

Boitani, L. (1995). Ecological and cultural diversities in the evolution of wolf-human relationships. In *Ecology and conservation of wolves in a changing world*: 3-12. Carbyn, L. N., Fritts, S. H., and Seip, D. R.(Eds.). Edmonton: Canadian Circumpolar Institute.

Keywords: *Canis lupus*/conservation/ecology/evolution/Malme/predator-human conflict

Abstract: The history of wolf persecution and extermination in Europe and North America followed a pattern that did not match the availability of suitable habitat for the wolf or any ecological factor linked to human density. An explanation of past and present attitudes toward wolves may be found in the early ecologies of human cultures in various regions of Eurasia. Nomadic shepherds seemed to have the most negative attitudes towards wolves, whereas sedentary crop and livestock growers appeared to be more ambivalent. Hunters and warriors had positive images of the wolf. When Europeans colonized North America, they brought with them their cultures, religions, and traditions. As most immigrants were from north and central Europe, they carried with them the worst attitudes toward wolves, that is, the negative attitudes of the Anglo-Saxon and the German world. Past attitudes have deeply influenced the relationships between human and wolves throughout history; knowledge and management of the deep motivations for today's attitudes deserve highest priority in any wolf recovery or management program.

# Ecological and Cultural Diversities in the Evolution of Wolf-human Relationships

■ Luigi Boitani

*The history of wolf persecution and extermination in Europe and North America followed a pattern that did not match the availability of suitable habitat for the wolf or any ecological factor linked to human density. An explanation of past and present attitudes toward wolves may be found in the early ecologies of human cultures in various regions of Eurasia. Nomadic shepherds seemed to have the most negative attitudes toward wolves, whereas sedentary crop and livestock growers appeared to be more ambivalent. Hunters and warriors had positive images of the wolf. When Europeans colonized North America, they brought with them their cultures, religions, and traditions. As most immigrants were from north and central Europe, they carried with them the worst attitudes toward wolves, that is, the negative attitudes of the Anglo-Saxon and the German world. Past attitudes have deeply influenced the relationships between humans and wolves throughout history; knowledge and management of the deep motivations for today's attitudes deserve highest priority in any wolf recovery or management program.*

## Introduction

The wolf (*Canis lupus*) was exterminated by humans from most of Europe (Delibes 1990), as well as from much of North America (Harrington and Paquet 1982). In Europe, wolf populations survive in the Iberian Peninsula, Italy, Greece, Sweden, and Norway. Larger populations can be found in Finland and in some eastern European countries (Poland, Czechoslovakia, Romania, Bulgaria, and former Yugoslavia) (Zimen and Boitani 1979, Delibes 1990) (Fig. 1). In North America, wolves are found in significant numbers in Alaska, Canada, and Minnesota, and are increasing in other parts of the continent (Harrington and Paquet 1982, cf. this volume).

The present distribution of wolves in Europe does not relate to human density, or activities, or availability of suitable habitat; yet the impact of humans on wolves is clear. Wolves survive only in the three Mediterranean "peninsulas," having been long exterminated from the rest of Europe, in some cases, for centuries. Why is this so? Explaining these distribution patterns might give insight into the extermination process, which in turn may affect conservation efforts not only in Europe, but worldwide. Determining the psychological and historical reasons for such major attitude differences among European countries might result in more sophisticated conservation plans and successful reintroduc-

tion and management of wolf-human conflicts. Why, in our contemporary culture, is the wolf considered "bad" to a much greater extent than its behavior and ecological role would justify? The answer to this question might be linked to the history of human cultures, and could provide hints for species management.

The hypothesis: I argue that wolf extermination follows a pattern closely linked to different early human ecology types and to the interactions among cultures. For example, I believe the ambiguous attitudes of contemporary Italians can be traced back to the ecology of the first important cultures of Roman times (Boitani 1982, 1986, 1992). Likewise, the negative attitudes of central-European cultures can be traced back to the ecological settings of those human populations.

As evidence for my hypothesis I will briefly review the extermination patterns of the wolf in Europe and North America, and compare those patterns to the role of the wolf in the most important human cultures throughout the last two millennia. Finally, I will briefly scan basic human ecology types behind those cultures, and merge them with some considerations of the way wolves reacted in those ecological relationships. Emphasis on the European context is necessary to explain North American patterns, as colonization is carried out mostly by Europeans. The implication of my conclusions for contemporary conservation and management of wolves are then presented.

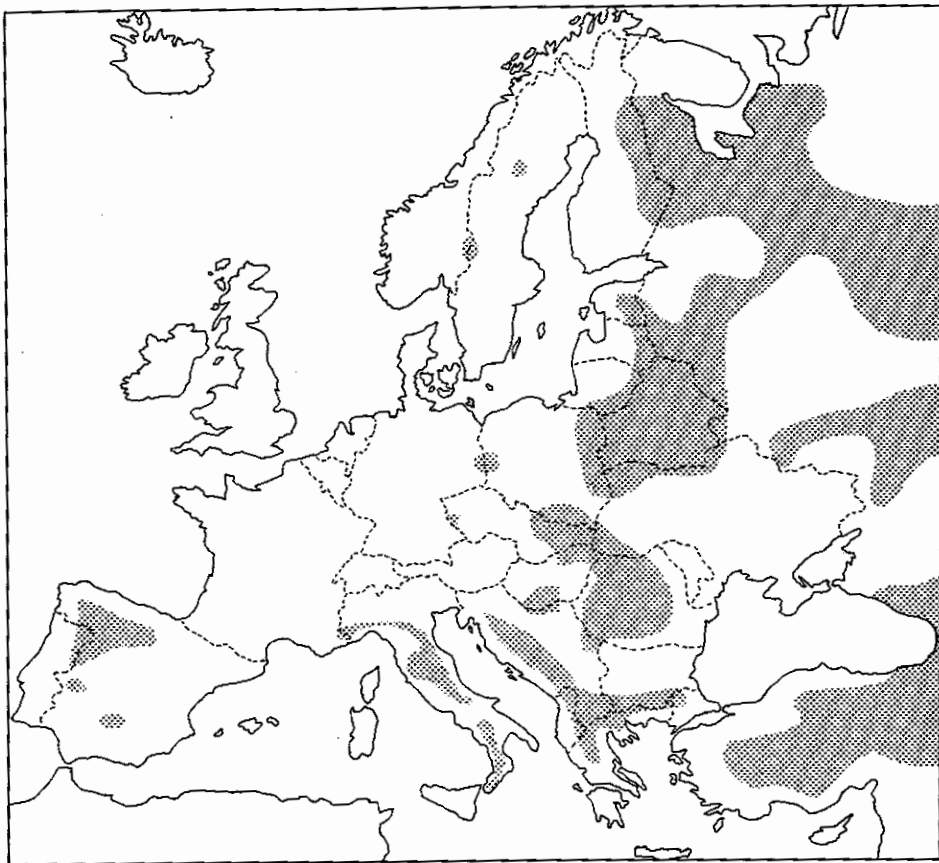


Fig. 1. Approximate wolf distribution in Europe, 1993.

### Wolf Extermination in Europe and North America

The extermination of wolves in northern and central Europe started early. It became well-organized and consistent between the Early Middle Ages and the early part of this century (Mallinson 1978, Zimen 1978).

#### Great Britain and Central Europe

Great Britain's history of wolf extermination exemplifies an organized elimination campaign (Fiennes 1976). Livestock were the most important economic asset, and the wolf was a constant threat. The Celts hunted wolves in the third and fourth centuries B.C. with the help of specially trained Irish

wolf hounds. Later, Edward the Peaceful created amnesty laws related to the wolf: lawbreakers could pay their dues in wolf heads. The first kings of England asked for wolf scalps as payment. England's last wolf was killed in early 1500 under Henry VII (Harmer and Shiple 1902).

During the Middle Ages, especially under King James I in Scotland, the wolf population was at a high density. As a result, the king organized hunts that occurred just after birth of the wolf pups. Despite the carnage that occurred, many wolves found refuge in the immense Scottish forests. During the reign of King James IV (1488–1513) the wolf population increased dramatically. In 1560, King James VI declared that all men — no matter how old or young — participate in the

hunt. Scotland rid itself of wolves by destroying its forests. A few animals were seen in the forests of Braemar and Sutherland until 1684, the probable date of the animal's extinction. In Ireland, the wolf was extinct by approximately 1770 (Harmer and Shiple 1902).

In central Europe, the battle against the wolf took on a less frantic pace and its results appeared at a slower rate. In France, between 800 AD and 813 AD, Charlemagne founded a special wolf hunting corps, called the "Louvetier" (Hainard 1961). When a member of the corps killed a wolf, they had the right to exact payment from those living within a radius of two leagues from where the animal was caught. Consequently, the Louvetier rarely hunted wolves in unpopulated areas. Therefore, the wolf population in the more remote areas of France was left undisturbed.

The French Revolution in 1789 saw the end of the Louvetier, but in 1814 the corps was revived. The Louvetier was paid by the central government, and had to report their activity annually to the prefect. In 1883, about 1,386 wolves were killed and the next year another 1,035; but when poison was introduced, many more wolves were killed (Victor and Larivière 1980). The last wolves were killed in 1927 in Deux-Sèvres and in Haute-Vienne (Beaufort 1987).

The last wolves were reported in central Europe at the beginning of the 19th century, when many large herbivores were seen for the last time. Deer and wild boar were exterminated by organized and effective hunts. Persecuted and deprived of its prey, the wolf eventually disappeared. In Denmark the last wolf was killed in 1772, and in Switzerland before the end of 19th century. In 1847, the last wolf in Bavaria was killed, and by 1899 they had completely disappeared in the regions of the Rhine from Coblenz to the Saar (Zimen 1978, Boitani 1986).

#### Northern Europe

Wolf extermination was not fully accomplished in Northern Europe until the beginning of this century. In Scandinavia, the wolf's main prey was the moose, which became extinct because it was killed for its meat and to reduce its competition with domestic beasts. Once again, the wolf was without prey and had to resort to domestic animals. Bloody persecution gradually confined wolves to the northern regions of the country. Here, the Laps hunted them to the last individual by organizing drives with hundreds of people participating (Turi 1931). By 1960, there were only a few wolves left; in the meantime, the moose population recovered to a peak of 70,000 (Curry-Lindahl 1965). Today only five to 10 wolves remain along the Norway-Sweden border, whereas Finland has a higher population supported by dispersal from the adjacent Russian regions.

#### Eastern and Southern Europe

Human densities in the Eastern Alps never reached the levels they did in central Europe, and there was never any grand-scale campaign to destroy wolves. In the 19th century,

wolves were said to be abundant and widespread in Poland, Hungary, and Transylvania. Their extermination was only possible at the beginning of this century by means of firearms and poison. The wolf was exterminated in nearly all of central-eastern Europe except in Czechoslovakia, Poland, Romania, Bulgaria, the former Yugoslavia, Albania, and Russia. Wolf populations in the Balkans were favored by their connections with those living in the vast lands of what was to be the Soviet Union (Zimen and Boitani 1979).

In southern countries around the Mediterranean basin, organized killing did not follow the consistent patterns of central European regions. The only organized extermination campaigns similar to those in France were conducted by Carlo VI in 1404 and then by Francisco I. Today, in the Iberian peninsula, the wolf is mostly confined to the mountainous regions and to the area across Spain and Portugal in the northern part of the peninsula (Grande del Brio 1984, Blanco et al. 1990).

Efforts to eradicate the wolf in Italy were more consistent between the Early Middle Ages and the last century. Bounties were regularly paid in the 12th and 13th centuries, and as recently as 1950 (Cagnolaro et al. 1974). The professional wolf-hunting corps lacked the organization and persistence of its counterpart in France and the mountain regions in the interior were not as easily patrolled. Therefore, in the Iberian peninsula and Italy, campaigns against the wolf were not as rigorous or well-organized as in Central and Northern Europe.

#### North America

The history of wolf extermination in North America is reported previously (cf. Young and Goldman 1944, Matthiessen 1959, Mech 1970, Lopez 1978, Brown 1983, Dunlap 1988). Prior to European colonization, the wolf enjoyed a congenial relationship with the American Indians: wolves were respected and also hunted (cf. Lopez 1978).

When the first domestic animals arrived in 1609 at Jamestown, Virginia, the war against the wolf was official. More than effective weapons, the American pioneer had a sense of solidarity and social cohesion, which in part was the effect of having common enemies, including the wolf. The battle against wolves was not an individual's affair, but a challenge to all. The wolf was the essence of wildness and cruel predation, the ally of barbaric Indians, a creature of twilight. Its elimination was depicted as more than just practical; it tested the resolve and spiritual fortitude of the pioneer. Its destruction could enable the spirit and unite a community. Massachusetts established the first bounty (one cent) in 1630. Pioneers, having fresh in mind the final victory over wolves back in England, were determined in their efforts to eliminate the predators from their homeland.

In the second half of the 19th century the battle against the wolf became more intense. Hunters had more effective killing methods including Newhouse traps (1843), and poison, mostly strychnine (Cluff and Murray this volume).

When the frontier moved west, another reason to kill wolves became more important: their fur. In 1870, the new livestock industry expanded into the vast rangelands beyond the prairies; the extermination of wolves, and many other game and predator species, reached its highest intensity (Rutter and Pimlott 1968). In the first decade of the 20th century, most of the 48 states were already cleared of wolves. Finally in 1915, wolf control became the responsibility of the federal government, and official full-time hunters were paid to eradicate the last animals. Only a small population in Minnesota survived; the recent comeback of the wolf in many northern United States is today's history (this volume).

### The Wolf in Human Cultures

Examination of myths and legends surrounding the wolf is useful in understanding the history of the animal's extermination, as are the reasons why the persecution of the animal was so fervent in some regions and not in others.

### Hunters and Warriors

Human cultures whose main subsistence was hunting and who shared a positive image of the wolf in all historical periods and geographical areas. In Palaeolithic times, humans were seminomadic hunters. Because they depended on animals for food and clothing, they developed an intimate relationship with the animals they pursued. Primitive hunters thought that certain animals were supernatural and believed it possible for the hunter and the prey to switch places, that is, to be mutually transformed. They believed in "guardian spirits" that would protect both humans and animals. The "Lord of the beasts" was a spirit with the power to provide prey and protection for the hunters (Hultkrantz 1965). Hunters would propitiate the gods for success by using special sacrifices and rituals. Examples can be found from most subarctic cultures (Ainu, Gilyak, Ciukci, Laps), and in all Eurasian cultures of hunters and warriors from Mongolia to the Caucasus and the Balkans (Paulson 1970).

The Inuit practiced a religion that was centered around a ceremony tied to the hunt. Inuit honored the wolf above all other animals. While ecology would have appeared to place these two hunters at odds, the wolf's role as hunter placed it, instead, in a seat of honor within human culture. Inuit and American Indians even tried to copy the wolf's hunting behavior. Because the wolf was such a significant role model, these peoples often associated the animal with the sun and its power with light and life (Paulson 1970). The Mongolians' myth of origins says Genghis Khan's first ancestors were a gray wolf sent from heaven and a white fawn. Myths of origin in most hunting communities have the wolf among the first ancestors, confirming the strong positive bond between humans and wolves.

When hunters settled down and became farmers, bands of people protected small villages from wild animals and from potential human invaders. These people were the first

"military bodies," the Indo-German "Mannerbunde" that behaved much like a group of wolves. The link between hunter and warrior is evident here. Evidence of this role in early hunter cultures can be found in "contemporary" similar cultures, such as the American Indians (e.g., Cheyenne, Sioux, Pawnee) (Mails 1972, Bird 1972, Hultkrantz 1965).

### Nomadic Shepherds

Shepherds had a negative image of wolves because wolves were the main threat to shepherds' economic survival. When the cultures of the northern Asiatic peoples mixed with those of nomadic herders in south-central Asia, attitudes towards the wolf became more ambiguous. The myth of the wolf as the first ancestor is recurrent (as for the T'u Kiue or for the Hsiung-u Chinese), but the image of the wolf as a dangerous beast also emerges. Among the Kara-Kirghisi, seven large wolves were identified by the seven stars of the Bear, and stalked horses in the steppes. These people also had a myth of a wolf ancestor similar to that of the Hsiung-u Chinese (Puech 1970).

Life for the Germanic people, who were basically nomadic shepherds and then warriors, meant a constant struggle with the environment. The wolf played a large role in this struggle and its image was among the most negative (in the German apocalypse, the wolf Fenrir murders Odin, father of the gods). The Germans were also warriors (though their culture maintained its strong pastoral roots) and often had the wolf as a totem. Warriors were called alfhednar or "humans with wolf skins." They could only be called by this name after an initiation ritual in which they would kill the wolf. Germanic people were mostly responsible for exporting this link between wolf and warrior into western cultures; their invasions of southern European countries were referred to as wolves' descents.

### Farmers and Sedentary Shepherds

These cultures often had a positive view of the wolf, or at least an ambiguous attitude, mixing fear, respect, hate, and love. In central Europe, between 1300 and 700 B.C., the Celts developed a basically sedentary farming society and in their mythology the wolf was viewed positively. It was connected with the cult of light and sun (the name of the Celtic god of light comes from that of the wolf "bleiz").

The Mediterranean cultures of southern Europe where most people were sedentary and farmers, also showed a consistently positive image of the wolf. Apollo, the master of light and order, an important god in Greek mythology, was associated with the wolf. The Greek word for wolf (lukos or luke) also means the light of dawn. The figure of Apollo was said to have arrived from the Nordic regions (the Celts?) (Curotto 1958). The Greek myths included Apollo's returning once a year to a "northern region" to rest. Wolves were also killed in Greece, and bounties were paid in Athens Solone in the sixth century BC. While this went on for

many years, there were no more documented cases of prizes given for killing the animal in the Greek or Roman worlds.

The wolf was a major figure in the lives of the Romans. The well-known legend of the founding of Rome by the twins Romulus and Remus comes from a Greek legend. However, the truth behind the legend is tied to the wolf cult present in the neighboring Sabine culture. The Sabines had two words for the wolf: lupus (the animal), and hirpus (the animal in its religious sense). The Latin word "lupus" comes from the Sabine language. Whereas the Romans were farmers, the Sabines were both shepherds and hunter-warriors and had religious practices (similar to those of Germanic peoples) that centered around the wolf with rituals, temples, and priests (Boitani 1986). Like the Indo-European Mannerbunde, the Sabine warriors fought under the sign of the wolf, which was their guide and totem. Romans never defeated the Sabines in battle, but won by merging with them. Romulus and Remus were the symbol of the Romans and the Sabines, unified and "twinned" in Roma (the she-wolf). Thus, the wolf became the symbol of the pax romana, its legions, its central power, and Rome's tradition of tolerance (Boitani 1986). The Roman feast of the Lupercali celebrated the peace between the Romans and the Sabines, and was established both to propitiate the gods for the fecundity of the herd (and of woman) and to defend humans from risks and dangers.

### The Church Domination

The advent of Christianity imposed radically new ways of thinking on Western people. People's attitudes towards the environment and the wolf changed considerably (Ortalli 1973).

The Bible presents the perspective of people that lived in a hostile environment within a pastoralist economy; hence they had a negative attitude toward wolves. While the figure of Jesus Christ replaced that of Apollo — the god of light and order — these figures were rarely associated with the positive image of the wolf. In Christian symbolism, the wolf became more a symbol of human rapacity and deceit, of wantonness and sexual excess, the animal ready to attack sheep, symbols of mildness, moderation, and goodness (Ortalli 1973). The sheep-wolf counterposition was often used symbolically. As an example, Isaiah says that during the Second Coming the lamb will sit with the wolf, as a triumph of peace. In the New Testament, Christ calls false prophets "wolves" and warns the disciples they will be like sheep in the land of predators when they go out to preach his word.

Humanity passed from a world of tolerant pagan polytheism to the black and white duality of Christianity. Something was either on the side of God, salvation, and goodness or on the side of the devil, evil, and perdition. The tolerance, logic, rationality, and knowledge of natural phenomena that were an integral part of the Classical world were manipulated by

the Church in favor of the supernatural, the mysterious, and faith in providence.

Politically the Church was ruthless and succeeded in completely subjugating contemporary culture (Lopez 1962, 1971). The Church was obsessed with the fear of heresy and therefore discouraged both oral and written traditions in order to eliminate any liberal interpretations of the Bible. The apostolic and papal traditions were the only points of reference for the Church, and the attitudes that were expressed in the Gospels and the Acts of the Apostles reflected the original relationship between people and the environment in the Middle East. Symbols and metaphors were taken from everyday life. The invasion of German culture, and its belief that the wolf was a dangerous predator, was used for all its worth by the Church. The wolf as heretic was a widely spread symbol after the fifth century.

The 10th century became known as the "Peace of God" era. After centuries of economic depression, farmers were trying to cultivate vast areas of unsettled land. In this "new frontier" climate, the wolf was seen as the enemy, symbol of the difficulties to the conquest of new land (Duby 1974, Fumagalli 1992). The Italians' more ambiguous attitude toward the wolf partially derived from the geography of central Italy, which did not lend itself to major settlement. Unlike the plains of central Europe, wolves were able to find refuge where people would not pursue them.

The Early Middle Ages saw the animal as a major obstacle to expansion and gave us our image of the "evil wolf." The wolf was seen as the most dangerous animal humans had to face and the codification of this role, in the legends of the saints (like St. Francis) reinforced the image of the wolf as predator (Ortalli 1973).

### The Renaissance and the Wolf in Literature

The Early Middle Ages laid the groundwork for attitudes toward the wolf. The 15th to the 17th centuries saw the most fervent campaign against the animal. It was also during this period that the most shocking stories of wolves devouring humans appeared (Zimen 1978, Bradier 1985).

The Church increased its control over the people by providing "scientific proof" of its doctrine. Scientific information was found in the famous "Physiologus" books. They were written to perpetuate the popular image of the natural world; authors added little moral lessons and often changed biological facts into religious metaphors. For many centuries these manuscripts were the only sources of knowledge of natural history (Brezzi 1978). Texts that preceded them were scarce. Aristotle in *Historia Animalium*, Pliny in *Naturalis Historia*, and many classical authors wrote in depth about wolves, drawing a rather accurate picture in light of their knowledge of the animal. Classical authors thought the wolf was more of a threat to herds than to people. Horace, as an example, gave an impartial observation of the behavior of

the animal. He reported once meeting a wolf by chance, but when the animal saw him, it fled immediately. Even by the late Middle Ages, a few Christian writers such as Albertus Magnus and Bartholomew Angelico wrote about wolves in an objective and accurate manner (Ortalli 1973). Unfortunately, their most scholarly writings rarely became part of popular culture. The Physiologus, on the other hand, inspired more popular works on natural history: the bestiaries. These books were filled with terrifying natural and fantastical animals, with many tales of the wolf being portrayed as a deceitful and lascivious beast. The roots of most beliefs could be traced back to the bestiaries of the Middle Ages (Ortalli 1973).

Fables, too, are a fundamental means of understanding the traditional cultural image of the wolf. The body of literature is immense, ranging from Aesop to Jack London, and its analysis becomes an itinerary of different epochs, environments, and moral attitudes. In Aesop's stories, typical of Mediterranean cultures, the wolf is a predator and a potential danger for herds, but is not "evil." Aesop frequently depicted the wolf in difficulty — while it was powerful, it was not attentive or quick-witted. It could be easily fooled or tricked, often by clever use of language. There were more fables that describe the wolf as a loser than as a winner, even if it seemed a terrifying predator.

The first written version of Little Red Riding Hood appeared in 1600, a dark time for the wolf. This fable is a perfect example of a culture detaching itself from the biological reality of an animal in order to construct an image for its own use. This fable represents the ultimate "other" wolf — that of the imagination as compared to the biological animal.

### Ecological Roots of Human Attitudes Toward the Wolf

There are three distinct relationships that humans have had with the environment: hunting, shepherding (both sedentary and nomadic), and agricultural. Agriculture refers to producing crops and farm animals.

Hunters were almost completely dependent on herbivores. Predators were their greatest competitors, but they never presented a serious threat. Hunters developed a sense of respect for the predator. They tended to identify with the wolf and emulated its behavior, because the animal's social and territorial behavior resembled that of humans (Hultkrantz 1965). Because humans have been hunters for a longer period than they have been shepherds or farmers, their relationship with the wolf is deeply rooted in their collective consciousness. Remnants of that relationship can be found in our beliefs, languages, and attitudes.

Hunters were also frequently warriors and their identification with the wolf during the hunt was transferred to their identification with the wolf when they were in battle. It worked the other way too. When warriors wore wolf skins

in battle, their victims immediately made the connection between wolf and conqueror (Brezzi 1978).

When the hunter became the nomadic shepherd, his relationship with the environment changed drastically. Nomadic herders had a good ecological reason to fear the wolf. Always on the move, with just a few animals and few means of defending themselves, they were economically vulnerable. Their main concern was protecting and maintaining their herds. The wolf was no longer a predator worthy of emulation, but a threat to defenceless livestock — an animal to fear and hate.

A clear shift in attitude is evident for those cultures that were first hunters, and then shepherds. The Laps in Scandinavia originally had an immense respect for the wolf. Their attitude changed when they started reindeer domestication; they began to refer to the animal as one of their worst enemies (Turi 1931).

Sedentary herders, to the contrary, had housing to protect their herds. Over the centuries, they were able to develop somewhat of an ecological compromise, where the loss of a few domestic animals was accepted as any other natural accident, like lightning or drought (Ortalli 1973). Where people were sedentary shepherds, the attitude toward the wolf was more tolerant. With the help of dogs that protected their herds, they learned the wolf's behavior patterns, and in turn, the wolf learned theirs. This relationship led to a tense, but relatively peaceful coexistence. Given enough time, the wolf learned to cope with human activities and avoid dangerous situations (Boitani 1982, 1986). Ecology and behavior of the wolf in Italy is among the best evidence of this capacity for "cultural" adaptation. Wolves and humans coexist in an overcrowded land with little conflict (Boitani 1986).

The different relationships the nomadic and sedentary shepherds had with wolves is reflected in the type of dogs they used. Nomadic shepherds selected strong and powerful hounds for pursuing and attacking wolves, e.g., the Irish wolfhound and the asiatic Borzoi, or Russian wolfhound. The sedentary shepherds selected a mastiff type and bred for a calm and strong guard dog, e.g., the ancient Maremma dog in Italy. The former is clear evidence of an attitude of actively destroying wolves; the latter is evidence of a passive, defensive attitude, an acceptance of the wolf's presence as long as it does not harm human property.

The next stage — the farmer, producing mostly crops, and only to a limited extent, livestock — lent itself to an even easier relationship with the wolf. Agriculture is perforce more sedentary. The farmer usually thought of the wolf as one of many environmental menaces — one that had to be accepted because it was inevitable (Capogrossi 1982).

### A Synthesis, A Look at North America, and a Conclusion

In northern and central Europe, the wolf had three major factors working against it: 1) the initial attitude of the nomadic shepherd; 2) the political and social structure that helped plan organized hunts; and 3) geographical and ecological homogeneity that encouraged systematic expansion and societal organization.

In southern Europe all of these existed, but on a much smaller scale. Expansion was limited, and there was little large-scale social and political organization. Roman civilization had agriculture at the root of its power, but Roman society was based in the city (Capogrossi 1982). The dominant agricultural class resided in the city and rarely had to suffer the day-to-day problems of country living. Their flocks of sheep were small, and agriculture in mountainous areas was confined to small terraces. This left huge, wooded areas to the wolf where it hunted its natural prey. The myth of the Roman wolf and its ties with the Sabines and warriors sanctioned the positive hunter-wolf relationship. The nomadic shepherd period was completely skipped.

Rome, therefore, had no reason to hate the wolf, that is until the time of the barbaric invasions. The Lombards invaded in the name of the wolf, and their devastations were closely associated with wolf raids. These began to change the generally positive view of the wolf in the Classical world (Lopez 1962, Ortalli 1973).

Barbarians dedicated most of their time to hunting and raising livestock, mostly cows and pigs. Crop production dropped to its lowest level in history. Many Romans left the city for their villas in the country — the nuclei of the later aristocrats' castles. Nature became an enemy, and the relaxed relationship the Romans had with the natural world gave way to a dark and negative representation of the external (to the village-castle) world (Fumagalli 1992).

Herein lies a fundamental difference between the Mediterranean regions and central Europe. Farms in the Mediterranean were small and dispersed, while those in Central Europe were nearer to one another in the plains. The latter situation lent itself to greater unification and cooperation among people. In Italy, this happened to a lesser extent. Lack of centralized powers translated into a less organized, less effective campaign for wolf eradication. Only in the seventh century did the fusion of the Roman and Germanic lifestyles result in a more pastoral society. Thus, organization for killing wolves assumed a larger importance (Duby 1974).

However, Roman and Greek cultures developed a positive image of the wolf that persisted for centuries, despite subsequent north-European negative influences. The positive image of the wolf started to abate by the end of the Roman Empire, but the heritage of the previous millennia was too deeply ingrained to disappear. This was the real origin of the ambiguity toward the wolf found in several contemporary cultures. This original positive attitude sur-

vived, in spite of the negative attitude later imported. Hundreds of examples can still be found in several legends, myths, and in our current languages (Hoffman-Krayer 1942). This ambivalence prevented a full-scale extermination effort and allowed the wolf to survive in those countries.

When Europeans colonized North America they brought with them their culture, religion, and traditions. As most immigrants were from north and central Europe, they carried with them the most negative attitudes toward the wolf, those of the Anglo-Saxon and Germanic world (Oakley 1986). In addition to a negative attitude toward wolves, already imbedded in the pioneer's cultural background, the conflict between wolves and American pioneers combined several of the worst conditions that occurred in the Old World. When American pioneers moved westward, their relationship with the wolf was equivalent to that of the nomadic shepherd, with all its negative components. At first, the prevailing form of animal husbandry was to allow large herds to range over vast areas, a most difficult challenge in the presence of wolves. Pioneers identified wolves and Indians as their worst enemies, a threat to personal safety and livestock, and an impediment in the march of progress and civilization. Wolves and Indians became symbols of the hostile environment they were trying to conquer (Nash 1967). The geography of the new land (vast and inaccessible areas) helped, and the pioneers were socially organized. Integration with the Indians did not occur (Lopez 1978), which may explain why the Indians' positive attitudes about wolves did not influence the pioneers' negative attitudes. The results were inevitable, as the history of wolf extermination in most of North America shows (Lopez 1978, Brown 1983).

Since European settlement in North America, the wolf has been largely perceived in negativistic, utilitarian, and dominative terms (*sensu* Kellert 1980b), and only during the second half of the 20th century is the basic attitude shifting. The wolf became a symbol of human persecution of animals. It was among the first species to be officially listed as endangered under the Endangered Species Act of 1973.

Contemporary American attitudes toward the wolf are ambivalent and stem from recent changes in perceptions of wildlife, not from the deeply embedded cultural ambiguity as suggested for the Mediterranean countries. Several studies of American views of predators in different contexts find a consistently hostile perception of the wolf, especially among the non-educated, farmers, lower income peoples, hunters, and livestock producers (Arthur et al. 1977, Buys 1975, Llewellyn 1978, Hook and Robinson 1982, Kellert 1985a, 1986). Studies by Johnson (1974) and More (1978) suggest that negative attitudes toward the wolf may be strongly related to generally hostile depictions of this animal in various myths, children's stories, and literature.

However, Kellert (1986) in Minnesota, and Briggs (1988) in New Mexico, found a trend toward positive appreciation of the wolf by more educated persons, urban dwellers, young males, and those having a lifestyle with closer contact with

nature. These results fit the above suggestion for a "recent" cultural shift in attitudes toward wolves and wilderness, especially when considering the substantial effort of the American culture to reevaluate its appreciation of Indian cultures (Nee and Oakley 1986). Several recent attitude surveys in the northwestern States suggest ambivalence toward wolves (McNaught 1987, Lenihan 1987, Tucker and Pletscher 1989, Bath and Buchanan 1989, Bath 1991a), although they also show different attitudes being strongly related to special interest groups. These results are affected by the "hot" issue of wolf reintroduction in the Yellowstone area.

Today's ambiguity in North American attitudes toward wolves is related to recent cultural changes, not to historical background. Unfortunately, we do not have a survey on the different attitudes of Americans immigrating from different European regions, as this might help test my hypothesis.

The red wolf reintroduction program faces little opposition in the southeastern States, where the prevailing rural economy is based on crop production (W. Parker, U.S. Fish and Wildlife Service, pers. commun.). However, the Yellowstone reintroduction program is facing its strongest opposition from well-organized livestock organizations (Bath 1991a).

The effects of the irrational and deep-rooted negative attitudes towards the wolf are seen clearly in three recent events in Europe: 1) the escape of a few wolves from an enclosure in Bavaria (Germany) in 1976 (Zimen 1978); 2) the return of a small group of wolves to Norway-Sweden since 1977 (Bjarvall 1983); and 3) the hunt of a wolf near Basel, Switzerland in 1990. In all cases, the reactions were disproportionate (not to say ridiculous) to the potential dangers. Such reactions are only partly explainable in terms of real dangers or of rational appraisal of the biological dimensions of the events. The ultimate explanation lies in the deep,

irrational, and emotional attitude that is embedded in the cultures of those countries.

### Lessons for Wolf Conservation and Management

The most obvious lesson from this analysis is that the most important issue in wolf conservation is public opinion. This factor is more difficult to handle than any biological problem posed by the wolf itself. Almost any wolf "problem" is first a human problem, and as such it should be addressed (Boitani and Zimen 1979). Wolf conservation is accomplished mostly by psychology and education. In many cases of conflict, the solution should be worked out by management through ad hoc programs, and through carefully selected groups of people representing different views of the wolf (livestock producers, hunters, wolf advocates, antiwolf groups). When planning for reintroduction, a number of human variables should be considered if the biological possibilities of reintroduction are to be consistent with socioeconomic reality.

Wolf control and extermination in the past were often possible only by a powerful organization of antiwolf groups. Such groups should receive careful attention in any wolf management program. Wolf advocate groups, on the other hand, are dispersed and disorganized. Their motivation extends beyond a love for wolves. It will be important to evaluate all possible reasons for their establishment and growth, e.g., reevaluation of nature *per se*, appreciation of the Indian and Inuit cultures, identification with the positive symbolism of the wolf (wildness, war, strength, social life, loyalty, predation, the balance of nature, etc.), and distance from ecological conflicts. We probably can expect their effectiveness to be related to their different motivations. Dealing with these groups should start from an understanding of their primary motivations.

The second lesson is that wolf-human conflicts are best contained through long-lasting associations between the two species, to allow them to learn about each other and find a compromise. The recent (1980-1985) recolonization by wolves of areas in the Italian northern Apennines (Tuscany and Liguria) where they were exterminated several decades ago, raised opposition by local people, yet conflicts with livestock are minimal. Conversely, opposition is lower in central Italy where wolves were never exterminated (Boitani 1992). The same patterns can be found when comparing areas of long-term wolf presence in Alaska or Minnesota with areas where reintroduction is proposed (Kellert 1985a). The difference in attitudes is likely the level of direct and personal knowledge of the wolf (cf. Kellert 1985a, 1990a). Prolonged coexistence with the wolf allows development of understanding and appreciation of the species as it is, whereas lack of close contact fosters the deeply irrational image of the wolf and the potential exacerbation of this image by the mass media.

Wolf-human conflicts are best resolved when both species "agree" on a certain amount of tolerance for the other's rights. Wolves can find the "agreement" through a process of natural/artificial selection and learning (cf. Fritts 1982,

for the USFWS' approach in Minnesota); humans must be educated to increase their tolerance of the wolf (and their rationality!). When planning for a reintroduction, perhaps the best approach is to provide the legislative and technical means to halt the program if necessary. The proposed "experimental population" status for the Yellowstone wolves will partly provide for this flexibility.

The third lesson is that humans should learn to view the depredations by the wolf as one more cause of natural mortality. Even though all reasonable means should be used to prevent depredations, we must accept the fact that not all are preventable. Consequently, compensation for damage done by wolves should be provided by society as a whole, and should not be left on the shoulders of stock producers (Boitani and Fabbri 1983).

### Acknowledgments

Stephen R. Kellert has given useful comments on the manuscript and added material on contemporary North American attitudes toward the wolves. I am grateful for the input by L.N. Carbyn, S.H. Fritts and D.R. Seip. Their review and collaboration is most gratefully appreciated.

Fig. 2 One of the greatest riddles in the ecology of wolves is the question why wolves have not attacked and killed humans more frequently than it appears from the historical record. Wolves in Canada's High Arctic (as seen in this photograph) are particularly accepting of man within close quarters. (Photo H.J. Russel)

