenac et al., 2005) suggesting attitudes were perhaps shifting once again back to the previous negative viewpoints. A content analysis of newspaper articles seemed to support this hypothesis (Bath and Majić, 2000). As part of this study that examined newspaper articles, data was also collected in 1999 from a representative sample of residents in three regions (Gorski Kotar, Lika and Dalmatia) within wolf range in Croatia. We found that attitudes toward wolves were positive in the northern region of Gorski Kotar, largely neutral in the central region of Lika, and mainly negative in the southern region of Dalmatia (Bath and Majić, 2000). An opportunity to reassess attitudes four years later, in 2003, provided the basis for this paper and the chance to assess whether attitudes have changed. Understanding the strength and direction of attitude change toward wolves in Croatia will allow the Croatian government to more effectively implement their adaptive management approach to wolf management in the country.

By controlling for the two important socio-demographic variables of age and gender, we identify and describe the potential change in attitudes toward wolves among the general public in the wolf-inhabited regions of Croatia. We identify whether the change in attitude is due to a real change or simply a reflection of change in the structure of the population.

2. Methods

2.1. Study area, sampling and data collection

The target populations for both studies were residents of Gorski Kotar (45°20′N, 14°53′E), Lika (44°40′N, 15°23′E) and Dalmatia (43°54′N, 16°09′E). The general public within the Croatian wolf range was divided into three regions (Fig. 1) defined as management units in the Wolf Management Plan for Croatia (Štrbenac et al., 2005) and labelled Gorski Kotar, Lika and Dalmatia. In both measurements we used stratified random sampling (Kalton, 1983) at a community level in order to get the samples representative of each of the three regions. The sampling was based on the most recent national census data, which were 1991 census for the 1999 study (Central Bureau of Statistics, 1992) and 2001 census for the 2003 study (Central Bureau of Statistics, 2001). Sampled population included all residents of the three regions older than 14 years. While typically respondents over 18 are selected for such social science research, in Croatia the census divided people into the age category 15–20 so sampling was done to be consistent with the census age class. The target sample was 400 per region ensuring a 95% confidence level and a 5% confidence interval (Sheskin, 1985). We carried out all the interviews in person at the respondent's place of residence. A team of five different interviewers conducted the interviews during each data collection period. All of them received interviewer training prior to implementing the interviews.

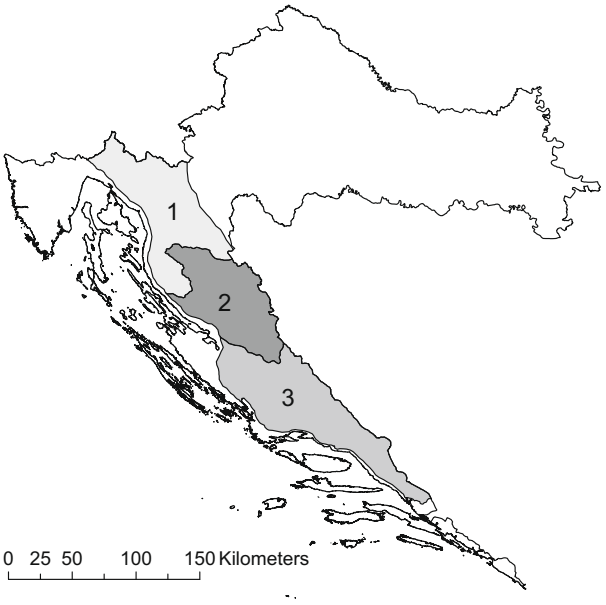

Fig. 1. Study area in both studies was divided into three regions which respond to the national management units (1 = Gorski Kotar, 2 = Lika, 3 = Dalmatia).

2.2. Research instrument

The questionnaire used in 1999 was designed by Bath and Majić (2000). It included items covering general attitudes toward wolves, attitudes toward different management options, knowledge and beliefs about wolves, experiences with wolves and demographic information about the respondents. The second questionnaire (Majić, 2007) was a modified version of the earlier one. All attitudinal and belief items included in the analysis were based on a 5-point Likert scale (Likert, 1932) ranging from strongly disagree to strongly agree.

2.3. Data analysis

We used screening of the data in order to check the accuracy. We followed the guidelines given by Tabachnick and Fidell (2001), and checked whether all values were in range and mean scores and standard deviations were reasonable. We used Mahalanobis distances in order to identify outlier cases with unusual patterns of responses and excluded them from the analysis. We also excluded cases with missing data (e.g. no age of the respondent).

We used principal components analysis (PCA) with a varimax rotation as an exploratory technique for identifying the types of attitudes measured by the questionnaire. Following several repetitions with adjusting the number of factors extracted (Tabachnick and Fidell, 2001), regression factor scores were saved as variables and used in the following analysis. To identify whether there was a change in attitudes a between the two measurements we calculated effect sizes and ran t test. To understand the differences in both samples, we calculated the effect sizes and ran MW-U test or Chi-square test, as appropriate.

Age was the most important socio-demographic variable predicting pro-wolf attitudes in the previous analysis of the data from 2003 (Majić, 2007). In order to control for age we partitioned the data into five birth cohort categories, following the guidelines given by Glenn (1977) and labelled them 1 (the youngest one) to 5 (the oldest one). The same study revealed that gender was the most important socio-demographic variable predicting fear of wolves, hence when running t test, data from both measurements (1999 and 2003) were weighted by gender. The data on gender were taken from the national census data from 2001 (Central Bureau of Statistics, 2001), as it was the census which was the closest in time to both data collection periods. Gender was weighted using simulated replication to correspond to the gender ratio from the census.

3. Results

3.1. Respondent characteristics

We obtained sample sizes of 402, 401 and 406 in 1999 and 406, 384 and 382 in 2003, for Gorski Kotar, Lika and Dalmatia, respec-