

ATTITUDES OF AUSTRIAN HUNTERS AND VIENNA RESIDENTS TOWARD BEAR AND LYNX IN AUSTRIA

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Abstract: We analyzed 3 aspects of the human dimension of large carnivore conservation in Austria. We examined hunter ranking of wildlife species and suggest that while hunters still remain negative to brown bears (*Ursus arctos*) and lynx (*Lynx lynx*), there are differences between those who live in provinces with a longer tradition of living with bears and lynx and those who have had little exposure to these large carnivores. We measured the attitudes of an urban population (Vienna) about the re-introduction of wildlife including large carnivores. People from Vienna supported large carnivore re-introductions, but much less than a reintroduction of herbivores or birds of prey. We analyzed the content of bear and lynx articles in Austrian hunting magazines since 1948. Bears especially have been consistently prominent in this media. Most articles came from provinces with bear and lynx presence. The number of negative personal statements remained constant, but the number of neutral or balanced statements greatly increased. Our study is a preliminary test of attitudes in Austria toward large carnivores. For successful future management of large carnivores in Austria, we emphasize the importance of further human attitude studies.

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The history of large carnivores and their management in Austria is similar to the history of large carnivores throughout Europe and North America. Wolves (*Canis lupus*), bears, and lynx were seen as vicious, blood thirsty killers; they were perceived as directly competing with humans for the good game animals (e.g. red deer [*Cervus elaphus*] and roe deer [*Capreolus capreolus*]), they occasionally killed livestock, and for most people, these predators were not considered worthy of existence (Lopez 1978, Breitenmoser 1998). Historically, large carnivore management in Austria meant extermination, and this extermination effort was very successful. All indigenous populations of bears, wolves, and lynx disappeared in Austria during the 19th century without any public outcry. While migrating individual animals have been reported every decade in the country, especially in the southern province of Carinthia, no viable population of any of these large carnivores has existed for many years (Bauer 1989, Gutleb 1993, Huber 1995, Spitzenberger et al. 1996, Zedrosser 1996, Rauer and Gutleb 1997). Occasional migrant large carnivores always elicited strong interest from the public and the media (H. Gossow, Institute of Wildlife Biology and Game Management, University of Agricultural Sciences, Vienna, Austria, unpublished data).

At the beginning of the 1970s, Carinthia became the first Austrian province to protect bears, lynx, and wolves from hunting. Other provinces protected these large carnivores within the next decades. The last province to protect all 3 large carnivores was Salzburg, which protected wolves in 1993. Bears, wolves, and lynx are now

legally protected in all Austrian provinces. All 3 species are managed within the Austrian hunting laws; each province has its own hunting law and the respective hunters associations have the right of co-determination in the creation of the law. Wolves were not included in our study because they do not exist currently in Austria.

Even though no scientific human dimensions research on public attitudes toward bears and lynx has been done in Austria, 2 large carnivore (lynx and bear) recovery efforts have been implemented. Lynx were reintroduced (6 males, 3 females) in the late 1970s at the Styrian–Carinthian provincial border and have spread throughout Carinthia expanding mostly southward from their release site. But lynx did not establish a viable population, and the present estimate is <10 individuals (Huber 1995). Three bears (2 females and 1 male) were reintroduced in 1989–92 to a remote area in the province of Lower Austria close to the neighboring provinces of Styria and Upper Austria. This area was selected mostly because of a male bear who had existed in this region since 1971. Approximately 10–15 individuals may exist today in this region (Rauer and Gutleb 1997, Fig. 1).

Bears also have recovered naturally in southern parts of Austria by expanding from a viable population in Slovenia. In southern Carinthia, there may be 10–15 animals; this population may increase due to the growing brown bear population in Slovenia (Gutleb 1993, Rauer and Gutleb 1997).

In 1971, Carinthia was the first province to establish a compensation program for damages caused by bears and lynx. In 1972 the province of Styria followed, then Lower

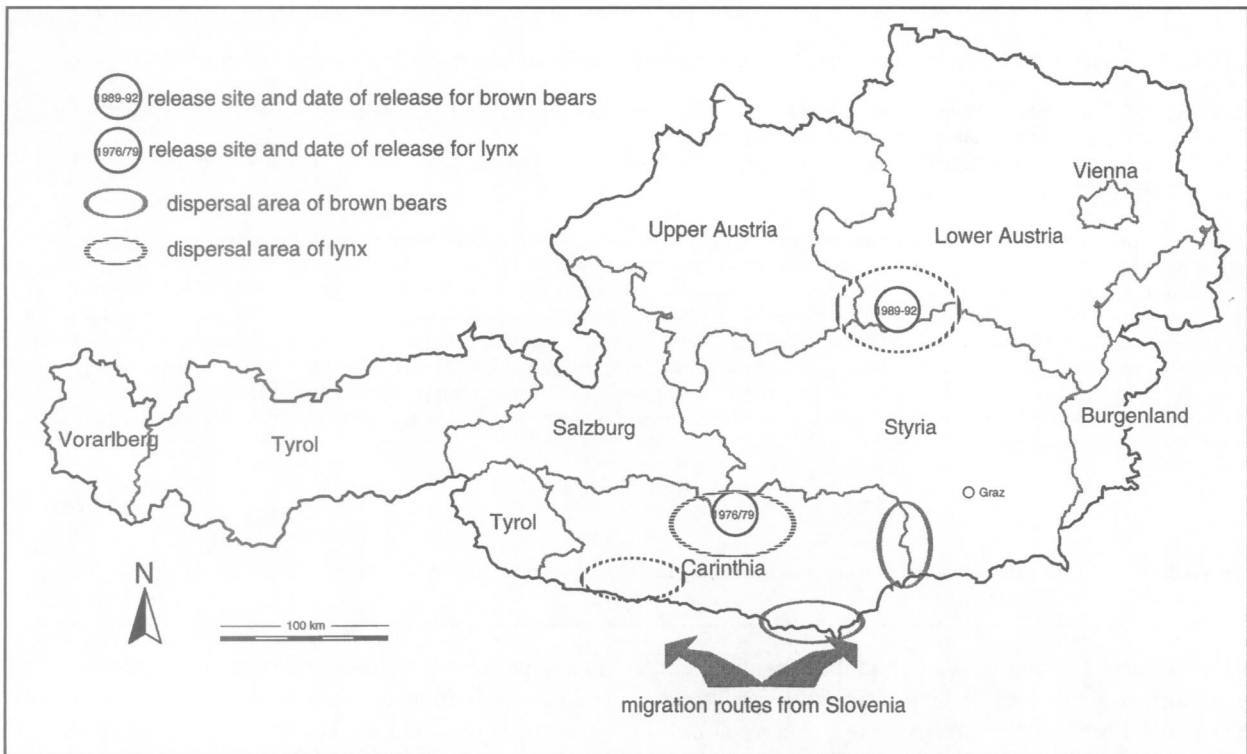


Fig. 1. Bear and lynx distribution in Austria, 1997.

Austria in 1989, and Upper Austria in 1994. Annual compensation payments for bears in Austria during 1991–96 averaged 275,000 Austrian Schillings (ATS) (approximately [US\$] 27,000); the highest amount of compensation occurred in 1994 (ATS 895,000, approximately US\$89,000) and the lowest amount paid was in 1996 (ATS 45,000, approximately US\$4,000). Most of the compensation paid for livestock depredation and beehive destruction by bears (Rauer and Gutleb 1997). Damages due to lynx are very rare, since the lynx population is very small in Austria. Thus, insurance payments for lynx damages are negligible.

Public attitudes toward bears and lynx and toward management approaches promoting their recovery remain relatively unknown. Sightings of these large carnivores, especially bears, are increasing (Gutleb 1993, Rauer and Gutleb 1997). As they become more visible, it is important to understand existing public attitudes toward coexistence with these species and how these attitudes may be influenced over time as the 2 carnivore populations grow.

The purpose of this study was to assess public attitudes toward bears and lynx and examine whether attitudes may differ spatially and temporally across the 9

Austrian provinces. Some provinces within Austria have had a much longer history with bears and lynx, thus we hypothesized that attitudes of residents in these provinces might differ from those of residents with no tradition with bears. When examining public attitudes, there are many different relevant publics. We focused on 2 groups: hunters and residents of Vienna. Hunters were selected as a target group because of their likely experience with large carnivores and their strong influence on wildlife management in Austria. Hunters also traditionally live in rural areas with exposure to bears and lynx. Managers must understand the attitudes and beliefs of this important stakeholder and address their concerns for successful bear and lynx recovery in Austria.

Vienna is the largest urban center in Austria, with approximately 1.6 million inhabitants. Viennese residents were selected as the second group in the study due to their influence in decision-making concerning wildlife management. As urban residents, their attitudes were hypothesized to differ from those of hunters who live primarily in rural areas. Opposition to hunting is also strongest in large urban centers (Kellert and Berry 1981). As a large urban center, Vienna has no tradition with large carnivores.

METHODS

We used 3 research methods to address the objectives of this study: a random mail questionnaire, a random telephone questionnaire, and content analysis of Austrian hunting magazines. To identify, document, and analyze hunter attitudes toward bears and lynx, a survey was mailed to a random sample of 1,005 hunters in proportion to the number of hunting licenses issued/province in 1994. No hunters from the provinces of Vorarlberg and Vienna were included in the sample because the sample size from these regions was too small for meaningful comparisons.

The survey included a cover letter briefly explaining the purpose of the study and the participating organizations. A self-addressed stamped envelope was provided. No additional mailings to non-respondents to increase the response rate were conducted because the questionnaire was anonymously distributed by the hunters associations. The hunter questionnaire consisted of 28 items focused primarily on hunter attitudes toward hunting and wildlife in general. One item asked hunters to rank 15 species using a 5-point Likert response format from "strongly like" to "strongly dislike". Lynx and bears were 2 of the species listed; other species were red deer, chamois (*Rupicapra rupicapra*), roe deer, wild boar (*Sus scrofa*), red fox (*Vulpes vulpus*), marten (*Martes foina*), brown hare (*Lepus europeus*), ducks (*Anas* spp.), capercaillie (*Tetrao urogallus*), woodcock (*Scolopax rusticola*), hazel grouse (*Bonasa bonasia*), goshawk (*Accipiter gentilis*), and golden eagle (*Aquila chrysaetos*). All survey data were collected in 1996. The statistical method used for data evaluation was the Duncan test for multiple range.

We collected data from Vienna residents using a telephone questionnaire similar to that used for the hunter population. We randomly selected interview partners from the current telephone directory. This telephone technique was considered appropriate to access this urban population as >95% of households in Vienna have telephones and <5% have unlisted numbers. The questionnaire was slightly shorter than the mail survey and consisted of 16 items addressing attitudes and beliefs about hunting and wildlife in general. We called individuals after 1800 hours and asked them to participate in a questionnaire which took approximately 15 minutes to complete. Only individuals ≥ 16 years old were asked to participate in the study. We divided people into age classes (16–20, 21–30, 31–40, 41–50, 51–60, 61–70, 71+). No calls were returned to numbers where no one answered the phone. Most individuals (approximately 90%) agreed to participate. Using this technique for the Viennese population produced 260 useable interviews. Responding individu-

als were asked about their opinion about reintroduction of herbivores (e.g., marmot [*Marmota marmota*] or ibex [*Capra ibex*]), large carnivores (e.g., bear or lynx), or birds of prey (e.g., peregrine falcon [*Falco peregrinus*] or barn owl [*Tyto alba*]). All interview data were collected in 1996. The statistical method used for data evaluation was the Duncan test for multiple range.

To assess how attitudes toward bears and lynx may have changed over time as well as space and to establish which provinces had traditions with these predators, we documented reports of bears and lynx in hunting magazines by province and year and analyzed for their positiveness or negativeness toward the 2 species. We used every issue of the 3 major Austrian hunting magazines determined by circulation numbers (*St. Hubertus*, *Oesterreichs Weidwerk*, *Der Anblick*) beginning in 1948. In 1996, *St. Hubertus*, *Oesterreichs Weidwerk*, and *Der Anblick* had distributions of 19,500, 47,000, and 15,000, respectively. These magazines were usually issued monthly; we used 1,848 issues in the analysis. Upon finding an article regarding bears or lynx from all over the world, we placed each article in 1 of 5 periods (1948–57, 1958–67, 1968–77, 1978–87, 1988–96). Since this part of the study was conducted in early 1997, this year could not be included in the analysis; thus, the last period (1988–96) contains only 9 years. For further analysis, we classified articles into reports or personal statements. A report was characterized by information containing a killing, a sighting, tracks, statistical data, or livestock predation caused by a bear or lynx. Each report containing data from Austria was linked spatially to the province of origin and temporally within the periods mentioned above. We considered articles which reflected opinions of the author to be personal statements and we analyzed them separately. We separated personal statements into positive, neutral, or negative based on the language used within the article and the overall tone. We considered an article to be positive when it clearly expressed favor for either bear or lynx, included only positive adjectives, and included positive images of the animal. The 2 following translated statements found in *Der Anblick* clearly illustrate the positive nature of the article.

"Praise God and Saint Hubertus that there are still hunters who do not shoot at everything they meet in the woods." (Erschen 1955:276)

"Hopefully we will still be able to protect this noble game species and save it from going extinct." (Palfy 1955:319)

We considered an article neutral if the author suggested positive and negative aspects of bears and lynx and reached no clearly positive or negative conclusion about

the species. If positive and negative adjectives in these articles were approximately the same, the article was considered neutral. The following statement from a hunter responding to the conflict between lynx supporters and non-supporters shortly after the reintroduction is an example of a neutral statement.

the conflict between lynx friends and lynx opponents has deepened.... Both sides should try to sit together and talk with each other. Then possibly—in a real Austrian manner—a compromise could be reached that will satisfy both sides. (Sander 1980)

Negative articles, similar to positive articles, were quite easy to identify. These articles were characterized by a clearly negative attitude toward the bear and lynx and the use of negative adjectives. Two examples from *St. Hubertus*:

The lynx kills because of an insatiable desire to kill, like the weasel or the pole cat. (Helleck 1963)

A reintroduction of lynx in civilized countries would be insane. (Rulf 1964:5)

RESULTS

Hunter Sample

After the single mailing and considering those surveys which were non-deliverable, we obtained an acceptable response rate of 52%, which produced an usable sample of 522 questionnaires. Hunters in all Austrian provinces ranked roe deer as the most liked species ($\bar{x} = 1.27$ on a scale of 1 to 5 where 5 was strongly dislike and 1 was strongly like; variance [s] = 0.35) of the 15 given to them; very little variation between any of the provinces resulted in this ranking of roe deer. All herbivores were ranked higher than any predator species. Brown bear and lynx were ranked the most negative of all 15 species by hunters from all provinces (Fig. 2). Brown bears received a mean score of 4.03 ($s = 2.00$) and lynx a mean value of 3.99 ($s = 2.02$). Provinces with a longer historical tradition with large predators such as Carinthia were more positive toward bears ($F = 2.6070$, $P = 0.02$) and lynx ($F = 2.3585$, $P = 0.03$) than provinces with little or no past experience with these carnivores, such as Upper Austria. For example, the mean bear score for Carinthia respondents was 3.52, compared to those of Upper Austria, where the mean was 4.44. Mean attitude scores for lynx for respondents from Carinthia were 3.44, compared to Upper Austria, where the mean attitude toward lynx was 4.34.

Vienna Sample

While an overwhelming number of Viennese respon-

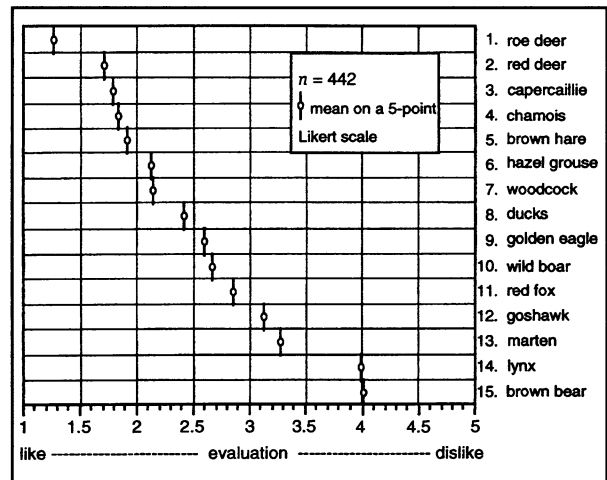


Fig. 2. Ranking of 15 game species by Austrian hunters in a 1996 survey. Lynx and bear are ranked as the most disliked species; roe deer is the most favored species.

dents supported reintroducing herbivores such as ibex (*Capra* sp.) (96% agree, $n = 259$) and birds of prey such as peregrine falcons (*Falco peregrinus*) and barn owls (*Tyto alba*) (98% agree, $n = 260$), support for reintroducing large carnivores was considerably less (70% agree, $n = 259$). While support for large carnivores was not as strong as for other species, this urban population with little experience with bears and lynx still supported recovering the species. This support remained strong even when asked if they would still support reintroducing wild

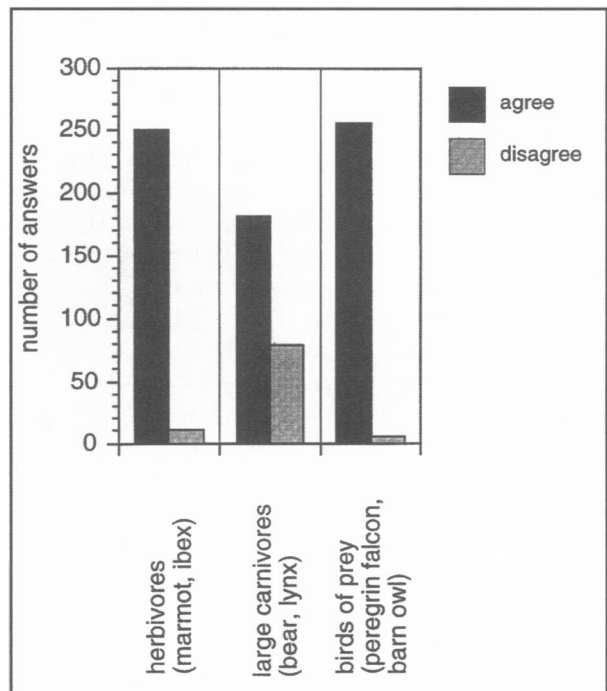


Fig. 3. Attitude of Vienna residents about the reintroduction of wild animals in Austria ($n = 259$), 1996.

animals if the economic costs were high (76% agree, $n = 257$, Fig. 3).

Within the Viennese urban population there were differences in attitudes among respondents. Younger respondents (16–20 years, 21–30 years, and 31–40 years) tended to favor reintroducing large carnivores more than older groups (41–50 years, 51–60 years, 61–70 years, and 71+ years). Those aged 61–70 were more negative than the 3 youngest age groups (16–20, 21–30, 31–40), and those aged 41–50 and >71 years of age were more negative than those aged 16–20 and 31–40 ($P = 0.05$, $n = 259$). While statistically significant differences were found, the mean scores ranged from 6.06 (16–20 years of age) to 6.50 (61–70 years of age), suggesting that large substantive differences between the groups do not really exist. A score of 6.0 indicated agreement toward reintroducing large carnivores, while a score of 7.0 was disagreement.

Hunting Magazine Content Analysis

We analyzed 1,848 magazine issues and found 362 articles dealing with either bears or lynx; 250 were related to bears and 112 to lynx. In general, most of the articles in these magazines dealt with red deer or roe deer, the most common big game species in Austria. The number of bear and lynx articles varied over time, and the pattern of articles for lynx and bear were different (Fig. 4). For brown bears, most articles (24% , $n = 60$) were in the first period (1948–57) and the most recent

period (1988–96, 23%, $n = 58$). The number of bear articles steadily increased since 1958–67 after falling initially from the high established for the first period examined (1948–57). The number of lynx articles over time reflect a cyclic pattern with very few articles during 1948–57, 1968–77 and 1988–96, but a considerably larger number of articles during 1958–67 (35%, $n = 39$) and 1978–87 (30%, $n = 33$). There have always been more articles concerning bears than lynx (Fig. 4).

Two hundred and four of the 362 articles (56%) were reports offering information about a killing, a sighting, tracks, statistical data, or livestock predation from various parts of the world; 93 (46%) of these 204 reports were from Austrian provinces. Most of the Austrian reports concerned bears ($n = 70$). While there was some variability in the number of bear and lynx articles over time (Fig. 3), spatially these bear and lynx reports varied tremendously (Fig. 4). Approximately 51% of all the bear and lynx reports were from Carinthia ($n = 47$), with several reports also from Styria and Lower Austria. Tyrol and Burgenland provinces each had a few bear reports, but no reports of lynx (Fig. 5). The number of reports also varied temporally. In contrast to the number of bear articles, which increased over time, the number of bear reports decreased over time. Conversely, lynx reports fluctuated over time following a similar pattern of the number of lynx articles over time (Fig. 4).

Fifty-five of the remaining 158 articles could be classified clearly into positive ($n = 20$), neutral ($n = 20$), or

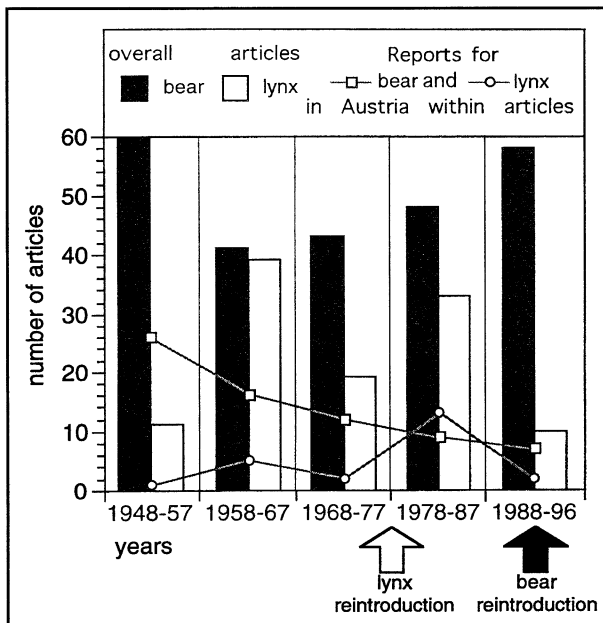


Fig. 4. Bear and lynx and their presence in Austrian hunting magazines. In 1,848 analyzed issues between 1948 and 1996 we found 250 articles about bears and 112 articles about lynx.

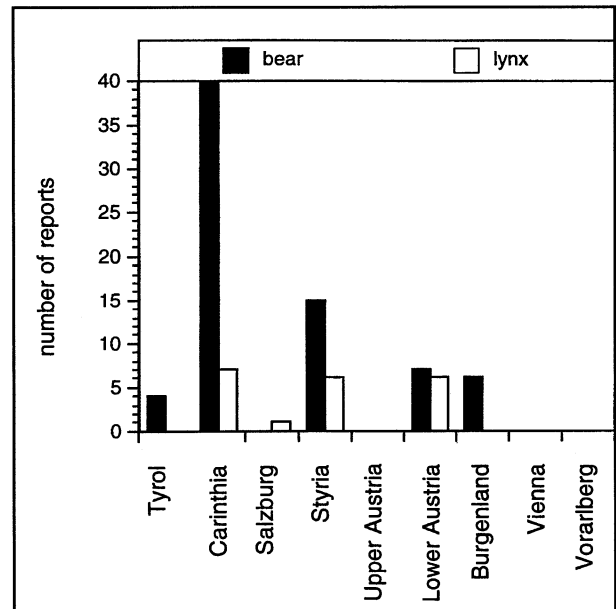


Fig. 5. Number of bear ($n = 70$) and lynx ($n = 23$) reports in Austrian provinces (analysis of Austrian hunting magazines from 1948–96).

negative ($n = 15$) personal statements about bears and lynx. The majority of articles were hunter stories about bears ($n = 65$), which did not lend themselves to be classified according to the criteria outlined for this paper. An additional 7 stories about lynx were not used. These stories illustrated more events that were neither portrayed positively or negatively. For example, an individual talking about his hunting trip to Alaska where he killed a bear did not seem to offer attitudinal information pertinent to our classification scheme. We classified the remaining 31 articles as scientific reports; these documents contained data from research studies and did not subjectively evaluate bears or lynx. Most of the personal statements about bears and lynx occurred in 1958–67 ($n = 21$); about the same number of statements were found over 3 periods 1948–57 ($n = 9$), 1978–87 ($n = 11$), and 1988–1996 ($n = 11$). Only three articles appeared during 1968–77. The attitude toward bears and lynx reflected in these statements appeared to change over time. Due to the relatively small sample sizes, which result when dividing these articles over time, these results should be interpreted cautiously. Initially (1948–57), attitudes toward bears and lynx appeared positive, with most of the articles (66%; $n = 9$) expressing the benefits of having bears and promoting bear conservation. The percent of positive articles toward the 2 species dropped after 1948–57 on average by 31% for the following periods; this does not necessarily mean that attitudes became more negative. Upon examining the statements more closely, the number of negative articles remained about the same throughout the 5 periods (on average 27%, $n = 15$) and it is the number of more neutral or balanced statements that increased from 11% ($n = 9$) in 1948–57 to 55% in 1988–96 ($n = 11$).

DISCUSSION

Results similar to our study have been documented in North America (Kellert and Berry 1981); predators are typically rated as the least liked of wildlife species with herbivores ranked typically among the highest. More recent research in North America, however, suggests that attitudes toward large predators are changing and that most of the public today supports large carnivore recovery (Bath 1989, Tucker and Pletscher 1989, Kellert 1994, Kellert et al. 1996). These changes in North American attitudes toward carnivores have occurred over a relatively short time (approximately the last 10 years). Carnivores that are being restored in various parts of North America with public support have been absent from the landscape for a much shorter period (approximately 50 years, for example, with wolves in Yellowstone National

Park) compared to the Austrian situation, where carnivores have been gone for 150 years or more in some areas. This longer absence seems to have affected current attitudes; Austrian hunters have remained negative toward bears and lynx while in North America hunters seem willing to accept some level of large carnivores (Bath 1989). For wildlife managers this indicates the importance to protect populations and not let them go extinct. It may be easier to recover populations of large carnivores when the populations have not been absent for many decades (Boitani 1995). Livestock husbandry techniques may still exist if predators have not been lost for generations.

Hunters from 4 of these 5 provinces with bear reports (Tyrol, Carinthia, Styria, and Lower Austria) ranked the bear more positively than the overall mean ranking of the bear. This supports our hypothesis that residents with experience or tradition with bears tend to be more positive than residents with little or no experience with bears. This pattern was not as evident with the ranking of lynx.

The number of bear and lynx articles and reports in hunting magazines varied over time and space. The large number of lynx articles during 1958–67 may be due to a discussion among several hunters about reintroducing the species. This idea of reintroducing lynx was not considered seriously until 20 years later. In 1976–79, lynx were reintroduced, and it is during this time (1978–87) when we saw another increase in the number of lynx articles. A similar situation may explain the increase in the number of bear articles over 1988–96; 3 bears were reintroduced into Lower Austria between 1989–92.

The large number of positive bear articles between 1948–57 seem to be attributed to the legal killing of a brown bear by a hunter; most hunters at the time felt the animal should not have been killed. The large percent of neutral articles written today (1988–96) in comparison to the polarized articles of the past should be encouraging to conservationists striving to present information about bears and lynx in an informed factual manner. Attitudes formed from factual information tend to be more positive toward the species and last longer than attitudes based on emotion. With more exposure to bears and lynx, attitudes may become more positive toward these species, depending on experience and management. Results from this study suggest that hunters who have had some historical tradition or connection with bears and lynx tend to be more positive.

The presence or absence of a predator seems to be an important factor in understanding and predicting public attitudes toward the species. For example, in Norway bears have only recently returned to parts of their former range after many years. Szinovatz and Bath (In Press)

found that Norwegian attitudes toward bears varied according to distance from the core area, where bears are returning. Those residents in the core area were more negative toward bears than those from non-core areas. In contrast, residents who have always lived with wolves in Riding Mountain National Park, Canada, tend to hold positive attitudes toward the animal (Ponech 1997). In Yellowstone National Park, USA, attitudes of residents from counties surrounding the park were more negative toward wolves than those of residents from further away from the park (Bath 1989, Bright and Manfredi 1996); however, these attitudes seem to be changing as wolves become more established in the area and people see the benefits of having wolves (Wilson and Heberlein 1996). It is important to establish positive values for wildlife species, especially large carnivores, because values do not change as quickly as attitudes when problems like livestock depredation occur (Fulton et al. 1996).

MANAGEMENT IMPLICATIONS

From a methodological viewpoint, it is often difficult and expensive to conduct regular attitude and belief assessments over a long period. Longitudinal human dimensions research is rare, as often it has been used by managers more as a form of crisis management than truly integrated into daily decision-making. Hence, the literature is full of one-shot case studies (e.g., Bjerke and Reitan 1994, Moe 1994). Integrating content analysis with data collection on specific target groups, as done in this study, may provide an indicator of how attitudes change over time. The combination of data collection techniques to explore the human dimensions of bear and lynx management used in this study may be applicable to other researchers trying to explore how attitudes may have changed looking retrospectively back in time. It remains important in conducting such human dimensions research to explore how attitudes change over time and vary across space. Closeness to the actual carnivore population remains an important variable in understanding attitudes toward the species and management options. Public attitudes toward bears and lynx in Austria still remain relatively unexplored; many other publics need to be involved. While attitudes toward bears and lynx are still negative in Carinthia, it is perhaps encouraging to resource managers that they are the most positive of all provinces toward bears and lynx as both species are present in this province and the bear population may be increasing.

More specific information concerning attitudes and beliefs about bears and lynx by target groups would be useful to better target educational efforts and address specific concerns. In this study a preliminary understand-

ing of historical and present attitudes of 2 target groups toward bears and lynx was gained. Further studies can build on this research by more carefully examining and restructuring the content analysis and expanding the target groups and attitudinal and belief items specific to bears and lynx. In the future, attitudes toward wolves will need to be explored as natural recovery of this species is likely to occur in the near future (Zedrosser 1996).

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