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# Human Dimensions in Wolf Management in Croatia

**Understanding attitudes and beliefs of residents in Gorski kotar, Lika and Dalmatia toward wolves and wolf management**

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# Executive Summary

## **Human Dimensions in Wolf Management in Croatia: Understanding attitudes and beliefs of residents in Gorski kotar, Lika and Dalmatia toward wolves and wolf management**

- Understanding and addressing wolf management in Croatia requires the cooperation and involvement of many interest groups. Understanding the attitudes and beliefs of these groups and the general public who live in Croatia wolf range will help in making more effective decisions regarding wolf management and will ensure easier implementation of wolf management plans.
- This report examines public attitudes toward and beliefs about wolves and wolf management across three defined zones (Gorski kotar, Lika, and Dalmatia) that lie in Croatian wolf range. This report presents the results that address overall attitudes toward wolves, attitudes toward hunting wolves and other management options, attitudes toward wolf-livestock conflicts, beliefs about wolves and their impacts, public knowledge about wolf biology, the nature of conflicts, personal experience with wolves, and socio-demographic characteristics.
- The overall purpose of this study is to establish a baseline assessment of general public, hunter, foresters, and student attitudes toward and beliefs about wolves, and to build cooperation between interest groups so to better manage wolves in Croatia. By understanding factors influencing attitudes and encouraging dialogue between interest groups better management plans can be designed and ease of implementation increased.
- Quantitative and qualitative data were collected from March 1999 to December 1999. Residents of Gorski kotar (n=402), Lika (n=401) and Dalmatia (n=406) were randomly selected proportional to population (omitting the urban centers along the coast) and interviewed using a quantitative research instrument consisting of 64 items. Smaller samples of hunters (n=209 over three zones), foresters (n=190 over three zones), shepherds (n=19 over three zones) and

students (n=339 over three zones) were also administered the quantitative questionnaire.

- Qualitative interviews also occurred with various interest groups. The purpose of these qualitative interviews was to gauge interest and support for this HD study and to identify key issues, possible solutions, and build trust and a willingness to work together between all interest groups. Understanding these issues allows for the construction of a common ground matrix (CGM), one of the first steps toward addressing conflicts in wolf management.
- Differences in attitudes and beliefs were found between interest groups and also within the same interest group over the three zones. For example, most general public residents supported maintaining wolves in Croatia for future generations but those residents in Gorski kotar were significantly more positive toward maintaining wolves (74% support) than those residents in Lika (69% support) and Dalmatia (55% support). And while hunters in Gorski kotar (57%) and Dalmatia (52%) supported the statement about maintaining wolves for future generations in Croatia, only 22% of the Lika hunters supported this statement. Foresters attitudes were more positive in Gorski kotar (73%), than in Lika (55%) or Dalmatia (43%). Students' attitudes also varied over space with those students in Gorski kotar (74%) expressing more positive attitudes than those in Lika (64%) or Dalmatia (53%).
- Most respondents believe wolves have a significant impact on big game animals and many also believe wolves have a significant impact on small game. Most respondents believe wolves should be hunted in specific hunting seasons in their respective region; at the moment the wolf is completely protected in Croatia.
- While most (49%) of the general public respondents in Gorski kotar stated that livestock owners should only get compensation if they use preventative measures, those residents of Lika (43%) and Dalmatia (42%) were less in agreement. Most respondents from the general public, hunters, foresters and students, and over all three zones agreed with the statement that livestock owners should receive money for living in a zone where there are wolves, instead of receiving compensation for losses that wolves cause.

- Fear of wolves was strongest amongst students in all three zones; approximately 63% of students in each zone stated that they would be afraid to hike in the woods if wolves were present. Large percentages of the general public in Gorski kotar (41%), Lika (46%) and Dalmatia (53%) also expressed a similar fear of hiking in the woods if wolves were present. This fear is especially interesting when considering that most residents in Gorski kotar (67%), Lika (64%) and Dalmatia (59%) claimed to have seen wild wolves sometime in their life. Most foresters and hunters also stated they had seen wild wolves.
- For approximately one third of the general public respondents in Gorski kotar and Dalmatia the wolf management issue was rated as highly important; in Lika about 24% indicated it was of high importance (a ranking of 9 or 10). Fewer respondents expressed no concern or interest in the wolf management issue (1 or 2 on a ten point scale).
- All interest groups involved in the study (biologists, Croatian Forests, Croatian Hunters Association, Ministry of Agriculture, Ministry of Environmental Protection and Zoning, Ministry of Tourism, Mountaineering Association) expressed interest in the HD study and a continued willingness to work together to identify common issues and solutions to address wolf management in Croatia.
- While results from a small sample of shepherds (n=19) reveal a strong disliking of wolves, nearly half of the shepherds still stated it was important to maintain wolves in Croatia for future generations and about a third believed wolves should exist for future generations within their own province.
- More than half of the shepherds expressed agreement to receiving money for living in a zone with wolves instead of receiving compensation for losses.

# Izvršni sažetak

## **Ljudska dimenzija u gospodarenju vukom u Hrvatskoj: Razumijevanje stavova i vjerovanja stanovnika Gorskog kotara, Like i Dalmacije, prema vuku i gospodarenju vukom.**

- Razumijevanje gospodarenja vukom u Hrvatskoj zahtijeva suradnju i sudjelovanje različitih interesnih skupina. Razumijevanje stavova i vjerovanja tih interesnih skupina i javnosti u dijelovima Hrvatske, koji su ujedno i stanište vuka, pomoći će pri donošenju učinkovitijih odluka po pitanju gospodarenja vukom, i osigurati lakšu provedbu plana gospodarenja vukom.
- Ovaj izvještaj analizira stavove i vjerovanja javnosti o vuku i gospodarenju vukom u tri definirane zone (Gorski kotar, Lika i Dalmacija), koje se nalaze u području vuka u Hrvatskoj. U njemu su predstavljeni rezultati analize stavova javnosti općenito prema vukovima, stavova prema lovljenju vukova i ostalim mogućnostima gospodarenja vukom, stavova vezanih uz problematiku interakcije vukova i domaćih životinja, zatim rezultati analize vjerovanja o vukovima i njihovom utjecaju na okolinu, rezultati analize poznavanja biologije vukova, prirode sukoba, osobnog iskustva sa vukovima, te socio-demografske karakteristike javnosti.
- Svrha ove studije je dobiti osnovni uvid u stavove prema, i vjerovanja o vuku, i to javnosti, lovaca, šumara i srednjoškolaca, te inicijacija suradnje među interesnim skupinama, kako bi se bolje gospodarilo vukom u Hrvatskoj. Razumijevanje čimbenika koji utječu na stavove interesnih skupina i poticanje dijaloga među interesnim skupinama omogućuje izradu boljih planova gospodarenja i njihovu lakšu provedbu.
- Kvantitativni i kvalitativni podaci su sakupljeni u razdoblju od ožujka do prosinca 1999. Stanovnici Gorskog kotara (n=402), Like (n=401) i Dalmacije (n=406)

nasumično su odabrani, sa veličinom uzorka proporcionalnom veličini populacije stanovništva (urbani centri uz obalu su izostavljeni) i intervjuirani uz pomoć kvantitativnog anketnog lista koji se sastojao od 64 stavaka. Manji uzorci lovaca (n=209 u tri zone), šumara (n=190 u tri zone), pastira (n=19 u tri zone) i srednjoškolaca (n=339 u tri zone) su također ispitani istim anketnim listom.

- Kvalitativni intervjui su provedeni sa različitim interesnim skupinama, a sa svrhom procjene potpore i interesa prema ovoj LD (ljudska dimenzija) studiji, te kako bi se prepoznala ključna pitanja i moguća rješenja i izgradilo povjerenje i volja za zajednički rad svih interesnih skupina. Analiza tih pitanja omogućava izradu MZS-a (matrica zajedničkih stavova), koja je jedan od prvih koraka ka razumijevanju konflikata u gospodarenju vukom.
- Pronađene su razlike u stavovima i vjerovanjima različitih interesnih skupina, a i unutar jedne interesne skupine u zonama. Na primjer, većina javnosti podržava održavanje vukova u Hrvatskoj za buduće generacije, ali javnost Gorskog kotara je značajno pozitivnija (74% podržava), nego Like (69% podržava) i Dalmacije (52% podržava). I dok su lovci u Gorskom kotaru (57%) i Dalmaciji (52%) podržali izjavu da je važno sačuvati vukove u Hrvatskoj za buduće generacije, samo 22% ličkih lovaca se složilo s istom izjavom. Stavovi šumara bili su pozitivniji u Gorskom kotaru (73%), nego u području Like (55%) ili Dalmacije (43%). Stavovi srednjoškolaca također prostorno variraju, pa su tako srednjoškolci Gorskog kotara pokazali pozitivnije stavove (74%) od onih iz Like (64%) ili Dalmacije (53%).
- Većina ispitanika vjeruje da vukovi značajno utječu na visoku divljač, a mnogi također vjeruju da je i na nisku divljač utjecaj vukova značajan. Većina ispitanika vjeruje da vukove u njihovom području treba loviti u određenim lovnim sezonama. Vuk je trenutačno potpuno zaštićen u Hrvatskoj.
- I dok većina (49%) ispitanika iz uzorka javnosti Gorskog kotara smatra da stočari trebaju primiti naknadu za štete od vukova samo ako koriste preventivne mjere,

stanovnici Like (43%) i Dalmacije (42%) se manje slažu sa izjavom. Većina ispitanika iz uzorka javnosti, lovaca, šumara i srednjoškolaca iz sve tri zone se slaže da stočari umjesto primanja naknada za gubitke uzrokovane vukovima, trebaju primati premije za stočarenje u području u kojem ima vukova.

- Strah od vukova je najizraženiji među srednjoškolcima u sve tri zone. Oko 63% srednjoškolaca u svakoj zoni je izjavilo da bi ih bilo strah šetati šumom u kojoj ima vukova. Visok postotak uzorka javnosti iz Gorskog kotara (41%), Like (46%) i Dalmacije (53%) također iskazuje isti strah. Taj strah je posebno zanimljiv ako se uzme u obzir činjenica da je većina stanovnika Gorskog kotara (67%), Like (64%) i Dalmacije (59%) izjavilo da su vidjeli vukove u divljini, isto kao i većina šumara i lovaca.
- Približno trećina ispitanika iz uzorka javnosti u Gorskom kotaru i Dalmaciji je ocijenilo pitanje gospodarenja vukom vrlo važnim. Oko 24% stanovnika Like je ocijenilo isto pitanje vrlo važnim (ocjena 9 i 10 na ljestvici od 1 do 10). Rijetki ispitanici su pitanje gospodarenja vukom ocijenili nevažnim (ocjena 1 i 2).
- Sve interesne skupine uključene u studiju (biolozi, Hrvatske šume, Hrvatski lovački savez, Ministarstvo poljoprivrede i šumarstva, Ministarstvo zaštite okoliša i prostornog uređenja, Ministarstvo turizma i Planinarski savez), su pokazale zanimanje za LD studiju, te volju za zajednički rad, kako bi se identificirala zajednička stajališta i rješenja.
- Iako rezultati analize stavova malog uzorka pastira (n=19) pokazuju jak negativan stav prema vukovima, gotovo polovica pastira ipak smatra da je važno sačuvati vukove u Hrvatskoj za buduće generacije, a približno trećina vjeruje da vukovi trebaju postojati i u njihovoj regiji za buduće generacije.
- Više od polovice pastira se slaže da bi umjesto naknada za štete od vukova trebali primati premije za stočarenje u području u kojem ima vukova.



# Table of Contents

Executive Summary .....	3
Izvršni sažetak .....	6
Table of Contents .....	ix
Table of figures .....	xi
List of tables .....	xiv
Introduction .....	15
Nature of human dimensions research .....	21
Factors used to define the study area .....	24
Characteristics of the study area.....	39
Methodology .....	42
Content analysis .....	42
Qualitative issues .....	43
Quantitative issues .....	44
Results .....	53
Results of the content analysis.....	54
About the sample .....	58
Attitudes toward the wolf.....	67
Attitudes toward hunting related issues .....	82
Underlying beliefs about wolves and their impact .....	88
Understanding biological facts and the nature of conflict .....	99
Beliefs about wolf – livestock issues .....	117
Qualitative results based on Common Ground Matrix (CGM) .....	133
Agricultural issues .....	136
Communication / Understanding people .....	138
Biological issues .....	139
Political / Legal .....	140
Using CGM to explore key groups and roles of various interest groups.....	141
Using CGM to explore possible solutionsImplications of findings for future wolf management .....	144
Key findings.....	145
Implications of CGM for communication efforts and future cooperation.....	149

Conclusion.....	150
Appendix 1: Questionnaire used to collect data.....	153
References .....	169

## Table of figures

Figure 1: Croatian State Parliament (1999).....	18
Figure 2: Time line of the major recent events concerning wolf in Croatia. ....	19
Figure 3: Counties in wolf range.....	26
Figure 4: Density of sheep in wolf areas.....	27
Figure 5: Density of cattle in wolf areas. ....	28
Figure 6: Wolf attacks to livestock (26 February 1995 – 15 August 1998).....	30
Figure 7: Forest plant communities.....	32
Figure 8: Altitudes above sea level. ....	33
Figure 9: Density of human population.....	35
Figure 10: Human population in wolf area, over the years. ....	36
Figure 11: Density of roads.....	37
Figure 12: Total human population of Croatia over the time.....	38
Figure 13: Agricultural population of Croatia over the time .....	38
Figure 14: HD study zones.....	40
Figure 15: Exapmle of a newspaper article covering the HD project. ....	55
Figure 16: Number of articles on wolves in Croatian printed media (January 1994 – October 1999).....	57
Figure 17: Attitudes toward wolves in Croatian printed media (January 1994 – October 1999).....	58
Figure 18: Koji od slijedećih odgovora najbolje opisuje Vaše osjećaje prema vuku? (Which of the following best describes your feelings toward wolves?).....	68
Figure 19: Imati vukove u Hrvatskoj je: (To have wolves in Croatia is:).....	70
Figure 20: Imati vukove u području Gorskog kotara / Like / Dalmacije je: (To have wolves in Gorski kotar / Lika / Dalmatia is:).....	71
Figure 21: Važno je održati populaciju vukova u Hrvatskoj zato da bi buduće generacije mogle uživati u njima. (It is important to maintain wolf populations in Croatia so that future generations can enjoy them.) .....	72
Figure 22: Važno je održati populacije vukova u području Gorskog kotara / Like / Dalmacije, zato da bi buduće generacije mogle uživati u njima. (It is important to maintain wolf populations in region of Gorski kotar / Lika / Dalmatia so that future generations can enjoy them.) .....	74
Figure 23: Važno je imati zdravu populaciju vukova u području Gorskog kotara / Like / Dalmacije. (It is important to have healthy populations of wolves in region of Gorski kotar / Lika / Dalmatia.) .....	75
Figure 24: Budućim generacijama moramo osigurati izdašnu populaciju vukova. (We should assure that future generations have an abundant wolf population.) .....	77
Figure 25: Bilo da bi imao priliku vidjeti vuka ili ne, važno mi je da oni postoje u području Gorskog kotara / Like / Dalmacije. (Whether or not I would get to see a wolf, it is important to me that they exist in region of Gorski kotar / Lika / Dalmatia.).....	79
Figure 26: Nije potrebno imati vukove u području Gorskog kotara / Like / Dalmacije, zato što izdašna populacija vukova već postoji u drugim dijelovima Hrvatske. (It is unnecessary to have wolves in region of Gorski kotar / Lika / Dalmatia because abundant populations of wolves already exist in other parts of Croatia.).....	80

Figure 27: Nije potrebno imati vukove u Hrvatskoj zato što izdašne populacije vukova već postoje u drugim europskim zemljama. (It is unnecessary to have wolves in Croatia because abundant populations already exist in other European countries.) .....	81
Figure 28: Vukovi bitno utječu na populacije visoke divljači. (Wolves have a significant impact on big game.) .....	83
Figure 29: Vukovi bitno utječu na populacije niske divljači. (Wolves have a significant impact on small game.).....	84
Figure 30: Vukovi smanjuju populacije jelena, srna i divljih svinja na neprihvatljivu razinu. (Wolves reduce populations of roe deer, red deer and wild boar to unacceptable levels.) .....	86
Figure 31: U području Gorskog kotara / Like / Dalmacije treba dozvoliti lov na vukove tijekom određene lovnne sezone. (Wolves should be allowed to be hunted in specific hunting seasons in region of Gorski kotar / Lika / Dalmatia.) .....	87
Figure 32: U području Gorskog kotara / Like / Dalmacije treba dozvoliti lov na vukove tijekom cijele godine. (Wolves should be allowed to be hunted year round in region of Gorski kotar / Lika / Dalmatia.).....	89
Figure 33: Vukove u području Gorskog kotara / Like / Dalmacije treba ubijati svim mogućim sredstvima, uključujući ubijanje mladunčadi u brlogu, te uporabu otrova. (Wolves should be killed by all means, including killing pups in dens and the use of poison in region of Gorski kotar / Lika / Dalmatia.).....	90
Figure 34: Vukovi bi trebali biti potpuno zaštićeni u Hrvatskoj. (Wolves should be completely protected in Croatia.) .....	91
Figure 35: Vukovi bi trebali biti potpuno zaštićeni u području Gorskog kotara / Like / Dalmacije. (Wolves should be completely protected in region of Gorski kotar / Lika / Dalmatia.) .....	92
Figure 36: Postojanje vukova u području Gorskog kotara / Like / Dalmacije jača turizam u tom području. (Having wolves in region of Gorski kotar / Lika / Dalmatia increases tourism in that region.) .....	94
Figure 37: U područjima gdje vukovi žive u blizini ljudi, napadi vukova na ljude su učestali. (In areas where wolves live in close proximity to humans, wolf attacks on humans are common.).....	96
Figure 38: Strah me je šetati šumom u kojoj ima vukova. (I would be afraid to hike in the woods if wolves were present.) .....	97
Figure 39: Koja od navedenih životinja je, po vašem mišljenju, najopasnija za ljude? (In your opinion, which animal is most dangerous to humans?).....	98
Figure 40: Vukovi su oduvijek postojali u području Gorskog kotara/Like/Dalmacije. (There used to be wolves throughout the entire region of Gorski kotar/Lika/Dalmatia.).....	101
Figure 41: Vukovi su potpuno zaštićeni u Hrvatskoj. (Wolves are completely protected in Croatia.).....	102
Figure 42: U pravilu samo dva člana čopora (jedan par) se pare i imaju mlade. (It is generally true that only two members (one pair) of a wolf pack breed in any one year.).....	104
Figure 43: Koliko često su vukovi uspješni u lovu? (How often is a wolf generally able to kill successfully wild prey?) .....	105
Figure 44: Koja je prosječna veličina vučjeg čopora u Hrvatskoj? (What is the average size of a wolf pack in Croatia?).....	107
Figure 45: Koliko je prosječno težak odrasli mužjak vuka u Hrvatskoj? (How much does the average adult male wolf weigh in Croatia?).....	108

---

Figure 46: Koliko vukova mislite da trenutčno ima u Hrvatskoj?. (How many wolves do you believe currently exist in Croatia?).....	109
Figure 47: Mislite li da broj vukova u Hrvatskoj: (Do you believe wolf numbers in Croatia are:).....	111
Figure 48: Mislite li da broj vukova u području Gorskog kotara/Like/Dalmacije: (Do you believe wolf numbers in region of Gorski kotar/Lika/Dalmatia are:) .....	112
Figure 49: Nemam ništa protiv porasta broja vukova u Hrvatskoj. (I would agree with increasing wolf numbers in Croatia.) .....	113
Figure 50: Imamo dovoljno vukova u Hrvatskoj. (We already have enough wolves in Croatia.) .....	114
Figure 51: Nemam ništa protiv porasta broja vukova u području Gorskog kotara/Like/Dalmacije. (I would agree with increasing wolf numbers in region of Gorski kotar/Lika/Dalmatia.) .....	115
Figure 52: Imamo dovoljno vukova u području Gorskog kotara/Like/Dalmacije. (We already have enough wolves in region of Gorski kotar/Lika/Dalmatia.) .....	116
Figure 53: Vukovi nanose velike štete na domaćim životinjama. (Wolves cause abundant damages to livestock.) .....	118
Figure 54: U područjima gdje vukovi žive u blizini domaćih životinja, njihova glavna hrana su domaće životinje. (In areas where wolves live near livestock, their primary food is livestock.) .....	119
Figure 55: Vukovi kolju ovce i koze samo ako nema dovoljno jelena i druge divljači. (Wolves kill sheep and goats only if there are not enough deer and other wild game.) .....	121
Figure 56: Ako bi određeni vuk ubijao stoku, složio bih se sa odstrijelom te problematične životinje. (If a wolf killed livestock, I would agree with killing this problem animal.) .....	122
Figure 57: Rado bih dotirao sredstva u fond za naknadu šteta stočarima. (I would be willing to contribute money towards a compensation program for farmers for losses due to wolves.) .....	124
Figure 58: Stočari bi, umjesto naknada za štete, trebali primiti premiju za stočarenje u području gdje ima vukova. (Livestock owners should receive money for living in a zone where there are wolves, instead of receiving compensation for losses that wolf causes.) .....	125
Figure 59: Stočari ne bi trebali primiti naknadu za štetu koju su nanijeli vukovi, ako nisu koristili metode prevencije nastanka šteta. (Livestock owners should not receive compensation for damages caused by wolves if they do not use methods to prevent damages.).....	126
Figure 60: Stočari bi trebali primiti naknadu za štete na stoci koje im nanose vukovi. (Livestock owners that lose livestock due to wolf attacks should be compensated.).....	127
Figure 61: Htio bih da se moja porezna davanja koriste za plaćanje naknada stočarima za štete uzrokovane vukovima. (I would like my taxes to be used toward paying compensation for damages caused by wolves.).....	128
Figure 62: Država bi trebala plaćati naknade stočarima za štete uzrokovane vukovima. (Administration should pay compensation to livestock owners who lose livestock to wolves.) .....	129
Figure 63: Stočari bi obavezno morali plaćati osiguranje stoke od vučjih napada. (Livestock owners should be required to buy insurance for protection against wolf attacks.) .....	130
Figure 64: Država bi trebala platiti osiguranje stoke od vučjih napada. (Administration should pay for this insurance for livestock.) .....	131

Figure 65: Trebalo bi odobriti odstrijel vukova u području Gorskog kotara/Like/Dalmacije.  
(There should be authorized wolf hunts in region of Gorski kotar/Lika/Dalmatia.)..... 132

## List of tables

Table 1: Number of predator damage claims by years.....	29
Table 2: Number of damage claims by counties (the predator is wolf) .....	31
Table 3: Number of killed, wounded or disappeared livestock, according to livestock breeders .....	31
Table 4: Example: Municipality of Mrkopalj from Zone 1 consists of 6 villages/towns .....	45
Table 5: Zone1: Sampling frame based upon 1991 human population figures .....	46
Table 6: Zone 2: Sampling frame based upon 1991 human population data.....	47
Table 7: Zone 3: Sampling frame based upon 1991 human population figures .....	47
Table 8: Attitudinal and belief items used in HD study.....	51
Table 9: Interest groups in newspapers or magazines.....	56
Table 10: Interest groups by zone and gender.....	59
Table 11: Interest groups by zone and age.....	60
Table 12: Have you ever seen a live wolf in the wild? .....	62
Table 13: Have you ever seen a wolf in captivity? .....	63
Table 14: On a scale from 1 to 10, how important is the issue of wolf management in Croatia to you personally?.....	65
Table 15: On a scale from 1 to 10, how important is it to you that you keep up to date with the issue of wolf management in Croatia? .....	66
Table 16: Common ground matrix.....	135
Table 17: Key issues, interest groups and their roles using a CGM approach.....	142

## Introduction

The history of wolf (*Canis lupus*) management in Croatia is similar to that seen in many other European countries. After many years of significantly reducing wolf numbers in the country, wolf numbers today are increasing. The species has been under complete protection in Croatia since 1995. Since the change in legislation in 1995, attitudes toward wolves appear to have become more negative, based upon newspaper articles and an increase in documented illegal killings. But an accurate representation of existing attitudes toward wolves and wolf management has not been done. It is important at this time, as the wolf population continues to increase, that public attitudes toward and knowledge about wolves and their management be better understood. Gathering representative data from the general public and key interest groups using a quantitative approach is essential for successful wolf management in Croatia. Wolf management seems to be more sociopolitical in nature than biological, thus requiring an understanding of this human dimension.

Up until 1894 the wolf was present in all parts of Croatia. During that year at least one wolf was killed in each of the former municipalities of Croatia. The wolf distribution has been reduced dramatically since 1894. The species has disappeared from the continental lowlands, but has survived in the areas of the Dinaric Mountains and in Dalmatia. While no scientific studies estimating the Croatian wolf population have been completed, based upon the size of available habitat and the number of wolves killed based on hunting statistics, the wolf population between 1954 and 1972 may have been as high as 600 to 1000 individuals. Today wolf population estimates for Croatia are 100 to 150 individuals.

Before the wolf was completely protected in 1995, wolves were heavily persecuted using all available means, particularly shooting, poisoning, and killing pups in dens. Hunting data provide the best indication of changes in the wolf population size over this period. In Croatia and Slavonia (lowland part of Croatia today) 1,324 wolves were killed between 1891 and 1921 (approximately 42 wolves

per year with a peak of 120 wolves in 1892). After WWII, a major effort was made to exterminate wolves in Croatia. The wolf was classified as an unprotected game species allowing it to be hunted “by all ways and means of hunting”. An “Order for the extinction of wolves” was issued in 1948 by the government and a bounty was paid for each killed wolf. Between 1946 and 1986, approximately 540 wolves were killed in Gorski kotar alone. During the same period, a single hunter in the Dalmatian mountains (Svilaja, Dinara and Kamešnica) killed approximately 68 wolves. Between 1954 and 1972, approximately 5,206 wolves were killed in Croatia resulting in an average of 274 dead wolves per year. Between 1960 and 1961, wolf mortality numbers decreased to 50, and further decreased in 1980-1981 to 32 animals. The change in the number of wolves killed could be attributed partly to a change in attitudes toward the species, but predominately is a reflection of fewer wolves in the country to kill. In Gorski kotar, the mean number of wolves killed per year dropped from 15 to 9, and then to one, in the periods 1945-1976, 1977-1986, and 1987-1993 respectively. Similar patterns were observed in other parts of Croatia. For example in Dalmatia by the

end of the 19<sup>th</sup> and beginning of the 20<sup>th</sup> centuries, ten wolves had been killed on average annually. By the end of the 1980s the wolf population in Croatia had been reduced significantly; the total population was estimated at approximately 50 animals. These remaining individuals survived in Gorski kotar and in Lika; the wolf was believed to have been exterminated from Dalmatia.

While the legal status of the wolf did not change until recently (1995), over time various extermination methods have become less popular. Poisoning was abandoned for the most part in 1972 and traps and bounties were removed shortly after in 1976. In 1984, the municipality of Vrbovsko in Gorski kotar took steps to ensure wolf numbers would not be completely eliminated; a decision was made to not kill wolves in the municipality unless there was more than one breeding pair.

The road to getting the wolf completely protected in Croatia after many years of persecution was legally relatively quick and easy. An initiative by concerned scientists to legally protect the wolf started on 12 Jan 1994 with the document, “The Justified Proposal for the Legal Protection



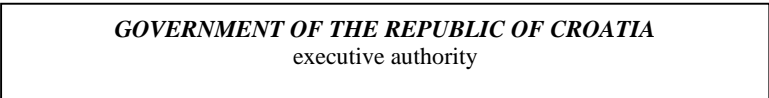
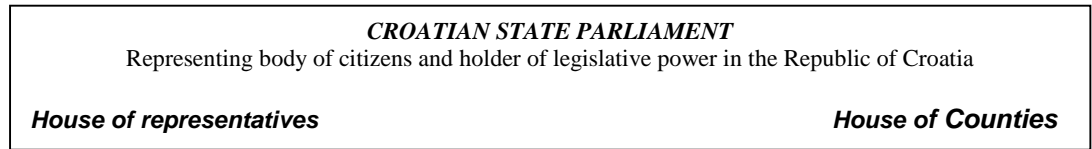
of the Wolf in Croatia”. The wolf became legally protected on 09 May 1995 (“Pravilnik o zaštiti pojedinih vrsta sisavaca“, N.N. 31/95). With official protection of the wolf, the government became responsible for payment of compensation to livestock owners for wolf damages to livestock. The State Directorate for Protection of Nature and Environment within the Ministry of Zoning, Construction and Housing was responsible for wolf management and compensation claims (Figure 1). In spring of 2000, a change of government in Croatia resulted in a new ministry being created, Ministry of Environmental Protection and Zoning.

During the first three years of legal protection, wolf mortality actually increased at least 5 times and perhaps as much as 11 times suggesting that the public was not consulted or supportive of the change in legislation. At that time no human dimensions data had been collected to assess the attitudes, nor any work towards building partnerships with interest groups completed. Without such public involvement in the decision-making process, successful implementation of the new policy remained challenging. Most of the illegal killing was by shooting and

while full protection remains as the national law, no one has been prosecuted for poaching. Despite the illegal killings, the wolf population appears to have steadily increased rising within two years to a population of approximately 93 to 111 animals and today estimates are approximately 100 to 150 wolves throughout the entire wolf range in Croatia.

As evident from the previous discussion, the wolf management debate and the public attitudes toward the species within Croatia have been influenced by several key events over the past fifteen years (Figure 2). Prior to full protection for the wolf, the general public in 1986 ranked the wolf fourth in a list of pests, behind the bear, wild boar and fox. In 1993, the wolf was ranked seventh on the pest list behind wild boar, insects, bear, lynx, rodents and fox. In 1994, the wolf appeared on a postage stamp for Earth Day. Since 1995 several seminars on assessing predator damages have occurred and preventative measures for livestock promoted, especially the use of guard dogs. Biological research on wolves and radio-collaring the first Croatian wolf began in October of 1998. The Human Dimension in wolf management project in Croatia was initiated in spring of 1999.

**Figure 1: Croatian State Parliament (1999)**



<b>MINISTRIES</b>
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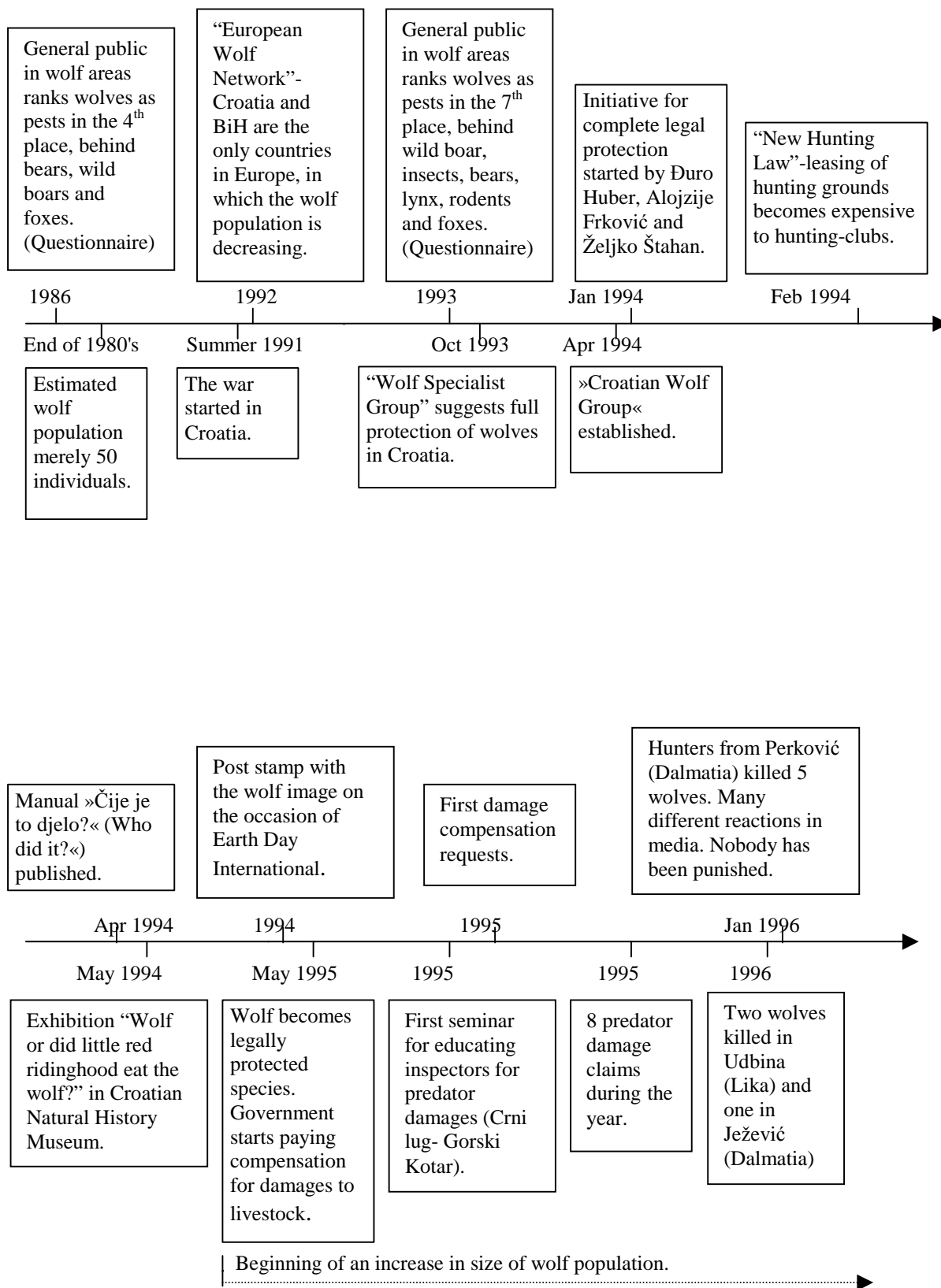
<b>STATE MINISTRIES</b>
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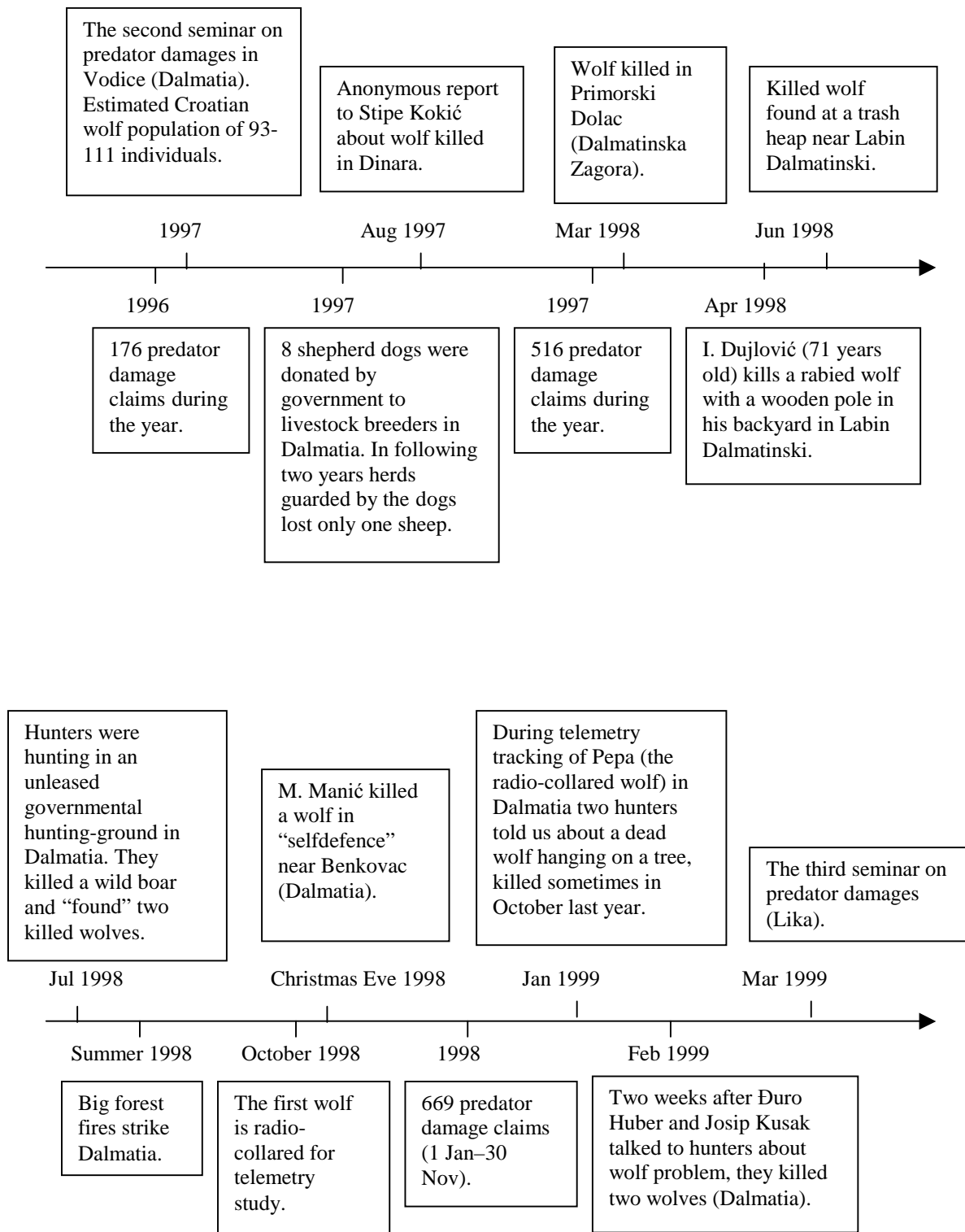
1. Ministry of Finance
2. Ministry of External Affairs
3. Ministry of Interior
4. Ministry of Defense
<b>5. Ministry of Zoning, Construction and Housing</b>
6. Ministry of Tourism
7. Ministry of Health
8. Ministry of Education and Sports
9. Ministry of Science and Technology
10. Ministry of Justice
11. Ministry of Homeland War Veterans

1. Ministry of Economy
2. Ministry of Agriculture and Forestry
3. Ministry of Maritime Affairs, Transportation and Communications
4. Ministry of Culture

STATE ADMINISTRATION ORGANIZATIONS
1. State Geodetic Directorate
<b>2. State Directorate for Protection of Nature and Environment</b>
3. State Directorate for Water Management
4. State Weather Bureau
5. State Bureau of Standards
6. State Bureau of Statistics
7. State Bureau of Intellectual Property
8. State Inspector's Office
9. State Institute for the Protection of Family, Motherhood and Youth
10. State Directorate for State Administration and Local Self-government

**Figure 2: Time line of the major recent events concerning wolf in Croatia.**





As the wolf population continues to grow and policies and management options be reconsidered, it will be important to understand the viewpoints of the general public, hunters, shepherds, foresters and students (the future decision-makers) toward wolves and possible management options. For some individuals and interest groups, the increasing wolf population provides increased opportunities for eco-tourism, the chance to hear a howl, see a paw print in the mud or a wolf scat. For others, more wolves bring more fear of human safety and greater threats to livestock. For many, myths and misunderstandings about the species remain high, thus creating challenges for governments who are forced to manage the

species and to gain an informed public consent about wolf management. Wildlife managers and government officials need to have scientific data to allow them to balance views heard by the loud minorities and truly understand how the majority of residents feel about the issue. This study establishes that baseline assessment of attitudes toward and beliefs about wolves and their management from a representative public in three zones (Gorski kotar, Lika, and Dalmatia). The study documents how attitudes and beliefs differ between interest groups, and also within interest groups across space, thus providing managers with information that should allow flexibility in management options by region.

## **Nature of human dimensions research**

Today, successful wildlife management involves not only an understanding of the biology of the species and its habitat, but also an understanding of public attitudes toward and knowledge about the species, and attitudes toward possible management approaches to the species. The human dimension of wildlife resource management is particularly important to understand when designing and

implementing management plans for large carnivores, which often arouse conflicting emotions among the general public. Indeed, large carnivore management is often more a socio-political issue than a biological one (Bath 1998). Wolf populations and their conservation in Croatia appear to be highly dependent upon human factors more than biological factors; these human aspects of the

wildlife resource management equation need to be understood through a scientific and objective process for successful wolf conservation to occur in Croatia. Successful wolf conservation is defined as the ability to implement a wolf management plan that has the support of the general public and most interest groups.

While wildlife management by definition has for many years realized that there is indeed a human dimension to successfully implementing species action and management plans, integrating human dimensions into daily decision-making remains a challenge for many wildlife agencies. In North America, Aldo Leopold, considered the founder of wildlife management, stated in 1943 that deer management was more about managing the people than managing the deer. Since those early statements, the human dimension in wildlife management is becoming increasingly integrated into wildlife management planning and decision-making in North America and with some very positive results. Wolf restoration efforts in Yellowstone National Park included a HD component, which was important in understanding the amount of support that existed for wolf

restoration, and the reasons why people were in favor or against wolf restoration (Bath 1991, Bath 1989, Bath and Buchanan 1989). This latter data were useful in designing effective educational efforts and working toward conflict resolution. Involving the public in the early development of a management plan was also the key to a successful wolf management plan for the Yukon, Canada. The Yukon Department of Renewable Resources implemented a controversial wolf management plan that contained measures for wolf control. Human dimensions research was also integrated into decision-making regarding polar bear management and a proposed national park in Churchill, Manitoba (Bath 1994). The integration of human dimension research into wildlife management issues in Europe is still relatively new. This project is the first quantitative HD in wolf management study representative of a large area and in fact the entire wolf range in Croatia. This includes the regions of Gorski kotar in the northwestern part of the country, Lika, and Dalmatia. The study area covers a large portion of the entire country; further information about the study area will be given shortly.

Human dimensions research “focuses on the public’s knowledge levels,

expectations, attitudes and activities concerning fish and wildlife resources and associated habitats. There is a close tie between human dimensions and conservation education research” (Adams 1988).

Human dimensions research can address various objectives:

- Baseline assessment to begin attitudinal and belief monitoring – has an educational effort, management policy, made a difference?
- Educational role – targeting specific weaknesses in knowledge to affect attitudes. Working toward designing more effective educational materials.
- Building partnerships – bringing groups together around a common data set. Working toward understanding the issues of a variety of interest groups, building trust, and initiating the first steps toward working together.
- Identification of areas of support and disagreement over management options, thus assessing the feasibility of approaches being successfully implemented.

- Identification of types of conflict (cognitive, values, costs/benefits, and behavioral conflicts) – the first step toward conflict resolution.

As the first quantitative HD in wolf management study in Croatia, one purpose of the project is to establish a baseline assessment of attitudes and beliefs toward wolves and their possible management at a time when the wolf population is increasing and little information has been communicated to the publics about wolves. This will allow for the evaluation of the effect of any future communication and public awareness efforts. It will also provide an understanding of how attitudes and beliefs change in relation to changes in the biological population, numbers of livestock damages, number of eco-tourism and economic opportunities, changes in legislation managing the wolf, and other social and economic conditions within the three regions – Gorski kotar, Lika and Dalmatia.

The study will also examine the variables influencing attitudes. Understanding the factors affecting attitudes is an initial step toward influencing such attitudes through a communication campaign and public awareness materials. If managers can

understand the nature of the attitudes held, it is then possible to develop appropriate messages to address the concerns causing those attitudes. These factors could include belief or lack of knowledge about the wolf, but could also include more complex issues involving economic concerns and mistrust of authorities. Various procedures can be used to explore these issues.

The primary purpose of this study however, is to provide a better

understanding of attitudes and beliefs toward wolves and wolf management, to explore how attitudes may differ between interest groups and within interest groups across space, and to create a forum through the involvement of various key interest groups that can feel comfortable in working together to continue to understand general public attitudes, beliefs, key issues and concerns from a variety of perspectives.

## Factors used to define the study area

Human dimensions research is interdisciplinary in nature and is most effective when information can be collected and blended directly with biophysical data over the same geographic space. In an effort to be most relevant for management decision-making concerning the wolf in Croatia, the HD study area included the entire wolf range in Croatia. Presently, wolves in Croatia are distributed over the entire Dinara Mountain Range, from the Slovenian border to the borders with Bosnia and Hercegovina and Montenegro. This includes an area of approximately 17,270 km<sup>2</sup>. On the margins of this area wolves are occasionally

present (6,840 km<sup>2</sup>). Wolves, however, are not found on the Istria peninsula (excluding Učka and Čičarija mountains), on any of the Croatian islands, and also not on the lowlands (29,212 km<sup>2</sup>).

It was hypothesized that attitudes and beliefs toward wolves and their management may differ across the entire wolf range, thus making it necessary to divide the wolf range into smaller areas that could be used to compare attitudes and beliefs. In determining how to identify the HD study zones within the Croatian wolf range, several factors (biophysical and human) were used. Wolf presence is



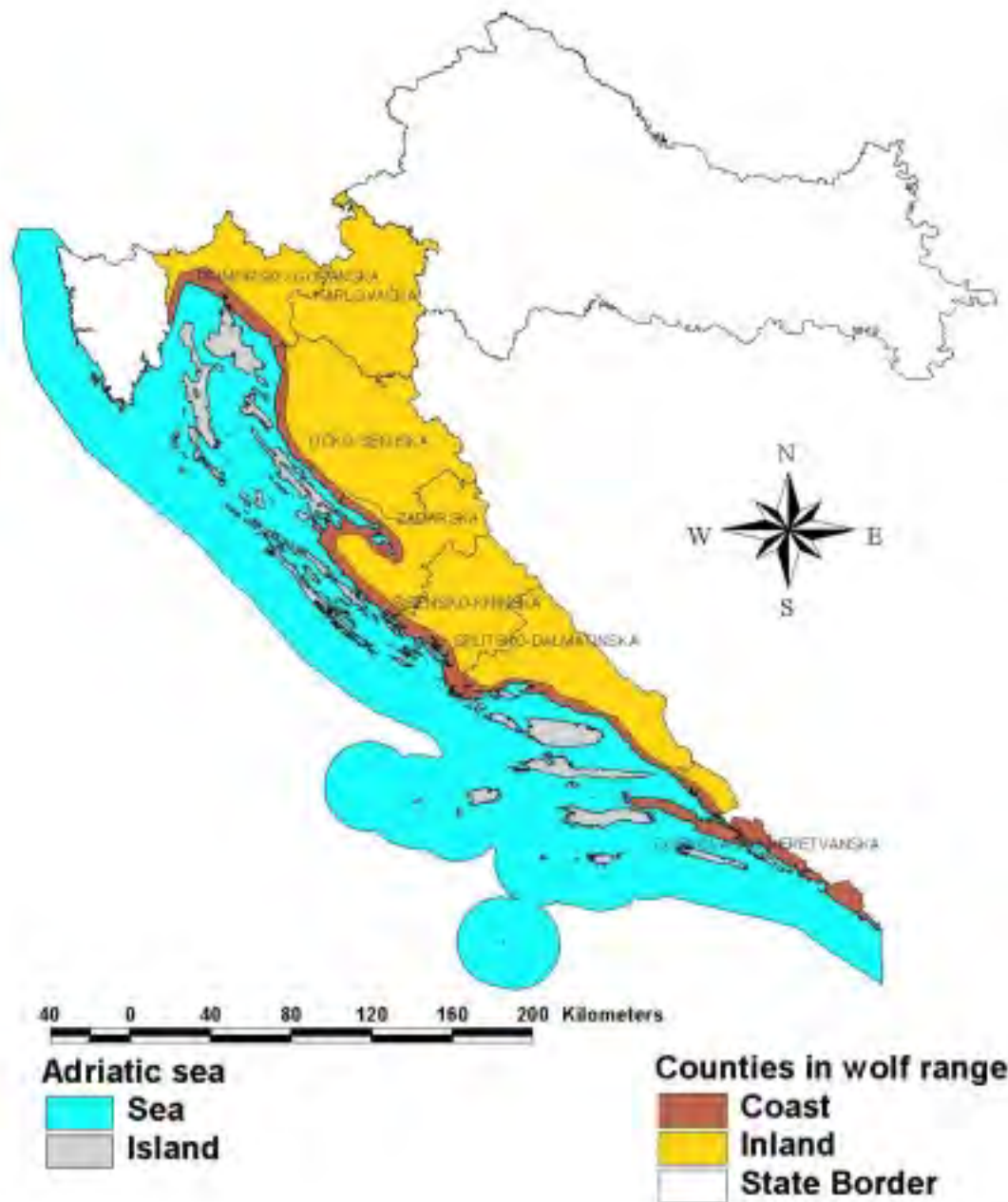
distributed over the following counties (županija): Dubrovačko-neretvanska županija, Karlovačka županija, Ličko-senjska županija, Primorsko-goranska županija, Splitsko-dalmatinska županija, Šibensko-kninska županija, and Zadarska županija (Figure 3). Areas that include occasional presence of the wolf include Žumberak, Petrova Gora, Zrinska Gora Mountains, and a narrow coastal area (excluding islands and the Istrian peninsula). Areas where wolves are not currently present include urban centers and lowlands, which are mostly deforested and transformed by cultivation. Some parts of the lowlands contain stable populations of wild ungulates and are therefore potential wolf habitat. Prey availability, livestock presence, wolf attacks on livestock, altitudes above sea level, forest cover, density of human population, and density of road traffic in Croatia were other variables considered in defining the HD study zones.

The main natural wolf prey in Croatia is red deer, roe deer, wild boar and hare. In areas where wolf is able to get to livestock (mostly sheep and goats), livestock becomes wolf prey as well. The Gorski kotar and Lika areas are mountainous regions containing the largest percentage

of forest in Croatia (50–70%). Human population densities are small in comparison to other areas with a density level of approximately 25/km<sup>2</sup>. Wild ungulates are relatively abundant in this area. In this northern zone according to scat analysis, wild prey is the predominant wolf food (81.3% of the wolf's diet). The numbers of sheep and goats are low resulting in low levels of conflict with livestock breeders. Numbers and range of sheep (Figure 4) and number and range of cattle in Croatia (Figure 5) aided in identifying areas where conflicts may be higher. In defining the HD study zones, zones that may experience different levels of conflict were considered.

In southern Croatia, where wolves are present, the area encompasses the southern end of Velebit Mountain to the border with Montenegro. This area can be divided into a northwestern part made of mountains (Dinara, Kamešnica, Svilaja and Biokovo), and a southern part of Dalmatinska Zagora, which lies along the Adriatic coast. In this larger area natural prey species are scarce; only wild boar and hare are present, but densities of sheep and goats are the highest in Croatia. Scat analysis results indicate that 86.4% of the wolf's diet is livestock, however, the

**Figure 3: Counties in wolf range.**



**Figure 4: Density of sheep in wolf areas.**

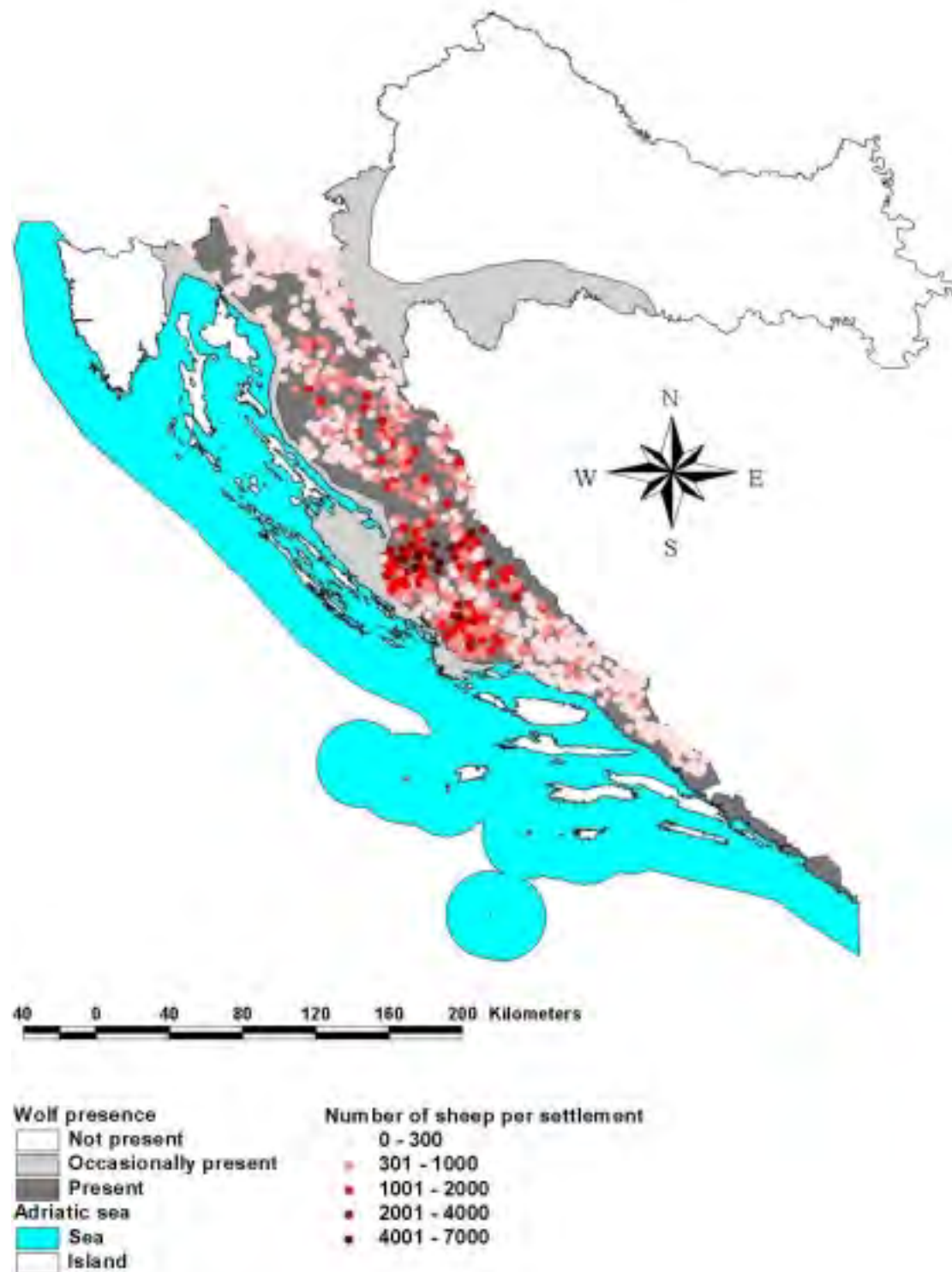
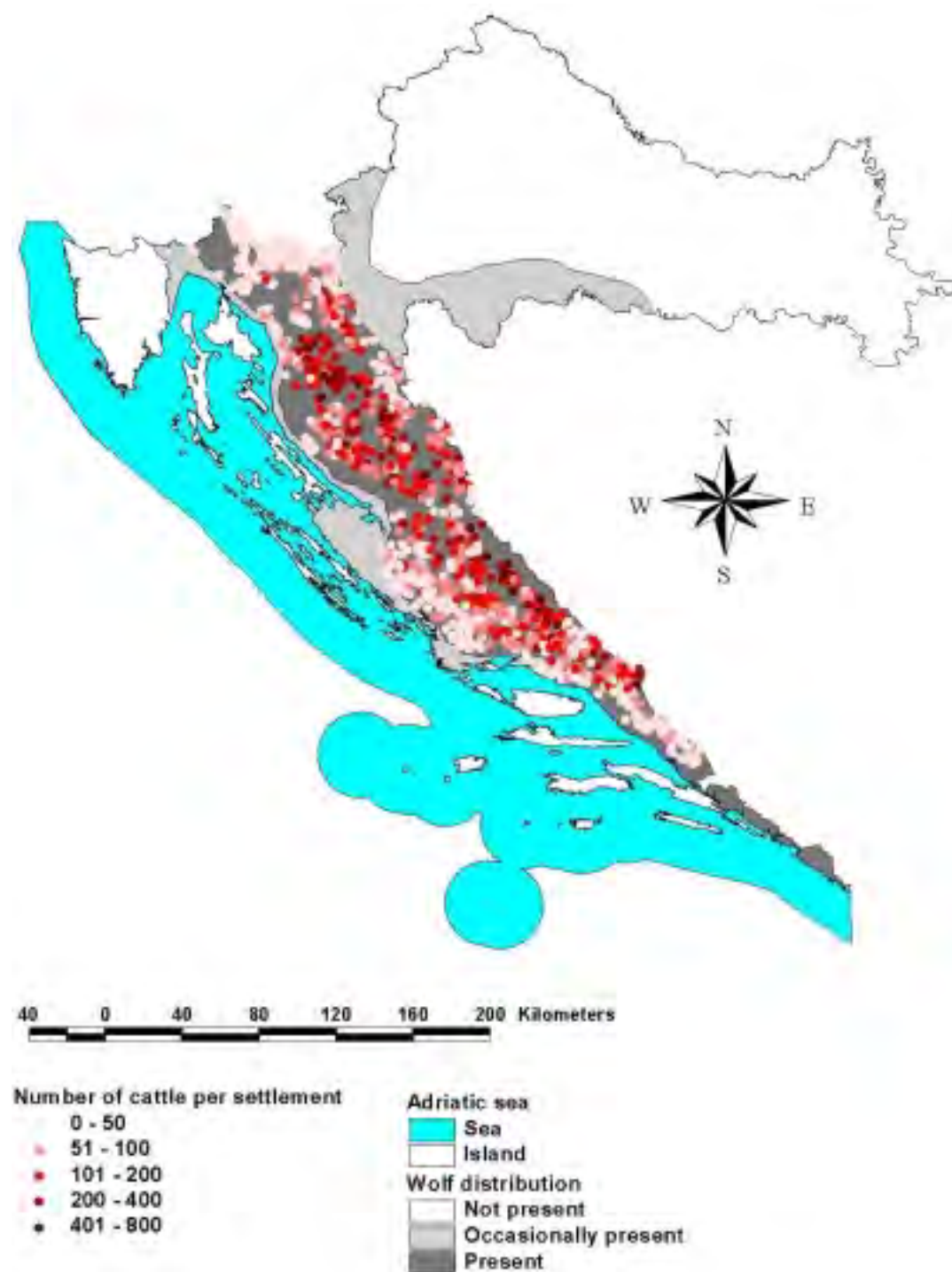


Figure 5: Density of cattle in wolf areas.



damages are not evenly distributed (Figure 6). The main reason causing the fluctuation of incidence of wolf attacks are different styles of livestock husbandry. In the mountainous part of the zone (on the Croatian side of Dinara mountain), livestock is put out to pasture during summer and fall, as long as the weather allows it. Livestock spends winter, however, at the foot of the mountain. There are approximately 150 sheep in a herd but usually two dogs and one shepherd guard the herd; some of the shepherds do carry guns. The average age of a shepherd in this area is 46.

In contrast, in the area of Dalmatinska Zagora livestock is grazed the entire year. And while the herds are much smaller (average size of a herd is 30 sheep), only about one third of the herds are guarded by a shepherd. Shepherds tend to be considerably older with an average age of 68. In this region guard dogs are rare and thus livestock losses are much higher.

Between 26 February 1995 and 15 August 1998, 82% of the predator damage claims were confirmed to be wolf kills. Compensation of approximately 1,262,982 HRK (approximately \$200,000 USD) was paid although livestock breeders had

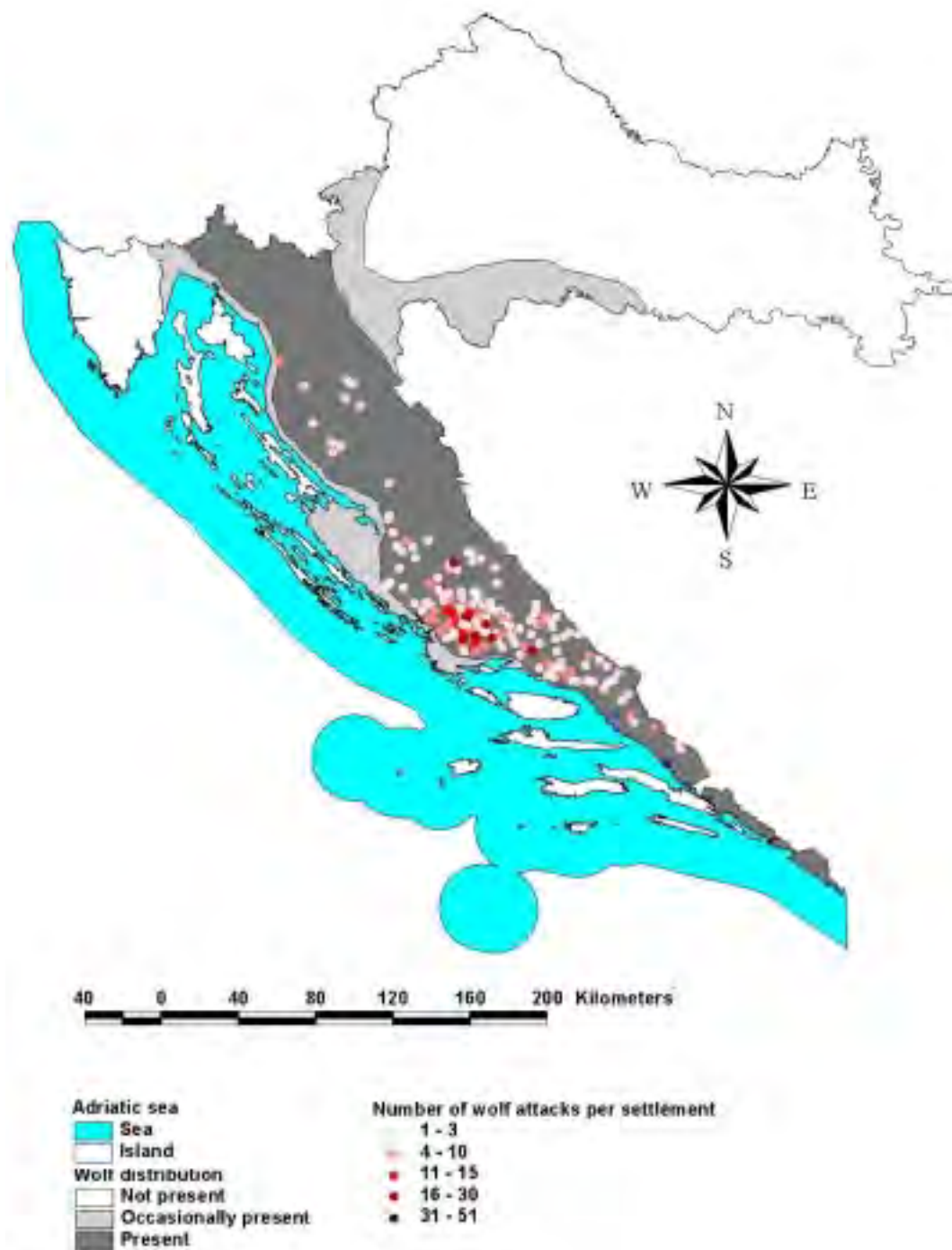
demanded compensation of 3,055,538.50 HRK. The number of predator damage claims has increased considerably over this time period partly because of a growing awareness that compensation can be received, as well as an increase in actual livestock depredation caused by a growing wolf population (Table 1).

**Table 1: Number of predator damage claims by years**

Year	# of damage claims
1995	5
1996	176
1997	516
1998	669 (Until Dec 1 <sup>st</sup> )

By examining damages by county it is clearly apparent that most damages occur in two counties: Splitsko-dalmatinska županija and Šibensko-kninska županija (Table 2). Most of the livestock losses are sheep and goats (Table 3). In an area defined by the rivers Krka and Cetina, a coastal line connecting their mouths and a line connecting their springs, 75.3% of all wolf attacks have been recorded. The size of the area is 3177 km<sup>2</sup>. This relatively small area has the largest concentration of

**Figure 6: Wolf attacks to livestock (26 February 1995 – 15 August 1998).**



all the damages. By addressing the wolf-livestock issue in this area, approximately

75% of all the compensation funds spent in recent years could be saved.

**Table 2: Number of damage claims by counties (the predator is wolf)**

County	# of damage claims
Dubrovačko-neretvanska županija	17
Karlovačka županija	2
Ličko-senjska županija	14
Primorsko-goranska županija	1
Splitsko-dalmatinska županija	255
Šibensko-kninska županija	333
Zadarska županija	30
<b>Total</b>	<b>652</b>

**Table 3: Number of killed, wounded or disappeared livestock, according to livestock breeders**

Species	Killed	Wounded	Disappeared
<b>Cattle</b>	53	11	1
<b>Horse</b>	16	5	1
<b>Goat</b>	534	134	225
<b>Donkey</b>	34	4	0
<b>Mule</b>	2	1	0
<b>Sheep</b>	1386	614	478
<b>Dog</b>	15	2	2
<b>Total</b>	<b>2040</b>	<b>772</b>	<b>707</b>

Vegetation cover was another factor used to help define the HD study zones. Forested areas of Croatia were examined over the Croatian wolf range (Figure 7) as

well as altitudes above sea level in Croatia (Figure 8).

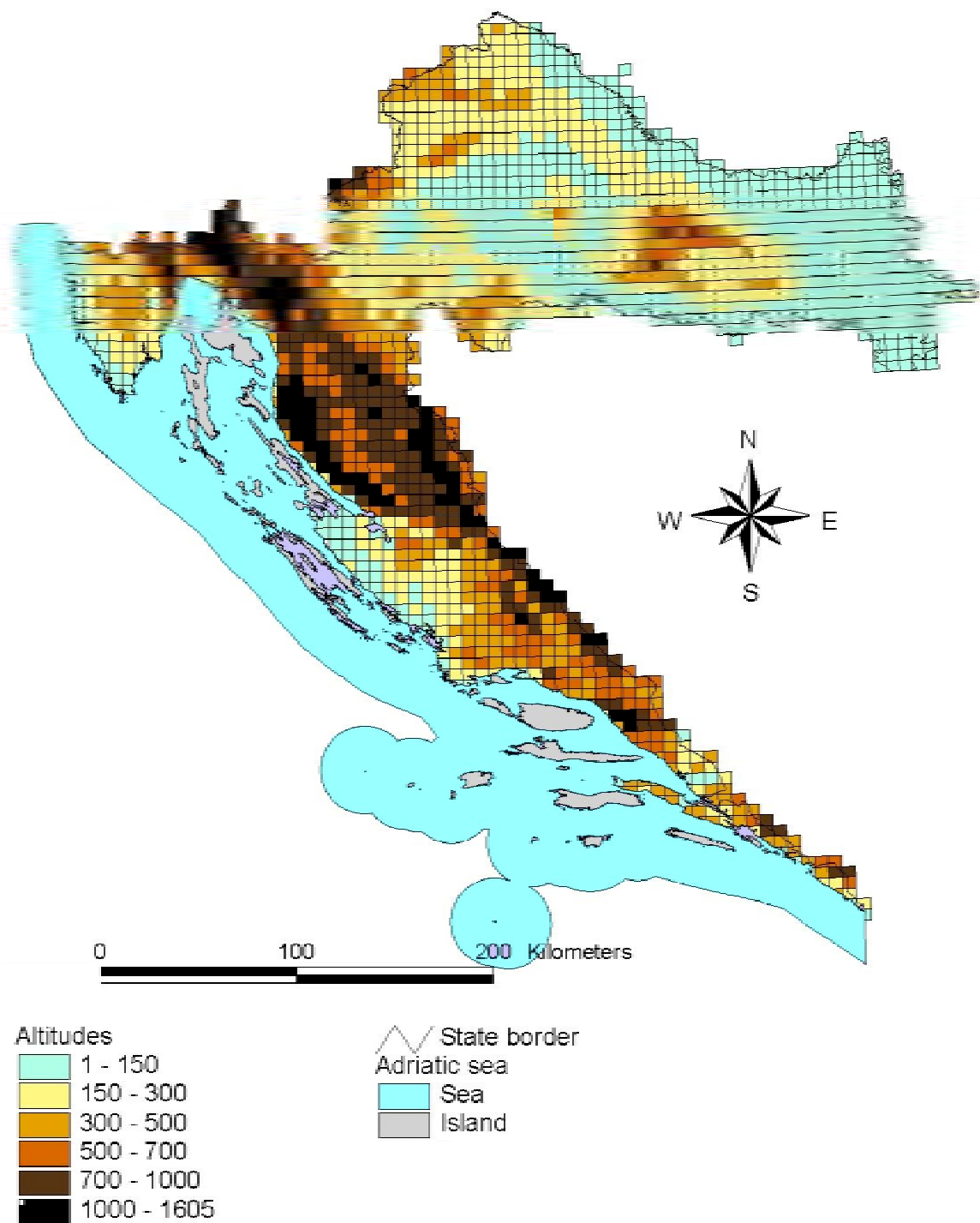
In addition to the many biophysical factors discussed above several human factors

**Figure 7: Forest plant communities.**





**Figure 8: Altitudes above sea level.**

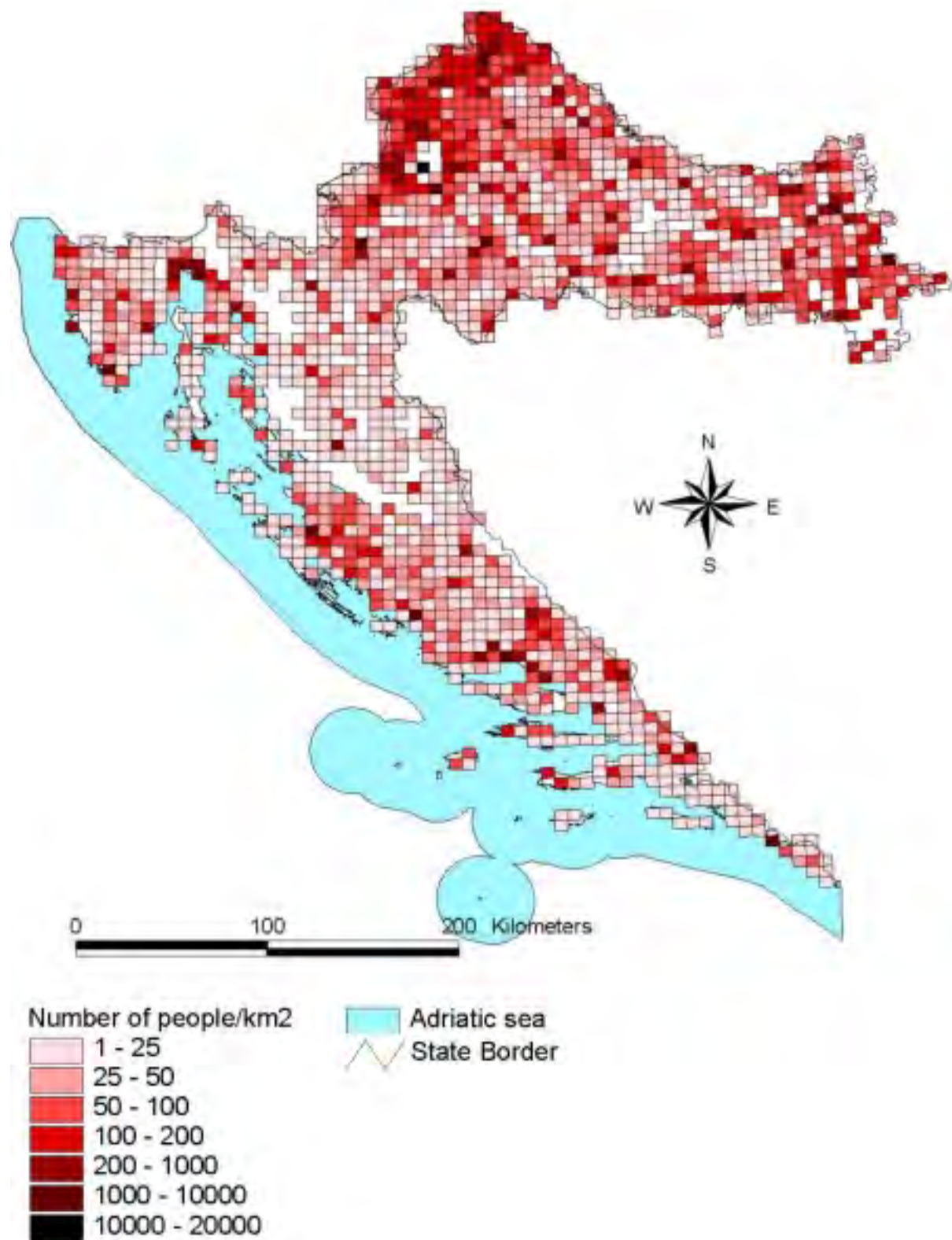


were used to determine suitable HD study zones. These included: density of human population, road density, total human population in Croatia, trends of human population in wolf range, trends of inland human population by counties, and trends of coastal human population by counties. Additional factors included decline in agricultural population of Croatia and the percent of population involved in agriculture.

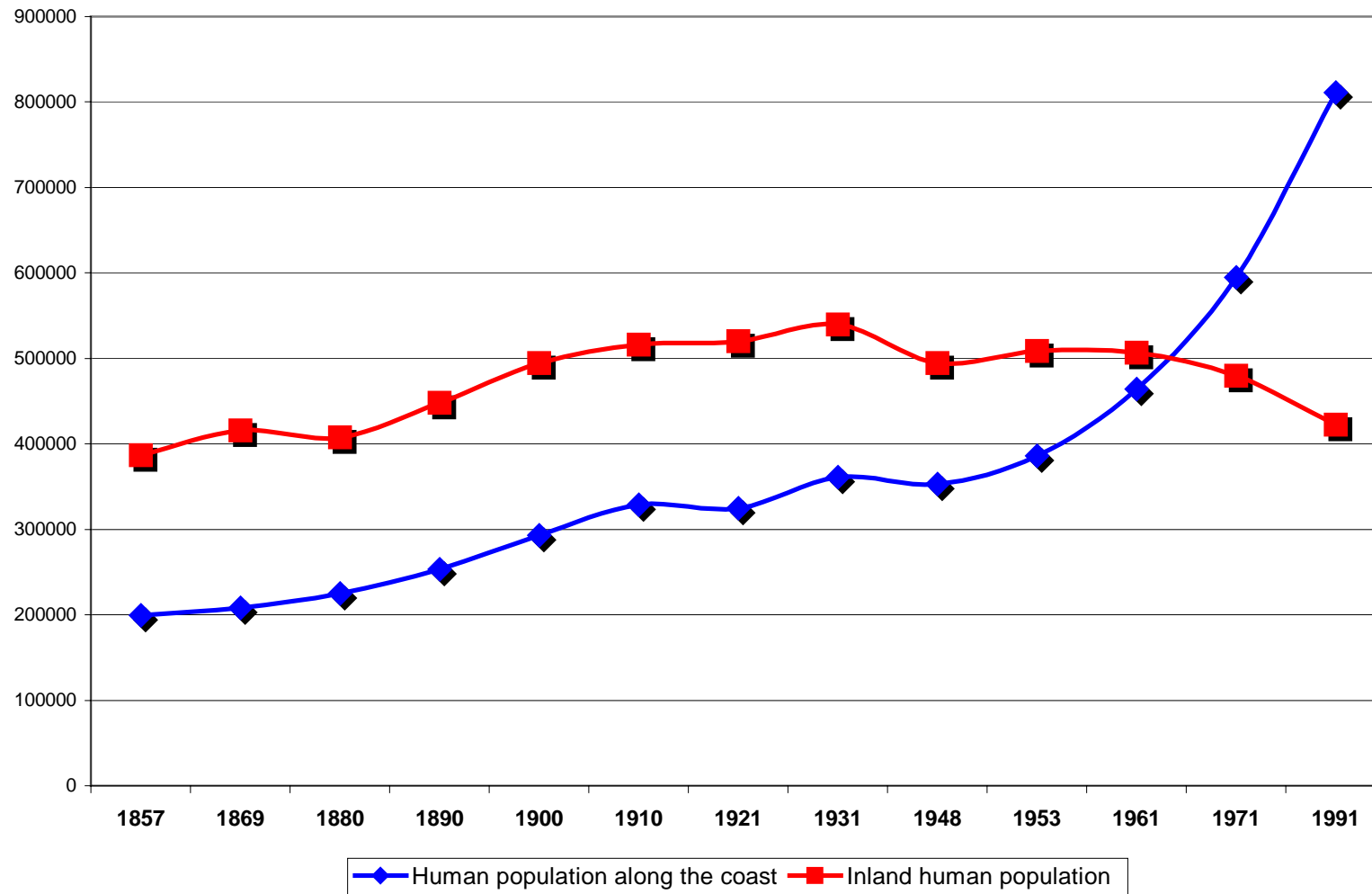
The majority of the human population in wolf range live in urban areas (Figure 9). The densely populated areas are the coastal areas (Figure 10). Road density in Croatia strongly correlates with the urban areas and the coastal zones (Figure 11). Human population within wolf range is decreasing (Figure 10). Gorski kotar and the northern part of Lika contain a very low human population density and the highest density of forests. Consequently forestry and small farms are the main sources of income in this area. Again, coastal areas and urban centers continue to experience an increase in size of human population, while human populations in

the inlands and small villages are growing smaller and older. Rural population is decreasing particularly the inland human population (Figure 10), while the urban population particularly the coastal human population is rapidly increasing, as well as total human population of Croatia (Figure 12). With the decline in the rural population, there has been a decline in the agricultural population of Croatia (Figure 13). This being said, the Dalmatian inlands have got the highest number of heads of sheep of all Croatian counties. The sheep breeders in this area, however, usually own small herds and livestock breeding is usually a secondary source of income. Employment is primarily in construction, services (tourism at the Adriatic coast) and industry. Dalmatian karst is agriculturally very poor and over the centuries people have had to struggle to increase their poor standard of living. The result has been widespread migration of rural people to urban centers or in some cases migration even out of the country. The remaining rural population is aging and small villages no longer have the amenities to hold the young people.

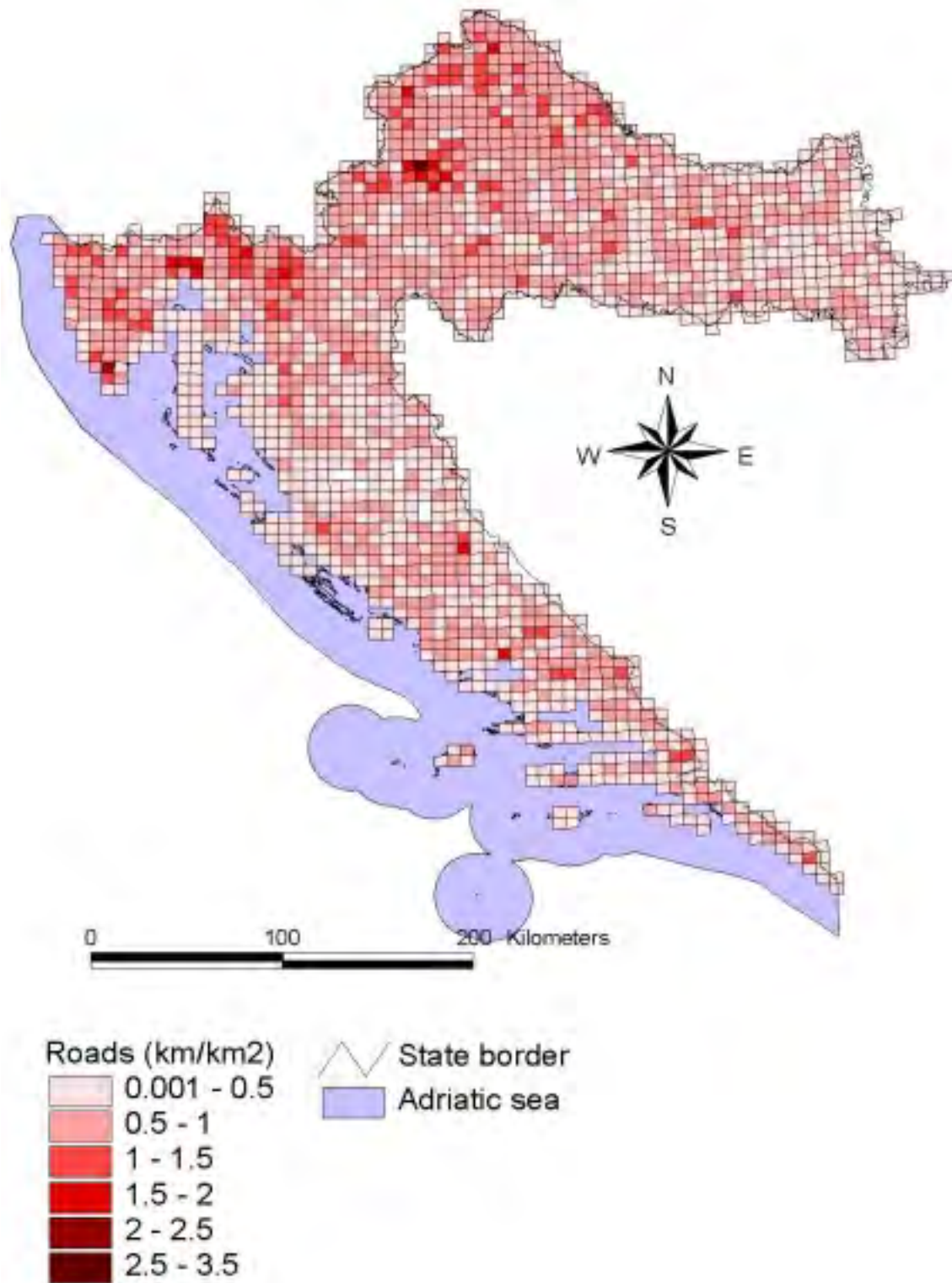
**Figure 9: Density of human population.**



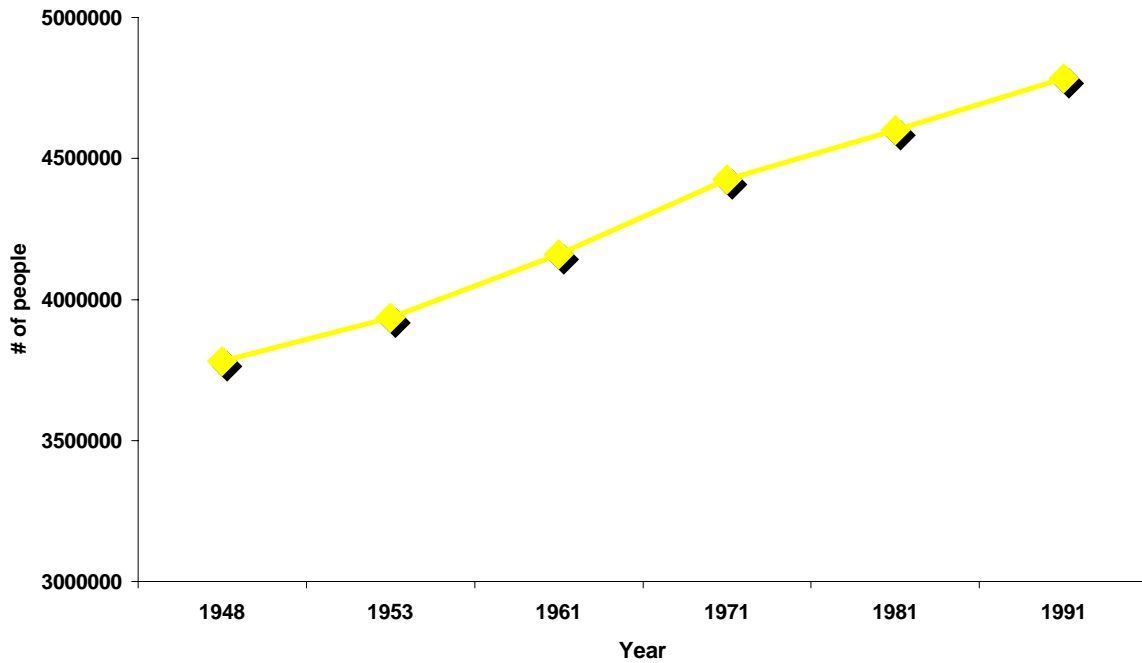
**Figure 10: Human population in wolf area, over the years.**



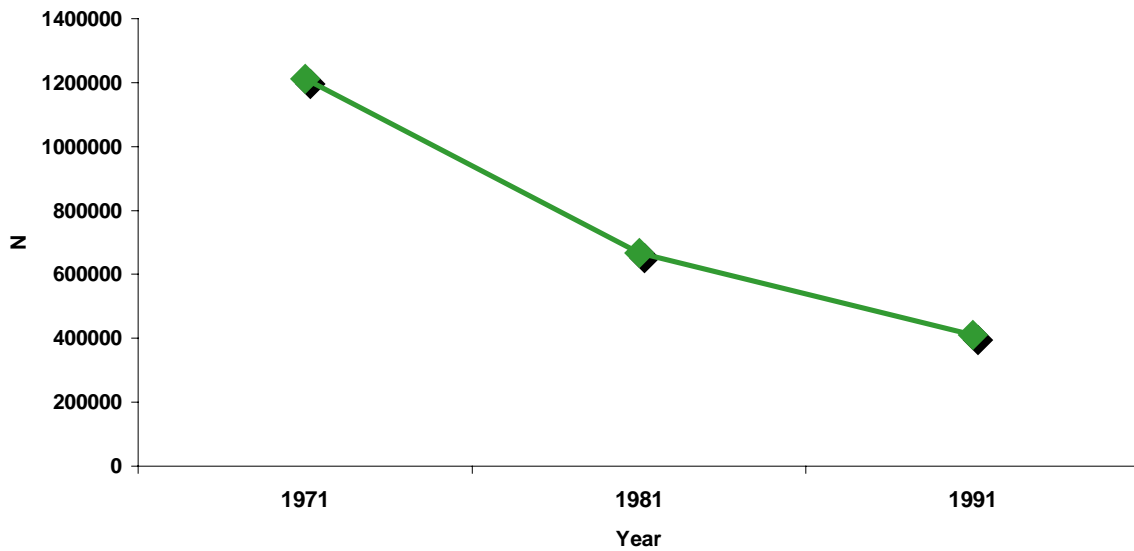
**Figure 11: Density of roads.**



**Figure 12: Total human population of Croatia over the time.**



**Figure 13: Agricultural population of Croatia over the time**



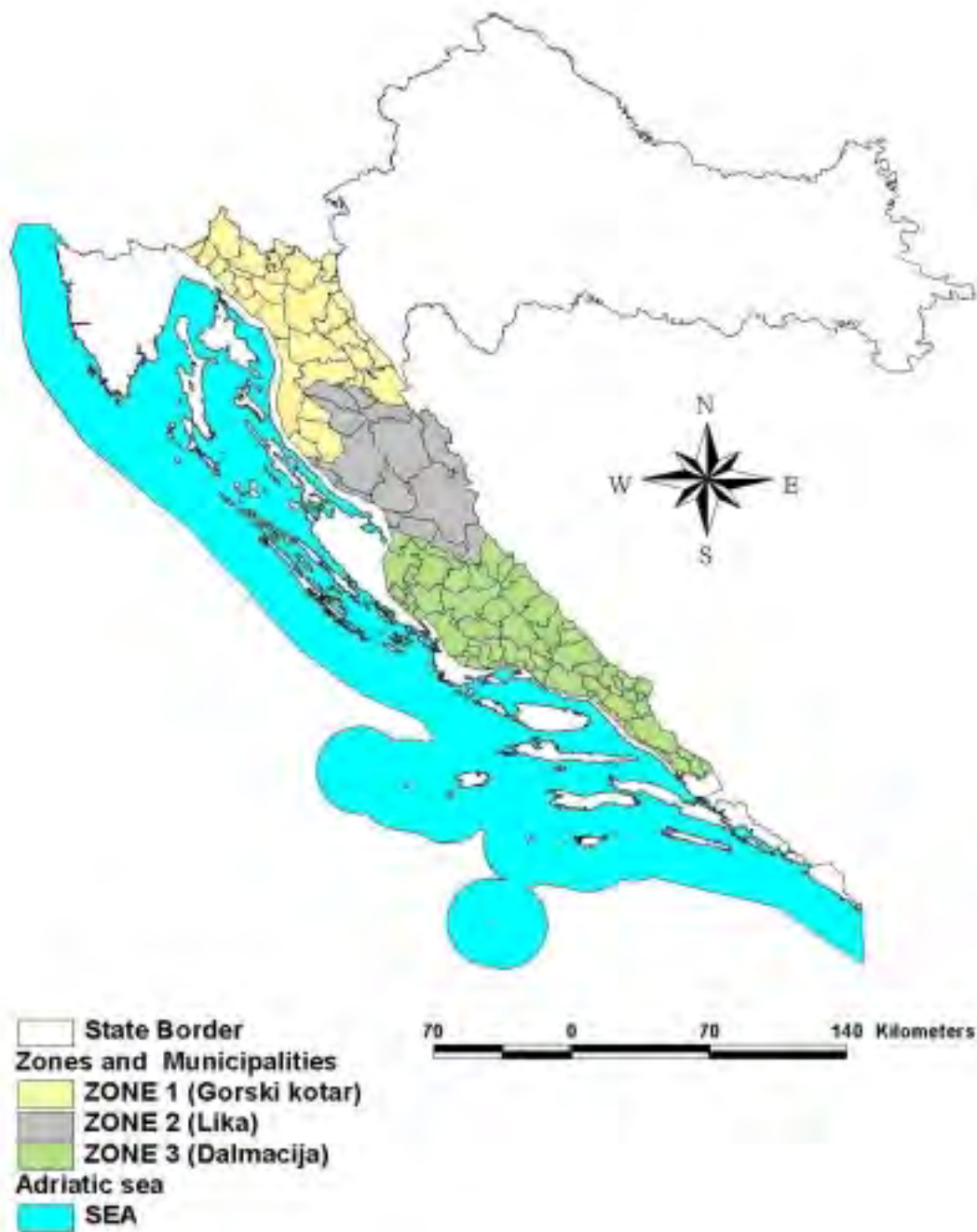
## Characteristics of the study area

After considering the many biophysical and human factors discussed above, the HD study zone within the Croatian wolf range was divided into three zones (Figure 14). Zone one, labeled Gorski kotar, is the most northern and mountainous zone and includes the entire region of Gorski kotar and the northwestern parts of Lika. The size of the zone is approximately 5,245 km<sup>2</sup> with a human population of 85,690 and a human population density of 16.33 people per km<sup>2</sup>. Forestry provides the main source of income for the region. The northwest border of the zone is defined by the state border to Slovenia, and towards the Istrian peninsula by the presence of wolves. The west border of the zone stretches along Velibit Mountain near the Adriatic Sea coast. The north border of the zone is defined by the constant presence of wolves. The eastern border represents the state border with Bosnia and Herzegovina while the southern border to zone two is defined by the biophysical and demographic characteristics (rivers, different vegetation, change in the number of livestock, and higher rates of attacks to livestock by wolves).

This zone one region is the most densely forested of the three zones (beech, silver fir, spruce and pine mixed forest dominate) and of Croatia. Gorski kotar is about 60-70% forested and therefore represents the best wolf habitat in the country. Wild ungulates are relatively abundant (red deer, roe deer, and wild boar are present). Number of sheep in the area is relatively low (23,787 sheep, density of 4.5 sheep per km<sup>2</sup>). Since wolf protection in 1995 up to Dec.1 1998, there has been only 7 wolf-livestock damage claims submitted. According to scat analysis, wild prey is the predominant wolf food in this zone.

Zone 1, Gorski kotar, includes two national parks that make up an important part of large carnivore habitat in Croatia: Plitvice Lakes National Park and Risnjak National Park. "Plitvička jezera" national park is placed in eastern Lika directly by the main road connecting Zagreb and Dalmatia. The park gets its name from the 16 lakes, comprising an area of about 2 km<sup>2</sup>. Total acreage of the park is nearly 200 km<sup>2</sup>. The park is densely forested (beech, silver fir, spruce and pine), with the highest peak at 1280 meters above sea level. The lowest altitude is 400 meters.

**Figure 14: HD study zones.**





The lakes are interconnected by waterfalls. The biggest altitude difference between two lakes is 25 meters. “Plitvice lakes” is one of the most important parts of wolf and bear habitat in Croatia. “Risnjak” national park is placed in mountainous Gorski kotar region in the west of Croatia. Geologically, Gorski kotar is part of the Dinaridi mountain system; here wide only 40 km. The area is wooded with a composition of 60% coniferous and 40% deciduous forest. Silver fir, spruce and beech are the most common trees. Size of the national park is 32 km<sup>2</sup>. The Risnjak summit is at 1528 meters above the sea level. Predators, present in the area are wolf, brown bear, lynx, wild cat and red fox. The park area is surrounded by roads including the main road Zagreb to Rijeka in the south and scattered small villages.

Zone 2 of the HD study zone includes the remaining parts of Lika and is approximately 4,396 km<sup>2</sup>. Human population in Lika is 88,767 people at a population density of 20.19 people per km<sup>2</sup>. The eastern border of the zone is the state border with Bosnia – Herzegovina while the western border spreads along the Adriatic Sea coast (defined by constant wolf presence). The southern border of zone 2 is with Dalmatia defined by

different biophysical and demographic characteristics.

Zone 2 is less forested than zone one. Beech forest dominates, with spatial walleyes, turned to grazing land. The number of sheep is considerably higher at 93,262 resulting in a density of 21.21 sheep per km<sup>2</sup>. In spite of a relatively high density of sheep, only seventeen wolf damage to livestock claims had been recorded since wolf protection (May 1995 to Dec 1 1998). Wild prey forms the majority of the diet of wolves in this zone.

There are also two national parks present in zone 2 of the HD project area. “Krka” national park is 142.2 km<sup>2</sup>, out of which 25.5 km<sup>2</sup> belongs to the river Krka. The river makes a series of waterfalls along its karst canyon. Several predators are present in the area: wolf, golden jackal, wild cat and occasionally the brown bear. “Paklenica” national park is located in the southern end of Velebit Mountain. This small (36.5 km<sup>2</sup>) park contains a series of geological and geomorphological attractions.

Zone 3 includes the inland parts of Dalmatia and is 6,170 km<sup>2</sup> in size. The human population is the highest of the

three zones at 236,943 people with a human population density of 38.40 people per km<sup>2</sup>. The coastal, very densely populated areas of Dalmatia are excluded from the zone as they are not in wolf range. The eastern border of the zone is the state border with Bosnia and Herzegovina. The Neretva River forms the southern border.

Poor Mediterranean vegetation and a rocky countryside make livestock raising

challenging in this zone. Only hare and wild boar are present. Scat analysis reveals that 86% of the wolf's food is livestock. There are 235,838 sheep in Dalmatia (density of 41.14 sheep per km<sup>2</sup>) and very high wolf damage occurs in this region. More than 683 claims have been filed since wolf protection. Although the numbers of sheep are relatively high, sheep owners usually own small flocks of sheep (average 30 sheep) that they use as a form of secondary income.

## Methodology

### *Content analysis*

In an effort to examine the possible influence of media and set a societal context within which our HD study occurred, a systematic collection and analysis of printed material was completed. Articles about the HD project published in Croatian newspapers were assessed in terms of the number of lines of text, photographs, names mentioned, and whether the LCIE was mentioned. This assessment began with the announcement of the project in April 1999 and continued until September 2000. The number of

interest groups mentioned in the articles was also noted.

In addition to examining articles and discussing media coverage pertaining to the HD project, a total of 162 articles were analyzed over a seven year period (August 1993 to September 2000). Articles were collected systematically from January 1994 to October 1999. Ten of the total eighteen newspapers or magazines were at the national level. Whether photographs were present and the number of articles mentioning various interest groups were

noted. The number of articles over time was also graphed. Each article was critically assessed for its content and classified as positive, negative, neutral or .

### ***Qualitative issues***

A qualitative and quantitative approach was used to collect data for this HD in wolf management in Croatia study. Qualitative interviews were conducted with 5 interest groups identified as key players in the wolf management debate in Croatia. These groups were identified based upon a set of criteria:

- Expressed interest in the wolf management issue in Croatia
- Potential role in influencing decisions concerning wolf management
- Expressed interest in learning more about the nature of this HD study
- Expressed willingness to discuss issues openly, and
- Expressed willingness to begin to work together toward finding common ground between all interest groups and addressing key issues.

HD project related. Findings from this content analysis are presented in the results section.

The interest groups who participated in the HD study were:

- Various Croatian wolf biologists
- Croatian Forests
- Ministry of Environmental Protection and Zoning
- Croatian hunters association
- Mountaineering Association (Nature Protection Commission)

Representatives of each group, usually members at the executive board level of the organization, were contacted and interviewed. These qualitative interviews usually lasted approximately two hours in length. The length of the interview varied amongst the groups and depended upon the number of people involved from the organization and the interest shown. All groups interviewed expressed a great deal of interest in the study and in receiving the results. This bodes well for future cooperation toward understanding and

addressing wolf management issues in Croatia.

The purpose of the qualitative interviews was to gather data that could be used in the development of a common ground matrix (CGM). Basically, this is a matrix that illustrates the key issues and solutions from each group in a visual manner. The result allows for an assessment of the common issues and solutions between each group, basically the common ground, hence its name. A CGM provides a safe starting place for all groups as they see that there are issues of common concern.

### ***Quantitative issues***

Obtaining representative data from residents of each of the three zones (Gorski kotar, Lika and Dalmatia) that could be generalized to the entire population was considered important in the design of the HD study. To be able to generalize to a larger population and thus provide managers with an accurate picture of public attitudes and knowledge levels toward the issue and the ability to balance the viewpoints of vocal interest groups (both in favor and against wolf restoration), a quantitative survey was implemented. Fowler (1984) suggests that

The CGM also provides a starting point for working toward a common vision, common set of objectives, and a means to achieve that end. The qualitative interviews also provided an opportunity to inform the various interest groups about the nature of human dimensions in wildlife resource management, the objective nature of this project, and begin to build possible partners for future HD work and discussion concerning wolf management. Results of the qualitative interviews and presentation of the CGM is provided in the results section.

a “full-scale probability survey should be undertaken only after it is certain that the information cannot be obtained in other ways and the need for information is significant”. Considering this is the first large scale HD study of its kind on wolf management issues in Croatia, and given the controversial nature of managing this large carnivore, Fowler’s criteria is definitely met.

The quantitative methodological issues for this HD study will be discussed within a framework suggested by Fowler (1988).

The key issues are: the sampling frame and chance of selection, sampling procedure, questionnaire design and pre-testing, exact wording of the items, interview process, field results and quality control checking.

A sampling frame “is the set of people that has a chance to be selected, given the sampling approach that is chosen” (Fowler 1988). Residents over 15 years of age were eligible to participate in the study. Residents from the large urban areas such as cities along the coast were omitted from the sampling frame. Random sampling proportional to municipality populations occurred to ensure a sample representative of the entire region. The number of completed questionnaires required by each municipality was calculated by taking the population numbers (over 15 years old) for the municipality multiplied by the percentage of the total population to obtain an overall sample size of 400 respondents per zone. A sample size of 400 was chosen per zone to allow for results to be accurate 19 times out of 20, plus or minus five percent. Such a sample size results in a 95% confidence level and a 5% confidence interval, an acceptable standard in social science research. To achieve this level of accuracy a minimum sample of 384 is actually needed but “in practice most

researchers attempt to obtain about 400 completed responses as usually a few questionnaires must be discarded during analysis” (Sheskin 1985).

**Table 4: Example: Municipality of Mrkopalj from Zone 1 consists of 6 villages/towns**

Village/Town	# people	# 15 and older
Begovo Razdolje	98	87
Brestova Draga	79	68
Mrkopalj	1196	996
Sunger	387	321
Tuk Mrkopaljski	7	7
Tuk Vojni	56	54
<b>Total</b>	<b>1823</b>	<b>1533</b>
<b>Sample size</b>	<b>9</b>	

In Croatia, each municipality could consist of one or more villages or towns thus requiring sample sizes to be selected randomly proportional also to the population size of villages/towns within the municipality (Table 4). For example, in zone 1 there were 478 villages/towns; in zone 2 there were 184 villages/towns and in zone 3, there were 425 villages/towns. Tables 5, 6 and 7 indicate the sample sizes needed and obtained from the various municipalities within each zone.

**Table 5: Zone1: Sampling frame based upon 1991 human population figures**

Municipality	# 15 and older	Sample size	Actual #
Bakar	774	4	5
Bosiljevo	2018	11	11
Brinje	5145	29	27
Brod Moravice	1045	6	6
Čabar	4301	24	24
Delnice	5513	31	32
Fužine	1738	10	13
Generalski Stol	183	1	1
Gospić	2995	17	17
Josipdol	3994	22	22
Karlobag	46	0	0
Klana	1091	6	6
Lokve	966	5	5
Mrkopalj	1533	9	9
Novi Vinodolski	147	1	1
Ogulin	13154	74	73
Otočac	4319	24	24
Perušić	931	5	5
Plaški	3619	20	20
Plitvička Jezera	2668	15	15
Rakovica	671	4	4
Ravna Gora	2655	15	15
Saborsko	1378	8	8
Senj	1401	8	8
Skrad	1307	7	7
Slunj		0	0
Tounj	1433	8	8
Vinodolska općina	1	0	0
Vrbovsko	6273	35	35
Vrhovine	225	1	1
<b>Total</b>	<b>71524</b>	<b>400</b>	<b>402</b>

**Table 6: Zone 2: Sampling frame based upon 1991 human population data**

<b>Municipality</b>	<b># 15 and older</b>	<b>Sample size</b>	<b>Actual #</b>
Donji Lapac	3824	21	21
Ervenik	1063	6	5
Gospić	15722	86	85
Gračac	9330	51	53
Jasenice	354	2	2
Karlobag	78	0	0
Knin	16224	89	89
Lovinac	2484	14	14
Obrovac	2420	13	13
Otočac	9116	50	50
Perušić	3932	21	20
Plitvička jezera	2761	15	17
Udbina	3978	22	22
Vrhovine	1877	10	10
<b>Total</b>	<b>73163</b>	<b>400</b>	<b>401</b>

**Table 7: Zone 3: Sampling frame based upon 1991 human population figures**

<b>Municipality</b>	<b># 15 and older</b>	<b>Sample size</b>	<b>Actual #</b>
Baška Voda	129	0	0
Benkovac	10043	21	21
Brela	153	0	0
Cista Provo	4108	9	9
Civljane	1413	3	3
Dicmo	2277	5	5
Donji Proložac	4100	9	10
Drniš	11882	25	27
Dugopolje	2396	5	5
Ervenik	2410	5	7
Hrvace	4328	9	10
Imotski	7528	16	16
Kijevo	1036	2	2
Kistanje	6473	14	14
Klis	3404	7	7

<b>Municipality</b>	<b># 15 and older</b>	<b>Sample size</b>	<b>Actual #</b>
Knin	2057	4	4
Kula Norinska	1264	3	3
Lećeveica	911	2	2
Lišane Ostrovičke	1248	3	3
Lokvičići	633	1	1
Lovreć	2997	6	6
Marina	407	1	1
Metković	878	2	2
Muč	3944	8	7
Obrovac	2745	6	6
Omiš	7009	15	15
Opuzen	229	0	0
Orlić	4404	9	10
Otok	5078	11	11
Pirovac	211	0	0
Ploče	2687	6	6
Podbablje	4769	10	10
Podgora	18	0	0
Pojezerje	1126	2	2
Prgomet	941	2	2
Primorski Dolac	802	2	2
Promina	2269	5	5
Runovići	2856	6	6
Ružić	2813	6	6
Seget	1270	3	3
Sinj	19662	42	42
Skradin	6519	14	14
Solin	417	1	1
Split	3150	7	7
Stankovci	2371	5	5
Šestanovac	2698	6	6
Šibenik	8380	18	18
Trilj	10657	23	23
Unešić	2973	6	6
Vodice	1248	3	3
Vrgorac	5841	12	11
Vrlika	4591	10	10



<b>Municipality</b>	<b># 15 and older</b>	<b>Sample size</b>	<b>Actual #</b>
Zadvarje	236	1	1
Zagvozd	1893	4	5
Zmijavci	1998	4	5
<b>Total</b>	<b>187880</b>	<b>400</b>	<b>406</b>

Households were randomly selected prior to entering the village using a random number table (eg. 3<sup>rd</sup> house on the right). Individuals within the household were randomly selected using the next birthday rule. The person in the household whose birthday was coming up next was asked to participate in the study; this ensured randomness of participants. In larger areas a grid system was set up over the village and random streets and households were chosen. The questionnaire was administered as a personal structured interview to respondents.

In addition to the general public sample selected randomly from the population of residents in Gorski kotar (n=402), Lika (n=401) and Dalmatia (n=406), additional sampling was done of hunters, foresters, shepherds and high school students through the cooperation with these organizations. Sample sizes for these groups were smaller than those obtained within the general public (N=1209); with 209 hunters selected from the three zones,

190 foresters selected, only 19 shepherds selected, and 339 students from the three zones. Due to the small sample sizes this data is not representative of the respective groups but it does provide some insight into how some of these interest groups feel about wolves and wolf management. Except for the results from shepherds, findings from the other groups are presented visually across zones beside the general public results. These interest group questionnaires were self-administered. Questionnaires were mailed to hunters and foresters, and returned by the mail. Data from students were gathered by administering the questionnaire in several classrooms of teenagers across the three zones.

Traditionally HD studies tended to be one-shot case studies collecting data at only one point in time and usually crisis management driven. This study has been designed as a baseline assessment and partnership building exercise thus allowing for the possibility to conduct a post-test to

evaluate whether attitudes and beliefs have changed over time and to allow attitudinal and belief monitoring to occur as new policies are implemented and the wolf population grows. This report discusses the results of the pretest or first phase. After a communication and public awareness campaign, this study could be implemented again allowing for a direct comparison of attitudes and knowledge levels and an ability to assess the effectiveness of the communication and public awareness efforts.

“The successful drafting of a questionnaire is as much an art as a science” (Sheskin 1985). Although an art, there are many points which if carefully considered can ensure a quality research instrument. To address all the aspects of the design process takes time. “Any serious questionnaire effort should evolve over at least four to six weeks” (Sheskin 1985). In this study, design of the questionnaire began with a facilitated workshop with biologists, veterinarians, foresters and hunters. After some discussion and testing of similar research instruments in Spain, Poland and France the questionnaire was ready to be implemented within a couple of months.

The questionnaire consisted of five sections:

- Attitudes toward wolves
- Beliefs about wolves or a knowledge section made up of factual questions
- Attitudes toward various management approaches
- Personal experience with wolves and assessments of the importance of the issue to the respondent, and
- Socio-demographic information about each respondent.

Several of the attitudinal and belief items had been tested before in HD studies on wolf management in Yellowstone National Park, Poland and Spain. Previous studies had revealed high reliability estimates for the attitude scale, meaning that the attitudinal items when combined consistently were good measures of attitudes toward wolves. Several of the belief items and attitudes toward management options had also been pre-tested in previous questionnaires with positive results. A list of the attitudinal and belief items used in this study can be found in Table 8. A copy of the entire questionnaire can be found in Appendix 1.

**Table 8: Attitudinal and belief items used in HD study**

<b>Attitude Items</b>	<b>Belief Items</b>
Which of the following best describes your feelings toward wolves?	How many wolves do you believe currently exist in Croatia?
To have wolves in Croatia is:	Do you believe wolf numbers in Croatia are: increasing, decreasing, remaining the same.
To have wolves in Gorski kotar / Lika / Dalmatia is:	How many wolves do you believe currently exist in Gorski kotar / Lika / Dalmatia?
It is important to maintain wolf populations in Croatia so that future generations can enjoy them.	Do you believe wolf numbers in region of Gorski kotar / Lika / Dalmatia are: increasing, decreasing, remaining the same.
It is important to maintain wolf populations in region of Gorski kotar / Lika / Dalmatia so that future generations can enjoy them.	How much does the average adult male wolf weigh in Croatia?
It is important to have healthy populations of wolves in region of Gorski kotar / Lika / Dalmatia.	There used to be wolves throughout the entire region of Gorski kotar / Lika / Dalmatia.
We should assure that future generations have an abundant wolf population.	Wolves are completely protected in Croatia
Whether or not I would get to see a wolf, it is important to me that they exist in region of Gorski kotar / Lika / Dalmatia.	It is generally true that only two members (one pair) of a wolf pack breed in any one year?
Wolves have a significant impact on big game.	How many sheep and goats do you think were killed by wolves last year in region of Gorski kotar / Lika / Dalmatia?
Wolves have a significant impact on small game.	Wolves will kill sheep and goats only if there are not enough deer and other wild game.
Wolves reduce populations of roe deer, red deer and wild boar to unacceptable levels.	How often is a wolf generally able to successfully kill wild prey?
It is unnecessary to have wolves in region of Gorski kotar / Lika / Dalmatia, because abundant populations of wolves already exist in other parts of Croatia.	What is the average pack size of wolves in Croatia?
It is unnecessary to have wolves in Croatia because abundant populations already exist in other European countries.	
Wolves should be completely protected in region of Gorski kotar / Lika / Dalmatia.	
Wolves should be completely protected in Croatia.	

Attitude Items	Belief Items
Wolves should be allowed to be hunted in specific hunting seasons in region of Gorski kotar / Lika / Dalmatia.	
Wolves should be allowed to be hunted year round in region of Gorski kotar / Lika / Dalmatia.	
Wolves should be killed by all means, including killing pups in dens and the use of poison in region of Gorski kotar / Lika / Dalmatia.	
Wolves keep roe deer populations in balance.	
Having wolves in region of Gorski kotar / Lika / Dalmatia increases tourism in Gorski kotar / Lika / Dalmatia.	
Wolves cause abundant damages to livestock.	
In areas where wolves live in close proximity to humans, wolf attacks on humans are common.	
In areas where wolves live near livestock, their primary food is livestock.	
I would be afraid to hike in the woods if wolves were present.	
In your opinion, which animal is most dangerous to humans: wolf, bear, lynx, equally dangerous, none are dangerous.	

Data from Gorski kotar, Lika and Dalmatia residents were collected between May 1999 and October 1999 through personal interviews using a team of up to five different research assistants, but a maximum of three working at the same time. The site project coordinator was always present during the data collection phase. The interviewer team consisted of all females. “An interview has been described as a conversation with a

purpose” (Fowler and Mangione 1990). During the interview process, interviewers can affect the data. Interviewer bias becomes more of a problem when conducting unstructured interviews that require large amounts of probing; in this study most of the items were closed-ended reducing the chances of interviewer bias. It is however, important to train the interviewers in the nature of the study, the importance of being objective, and the

importance of reading the questions exactly as worded. All interviewers used in this study received a training session. While research has not revealed huge differences between the success rates of male versus female interviewers, the interviewers selected in this study were female as females are seen as less threatening when approaching potential respondents and thus are more likely to have better success in obtaining a response.

Personal interviewing can yield the highest response rate of any survey technique. In this study the overall response rate for the general public was 81.4%. Refusal rates were low in this study and those who did refuse to participate tended to be elderly men and women. This is consistent with other field projects that have found similar results in response rates. Across the three zones, response rates were similar ranging from a low of 77% in zone 1 to a high of

86% in zone 2; the response rate for zone 3 was 82.4%. Overall, there were no significant differences in refusal rates from one place to another. This would suggest non-response bias is not an issue to worry about with this study for the general public residents. While sample sizes for hunters, foresters, and students are lower, results can be still discussed within a reasonable degree of confidence level. Results from shepherds, however, should be interpreted cautiously.

Quality control and checking procedures were used during the data entry and analysis stages of this study. A random 10% of all questionnaires were checked for data entry errors and any errors found corrected. Only a few errors were found and these were corrected before conducting any analysis. Quality control and checking procedures did not reveal any significant problems with the data and analysis completed.

## Results

This section of the report will present the qualitative and quantitative results. Results of the content analysis will be presented first to set the context of what was

happening in the media prior to and during the HD in wolf management in Croatia study. Before discussing the quantitative descriptive results from the general public

in the three zone area and the results from the hunters, foresters, and students, the age and gender characteristics of the sample will be examined. In addition, variables asking respondents about the importance of the issue will be presented. Gaining first an understanding of the societal context of the study through the media analysis, and then discussing the characteristics of the sample sets a context within which other research results can be discussed.

The results from the general public, hunters, foresters, and students across all three zones are then presented simultaneously using a rain drop method, which allows the reader to instantly compare groups across space and

differences amongst groups. The results will be examined by section:

- General attitudes toward the wolf
- Attitudes toward hunting-related issues
- Understanding beliefs about wolves and their impact
- Understanding biological facts and the nature of conflict
- Beliefs about wolf-livestock issues

The results of the common ground matrix (CGM) exercise with the 5 interest groups will be presented after discussing the quantitative descriptive results. Additional quantitative data on the smaller sample size of shepherds are explored after these CGM results.

## ***Results of the content analysis***

Since the beginning of the HD project in Croatia there were five major articles solely about the HD project in the printed media (Figure 15). Articles were published in four different newspapers or magazines. Two of the newspapers/magazines were at the national level and two were regional, covering parts of a wolf range in Croatia. The articles consisted of an average of 140 lines of text per article (72 lines to 204 lines) and were written by five different

authors. Photographs of the project director (Dr. Alistair Bath) and/or the site project coordinator (Aleksandra Majić) accompanied two of the five articles. Their names were both mentioned in four of the articles. Four of the five articles also talked about the LCIEE. The most often mentioned interest groups in these articles were hunters, livestock owners, foresters and biologists (all were present in all articles). Less present in the articles but

Figure 15: Example of a newspaper article covering the HD project.

**gorski kotar** PETAK, 2. SRPNJA 1999. 19

ISTRAŽIVAČKI PROJEKT NA PODRUČJU GORSKOG KOTARA, LIKE I DALMACIJE

# LJUDSKA DIMENZIJA U GOSPODARENJU VUKOM

Osnovni cilj istraživanja, što će biti uglavnom provedena anketiranjem pojedinih interesnih skupina i javnosti, bolje je razumijevanje problematike vezane uz vuka, i to spoznavanjem i dokumentiranjem interesa, stavova i vjerovanja o toj šumskoj zvijeri, kao i što bolja učinkovitost gospodarenja vukom

**DELNICE** - Na područja Gorskog kotara, Like i Dalmacije u tijeku su znanstvena istraživanja u sklopu projekta «Ljudska dimenzija u gospodarenju vukom u Hrvatskoj». Inicijator ovog projekta je Memorijalno Sveučilište iz grada St. John's, u kanadskoj provinciji Newfoundland, koje ga provodi u suradnji s Europskom inicijativom za velike zvijeri Svjetskog fonda za prirodu, sa sjedištem u švicarskom mjestu Gland. Voditelj projekta je dr. Alistair Bath, profesor s tog sveučilišta, dok je njegov koordinator za područje naše zemlje Aleksandra Majić, apsolventica zagrebačkog Veterinarskog fakulteta. Osnovni cilj istraživanja, što će biti uglavnom provedeno anketiranjem pojedinih interesnih skupina i javnosti, bolje je razumijevanje problematike vezane uz vuka, i to spoznavanjem i dokumentiranjem interesa, stavova i vjerovanja o toj šumskoj zvijeri, kao i što bolja učinkovitost gospodarenja vukom. Istovremeno, slični projekti provode se u Španjolskoj, Poljskoj i Portugalu, dok su na području Slovenije u tijeku istraživanja o problematiki gospodarenja međvjedom.

### Anketiranje građana i interesnih skupina

Cjelokupno područje na kojem će biti anketirano lokalno stanovništvo i predstavnici interesnih skupina, a to su lovci, šumari, stočari, biolozi, djelatnici Državne uprave za zaštitu prirode i



**Dr. Alistair BATH:** Inicijator velikog istraživačkog projekta potekla je iz Kanade

okoliša, te turistički djelatnici, podijeljeno je u tri zone. Prva, odnosno sjeverna zona obuhvaća Gorski kotar i manji sjeverozapadni dio Like, zatim druga (središnja) zona obuhvaća preostale dijelove Like, a treća (južna) zona Dalmacija. U svakoj od tih zona bit će anketirano, nasumce odabranih, po 400 stanovnika, te predstavnici pojedinih interesnih skupina, iz svih jedinica lokalne samouprave. Anketa, koja je anonimna, bit će na cjelokupnom području okončana tijekom rujna, a 56 pitanja grupirano je u nekoliko zasebnih cjelina. Anketirani će, zaskrutivanjem jednog od nekoliko ponuđenih odgovora, dati svoje mišljenje o problematiki populacije vuka, o poznavanju i gospodarenju, kao i o osobnim iskustvima s tom zvijeri. Značajan set pitanja odnosi se i na moguć-



**Aleksandra MAJIĆ:** Anketom do boljeg razumijevanja za vuka  
Snimila A. KUDIN

nost plaćanja naknade štete stočarima nastale napadima vukova na stoku, te na odobrevanje njihova odstrela.

Voditelj projekta dr. Alistair Bath ima bogato iskustvo u ovakvim istraživanjima jer je prije ovog projekta radio na kontroli vukova u kanadskoj provinciji Yukon, zatim na ispitivanju javnog mišljenja koje je prethodilo povratku vukova na područje Nacionalnog parka Yellowstone (USA), a trenutno vodi projekte ljudske dimenzije u gospodarenju vukom u tri europske zemlje (Poljska, Portugal i Španjolska).

### Sociopolitička iznad biološke naravi

Istaknuo je sljedeće: gospodarenje velikim zvijerima, kakva je i vuk, često je više sociopolitičke, negoli biološ-

ke naravi. Vuk nekim ljudima predstavlja simbol divljine vrijedan zaštite, dok je za druge bezvrijedna i beskorisna zvijer koju treba eliminirati iz Hrvatske. Mnogstvo mitova o tom stvorenju utječe na obje strane gledišta. No da bi se učinkovito gospodarilo vukom u Hrvatskoj, potrebno je razumjeti ljude koji obitavaju u područjima koja su ujedna i stanište vuka. Potrebno je razumjeti njihove interese i probleme i posvetiti im se, znanstveno dokumentirati stavove i vjerovanja različitih interesnih skupina koje su u doticaju s gospodarenjem vukom, te stavove i vjerovanja šire javnosti. Tek nakon što smo razumjeli interese i probleme svih interesnih skupina i javnosti, možemo pristupiti učinkovitom gospodarenju vukom, gospodarenju koje će biti odraz razumijevanja i zalaganja svih zainteresiranih građana.

Rezultati ovog projekta-studije pomoći će boljem razumijevanju i mogućem predviđanju događanja, kako u ostalim dijelovima Europe, tako i boljem razumijevanju i provođenju gospodarenja vukom u Hrvatskoj.

Aleksandra Majić, savjetnica u projektu «Ljudska dimenzija u gospodarenju vukom u Hrvatskoj», napomenula je da su pojedine zone u kojima će biti provedeno anketiranje, definirane prema njihovim biofizikalnim i demografskim karakteristikama, kao i prema gustoći broja ovaca u tim krajevima.

I. TOMAC

still mentioned were the Ministry of Agriculture and Forestry (2/5), Ministry of Environmental Protection and Zoning (4/5), Ministry of Tourism (2/5), and environmentalists (3/5).

In addition to the printed media, the HD project was featured on Croatian national television twice. Near the beginning of the project both Dr. Alistair Bath and Aleksandra Majić were interviewed about the project, its purpose, and the nature of human dimensions in wolf management. The HD project was again featured during the Plitvice meetings of the LCIEE core group where Aleksandra Majić, the site project coordinator, was interviewed and

slides illustrating the results shown on Croatian national television.

Table 9 illustrates the various interest groups and the number of times they were mentioned in the 162 articles. Hunters and livestock owners were mentioned the most within the articles; hunters appeared in 65% of the articles while livestock owners appeared in 61% of the articles. In descending order, Ministry of Environmental Protection and Zoning was mentioned 40% of the time followed by biologists (33%), environmentalists (27%) and foresters (13%). Ministry of Tourism and Ministry of Agriculture and Forestry were mentioned in 9% and 5% of the articles respectively.

**Table 9: Interest groups in newspapers or magazines.**

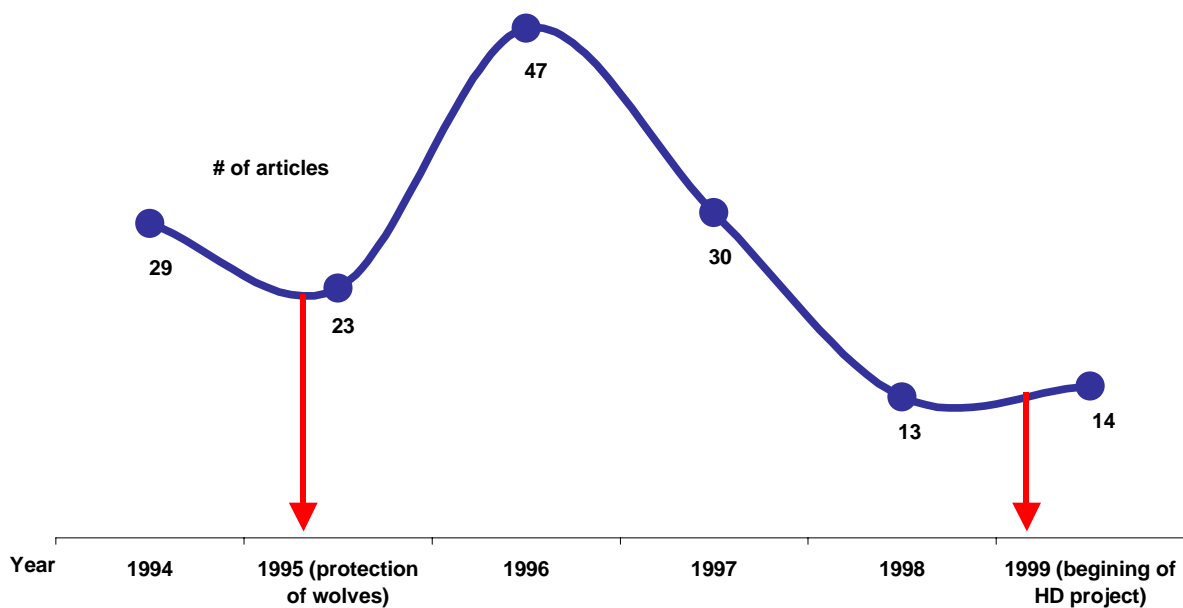
<b>Interest group</b>	<b># of articles the interest group was mentioned in</b>
Hunters	105
Livestock Owners	99
Ministry of Environmental Protection and Zoning	64
Biologists	54
Environmentalist	44
Foresters	21
Tourism	15
Ministry of Agriculture and Forestry	8



The 156 articles examined from 1994 to 1999 were not distributed equally over the six-year time period. The year after the wolf was fully protected in Croatia more than twice the number of articles occurred. After this peak, the number of articles has declined considerably suggesting that

concerns over protection may have died down in the media. A slight increase has been seen in interest in wolf management again after the initiation of the human dimensions in wolf management project (Figure 16).

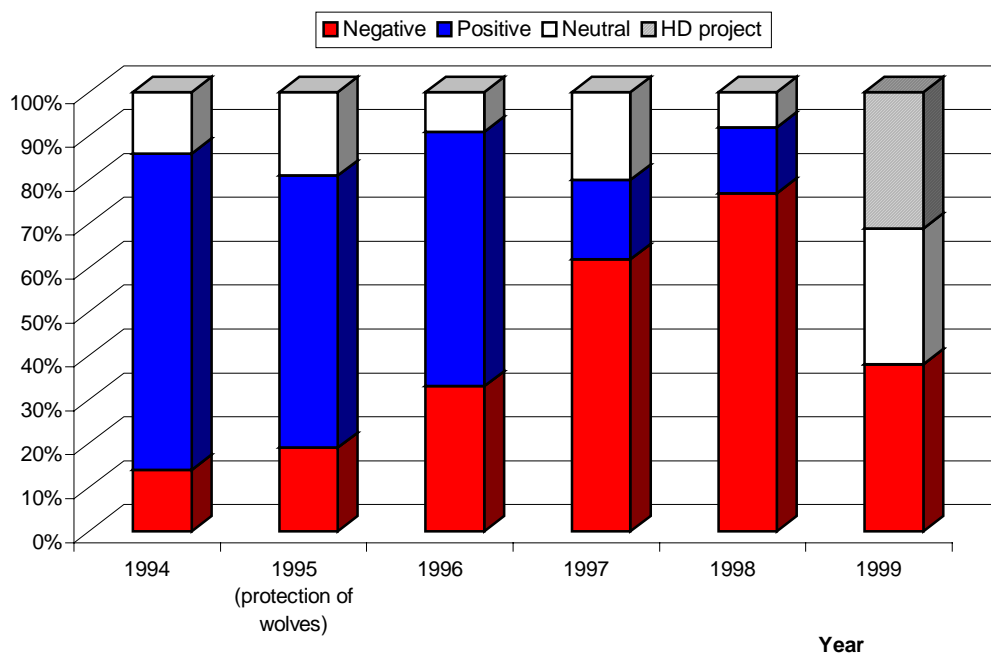
**Figure 16: Number of articles on wolves in Croatian printed media (January 1994 – October 1999).**



Prior to the complete protection of the wolf, public attitudes toward wolves in Croatia, as reflected in the newspapers, were predominantly positive. After wolves became protected, negative attitudes toward wolf articles increased

dramatically. Negative press continued up to the year of the beginning of the HD project when it appears negative attitudes were reduced partly by the HD project; neutral responses seem also to have increased at the same time (Figure 17).

**Figure 17: Attitudes toward wolves in Croatian printed media (January 1994 – October 1999).**



There were 156 articles from 18 different newspapers and magazines analysed.

### ***About the sample***

There were 1209 respondents to the questionnaire from the general public in the three zones. The sample was made up of primarily males. In Gorski kotar, 63% of the respondents were male; in Lika, 60% were males and in Dalmatia there were 57% males. A smaller sample of hunters (n=209) was obtained with most hunters coming from Dalmatia (n=110). In

Gorski kotar and Lika there were 71 and 27 hunters respectively in the sample. There were only three female hunters in the entire hunter sample, one from each zone. Foresters (n=190) were mainly drawn from the forested area of the study zone in Gorski kotar (n=127); in Lika and Dalmatia, there were 41 and 18 foresters respectively in the sample. While there

were more female foresters than hunters, the sample of foresters consists mainly of males, 89% male in Gorski kotar, 98% male in Lika, and 86% male in Dalmatia. These percentages are influenced by the relatively small sample sizes of foresters in each zone. Another key interest group in the study were high school students

(n=339), the future decision-makers in Croatia. Most of the high school students in the sample were female; 69%, 61% and 63% of the students in Gorski kotar, Lika and Dalmatia respectively were female. A breakdown of interest groups by zone and gender can be found in Table 10.

**Table 10: Interest groups by zone and gender.**

Gender	Zone	Statistics	Interest Group				Total
			General Public	Hunters	Foresters	High School Students	
Female	1	Count	150	1	14	86	252
		% within zone	59.5%	.4%	5.6%	34.1%	100.0%
	2	Count	159	1	1	80	241
		% within zone	66.0%	.4%	.4%	33.2%	100.0%
	3	Count	174	1	3	52	242
		% within zone	71.9%	.4%	1.2%	21.5%	100.0%
	<b>Total</b>	Count	483	3	18	218	735
		% within zone	65.7%	.4%	2.4%	29.7%	100.0%
	Male	1	Count	252	70	113	38
% within zone			53.3%	14.8%	23.9%	8.0%	100.0%
2		Count	242	26	41	52	363
		% within zone	66.7%	7.2%	11.3%	14.3%	100.0%
3		Count	232	109	18	31	394
		% within zone	58.9%	27.7%	4.6%	7.9%	100.0%
<b>Total</b>		Count	726	205	172	121	1230
		% within zone	59.0%	16.7%	14.0%	9.8%	100.0%

The mean age of the general public respondents was 50 years old. Approximately 25% of the respondents from the general public were over 64 years old. The mean age of general public

respondents for Gorski kotar (51), Lika (49) and Dalmatia (51) were similar. Table 11 illustrates the age breakdown by interest group and geographic zone.

**Table 11: Interest groups by zone and age.**

Interest Group	Zone		Years				Total	
			14 - 34	35 - 49	50 - 64	65 - 94		
General Public	1	Count	77	89	135	100	401	
		% within zone	19.2%	22.2%	33.7%	24.9%	100.0%	
	2	Count	105	88	100	102	395	
		% within zone	26.6%	22.3%	25.3%	25.8%	100.0%	
	3	Count	80	105	110	105	400	
		% within zone	20.0%	26.3%	27.5%	26.3%	100.0%	
	Total	Count	262	282	345	307	1196	
		% within zone	21.9%	23.6%	28.8%	25.7%	100.0%	
	Hunters	1	Count	11	29	18	4	62
			% within zone	17.7%	46.8%	29.0%	6.5%	100.0%
2		Count	11	11	4	1	27	
		% within zone	40.7%	40.7%	14.8%	3.7%	100.0%	
3		Count	18	51	32	8	109	
		% within zone	16.5%	46.8%	29.4%	7.3%	100.0%	
Total		Count	40	91	54	13	198	
		% within zone	20.2%	46.0%	27.3%	6.6%	100.0%	
Foresters		1	Count	41	55	27	1	124
			% within zone	33.1%	44.4%	21.8%	.8%	100.0%
	2	Count	21	13	5		39	
		% within zone	53.8%	33.3%	12.8%		100.0%	
	3	Count	7	10	4		21	
		% within zone	33.3%	47.6%	19.0%		100.0%	
	Total	Count	69	78	36	1	184	
		% within zone	37.5%	42.4%	19.6%	.5%	100.0%	
	Highschool Children	1	Count					124
			% within zone					100.0%
2		Count					132	
		% within zone					100.0%	
3		Count					83	
		% within zone					100.0%	
Total	Count					339		
	% within zone					100.0%		

Only a small percentage of the general public sample in Gorski kotar (13.5%), Lika (8%) and Dalmatia (11%) hunted in the previous year. A very large majority of residents in all three zones do not hunt. And while most foresters in Gorski kotar had hunted in the previous year, most foresters in Lika (61%) and Dalmatia (67%) did not hunt last year. As expected, none of the high school students in any zone had hunted the previous year, and most hunters had indeed hunted in the previous year. In response to the item: Have you ever seen a live wolf in the wild, it was very interesting to see that most general public, hunters and forester respondents believed, and stated, they had

seen a wolf in the wild (Table 12). While not most students, even a fairly large percentage of high school students, particularly in Dalmatia, claimed they had also seen a wolf. Given the secretive nature of the species and the actual numbers of wolves in Croatia this number seems high indicating a lot of people viewing animals they believe are wolves, or a highly visible wolf population which bodes well for eco-tourism opportunities. This result indicating that many have seen wild wolves is made even more interesting by knowing that most respondents in all groups have seen wolves in captivity (Table 13), thus perhaps contributing to the validity of their earlier statements.

**Table 12: Have you ever seen a live wolf in the wild?**

				Have you ever seen a live wolf in the wild?		
Interest Group	Zone			Responses		Total
				Yes	No	
General Public	1	Count	268	134	402	
		% within zone	66.7%	33.3%	100.0%	
	2	Count	257	142	399	
		% within zone	64.4%	35.6%	100.0%	
	3	Count	237	168	405	
		% within zone	58.5%	41.5%	100.0%	
	Total	Count	762	444	1206	
		% within zone	63.2%	36.8%	100.0%	
Hunters	1	Count	47	24	71	
		% within zone	66.2%	33.8%	100.0%	
	2	Count	20	7	27	
		% within zone	74.1%	25.9%	100.0%	
	3	Count	94	11	105	
		% within zone	89.5%	10.5%	100.0%	
	Total	Count	161	42	203	
		% within zone	79.3%	20.7%	100.0%	
Foresters	1	Count	94	26	120	
		% within zone	78.3%	21.7%	100.0%	
	2	Count	27	11	38	
		% within zone	71.1%	28.9%	100.0%	
	3	Count	14	7	21	
		% within zone	66.7%	33.3%	100.0%	
	Total	Count	135	44	179	
		% within zone	75.4%	24.6%	100.0%	
Highschool Students	1	Count	22	102	124	
		% within zone	17.7%	82.3%	100.0%	
	2	Count	35	97	132	
		% within zone	26.5%	73.5%	100.0%	
	3	Count	31	52	83	
		% within zone	37.3%	62.7%	100.0%	
	Total	Count	88	251	339	
		% within zone	26.0%	74.0%	100.0%	

**Table 13: Have you ever seen a wolf in captivity?**

				Have you ever seen a wolf in captivity?		
Interest Group	Zone			Responses		Total
				Yes	No	
General Public	1	Count	317	83	400	
		% within zone	79.3%	20.8%	100.0%	
	2	Count	310	87	397	
		% within zone	78.1%	21.9%	100.0%	
	3	Count	302	103	405	
		% within zone	74.6%	25.4%	100.0%	
	Total	Count	929	273	1202	
		% within zone	77.3%	22.7%	100.0%	
	Hunters	1	Count	63	8	71
			% within zone	88.7%	11.3%	100.0%
2		Count	22	5	27	
		% within zone	81.5%	18.5%	100.0%	
3		Count	88	16	104	
		% within zone	84.6%	15.4%	100.0%	
Total		Count	173	29	202	
		% within zone	85.6%	14.4%	100.0%	
Foresters		1	Count	110	10	120
			% within zone	91.7%	8.3%	100.0%
	2	Count	33	5	38	
		% within zone	86.8%	13.2%	100.0%	
	3	Count	20	1	21	
		% within zone	95.2%	4.8%	100.0%	
	Total	Count	163	16	179	
		% within zone	91.1%	8.9%	100.0%	
	Highschool students	1	Count	86	38	124
			% within zone	69.4%	30.6%	100.0%
2		Count	74	57	131	
		% within zone	56.5%	43.5%	100.0%	
3		Count	52	31	83	
		% within zone	62.7%	37.3%	100.0%	
Total		Count	212	126	338	
		% within zone	62.7%	37.3%	100.0%	

Two items asked respondents about their interest in the wolf management issue in

Croatia. The first item asked respondents about their level of importance of keeping

up to date with the issue of wolf management in Croatia. This item was used to assess the interest by various interest groups in the issue; thus it provides managers, willing to communicate messages about wolf management, data about what groups over what geographical space are most receptive to receiving those messages. Table 14 presents the results using a ten-point scale ranging from not important (1) to extremely important (10) to the item: How important is it to you that you keep up to date with the issue of wolf management in Croatia? More than 50% of all general public respondents indicated 8, 9 or 10 on the scale; Dalmatia residents expressed the strongest interest in keeping up to date with the issue with more than 45% expressing extremely important (10) compared to approximately 34% of residents in Gorski kotar and Lika. Managers should concentrate on getting information especially out to the general public in Dalmatia. The general public on average expressed a stronger interest than hunters, students or foresters. A relatively small percentage of respondents in all groups stated no importance (1). The highest amount of interest from all groups seemed to be from those living in Gorski kotar and Dalmatia. Only the high school

students in Lika had higher scores than the other groups.

The interest in the wolf management issue by residents of Dalmatia is also indicated in their response to: how important is the issue of wolf management in Croatia to you personally? More than 30% of Dalmatia general public residents stated extremely important (10) compared to 27% and 18% of residents in Gorski kotar and Lika respectively (Table 15). While hunters in Gorski kotar had the highest percentage expressing extremely important (10) compared to other hunters, a much larger percentage of Lika hunters (64%) stated 8, 9 or 10 along the importance scale compared to 48% in Gorski kotar.

These first few variables (gender, age, hunting participation, whether residents have viewed a wolf, and importance of the issue) set the stage for a more detailed discussion of resident and interest group responses to attitudinal and belief items. From these first few items we have already learned a lot about the characteristics of the sample.



**Table 14: On a scale from 1 to 10, how important is the issue of wolf management in Croatia to you personally?**

Interest Group		Responses										Total	
		Not important	2	3	4	5	6	7	8	9	Extremely important		
General Public	Zone 1	Count	73	8	25	12	66	25	27	36	21	108	401
		% within zone	18.2%	2.0%	6.2%	3.0%	16.5%	6.2%	6.7%	9.0%	5.2%	26.9%	100.0%
	Zone 2	Count	52	26	31	14	68	26	34	45	25	70	391
		% within zone	13.3%	6.6%	7.9%	3.6%	17.4%	6.6%	8.7%	11.5%	6.4%	17.9%	100.0%
	Zone 3	Count	93	18	18	23	40	24	11	34	21	122	404
		% within zone	23.0%	4.5%	4.5%	5.7%	9.9%	5.9%	2.7%	8.4%	5.2%	30.2%	100.0%
<b>Total</b>		Count	218	52	74	49	174	75	72	115	67	300	1196
		% within zone	18.2%	4.3%	6.2%	4.1%	14.5%	6.3%	6.0%	9.6%	5.6%	25.1%	100.0%
Hunters	Zone 1	Count	8	2	3	2	11	9	2	5	2	27	71
		% within zone	11.3%	2.8%	4.2%	2.8%	15.5%	12.7%	2.8%	7.0%	2.8%	38.0%	100.0%
	Zone 2	Count	6		1		3			8	1	8	27
		% within zone	22.2%		3.7%		11.1%			29.6%	3.7%	29.6%	100.0%
	Zone 3	Count	17	6	9	6	14	6	6	10	4	25	103
		% within zone	16.5%	5.8%	8.7%	5.8%	13.6%	5.8%	5.8%	9.7%	3.9%	24.3%	100.0%
<b>Total</b>		Count	31	8	13	8	28	15	8	23	7	60	201
		% within zone	15.4%	4.0%	6.5%	4.0%	13.9%	7.5%	4.0%	11.4%	3.5%	29.9%	100.0%
Foresters	Zone 1	Count	4	1	3	5	22	13	11	22	8	32	121
		% within zone	3.3%	.8%	2.5%	4.1%	18.2%	10.7%	9.1%	18.2%	6.6%	26.4%	100.0%
	Zone 2	Count	3	5	2	2	5	4	3	4	1	8	37
		% within zone	8.1%	13.5%	5.4%	5.4%	13.5%	10.8%	8.1%	10.8%	2.7%	21.6%	100.0%
	Zone 3	Count	1	1		1	6	6	2	1		3	21
		% within zone	4.8%	4.8%		4.8%	28.6%	28.6%	9.5%	4.8%		14.3%	100.0%
<b>Total</b>		Count	8	7	5	8	33	23	16	27	9	43	179
		% within zone	4.5%	3.9%	2.8%	4.5%	18.4%	12.8%	8.9%	15.1%	5.0%	24.0%	100.0%
High School Students	Zone 1	Count	7	1	1	11	35	18	8	16	6	19	122
		% within zone	5.7%	.8%	.8%	9.0%	28.7%	14.8%	6.6%	13.1%	4.9%	15.6%	100.0%
	Zone 2	Count	12	3	5	2	26	9	13	15	9	33	127
		% within zone	9.4%	2.4%	3.9%	1.6%	20.5%	7.1%	10.2%	11.8%	7.1%	26.0%	100.0%
	Zone 3	Count	3	2	1	5	20	12	14	12	6	7	82
		% within zone	3.7%	2.4%	1.2%	6.1%	24.4%	14.6%	17.1%	14.6%	7.3%	8.5%	100.0%
<b>Total</b>		Count	22	6	7	18	81	39	35	43	21	59	331
		% within zone	6.6%	1.8%	2.1%	5.4%	24.5%	11.8%	10.6%	13.0%	6.3%	17.8%	100.0%

**Table 15: On a scale from 1 to 10, how important is it to you that you keep up to date with the issue of wolf management in Croatia?**

Interest Group	Zone		Responses										Total
			Not important	2	3	4	5	6	7	8	9	Extremely important	
General Public	1	Count	57	12	18	12	46	28	28	38	25	137	401
		% within zone	14.2%	3.0%	4.5%	3.0%	11%	7.0%	7.0%	9.5%	6.2%	34.2%	100.0%
	2	Count	41	16	19	10	50	28	31	44	22	131	392
		% within zone	10.5%	4.1%	4.8%	2.6%	13%	7.1%	7.9%	11.2%	5.6%	33.4%	100.0%
	3	Count	61	14	16	7	41	20	14	32	17	183	405
		% within zone	15.1%	3.5%	4.0%	1.7%	10%	4.9%	3.5%	7.9%	4.2%	45.2%	100.0%
Total	Count	159	42	53	29	137	76	73	114	64	451	1198	
	% within zone	13.3%	3.5%	4.4%	2.4%	11%	6.3%	6.1%	9.5%	5.3%	37.6%	100.0%	
Hunters	1	Count	7	1	3	2	17	8	3	6	1	23	71
		% within zone	9.9%	1.4%	4.2%	2.8%	24%	11%	4.2%	8.5%	1.4%	32.4%	100.0%
	2	Count	5		1		1	2	1	9	3	5	27
		% within zone	18.5%		3.7%		3.7%	7.4%	3.7%	33.3%	11.1%	18.5%	100.0%
	3	Count	13	7	8	6	12	6	6	6	10	28	102
		% within zone	12.7%	6.9%	7.8%	5.9%	12%	5.9%	5.9%	5.9%	9.8%	27.5%	100.0%
Total	Count	25	8	12	8	30	16	10	21	14	56	200	
	% within zone	12.5%	4.0%	6.0%	4.0%	15%	8.0%	5.0%	10.5%	7.0%	28.0%	100.0%	
Foresters	1	Count	9	1	4	7	22	14	13	19	7	25	121
		% within zone	7.4%	.8%	3.3%	5.8%	18%	12%	11%	15.7%	5.8%	20.7%	100.0%
	2	Count	2	3	4	2	8	4	2	3	2	6	36
		% within zone	5.6%	8.3%	11%	5.6%	22%	11%	5.6%	8.3%	5.6%	16.7%	100.0%
	3	Count	2			3	6	3	2	1		4	21
		% within zone	9.5%			14.3%	29%	14%	9.5%	4.8%		19.0%	100.0%
Total	Count	13	4	8	12	36	21	17	23	9	35	178	
	% within zone	7.3%	2.2%	4.5%	6.7%	20%	12%	9.6%	12.9%	5.1%	19.7%	100.0%	
High School Students	1	Count	6		11	10	25	15	8	15	7	25	122
		% within zone	4.9%		9.0%	8.2%	20%	12%	6.6%	12.3%	5.7%	20.5%	100.0%
	2	Count	17	2	5	5	9	9	10	15	14	39	125
		% within zone	13.6%	1.6%	4.0%	4.0%	7.2%	7.2%	8.0%	12.0%	11.2%	31.2%	100.0%
	3	Count	6	5	5	5	16	7	6	14	8	10	82
		% within zone	7.3%	6.1%	6.1%	6.1%	20%	8.5%	7.3%	17.1%	9.8%	12.2%	100.0%
Total	Count	29	7	21	20	50	31	24	44	29	74	329	
	% within zone	8.8%	2.1%	6.4%	6.1%	15%	9.4%	7.3%	13.4%	8.8%	22.5%	100.0%	

## ***Attitudes toward the wolf***

Fishbein and Ajzen (1975) defined attitude as “a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object.” Attitudes have been conceptualized further into four main components that have been adapted for this study:

- Affective – feelings of liking or disliking of the wolf
- Cognitive – beliefs about the wolf that may be true or not true
- Behavioral intention – a statement of how one would behave in a certain situation (eg. Willingness to view a wolf)
- Behavior – overt or actual behavior (eg. purchased a trip to view wolves) and verbal behavior (what someone states they did).

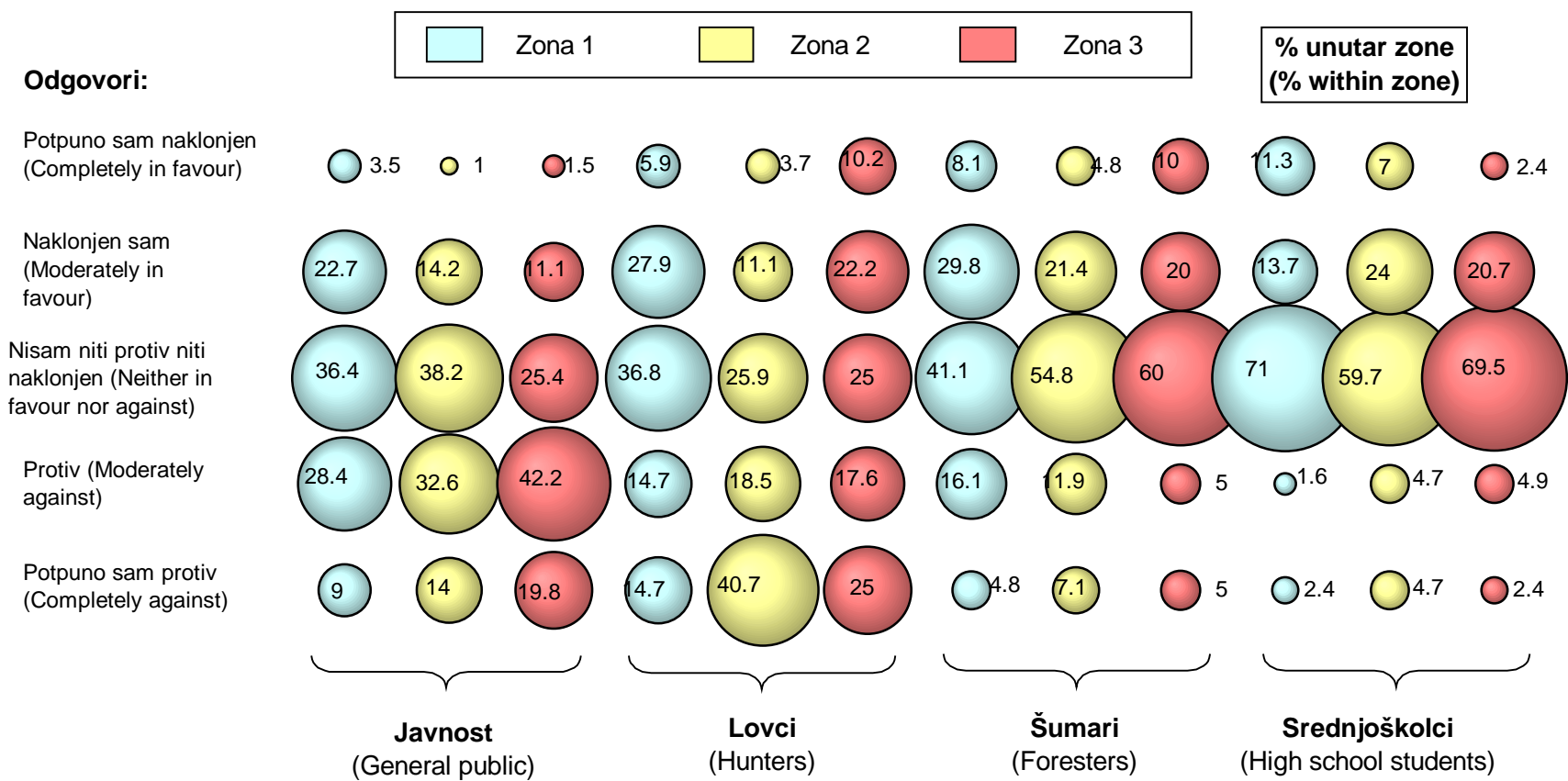
The different sections of the questionnaire attempt to address each component of attitude. In this section, affective aspects of attitude are discussed.

Results in this section and subsequent sections are presented in coloured figures using bubble charts. The circles are proportional to the percentage stated by

respondents for that group and region. By studying the same colour across groups (general public, hunters, foresters, and high school students), it is possible to examine how various interest groups vary in their attitudes and beliefs across the same zone. Interest groups and the general public may also differ though in their attitudes and beliefs over space or in this case over the three zones, Gorski kotar, Lika, and Dalmatia. Thus it is possible to identify differences within an interest group or the general public by examining the three colours across the same group. By understanding how attitudes and beliefs vary across space and group, more effective targeting of educational messages are possible. In addition, such information provides managers an indication of support or opposition for certain management practices by area, thus allowing for flexibility in management options by area.

Perhaps what is most striking in examining the responses to the item: “Which of the following best describes your feelings toward wolves” is the huge amount of neutral responses (neither like nor dislike wolves) from high school students in all three zones (Figure 18). In contrast to

**Figure 18: Koji od slijedećih odgovora najbolje opisuje Vaše osjećaje prema vuku? (Which of the following best describes your feelings toward wolves?)**



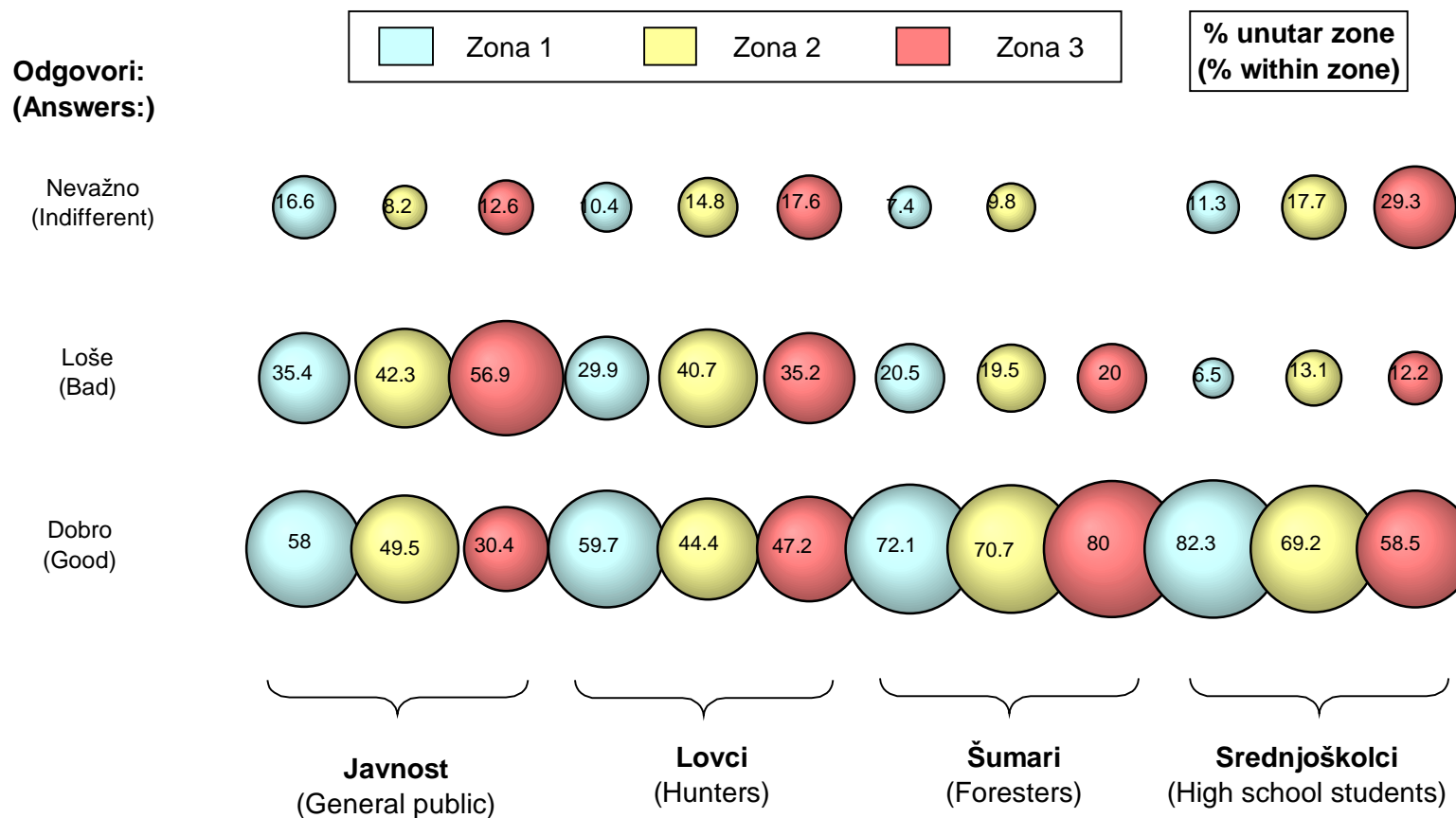
results seen in North America and in other parts of Europe which often indicate a strong positive feeling from students or a polarized viewpoint (strong liking and strong disliking with few neutral) toward wolves, most Croatian students expressed a neutral attitude initially toward the animal. Such a large number of neutral responses could be influenced by an awareness campaign. This must be balanced however with the understanding of importance of the issue and lack of interest by some students to stay informed about the issue. Attitudes of the general public did differ across the three zones with more positive attitudes seen in Gorski kotar than in Dalmatia. Hunters' attitudes were also not uniform across all three zones; approximately 41% of Lika hunters expressed a strong dislike toward wolves compared to only 15% and 25% of their Gorski kotar and Dalmatia colleagues respectively.

And while students in all three zones expressed neutral feelings toward wolves when asked about their liking or disliking of the animal, when asked whether to have wolves in Croatia was good, bad or indifferent, most expressed a positive response to having them in Croatia (Figure 19). Most general public residents in

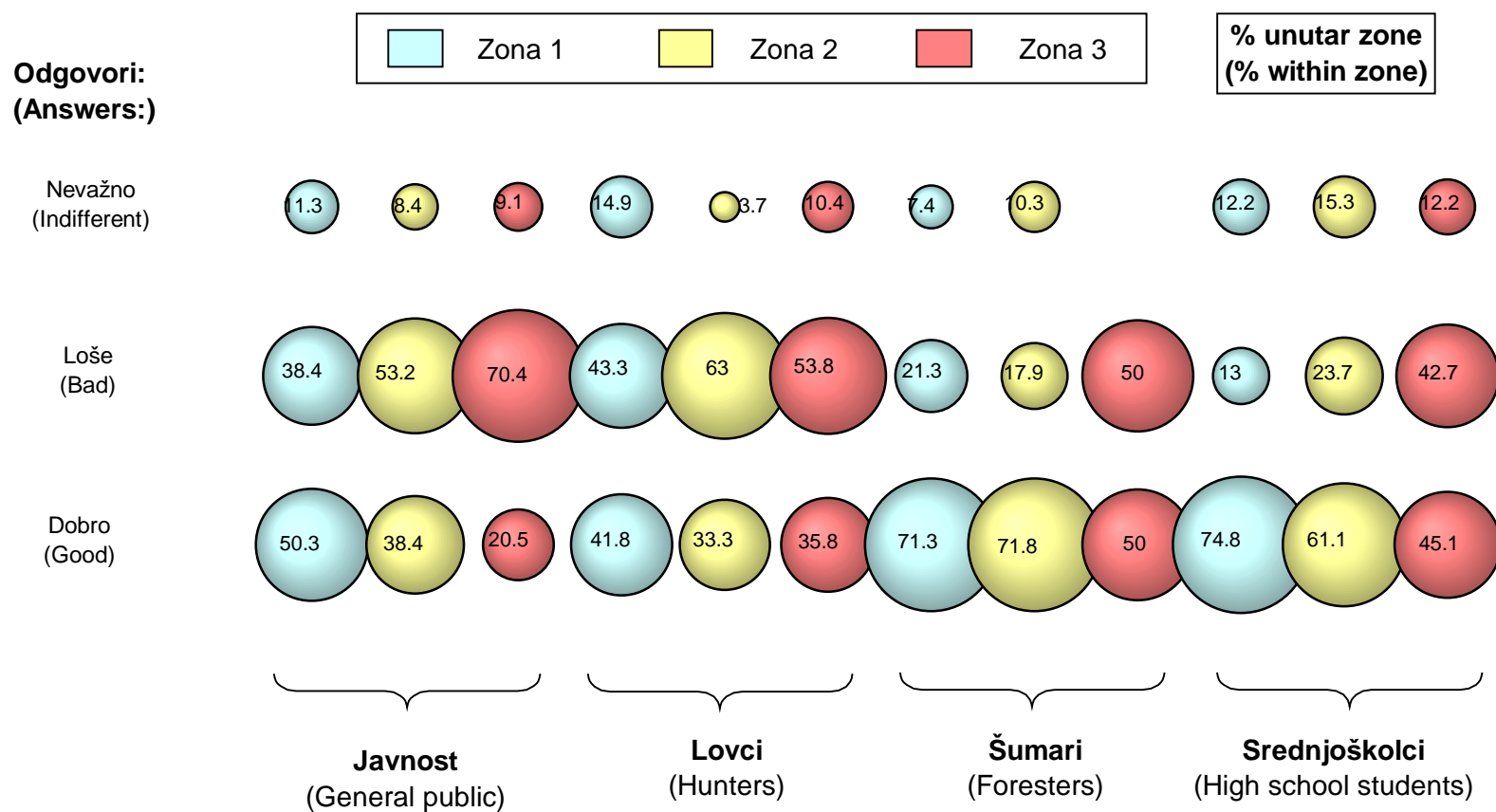
Gorski kotar and Lika, most hunters, foresters, and high school students believe it is good to have wolves in Croatia. Most general public residents in Dalmatia (57%) believe having wolves in Dalmatia is bad. When asked about the presence of wolves within their own region, feelings became more negative toward wolves. This change in attitude, described as the NIMBY (Not in my backyard) syndrome, was apparent to some extent for all interest groups. Negative attitudes toward wolves are strongest in Dalmatia where more than 70% of the general public believed having wolves in the region is bad. And while students remained positive toward wolves in all three zones, in Dalmatia only 2% separated those students who were positive and negative. These results suggest that respondents who are neutral or only slightly positive toward wolves can be influenced relatively easily when forced to think about wolf management "a little closer to home". Figure 20 illustrates quite clearly that there are differences within the same group across the regions and between groups across the same zone.

The majority of respondents in most groups and in most regions agreed or strongly agreed that it is important to maintain wolf populations in Croatia for

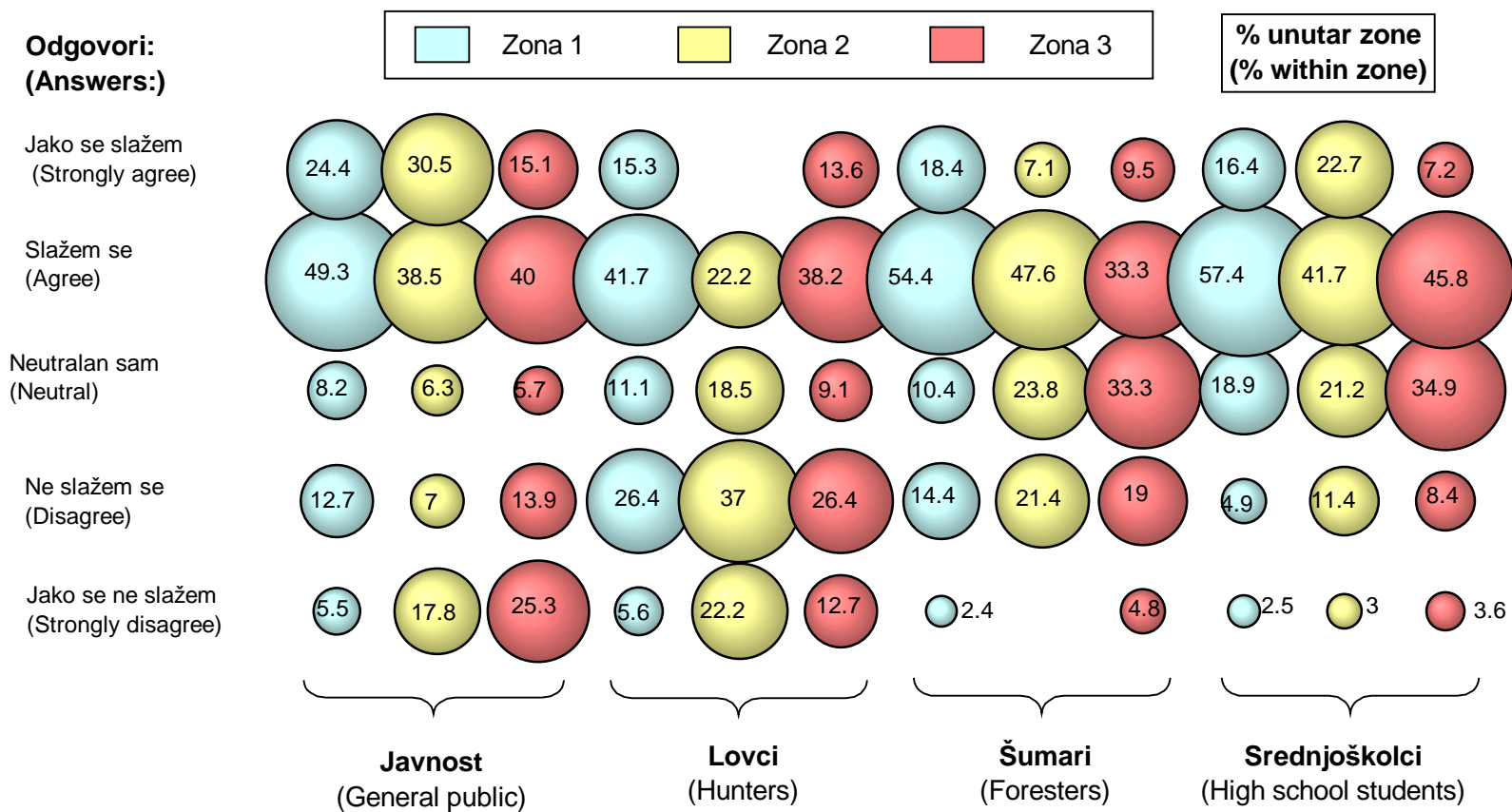
**Figure 19: Imati vukove u Hrvatskoj je: (To have wolves in Croatia is:)**



**Figure 20: Imati vukove u području Gorskog kotara / Like / Dalmacije je: (To have wolves in Gorski kotar / Lika / Dalmatia is:)**



**Figure 21: Važno je održati populaciju vukova u Hrvatskoj zato da bi buduće generacije mogle uživati u njima. (It is important to maintain wolf populations in Croatia so that future generations can enjoy them.)**





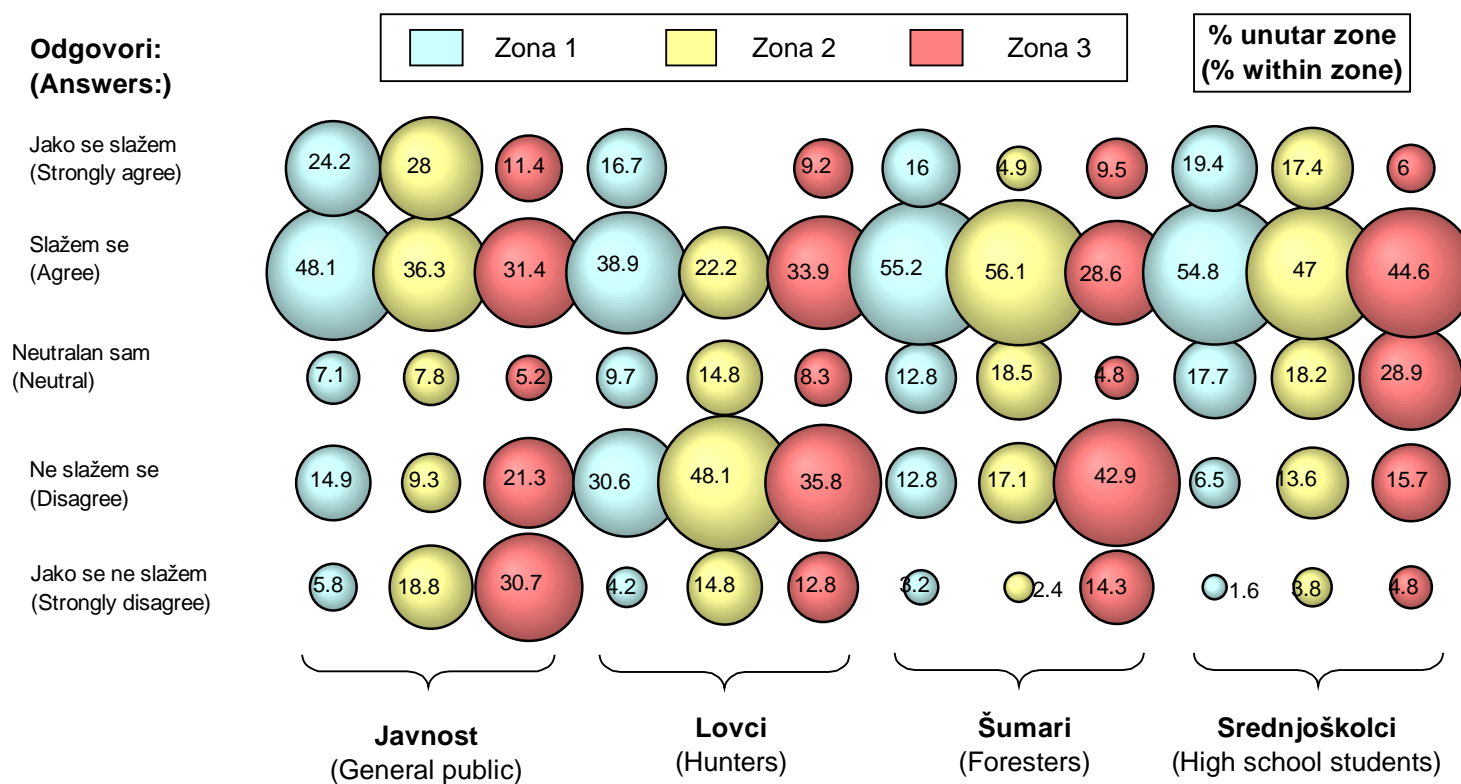
future generations (Figure 21). The strongest support for wolves clearly exists in Gorski kotar where approximately 74% of the general public residents, foresters, and high school students agreed or strongly agreed with the statement: it is important to maintain wolf populations in Croatia for future generations. The majority of hunters in Gorski kotar (57%) also supported maintaining wolves for future generations. The value of wolves for future generations may be important enough to support having wolves in Croatia and to move away from a neutral or indifferent attitude. In terms of developing a persuasive communication message, maintaining wolves for future generations (basically so children and grandchildren have an opportunity to know that wolves exist in Croatia) is a strong message. Individuals opposed to wolves will have difficulty developing a counter-argument that it is not important for children or grandchildren to have the opportunity to know wolves exist in Croatia. Such a message and argument could not be won in a public debate. Those in favor of wolf conservation need to look for this type of message to develop their communication campaign around. Even in Dalmatia where attitudes are not as positive, most respondents supported

maintaining wolves for future generations in Croatia. The only group that opposed the statement with a majority was Lika hunters; nearly 60% disagreed or strongly disagreed with maintaining wolves for future generations in Croatia.

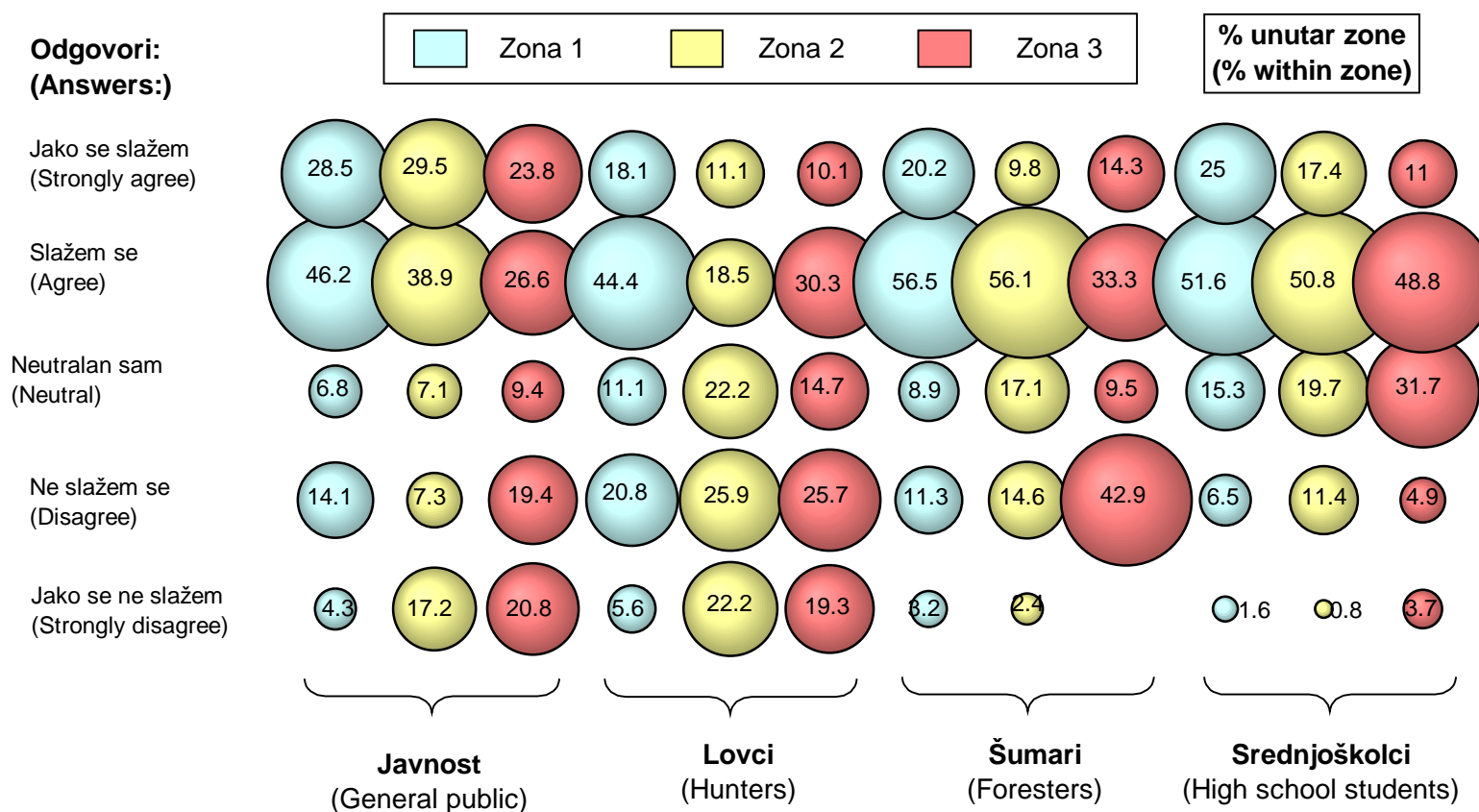
In contrast to an earlier item asking respondents to think about wolf management within their own region that produced more negative attitudes toward wolves, attitudes toward maintaining wolf populations within their own region for future generations in most cases still was supported by most respondents (Figure 22). The most noticeable changes were with general public residents in Dalmatia who became considerably negative. Hunters in Lika, and hunters and foresters in Dalmatia became more negative and expressed a lack of support with maintaining wolves for future generations within their own region.

The general public residents in all provinces including Dalmatia, supported the statement: it is important to have healthy populations of wolves within their respective regions (Figure 23). The strength of that support, however, differed among the general public residents considerably; in Gorski kotar 75% of the

**Figure 22: Važno je održati populacije vukova u području Gorskog kotara / Like / Dalmacije, zato da bi buduće generacije mogle uživati u njima. (It is important to maintain wolf populations in region of Gorski kotar / Lika / Dalmatia so that future generations can enjoy them.)**



**Figure 23: Važno je imati zdravu populaciju vukova u području Gorskog kotara / Like / Dalmacije. (It is important to have healthy populations of wolves in region of Gorski kotar / Lika / Dalmatia.)**



general public supported the statement, 68% of residents in Lika believed it was important to have healthy populations of wolves within their province, and only 50% of Dalmatian residents believed the same. Attitudes of hunters differed significantly across the three regions; in Gorski kotar 63% of hunters agreed or strongly agreed that healthy populations of wolves should exist within Gorski kotar. In contrast, only 30% and 40% of the hunters in Lika and Dalmatia respectively agreed or strongly agreed with the statement. Such variability in responses within a single interest group (hunters) clearly indicates the need for different communication efforts, and possibly different management practices across space. The results also demonstrate the need to identify and document attitudes across space, and not assume that a hunter is a hunter regardless of location in terms of their attitudes toward wolves and wolf management.

The results from the next item, “We should assure that future generations have an abundant wolf population”, highlights the importance of choosing the correct words in conveying a message. Previous items had indicated some support for wolves for future generations and some

support for a healthy or viable population, as well as differences in support across the various interest groups and the general public in the three regions. The majority of general public residents in Gorski kotar (60%), Lika (70%) and Dalmatia (76%) strongly disagreed or disagreed that there should be an abundant population of wolves for future generations (Figure 24). It will be important to explore, possibly through a focus group, how many wolves the public perceives as “abundant” as well as how many wolves are perceived as “a healthy or viable population”. While biologists may have an idea of the number of wolves that would constitute a healthy population of wolves able to sustain itself for future generations, the public may see this number as an abundant population. It will be important to explain this concept carefully. On a positive note, a large percentage of respondents in all interest groups support a healthy wolf population, and share a willingness to ensure wolves do exist for future generations. The challenge will be defining both socially and biophysically the number of wolves that constitute a healthy population able to sustain itself for future generations, and not a population number perceived as abundant by the Croatian public.

**Figure 24: Budućim generacijama moramo osigurati izdašnu populaciju vukova. (We should assure that future generations have an abundant wolf population.)**

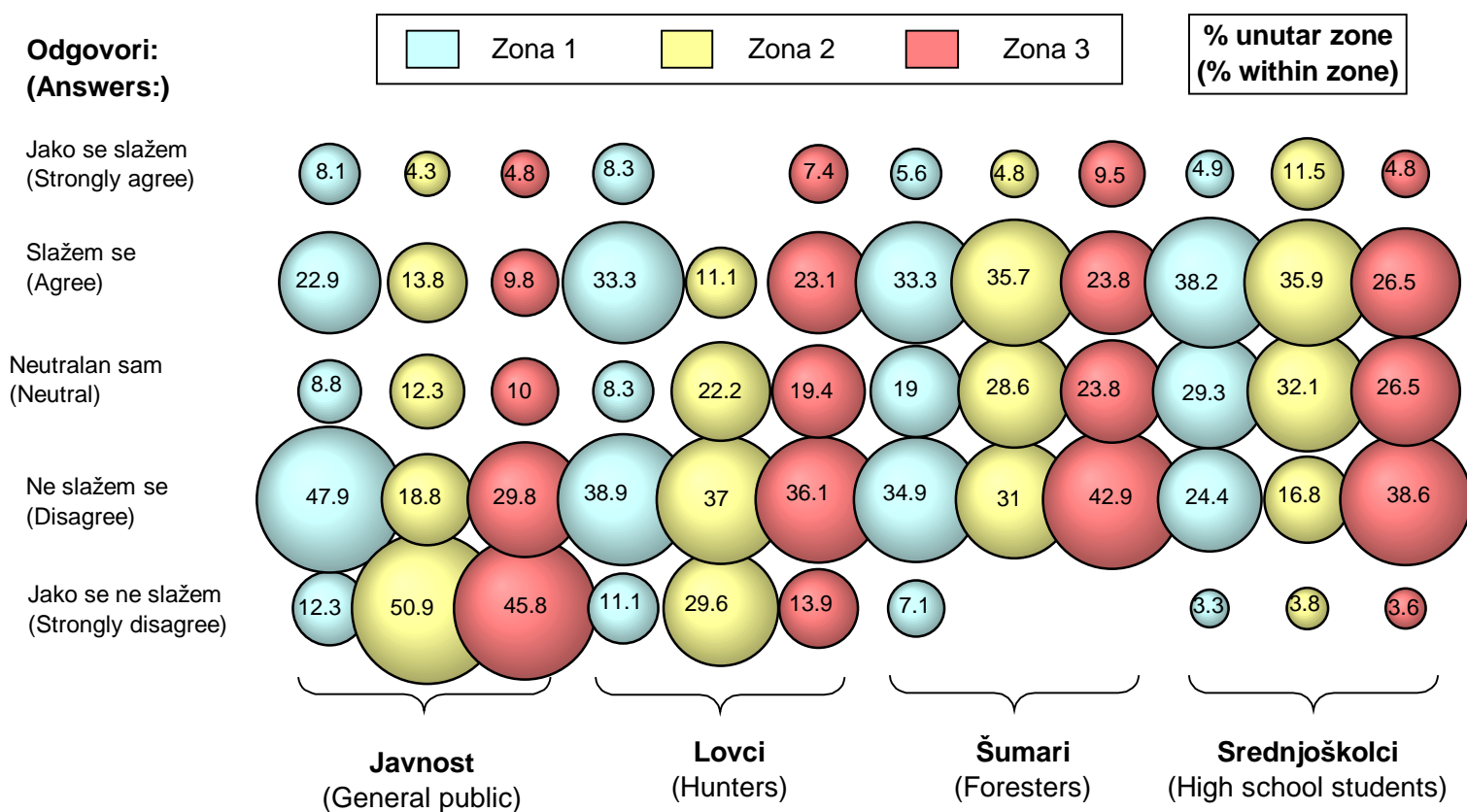
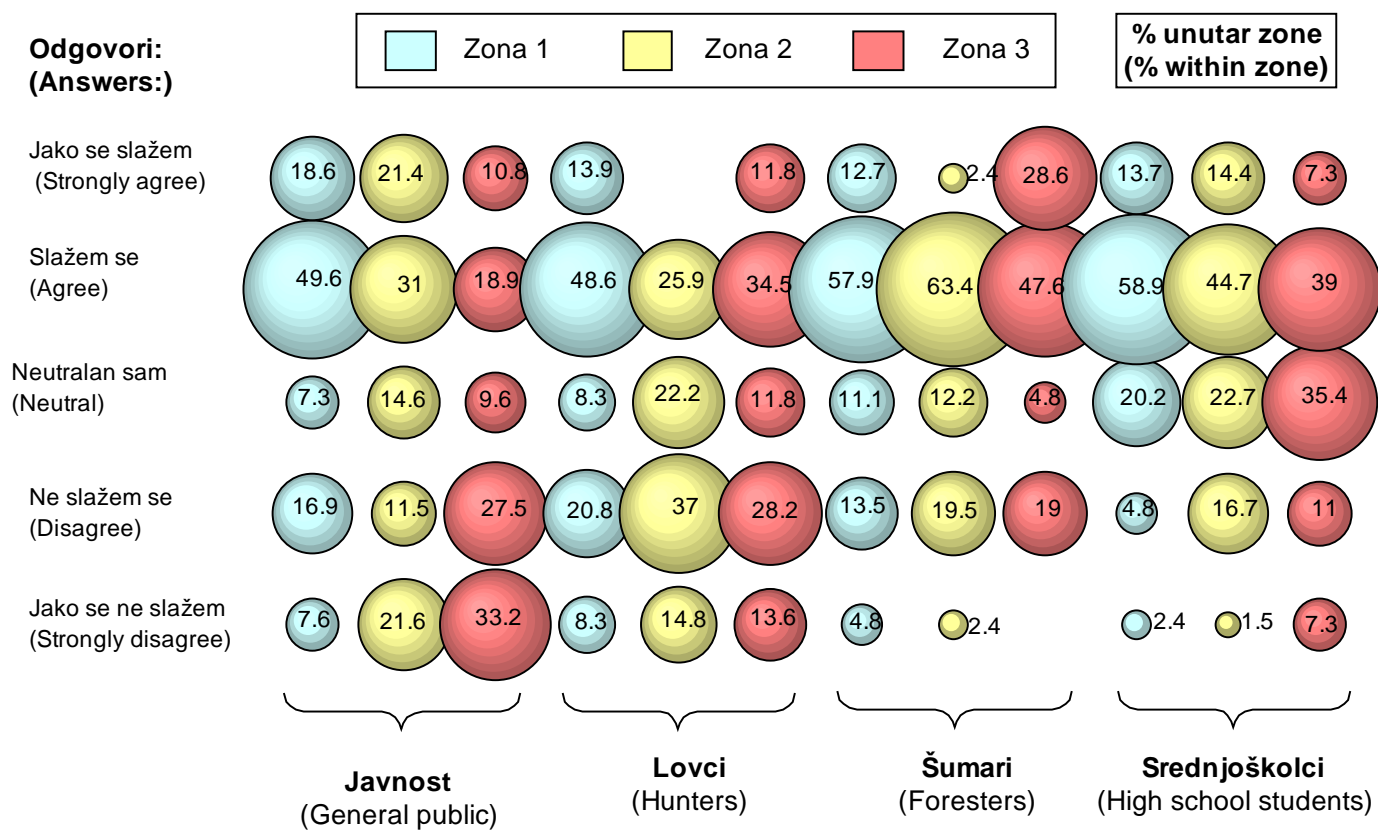


Figure 25 presents the results to the item: “Whether or not I have the opportunity to see a wolf, it is important for me to know that they exist in Gorski kotar/ Lika/ Dalmatia.” In Gorski kotar, an overwhelming 68% agreed or strongly agreed with this statement; only 25% disagreed. In Lika, residents were also positive toward wolves; most residents (53%) agreed or strongly agreed with the statement; 33% indicated strongly disagree or disagree. The attitudes in Dalmatia were quite different. Only 30% of residents in Dalmatia agreed or strongly agreed that it was important to know that wolves exist within their province; most residents (61%) disagreed or strongly disagreed with the statement. Most of the other interest groups within various zones held positive attitudes stating that whether or not they had the opportunity to see a wolf that it was important to know they exist within their region; the one exception were hunters in Lika. The general positive attitudes by most groups toward this item do have interesting communication implications. This suggests that from a communication campaign perspective once again a value persuasive message emphasizing the existence value of the wolf is important and would gain support with many sectors of the public. Such

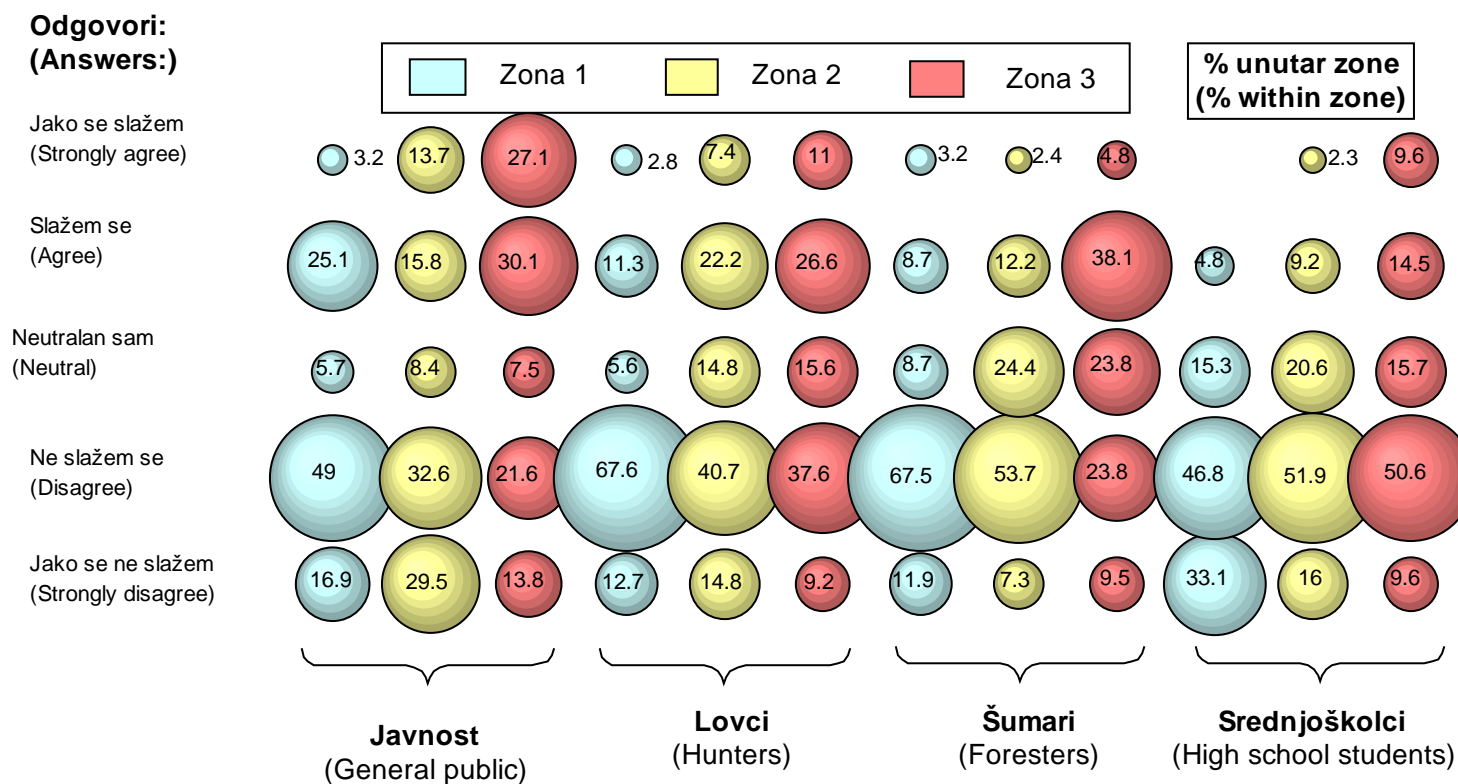
value messages may be as important, if not more, in influencing attitudes than factual knowledge messages.

Additional attitudinal items explored the importance of having wolves within the region if they existed in other parts of Croatia and if they existed in other parts of Europe. Two items worded in the negative may have lead to some difficulty of interpretation by respondents. Most general public residents in Gorski kotar (66%) and Lika (62%) believed it was still important to have wolves in their region even if they existed in abundant populations in other parts of Croatia. Dalmatian residents were less positive (35%) than the publics in the other two zones (Figure 26). All other groups were very positive; approximately 80% of hunters and high school students in Gorski kotar indicated their support for wolves within their own region even if wolves existed in other parts of Croatia. When asked about whether it was still necessary to have wolves in Croatia if healthy populations existed in other parts of Europe, the majority of respondents in all groups and across all zones (including the general public in Dalmatia) stated that it was still necessary to have wolves in

**Figure 25: Bilo da bi imao priliku vidjeti vuka ili ne, važno mi je da oni postoje u području Gorskog kotara / Like / Dalmacije. (Whether or not I would get to see a wolf, it is important to me that they exist in region of Gorski kotar / Lika / Dalmatia.)**

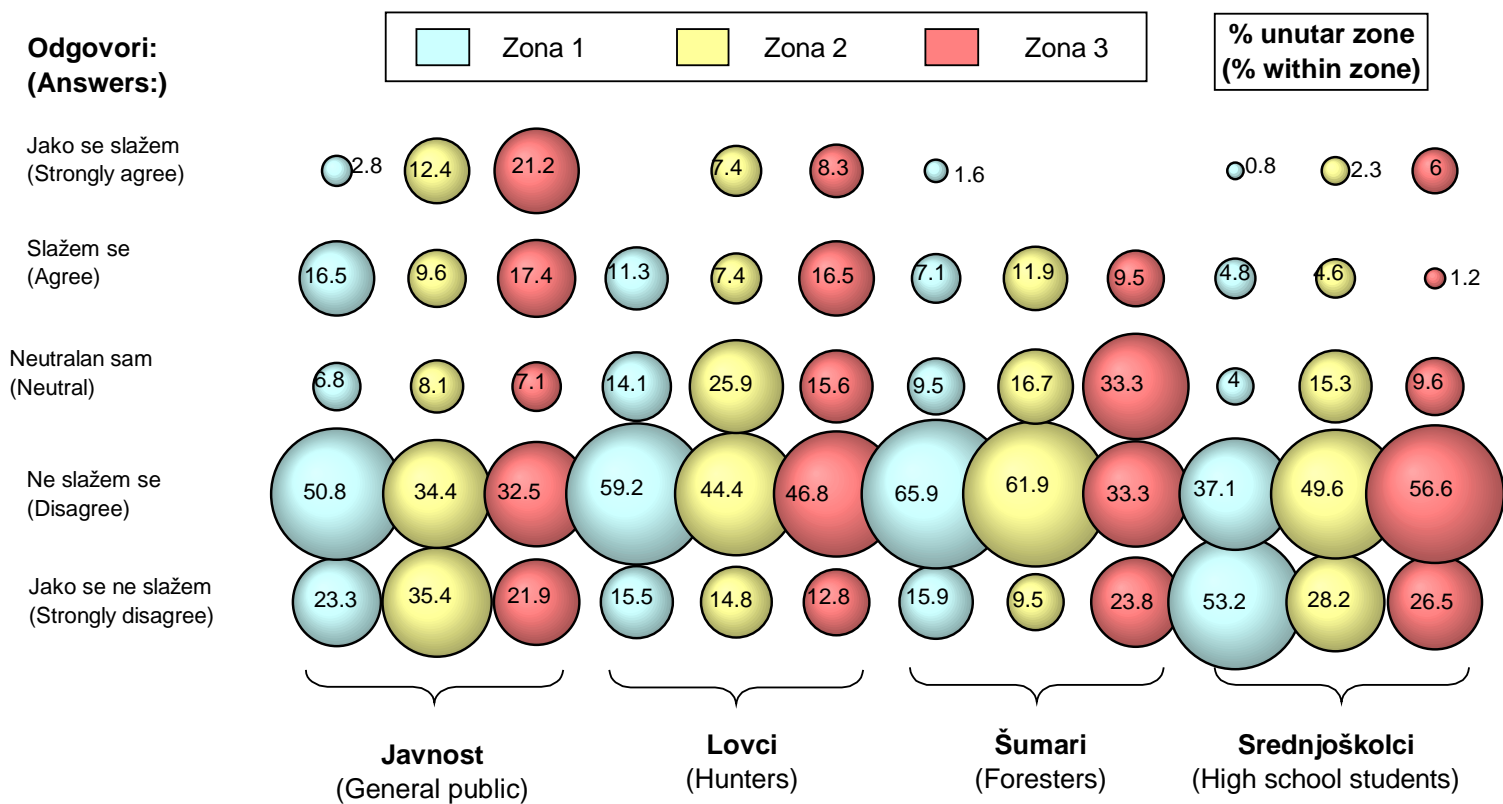


**Figure 26: Nije potrebno imati vukove u području Gorskog kotara / Like / Dalmacije, zato što izdašna populacija vukova već postoji u drugim dijelovima Hrvatske. (It is unnecessary to have wolves in region of Gorski kotar / Lika / Dalmatia because abundant populations of wolves already exist in other parts of Croatia.)**





**Figure 27: Nije potrebno imati vukove u Hrvatskoj zato što izdašne populacije vukova već postoje u drugim europskim zemljama. (It is unnecessary to have wolves in Croatia because abundant populations already exist in other European countries.)**



Croatia (Figure 27). From a communication perspective, there may be another value persuasive message that could be developed here that contains a national pride value in it. It seems that

having wolves in Croatia and indeed within the region (in most cases) is important whether or not wolves exist elsewhere in Europe or in other parts of Croatia.

### ***Attitudes toward hunting related issues***

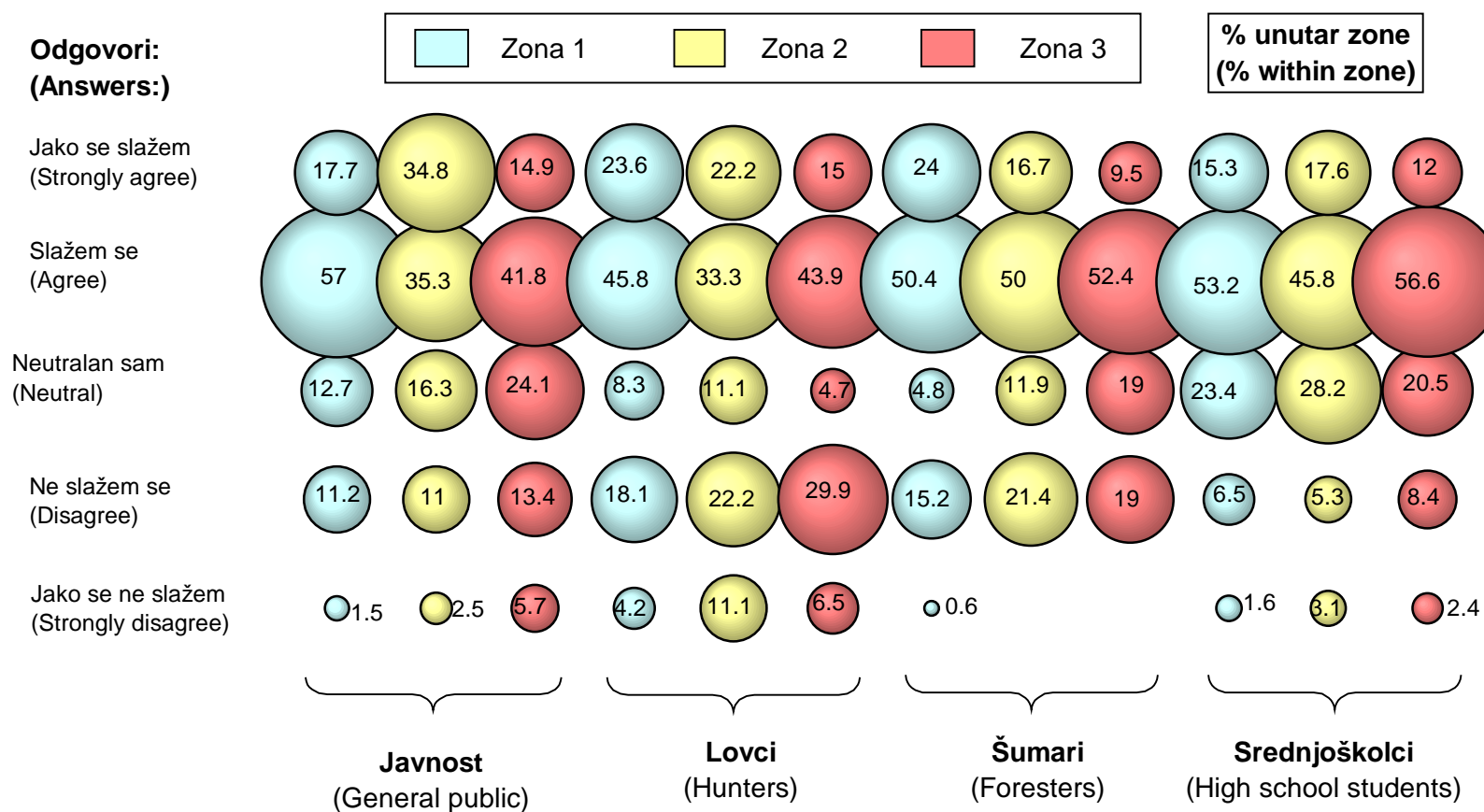
The impact wolves have on ungulate numbers and hunting opportunities is often an argument that surfaces when debating forms of management of the wolf. While in Yellowstone National Park during discussions of wolf reintroduction, the issue was often mentioned, most hunters and the majority of the statewide general publics were not concerned about the impacts wolves might have on ungulates and hunting opportunities at all (Bath and Buchanan 1989). To examine whether the same was true in Croatia several items were used to assess attitudes related to wolves and hunting.

In response to the item: "Wolves have a considerable impact on large game", most respondents in all interest groups and the general public across all zones agreed or strongly agreed. Percentages of agreement ranged from a high of 75% from the general public in Gorski kotar, who remain very positive toward wolves, to a low of

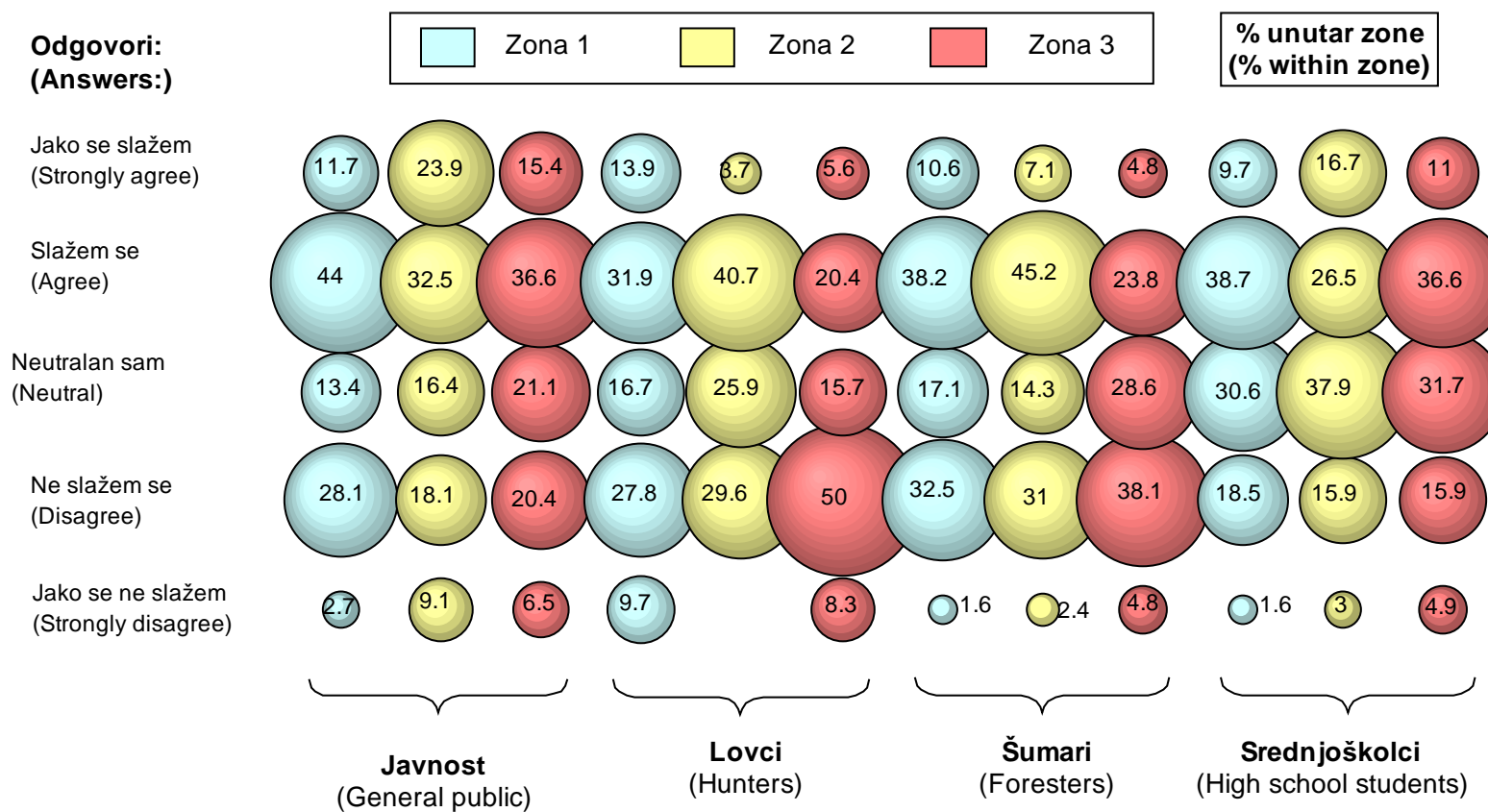
56% from Lika hunters. Nearly 70% of hunters in Gorski kotar and 60% of Dalmatian hunters also believe wolves have a considerable impact on large game. Large majorities of students from all three zones expressed strong feelings that wolves do cause a considerable impact on large game (Figure 28). What is interesting is while many respondents felt wolves cause a significant impact on large game animals, most remain quite positive toward the species suggesting that the hunting issues may not be as important in influencing attitudes as earlier believed.

In contrast to findings found in France where general public residents in Savoie, France believed wolves had a much larger impact on small game animals than large game animals (Bath 2000), general public residents in Croatia believed wolf impact on small game animals was not as great as wolf impact on large game animals. Respondents in all groups and across all

**Figure 28: Vukovi bitno utječu na populacije visoke divljači. (Wolves have a significant impact on big game.)**



**Figure 29: Vukovi bitno utječu na populacije niske divljači. (Wolves have a significant impact on small game.)**



zones in Croatia seemed less sure about the impact wolves may have on small game. In several cases, an interest group was almost divided into thirds with their responses being agree, neutral and disagree (Figure 29).

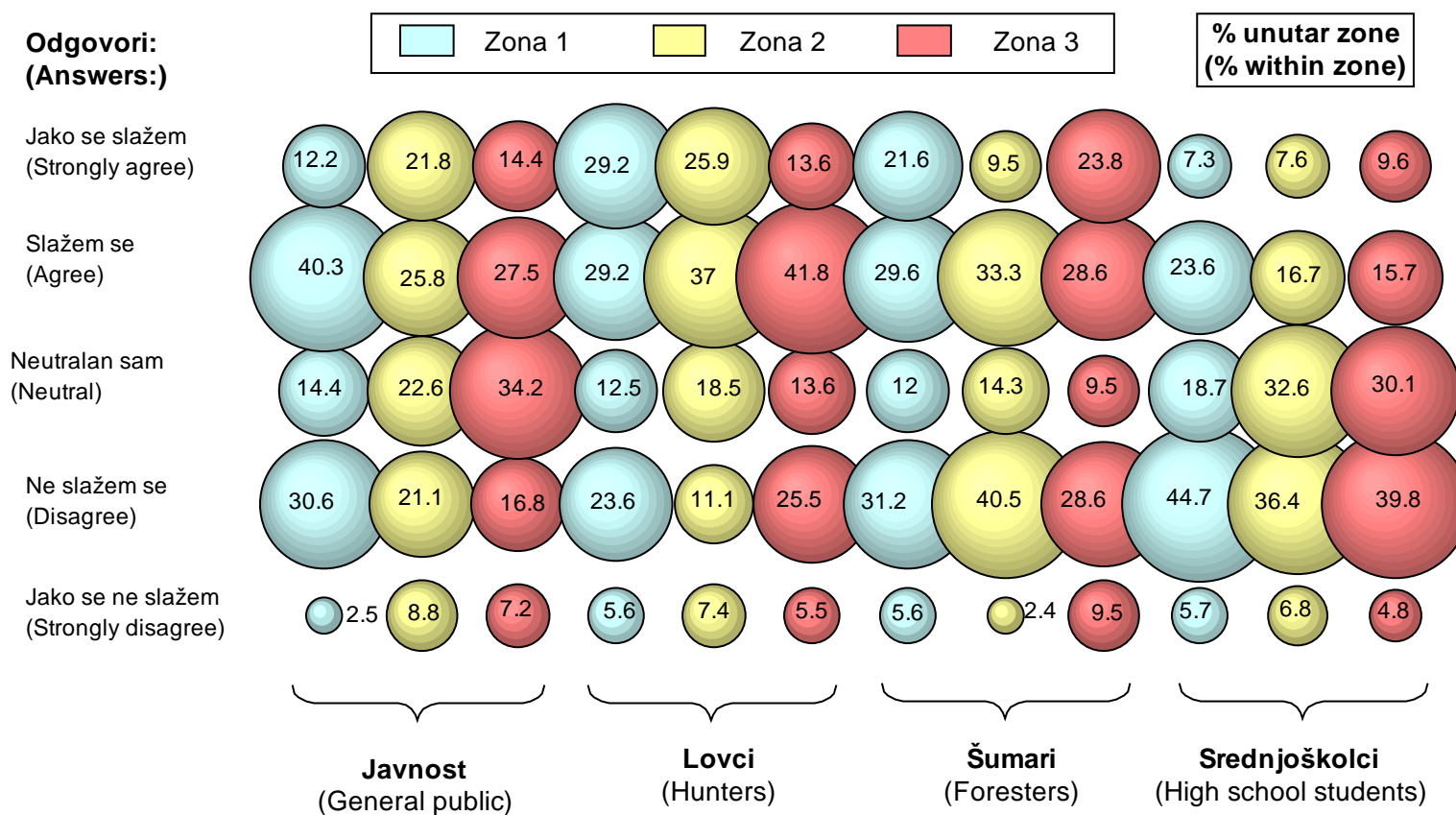
While responses to previous items suggested that residents believed wolves had a significant impact on large and small game populations, when asked specifically about the impact wolves have on roe deer, red deer and wild boar and whether this impact reduced populations to unacceptable levels a mixed reaction resulted from the various groups across the three zones (Figure 30). All hunters seemed to remain consistent believing there was an impact and that wolves did reduce these ungulate populations to unacceptable levels. Foresters and to a lesser extent students in the different regions seemed less clear in their attitudes about wolves reducing numbers to unacceptable levels.

The above hunting related items focused upon the affective and cognitive aspects of attitude asking respondents about perceived impact of wolves on ungulates and exploring the affective (liking/disliking) aspects toward these

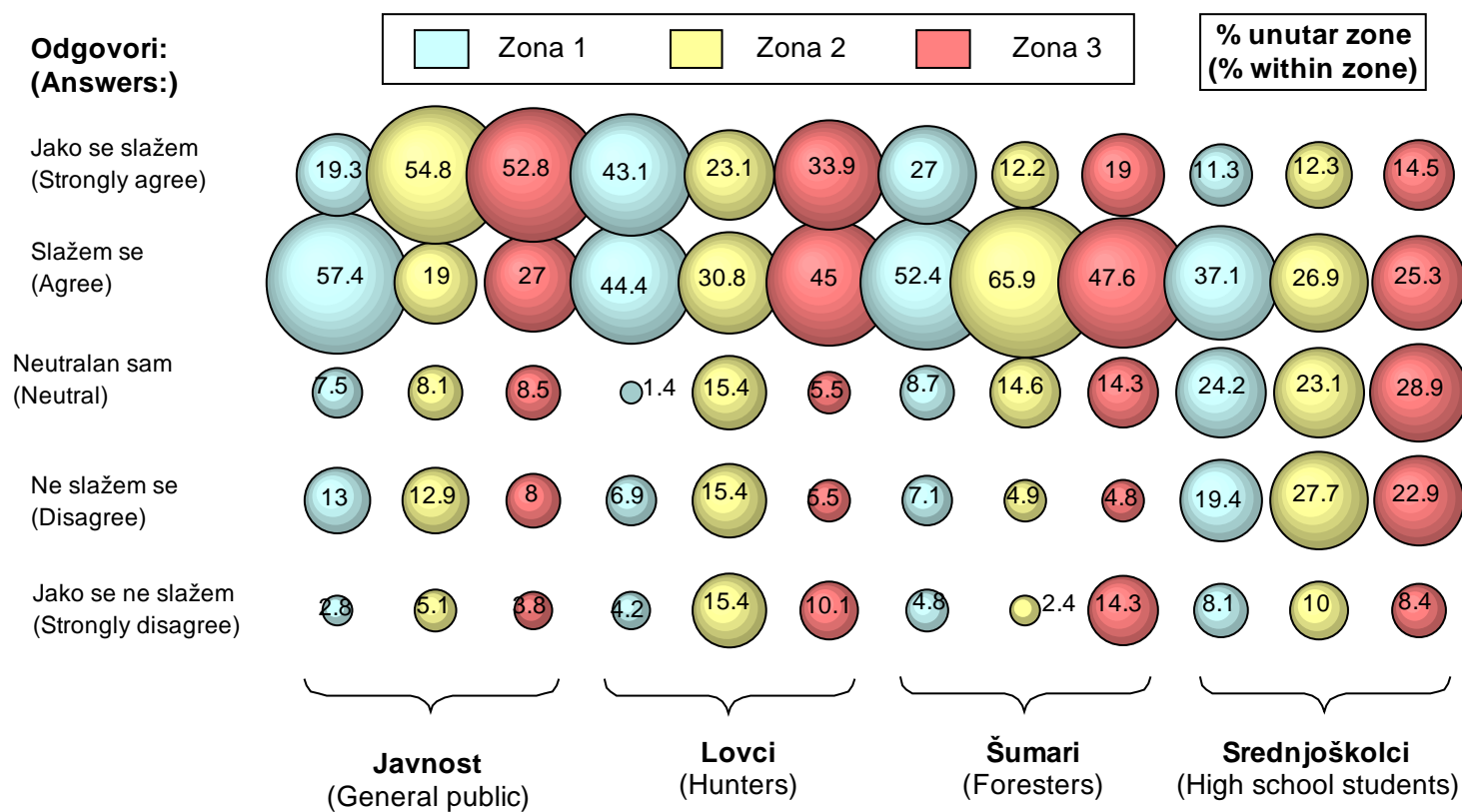
ungulates. The next few items are more behavioral intention items asking about support or disagreement toward various management/hunting practices.

Most general public residents in all three zones, hunters, and foresters clearly supported a specific hunting season on wolves within their respective region. Students were the least supportive of hunting with many students expressing neutral and about an equal number stating support and opposition to hunting seasons, especially students from Lika and Dalmatia. Students from Gorski kotar had the strongest support for hunting seasons on wolves, much stronger support than that found in Lika or Dalmatia. This suggests that student attitudes toward hunting may be different from the other interest groups and the general public (Figure 31). The support for a legal hunting season on wolves may exist because of the perception that there are many wolves in Croatia. In contrast in France where wolf numbers are significantly lower, most general public residents of Savoie (53%) and Des Alpes Maritimes (54%) opposed a legal hunting season within their respective provinces for wolves. Approximately 35% indicated they would support such a management action.

**Figure 30: Vukovi smanjuju populacije jelena, srna i divljih svinja na neprihvatljivu razinu. (Wolves reduce populations of roe deer, red deer and wild boar to unacceptable levels.)**



**Figure 31: U području Gorskog kotara / Like / Dalmacije treba dozvoliti lov na vukove tijekom određene lovne sezone. (Wolves should be allowed to be hunted in specific hunting seasons in region of Gorski kotar / Lika / Dalmatia.)**



Strong opposition exists, however, for allowing wolves to be hunted year round within the specific region from all Croatian groups except the general public in Dalmatia (Figure 32). However, when asked to respond to the item: “wolves should be killed by all means in their respective regions”, all groups across all zones expressed extremely strong opposition to such a proposed management action. Even 70% of the Dalmatian general public disagreed or strongly disagreed with the statement. Opposition from Gorski Kotar (88%) and Lika (84%) were much stronger. Students from Gorski kotar had the strongest feelings against hunting wolves by any means; 97% of these students disagreed or strongly disagreed with the statement (Figure 33).

To test for consistency in response to the management items concerning a limited hunting season on wolves and other

hunting issues related to wolves, two items about complete protection of the animal were asked. Respondents were asked to respond to: “wolves should be completely protected in Croatia” (Figure 34) and to the item: “wolves should be completely protected within Gorski kotar / Lika / Dalmatia” (Figure 35). Most general public respondents in all three zones, hunters and foresters disagreed or strongly disagreed with both statements. The only amount of any support for complete protection came from high school students; about a third of the students expressed neutral responses to complete protection. These results would suggest that most respondents feel that a limited hunting season on wolves should exist but that wolves are not to be hunted year round or by any means. Most Croatians in wolf range want wolves to continue to exist and be available for future generations to enjoy.

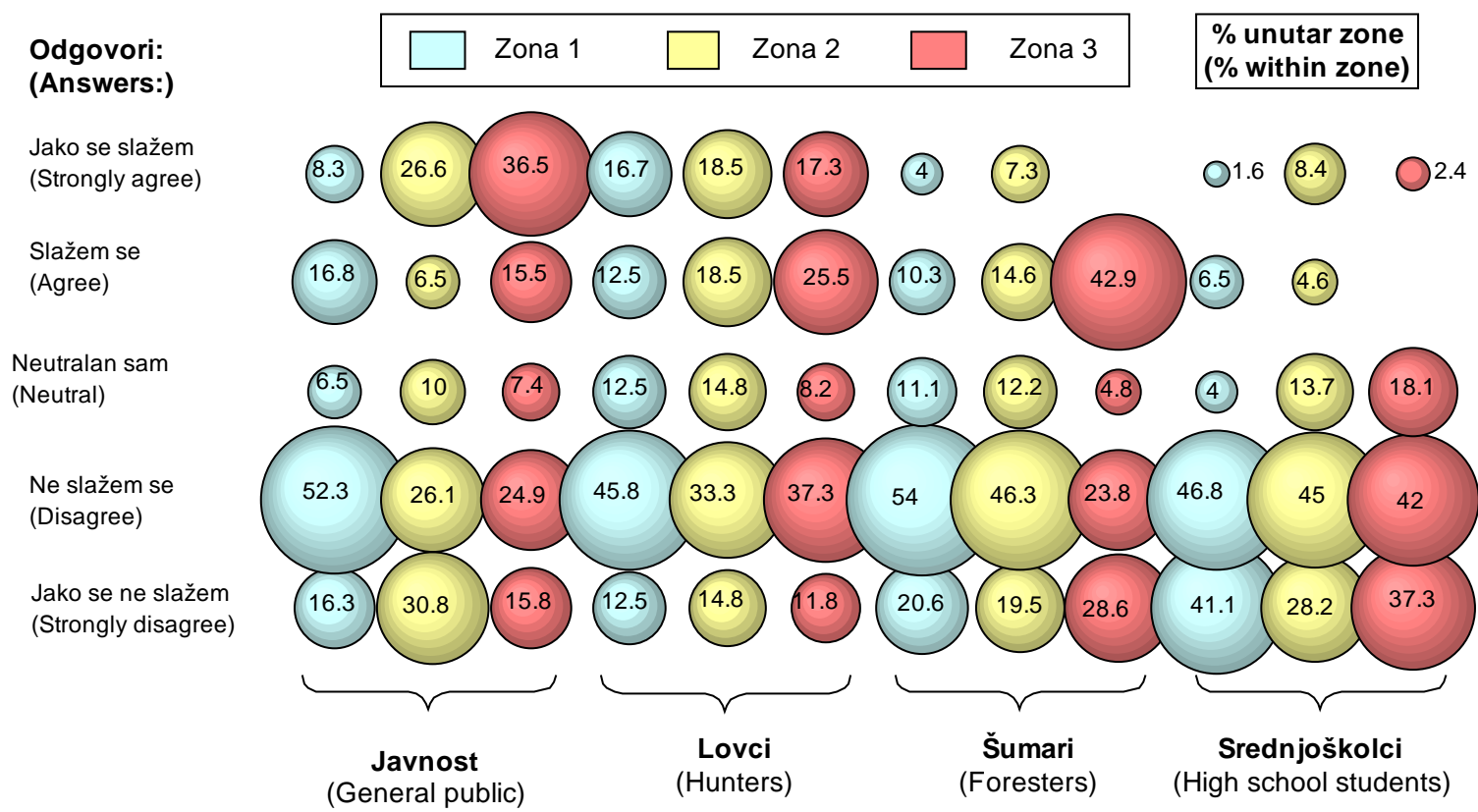
### ***Underlying beliefs about wolves and their impact***

Public attitudes toward wolves and their management are affected by a collection of beliefs that make up a belief system. Some of these beliefs are more important than others in affecting attitudes. Our overall attitude toward wolves is a product of our

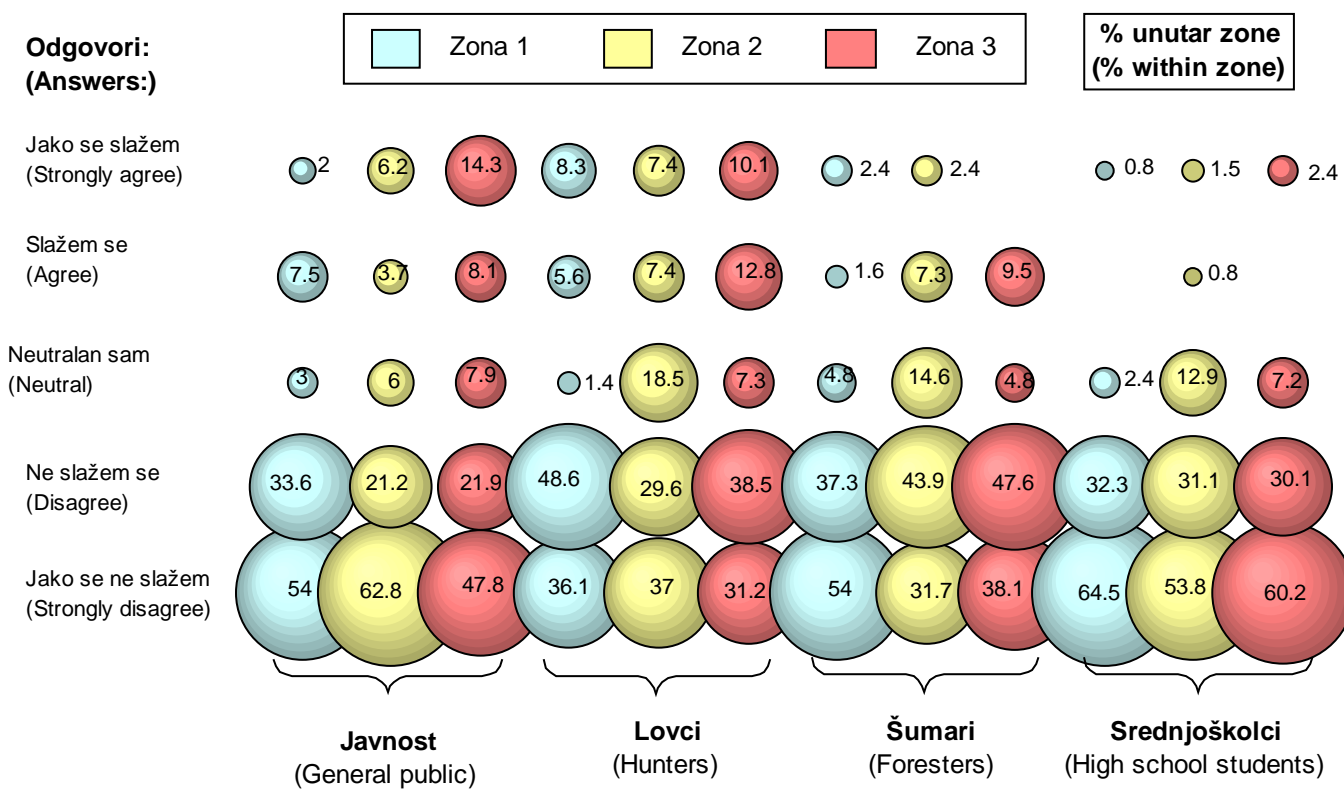
beliefs and the evaluation of that belief (whether it is good or bad, and the likelihood that the belief could occur). In forming our attitudes toward wolves people strive to keep their affective components of attitude (liking or disliking



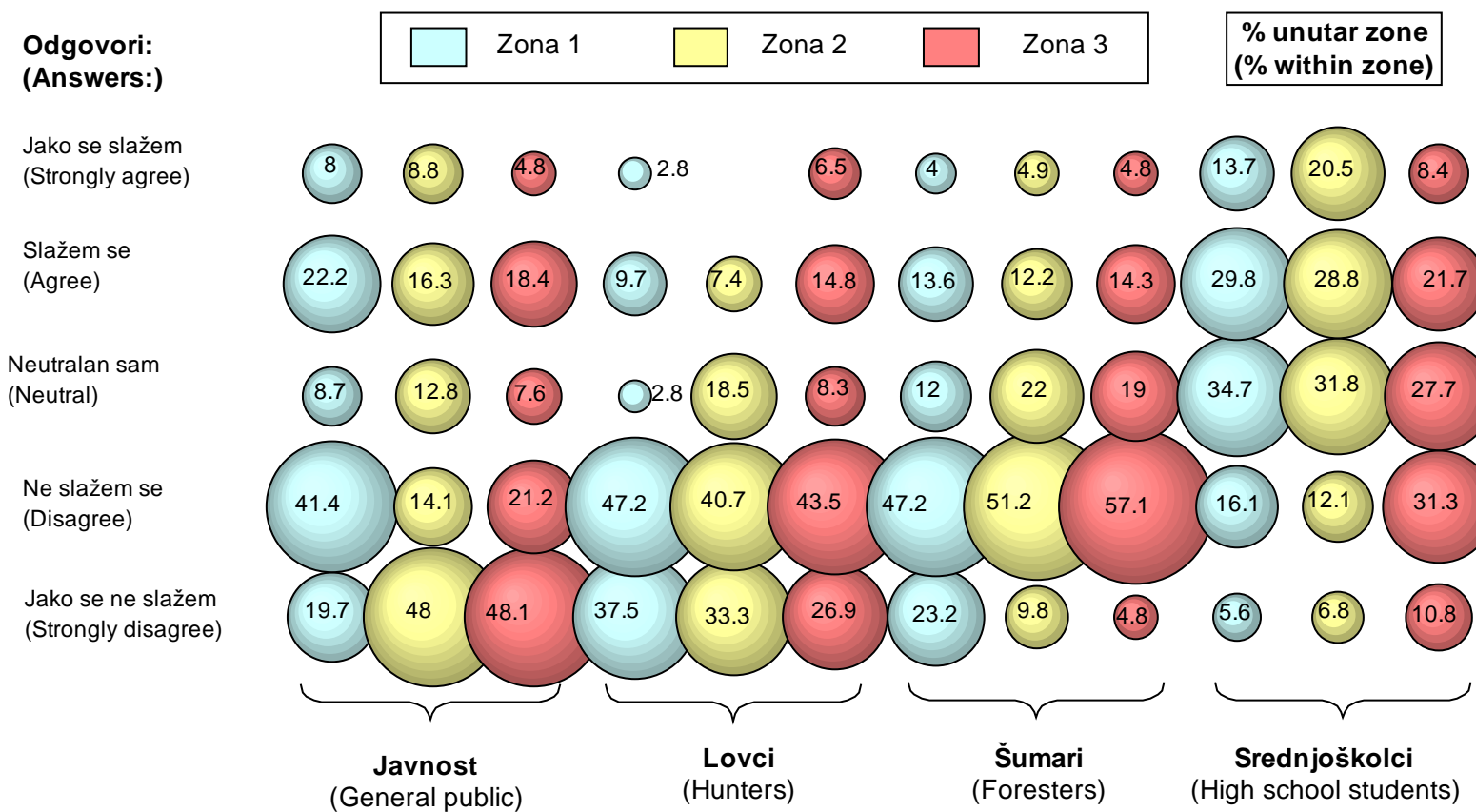
**Figure 32: U području Gorskog kotara / Like / Dalmacije treba dozvoliti lov na vukove tijekom cijele godine. (Wolves should be allowed to be hunted year round in region of Gorski kotar / Lika / Dalmatia.)**



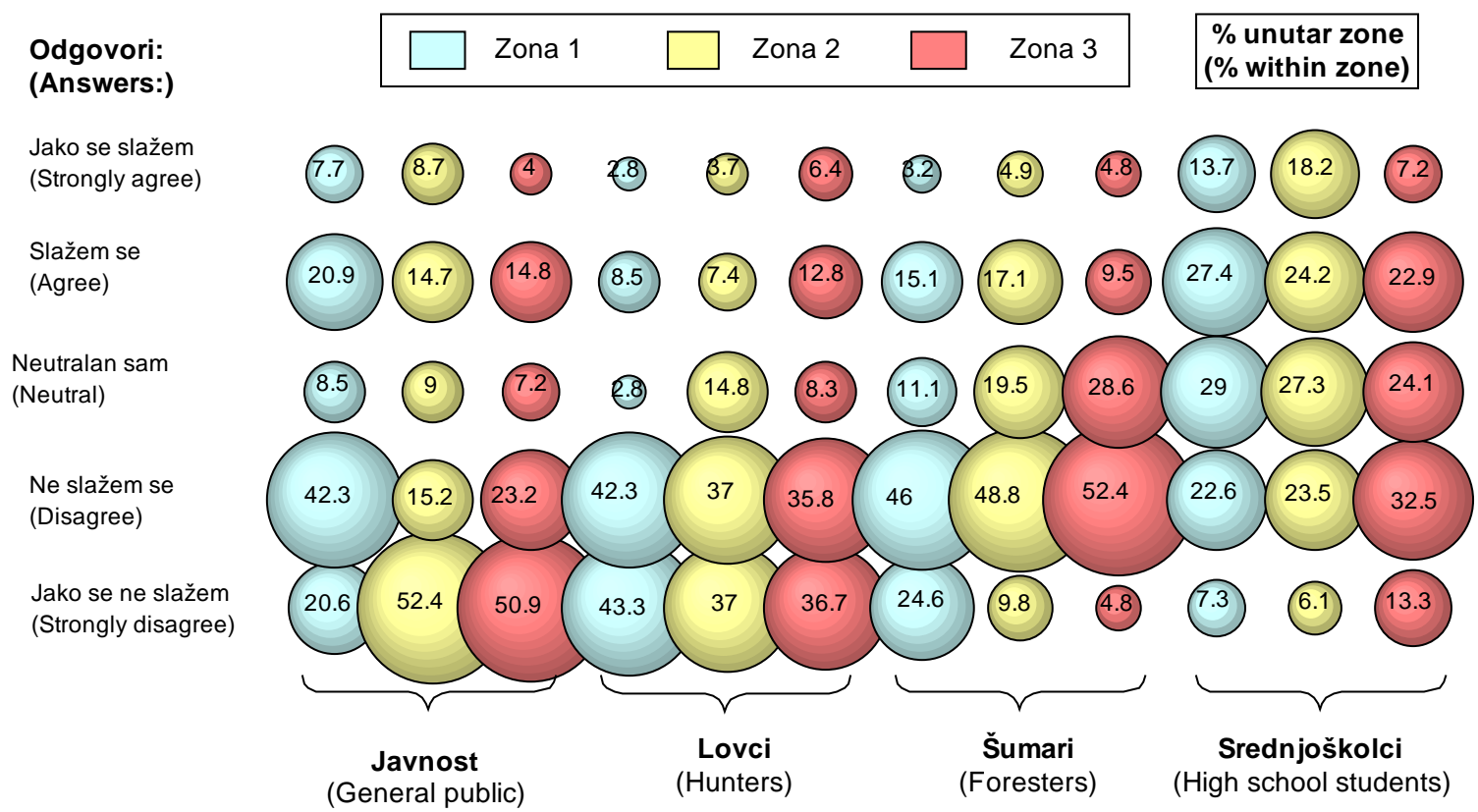
**Figure 33: Vukove u području Gorskog kotara / Like / Dalmacije treba ubijati svim mogućim sredstvima, uključujući ubijanje mladunčadi u brlogu, te uporabu otrova. (Wolves should be killed by all means, including killing pups in dens and the use of poison in region of Gorski kotar / Lika / Dalmatia.)**



**Figure 34: Vukovi bi trebali biti potpuno zaštićeni u Hrvatskoj. (Wolves should be completely protected in Croatia.)**



**Figure 35: Vukovi bi trebali biti potpuno zaštićeni u području Gorskog kotara / Like / Dalmacije. (Wolves should be completely protected in region of Gorski kotar / Lika / Dalmatia.)**

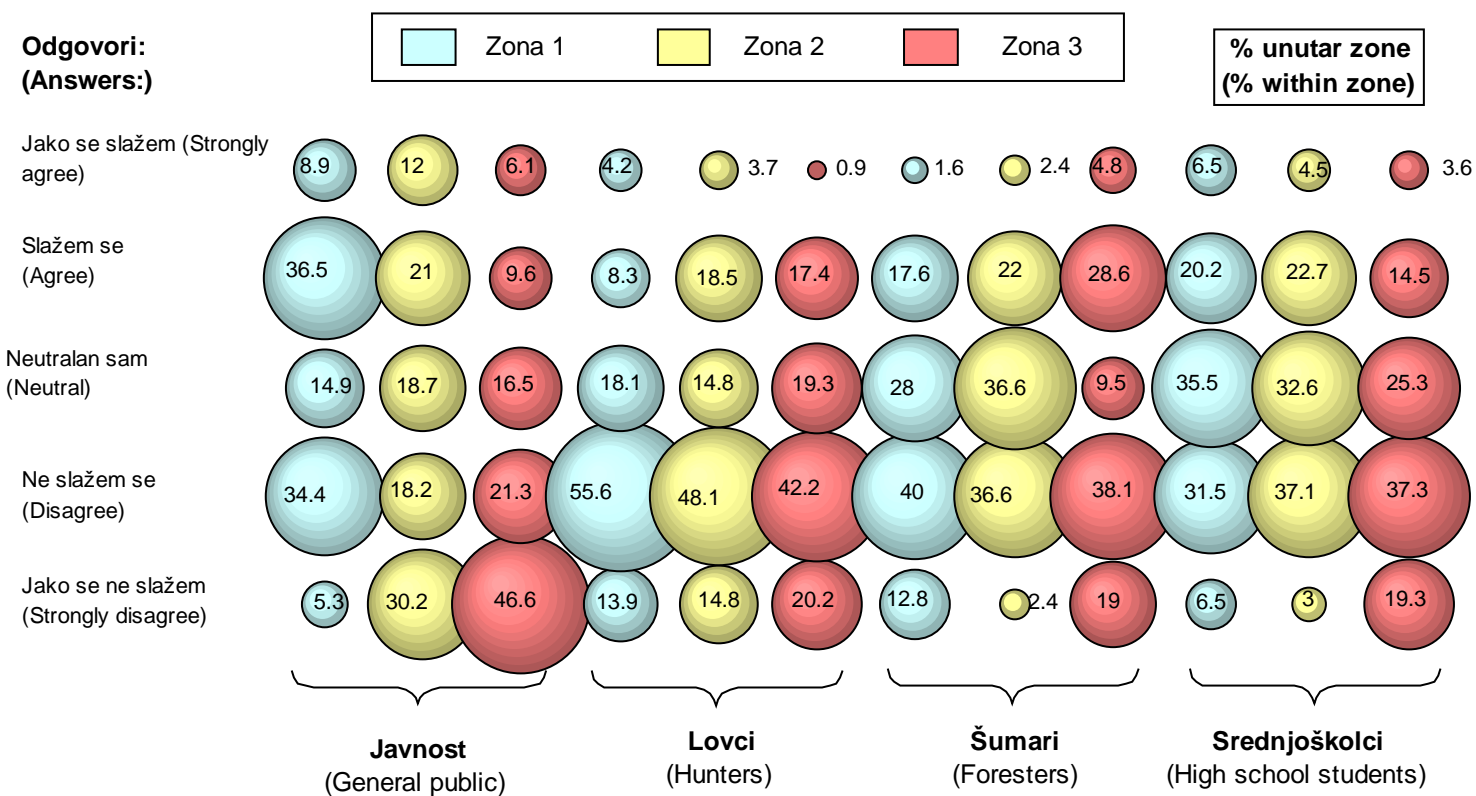


of wolves) consistent with their cognitive component (beliefs and evaluations of those beliefs). For example, if I dislike wolves (affective), I believe they have killed people (cognitive belief), and having people killed is of course bad (evaluation of belief). The behavioral intention that could result from this is to support a wolf control program and actual behavior (fourth component of attitude) may be a history of shooting wolves. In this example all aspects of attitude are consistent with each other producing a negative overall attitude toward wolves. Persuasive communication efforts strive to understand the underlying beliefs and directly affect or change the belief most strongly linked to attitude, thus causing what's been called cognitive dissonance (Fishbein and Ajzen 1975). In this above example, if information convinces me that wolves do not kill people, I no longer have a consistent reason to dislike wolves, resulting then in a change of other components of my attitude. In this section, results about beliefs about wolves and their possible impact are presented.

For some individuals, support for conservation efforts occurs only when economically it can be shown that the species generates income. Figure 36

presents the results of an item regarding perceived tourism benefits to the respondent's region if wolves are present. Most respondents in all groups do not believe that having wolves in their region will increase tourism in their region. These findings are consistent with those found in France where most general public residents of Des Alpes Maritimes (59%) and in Savoie (63.5%) also do not believe that the presence of wolves affects positively tourism within their province (Bath 2000). A recent report from WWF-UK (2000) suggests that tourism and carnivores can generate significant economic benefits to local communities. Sharing examples from other regions and conducting an economic study of the value of wolves in Croatia may affect this belief and influence those whose attitudes toward wolves are strongly driven by economic arguments. There is, however, one exception. Approximately 45% of the general public in Gorski kotar did agree or strongly agree that having wolves in their region would increase tourism. In light of this general public attitude and the overall positive attitude toward wolves by most groups in Gorski kotar, the Croatian Ministry of Tourism, one of the strongest Ministries in the Croatian government, has decided to promote wolves and eco-

**Figure 36: Postojanje vukova u području Gorskog kotara / Like / Dalmacije jača turizam u tom području. (Having wolves in region of Gorski kotar / Lika / Dalmatia increases tourism in that region.)**

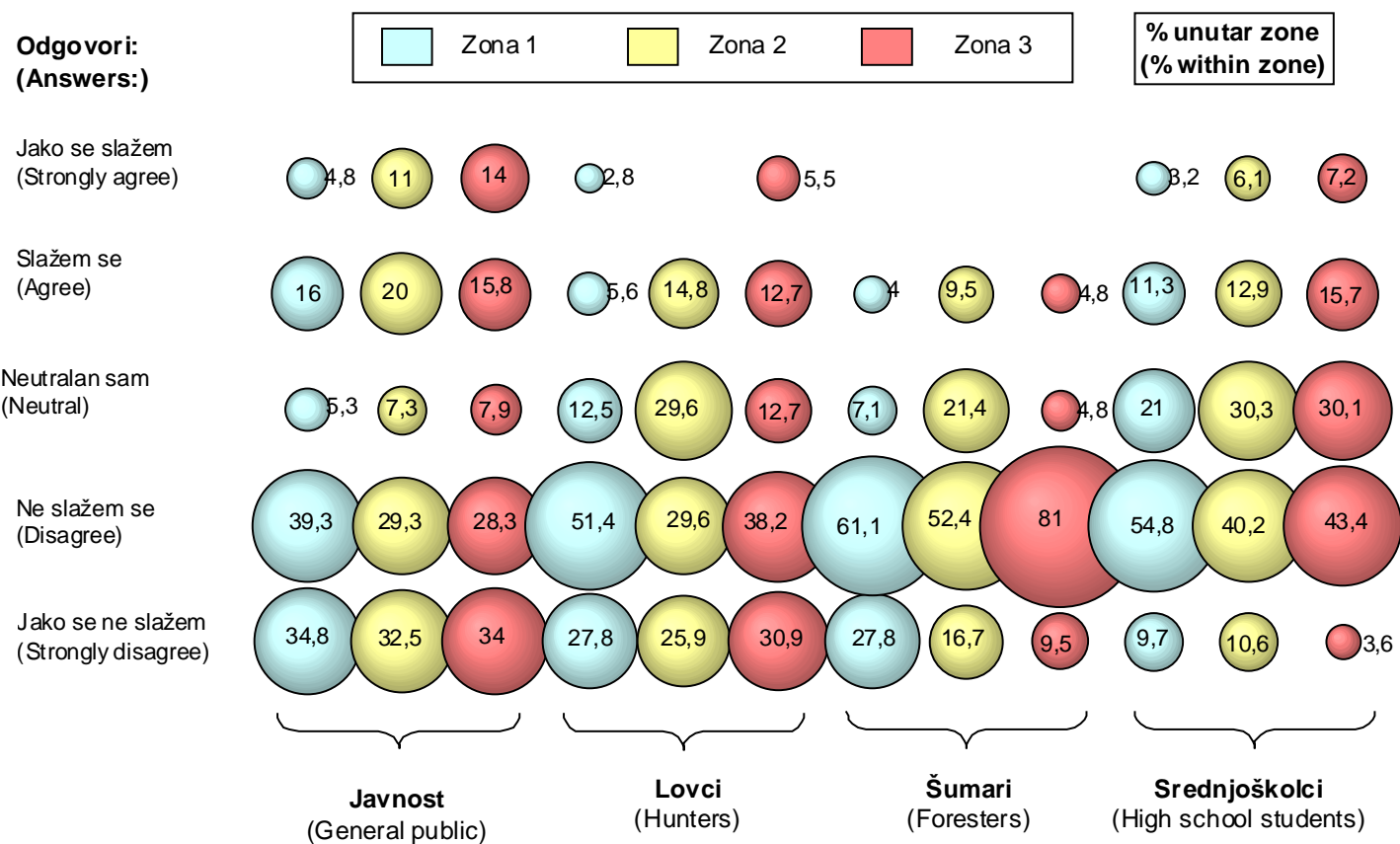


tourism opportunities within the region. Understanding that there is support for wolves from the local people in Gorski kotar through this quantitative and representative HD study, the Ministry of Tourism can confidently move ahead with this new initiative without fear of public backlash.

Attitudes are learned from childhood and attitudes toward wolves may be affected by the many myths and stories of wolves attacking small children dressed in red (Little Red Riding Hood) and attacks on livestock (Three Little Pigs and others). Three belief items focused upon this fear element of wolves. In response to: “In areas where wolves live in close proximity to humans, wolf attacks on humans are common”, most respondents in all interest group and across all zones expressed some form of disagreement (Figure 37). It is interesting, however, to note that approximately 30% of Lika and Dalmatia students indicated neither agree nor disagree indicating a little bit of uncertainty on behalf of the students. This relatively large percentage of neutral responses from high school students suggests the need to address this issue within an educational program. When respondents were asked about whether

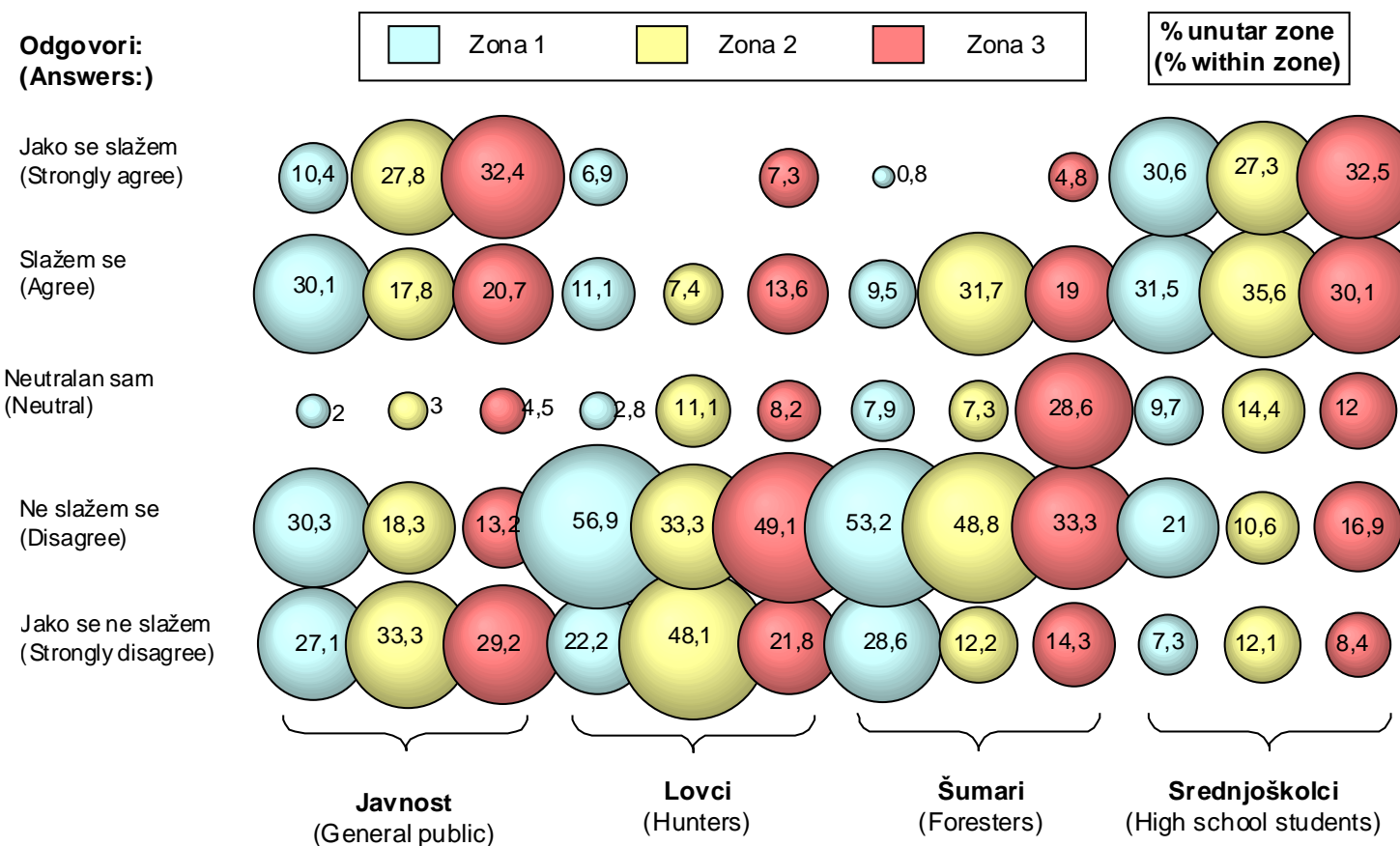
they would personally be afraid to hike in the woods if wolves were present, a large percentage of Gorski kotar residents (41%), Lika residents (46%) and Dalmatian residents (53%) agreed or strongly agreed (Figure 38). Larger percentages, as expected of students, expressed fear of hiking in the woods if wolves were present. Approximately 62% of students, regardless of region, agreed in some way to the statement, thus expressing fear of the animal. Very few individuals indicated neutral on this item. Basically, those that may have been neutral on the previous item stated an opinion when asked specifically about their fear. Lastly, respondents were asked about their fear of large carnivores and which animal was most dangerous given the wolf, bear, lynx, all of them, and none of them (Figure 39). Many respondents correctly identified the bear as the most dangerous, however, a third of the general public respondents from all regions did believe that all were equally dangerous. Most high school students considered all the species equally dangerous. Perhaps of interest to those managing lynx, more residents in Gorski kotar rated the lynx more dangerous than wolves; this was also the case with high school students regardless of zone who

**Figure 37: U područjima gdje vukovi žive u blizini ljudi, napadi vukova na ljude su učestali. (In areas where wolves live in close proximity to humans, wolf attacks on humans are common.)**

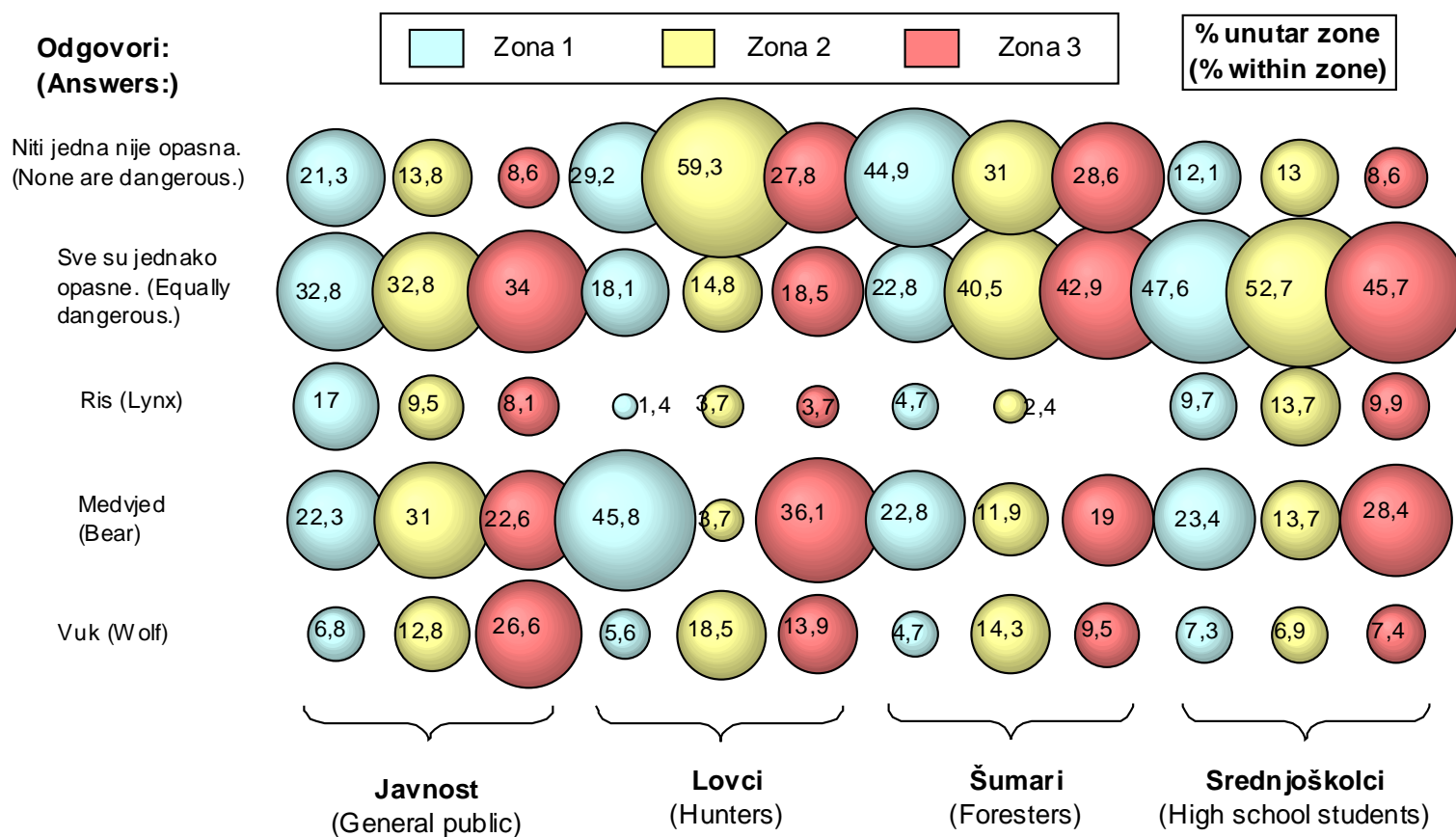




**Figure 38: Strah me je šetati šumom u kojoj ima vukova. (I would be afraid to hike in the woods if wolves were present.)**



**Figure 39: Koja od navedenih životinja je, po vašem mišljenju, najopasnija za ljude? (In your opinion, which animal is most dangerous to humans?)**



believed lynx was more dangerous than wolves to humans.

Certain beliefs about wolves seem to be part of every European country's cultural history. Many residents in a variety of countries throughout Europe believe that wolves were actively reintroduced to their country, often by helicopter, and by the government or environmentalists. While a specific question was never asked of Croatian respondents about active wolf

reintroduction to the country, several individuals expressed that they believed wolves were brought to the country by United Nations' helicopters. Such attitudes continue to foster mistrust between groups and particular challenges to engaging groups in an open and fruitful discussion about wolf management in the country. Similar beliefs have been documented in France (Bath 2000) and in Spain (Bath 2000).

### ***Understanding biological facts and the nature of conflict***

When designing educational materials and communication campaigns, traditionally the focus of the messages has been on the biology of the species, its historical range, population numbers and present status, the assumption being that by increasing the public's biological knowledge of the species their attitudes will become more positive. While indeed several studies have shown that respondents with higher knowledge levels about wolves tend to have more positive attitudes toward the species (Bath 1989, Bath and Buchanan 1989, Bath 1991, Kellert 1985), an increase in knowledge can also affect attitudes in a negative direction (Bath 1994). And as discussed earlier, there may

be other persuasive messages that might be as important if not more important than such basic biological facts (for example existence and future generation values). A lot of this depends upon the nature of the conflicts between the groups.

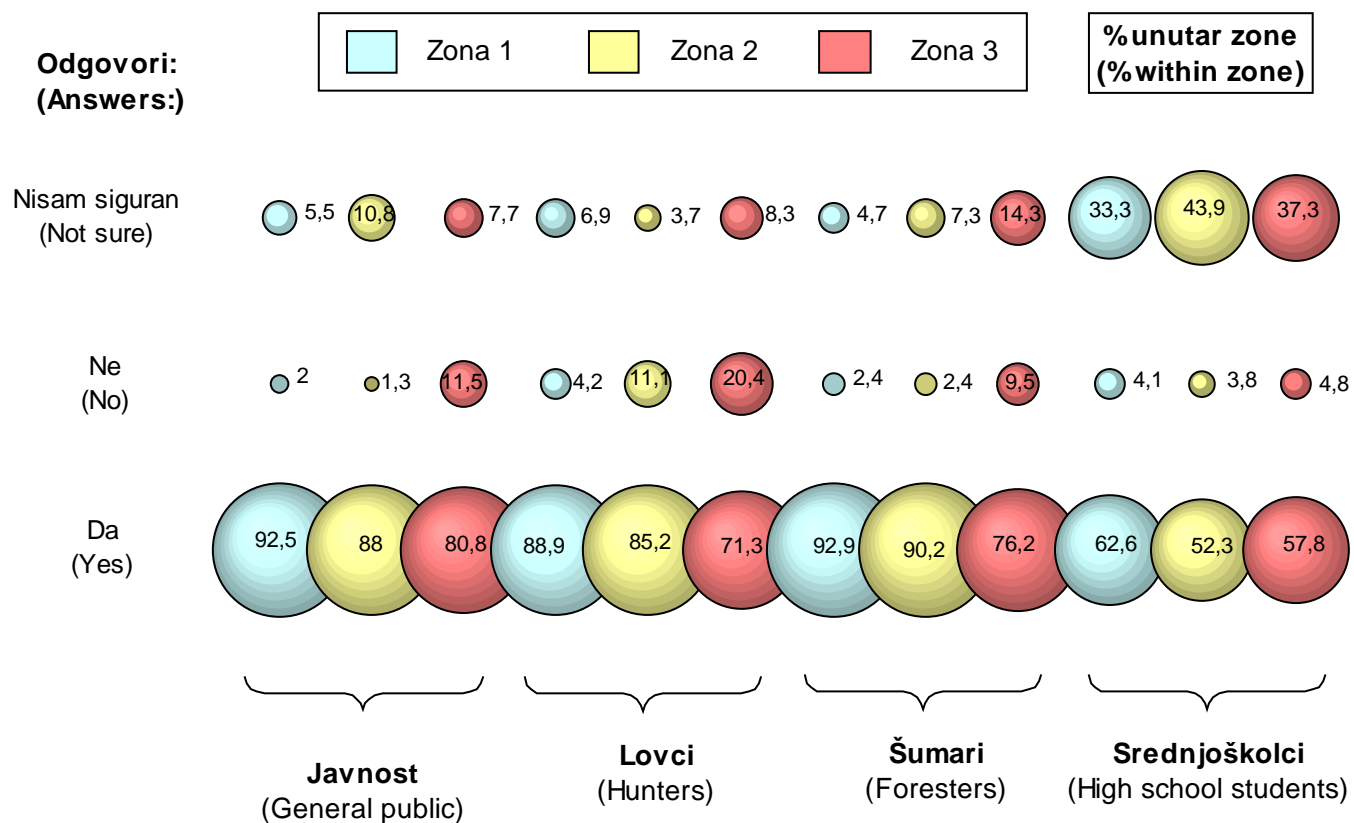
Conflicts may exist because of a lack of knowledge about facts. This cognitive conflict can be resolved with educational messages. Conflicts though may occur over values. For example, two parties agree on the number of wolves in Croatia but disagree on the value that they should be protected for future generations. Thirdly, a conflict may result over a disagreement over costs and benefits.

There is agreement that there are approximately 150 wolves left in Croatia (no cognitive conflict). It is important to protect them for future generations (no value conflict), but one group wants wolves protected in one area and not the other. This may occur because one party wants the benefits of an eco-tourism operation in one place and someone else in another area so they choose to disagree about the overall wolf management. Another example of a cost/benefit conflict may be a shepherd who agrees on the numbers of wolves, the value that wolves should be protected, but wants wolves not protected in his/her immediate area. This could be because he/she does not wish to bear the costs from livestock depredation. The fourth type of conflict is a behavioral conflict and may result because of past mistrust between agencies or individuals; quite often it can even be personal. For example, some residents believe that government and biologists actively restored wolves to Croatia and because of this belief are unable to trust what the government now says on other issues. Residents may also just remain annoyed at an agency for past issues and disagree just because that agency is suggesting the idea. These behavioral, cost/benefit, and value issues are difficult to address through

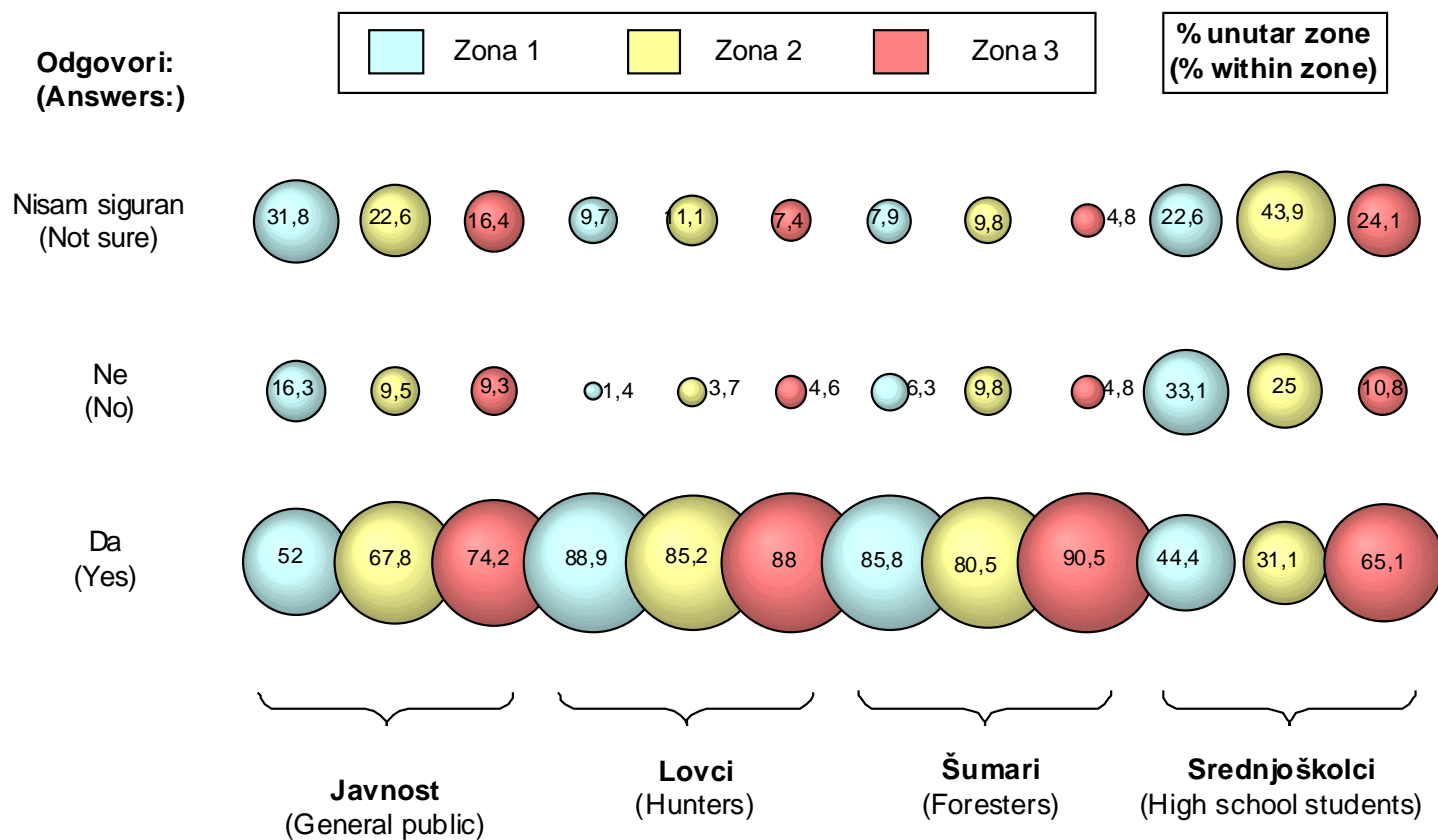
educational materials and messaging, but may be tackled through a more active public involvement process and communication campaign.

The results from the biologically based belief questions are presented in the following figures. From these items knowledge scores can be calculated. One measure of the effectiveness of an educational and communication campaign is to compare knowledge scores before and after the campaign. Most respondents in all zones and across all interest groups correctly identified that wolves historically had existed in their respective regions (Figure 40). More than one third of high school students (ranging from 33% in Gorski kotar to 44% in Lika) were not sure whether wolves had existed within their region historically. Most respondents in all groups and across all zones knew that wolves were protected in Croatia (Figure 41). This being said, it is interesting to note that 32% of Gorski kotar general public residents were not sure and approximately the same percentage of students from Gorski kotar believed wolves were not protected, 23% expressed they were not sure. Nearly 44% of Lika students were not sure about the legal status of the wolf; an additional 25%

**Figure 40: Vukovi su oduvijek postojali u području Gorskog kotara/Like/Dalmacije. (There used to be wolves throughout the entire region of Gorski kotar/Lika/Dalmatia.)**



**Figure 41: Vukovi su potpuno zaštićeni u Hrvatskoj. (Wolves are completely protected in Croatia.)**



indicated incorrectly that wolves were not protected. Students in general were the least knowledgeable about wolves of the various interest groups in the study.

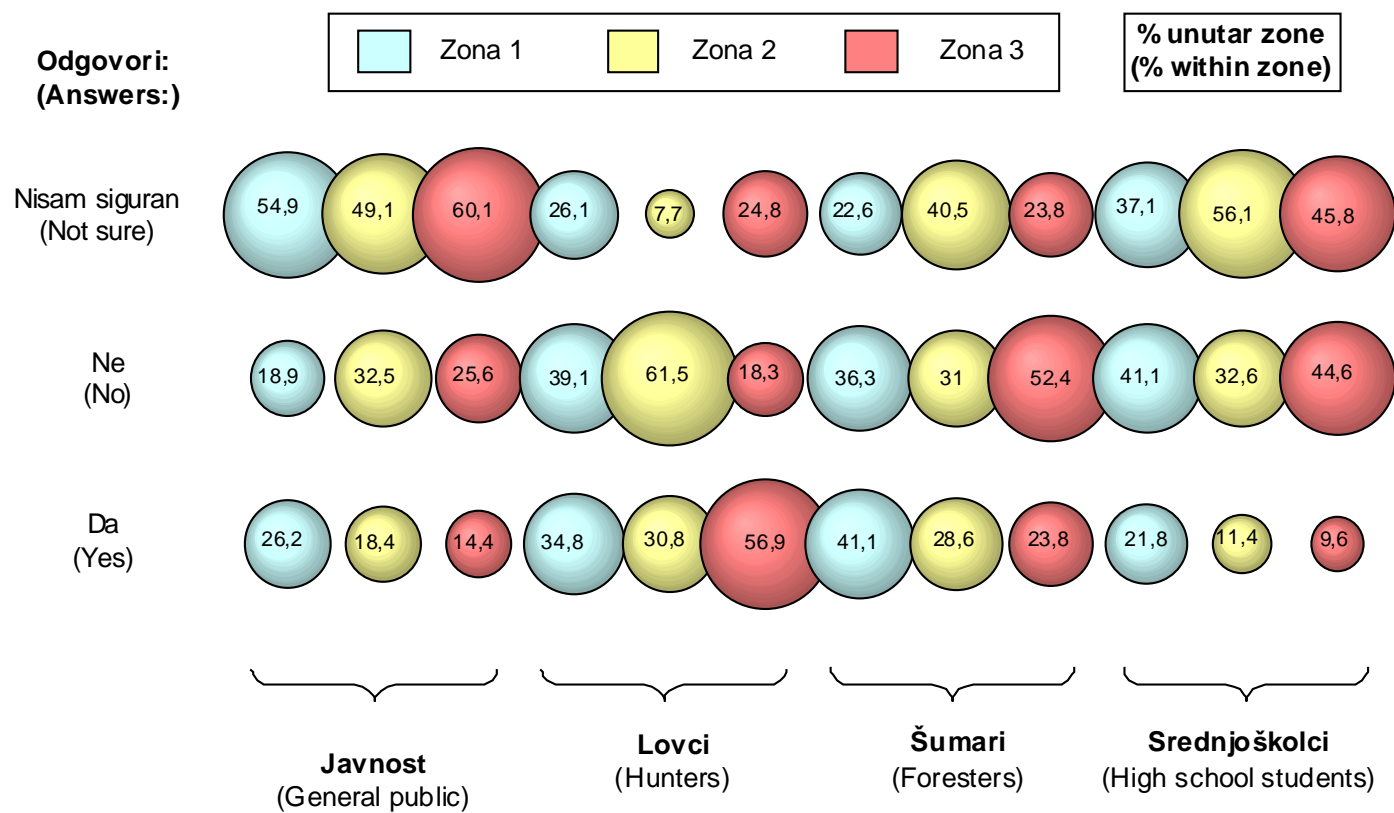
It is generally true that only two members (one pair) of a wolf pack breed in a single year. Many respondents were not sure about this fact (Figure 42). What perhaps should be disconcerting to environmental educators and managers is the large percentage of hunters in Gorski kotar (39%) and Lika (62%) especially that believed the statement was false. Large percentages of students (41%, 33% and 45%) from Gorski kotar, Lika and Dalmatia respectively did not believe that only one pair breed in a single year; most others indicated they did not know. This may be a factual message that could be communicated to students and hunters. Such information could affect attitudes toward hunting and perceptions of a rapidly growing wolf population.

While biological research in Croatia has yet to determine the success rate for wolves with respect to the number of chases of wild prey, research from North America suggests that success rates per chase tend to be quite low. While it will vary by season, pack size, winter

conditions, and prey, it seems safe to say that in most cases it will be less than 10%. While relatively large percentages of respondents expressed that they did not know the success rate. Of those individuals who indicated an answer, most believed it was 50% or better (Figure 43). Perceptions of hunting success did vary across zone within the same interest group. For example, while 45% of the Dalmatian general public believed wolves were successful every time when attacking wild prey, significantly less Lika (33%) and Gorski kotar (22%) residents shared the same view. A widely held belief that the species is an incredibly efficient killer (50% or better success rate) could be directly influencing attitudes toward their perceived impact on large and small game animals and the perceived need to control wolf numbers.

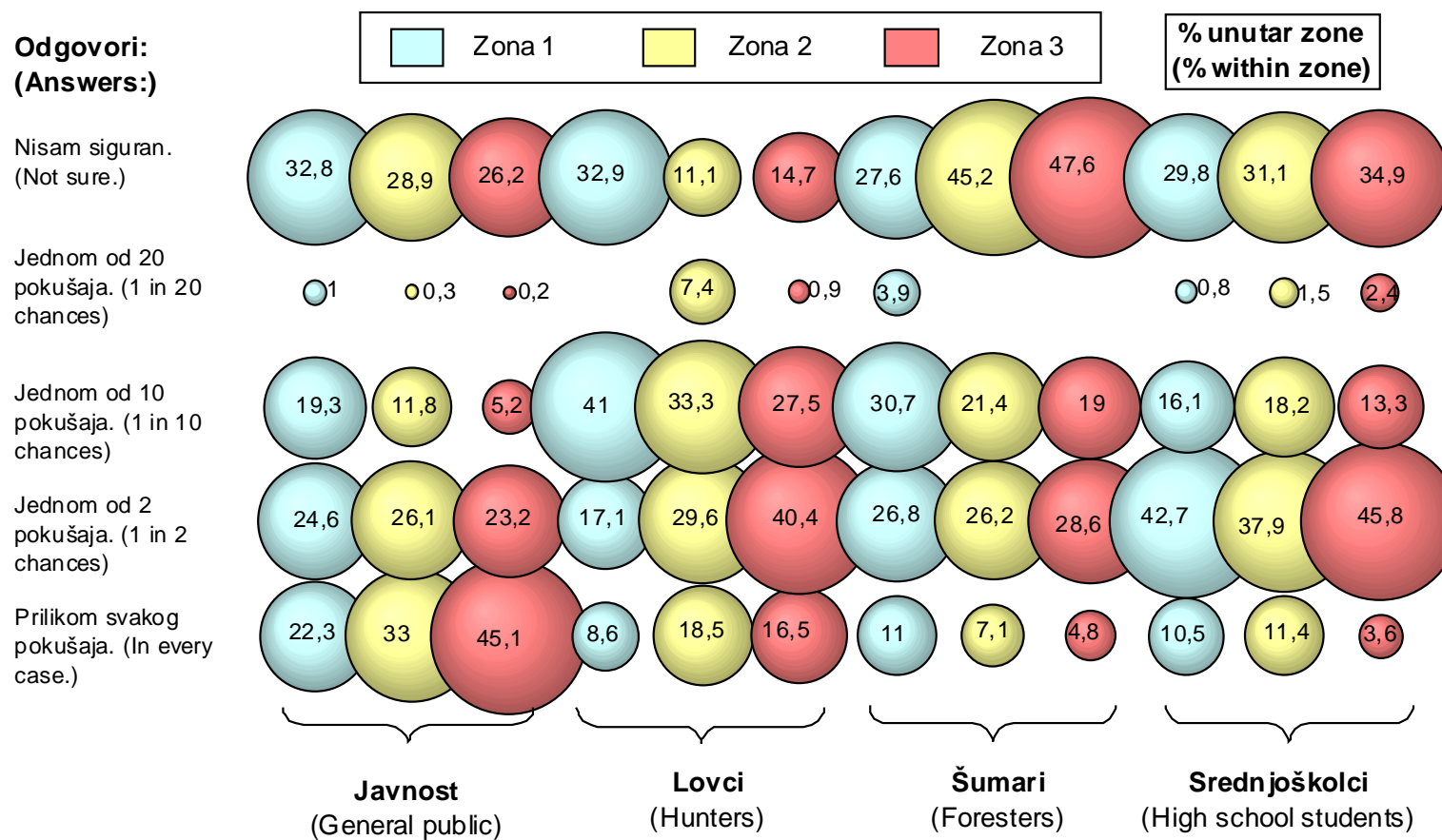
Fear of hiking in the woods if wolves were present did exist amongst a good percentage of the respondents. This fear may be linked with the knowledge of pack size and average weight of an adult male wolf, the next two items to discuss. Most respondents identified correctly that pack size in Croatia was less than 10 animals. Students, who had the highest fear of hiking in the forest, did have the largest

**Figure 42: U pravilu samo dva člana čopora (jedan par) se pare i imaju mlade. (It is generally true that only two members (one pair) of a wolf pack breed in any one year.)**





**Figure 43: Koliko često su vukovi uspješni u lovu? (How often is a wolf generally able to kill successfully wild prey?)**



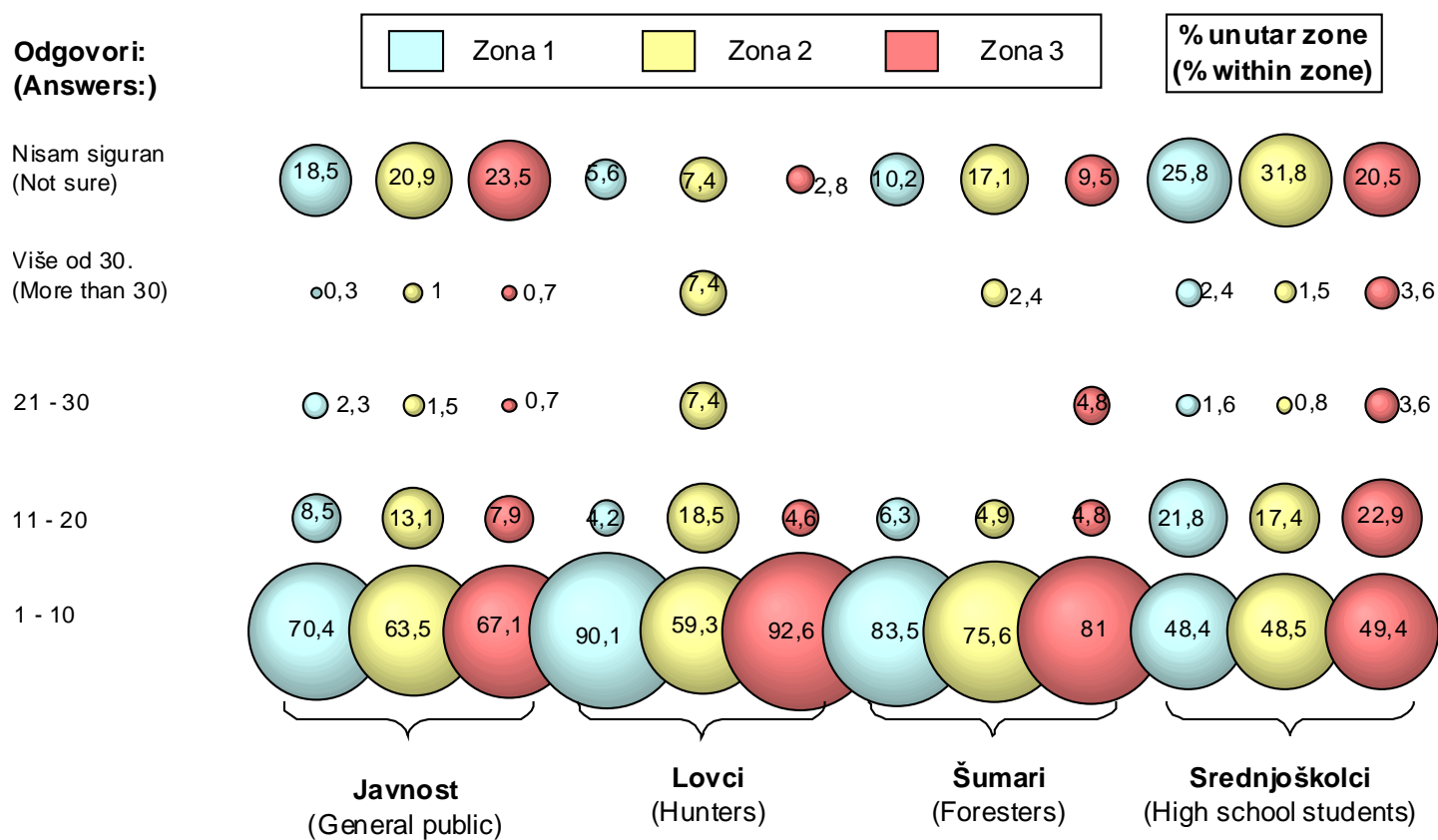
percentage of respondents who indicated they were not sure about pack sizes, or indicated pack sizes of 11-20 animals (Figure 44). Relatively large percentages of students in Gorski kotar (35%), Lika (43%) and Dalmatia (25%) expressed they were not sure also about the average weight of a male adult wolf. Approximately 23% of general public residents in Lika and Dalmatia believed wolves were more than 60kg in size, compared to 10% in Gorski kotar (Figure 45). A more accurate knowledge of the species by residents in Gorski kotar does explain partly the greater tolerance for the animal compared to the other regions. It only makes sense that those respondents holding perceptions of huge marauding wolf packs in the woods would hold a fear to hike in the woods.

In past HD in wolf management studies, the public perception of the number of wolves and the status of the population (whether it is increasing, decreasing, or remaining the same) have been important factors in influencing attitudes. Presently in Croatia there are approximately 150 wolves in the entire country; many residents in Gorski kotar(47%), Lika (49%) and Dalmatia (53%) believe there are more than 200 animals in the country

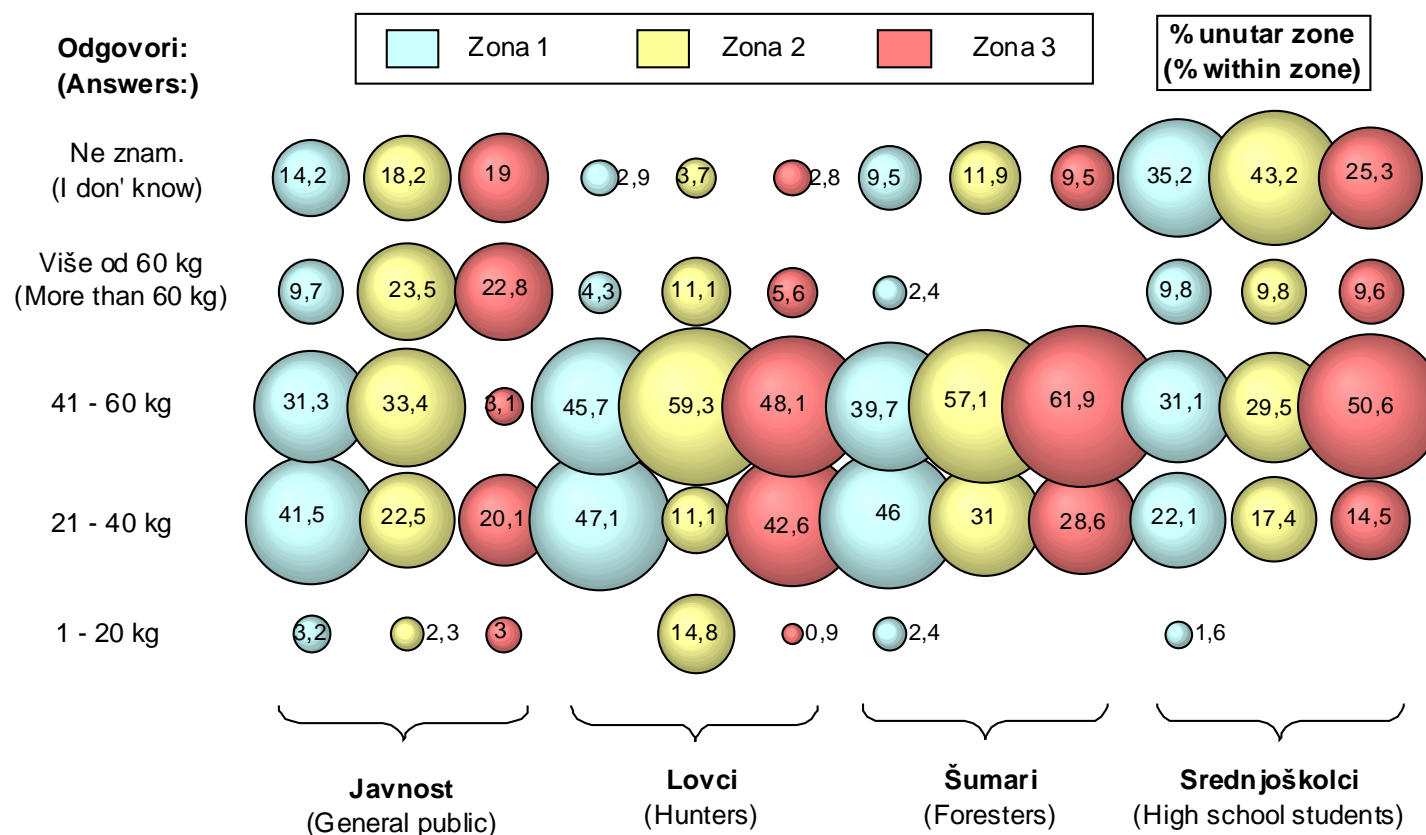
(Figure 46). The item was asked as an open-ended question so not to bias responses; given a set of categories or potential answers, respondents tend to gravitate to the middle of the response set. An open-ended question removes this effect, however, a larger non-response to the item is the result, as was the case here. Some estimates of the wolf population in Croatia are in the thousands; 20% of Dalmatian general public residents believe there are more than one thousand animals in the country. With such strong beliefs about numbers, it is not surprising that many residents in Dalmatia hold more negative attitudes toward the wolf.

Such misinformation and lack of information has a significant impact on attitudes toward the species and attitudes toward management approaches. It is interesting to note that even with this overestimate of wolves in Croatia, the general feeling of residents is to protect the species and ensure its existence for future generations. As more residents realize that numbers of wolves in the country are in fact lower, this support should increase. Therefore, communicating the numbers of wolves that exist in Croatia and the probability that given this number they

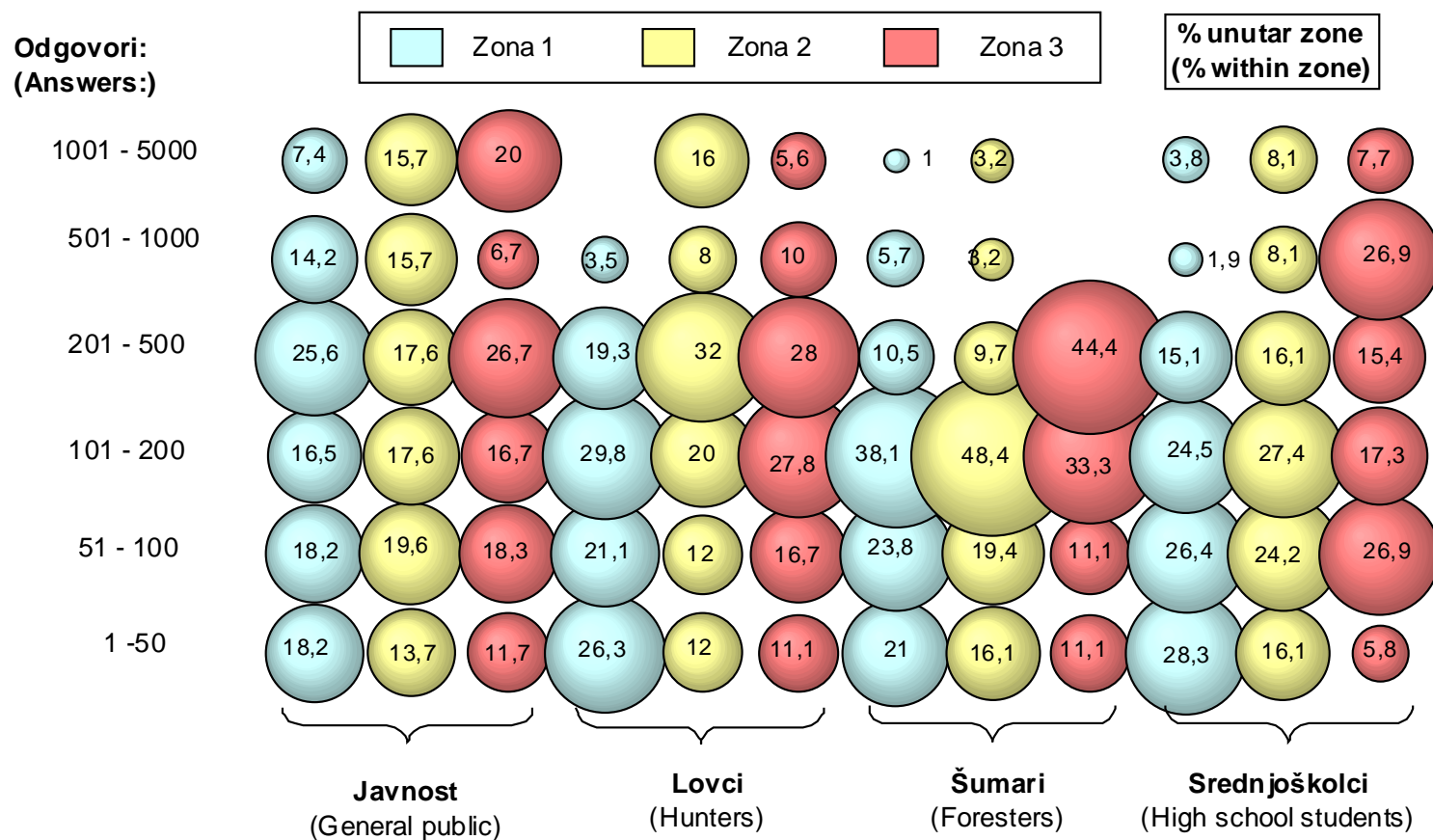
Figure 44: Koja je prosječna veličina vučjeg čopora u Hrvatskoj? (What is the average size of a wolf pack in Croatia?)



**Figure 45: Koliko je prosječno težak odrasli mužjak vuka u Hrvatskoj? (How much does the average adult male wolf weigh in Croatia?)**



**Figure 46: Koliko vukova mislite da trenutano ima u Hrvatskoj?. (How many wolves do you believe currently exist in Croatia?)**



would survive for future generations are key messages for all residents.

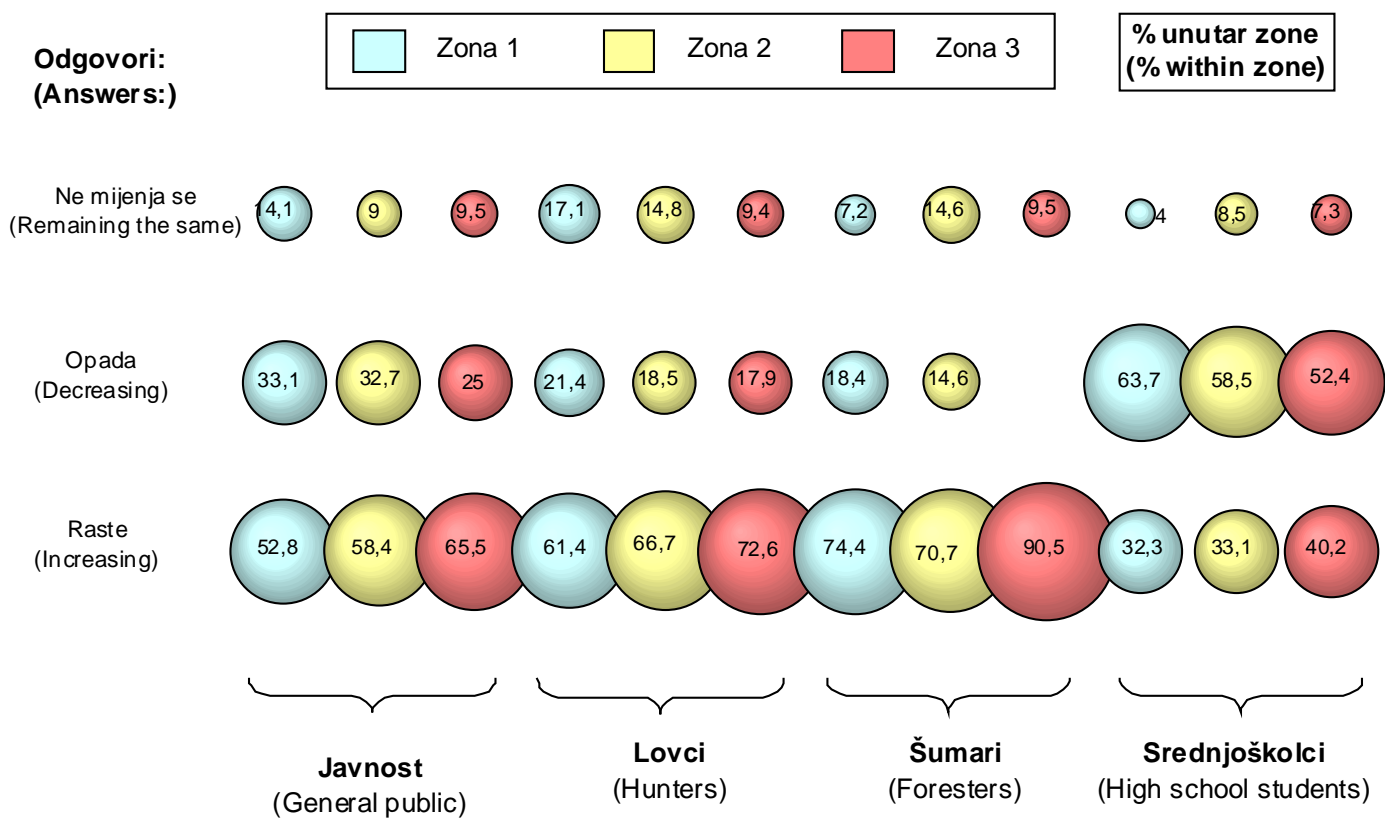
While most respondents in most groups correctly identified that the number of wolves in Croatia is increasing (Figure 47), a notable exception was high school students from all three zones. Nearly 64% of Gorski kotar students, 59% of Lika students, and 52% of Dalmatian students believe the wolf population is declining in Croatia. Within the general public there are also relatively large percentages of residents from Gorski kotar (33%), Lika (33%), and Dalmatia (25%) who believe wolf numbers are decreasing within the country. Similar results were found when respondents were asked about their perceptions of wolf numbers within their own respective regions (Figure 48), with the exception being that 93% of Gorski kotar hunters felt wolf numbers were increasing within their province.

The last four items in this section asked respondents about their feelings toward increasing and decreasing the number of wolves in Croatia and in their respective regions. Most residents of Gorski kotar were split in their opinion about increasing wolf numbers in Croatia; 44% were in favour, 39% were against and 17% were

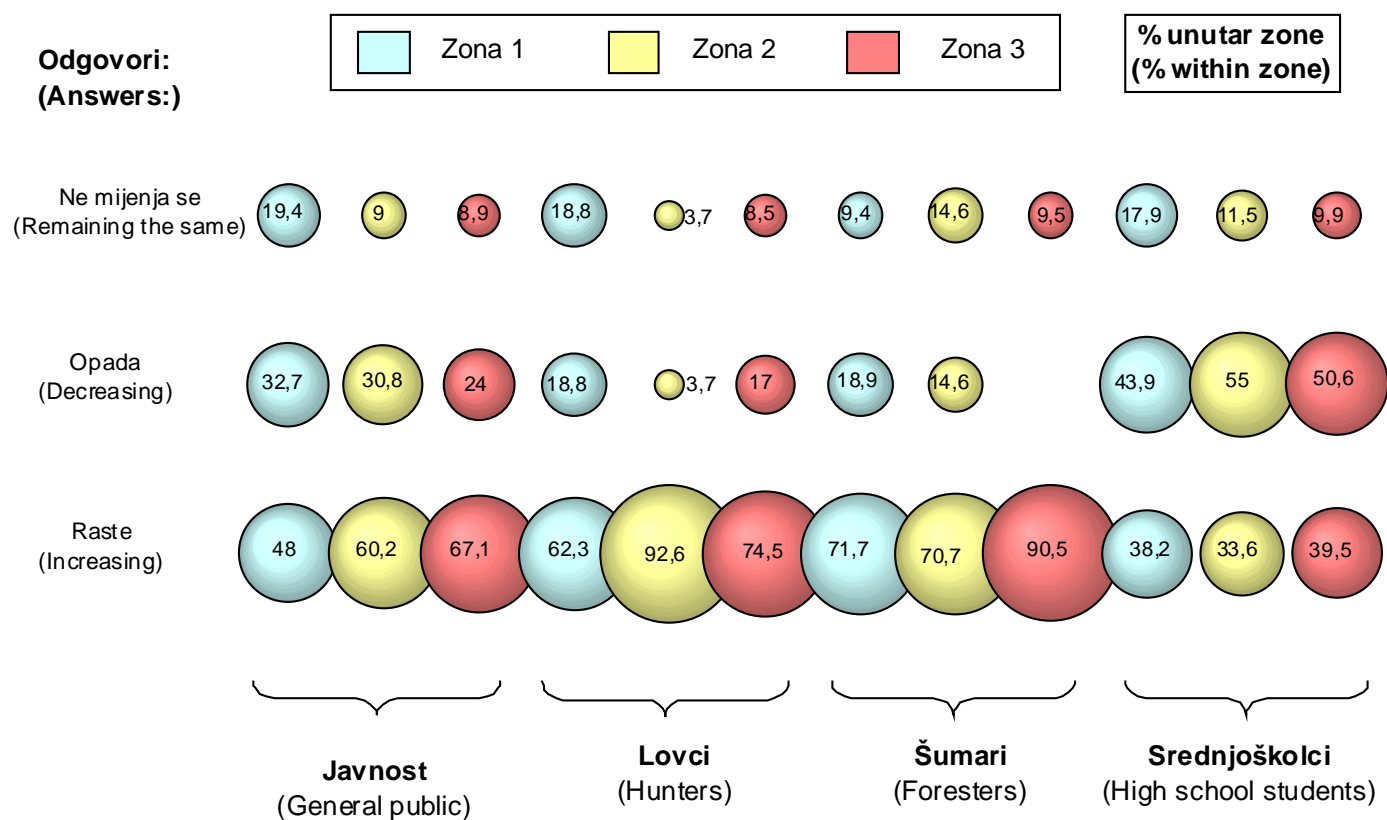
neutral (Figure 49). Students in Gorski kotar (54%) and Lika (42%) expressed an interest in increasing wolf numbers in Croatia and while only 24% of Dalmatian students felt the same way, 52% of Dalmatian students stated neutral which may indicate a population that could be swayed in either direction with the right persuasive messages. On a corresponding item (We already have enough wolves in Croatia) used as a check on consistency of responses where respondents would answer in the positive to stay consistent with their earlier attitude answered in the negative, similar percentages were found (Figure 50).

When asked the same two questions for their respective provinces similar responses were again found. Students in Gorski kotar expressed stronger positive attitudes (68% versus 54%) toward increasing numbers within their own province than previously stated toward increasing numbers for the country of Croatia. Such findings challenge the traditional belief that as issues get closer to home (nimby), support wanes. The general public in Gorski kotar is once again split on this issue. Nearly 44% of the public wants more wolves in the region while 44% indicate no more wolves; 12% of

**Figure 47: Mislite li da broj vukova u Hrvatskoj: (Do you believe wolf numbers in Croatia are:)**

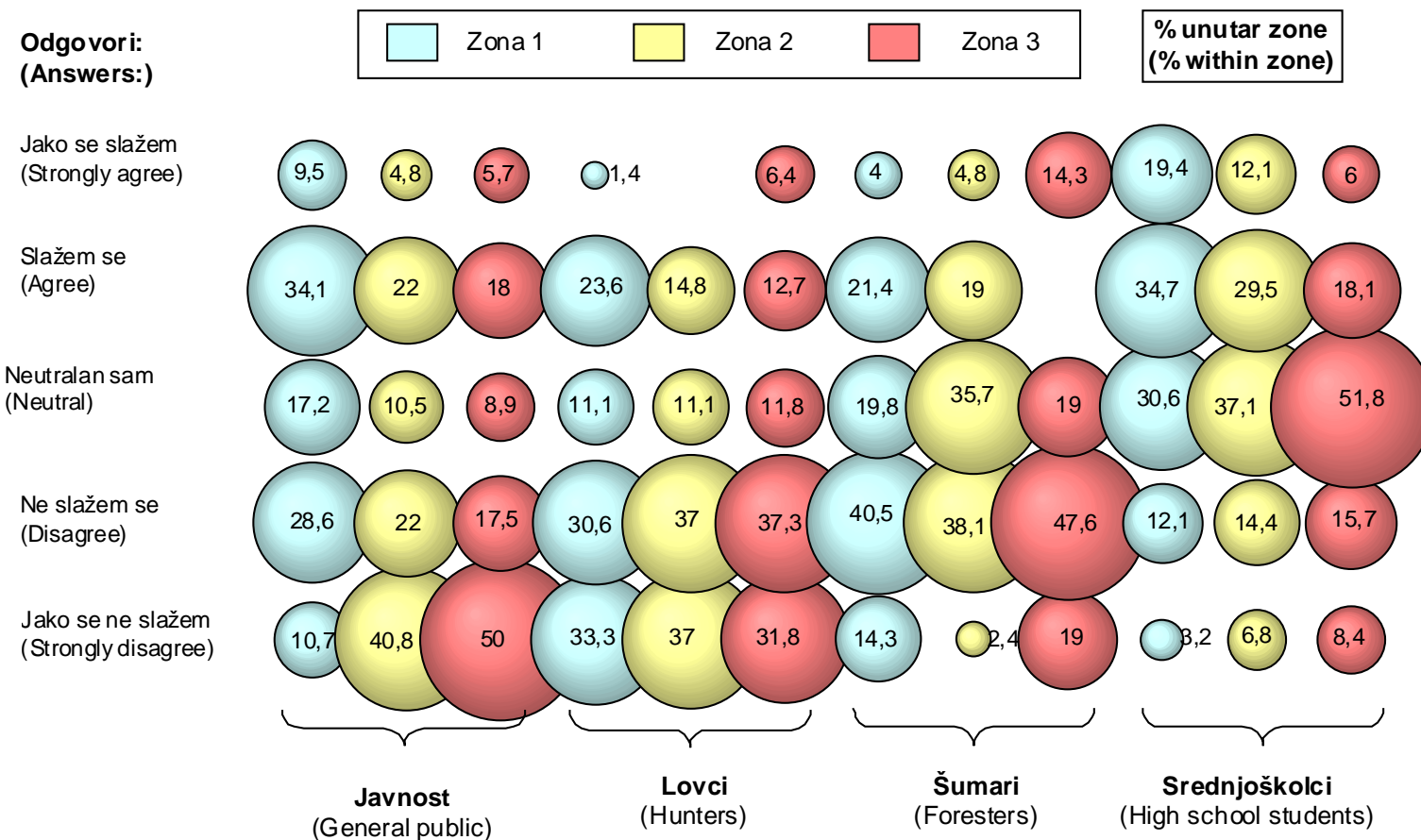


**Figure 48: Mislite li da broj vukova u području Gorskog kotara/Like/Dalmacije: (Do you believe wolf numbers in region of Gorski kotar/Lika/Dalmatia are:)**

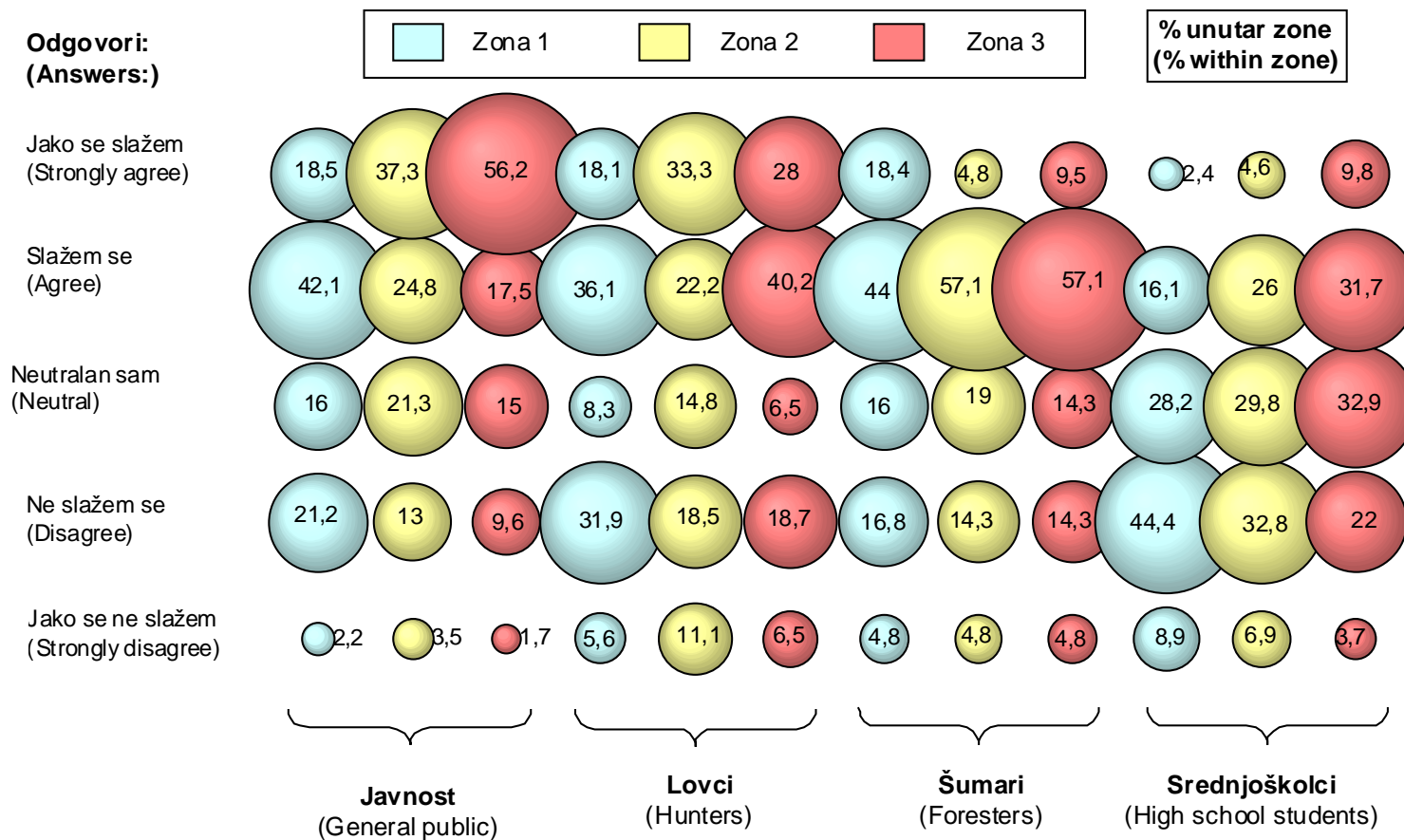




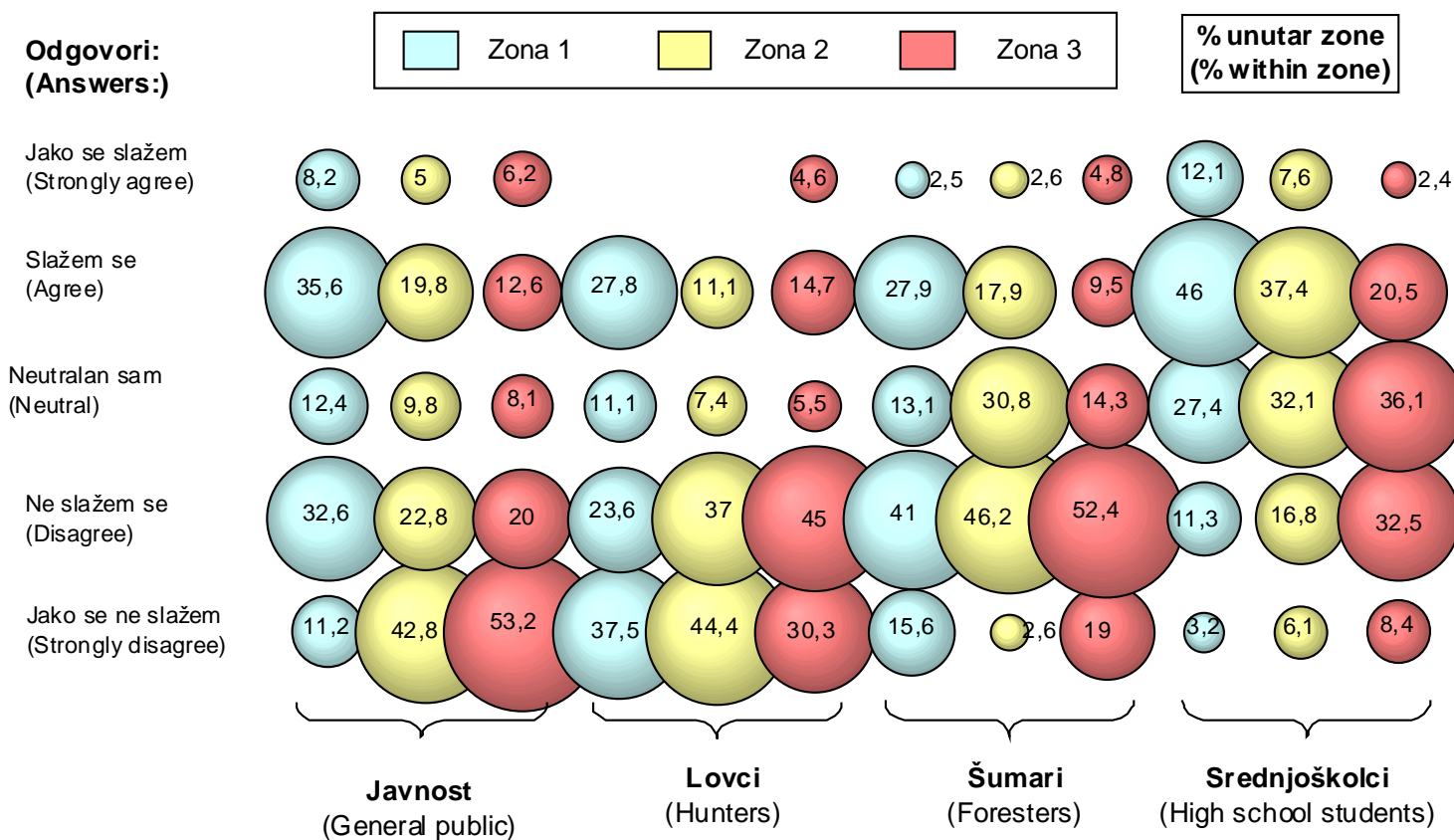
**Figure 49: Nemam ništa protiv porasta broja vukova u Hrvatskoj. (I would agree with increasing wolf numbers in Croatia.)**



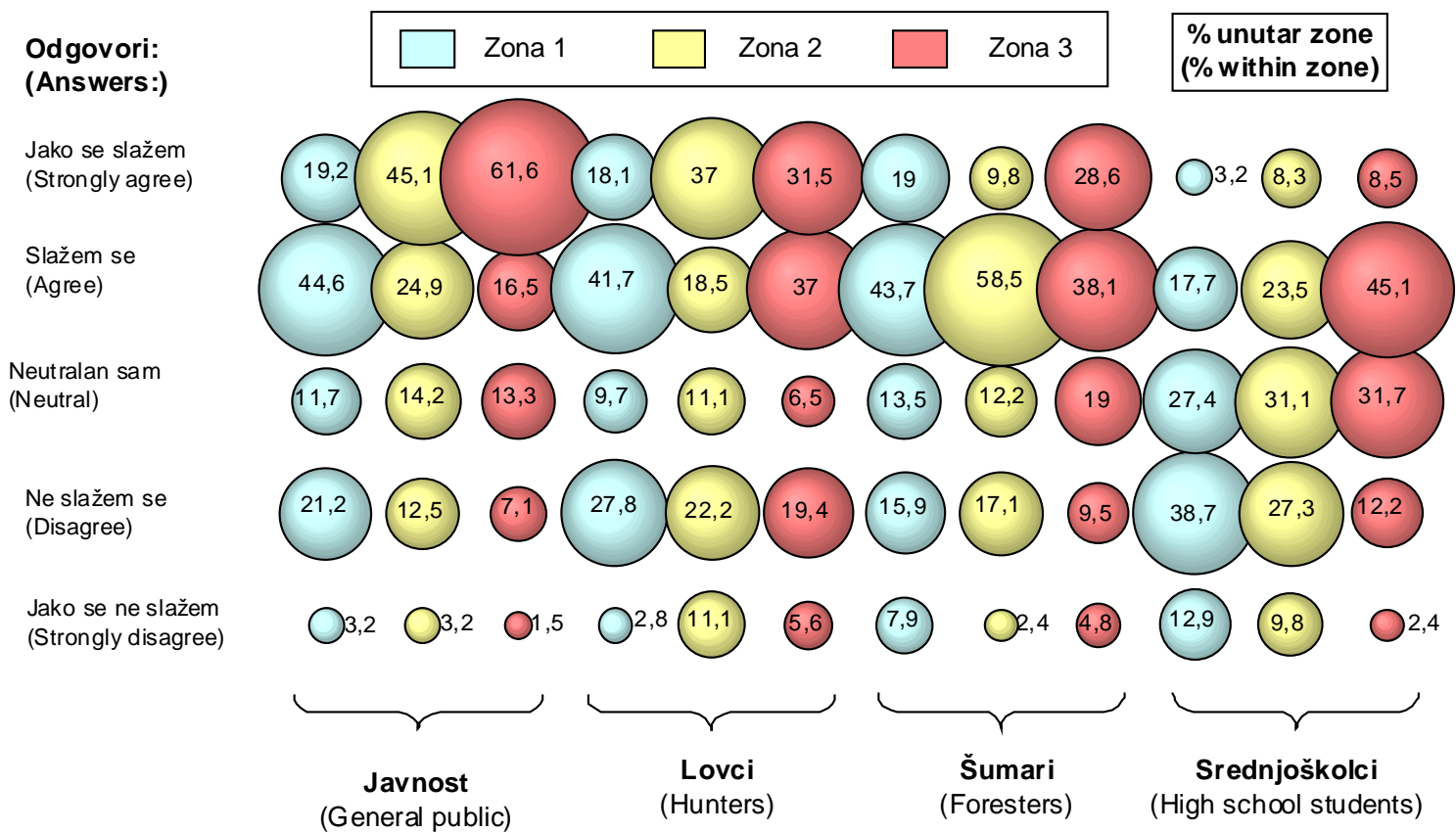
**Figure 50: Imamo dovoljno vukova u Hrvatskoj. (We already have enough wolves in Croatia.)**



**Figure 51: Nemam ništa protiv porasta broja vukova u području Gorskog kotara/Like/Dalmacije. (I would agree with increasing wolf numbers in region of Gorski kotar/Lika/Dalmatia.)**



**Figure 52: Imamo dovoljno vukova u području Gorskog kotara/Like/Dalmacije. (We already have enough wolves in region of Gorski kotar/Lika/Dalmatia.)**



residents are neutral (Figure 51). Other groups tend not to support an increase in wolf numbers at this time. In contrast to responses to the previous item, when asked: “we already have enough wolves in the region”, residents of Gorski kotar actually showed more support (65%) for

not increasing the wolf numbers (Figure 52). In summary, Croatian respondents seem for the most part content with the number of wolves in the country and within their region, however, residents do believe there are far greater numbers of wolves in Croatia than may actually exist.

### ***Beliefs about wolf – livestock issues***

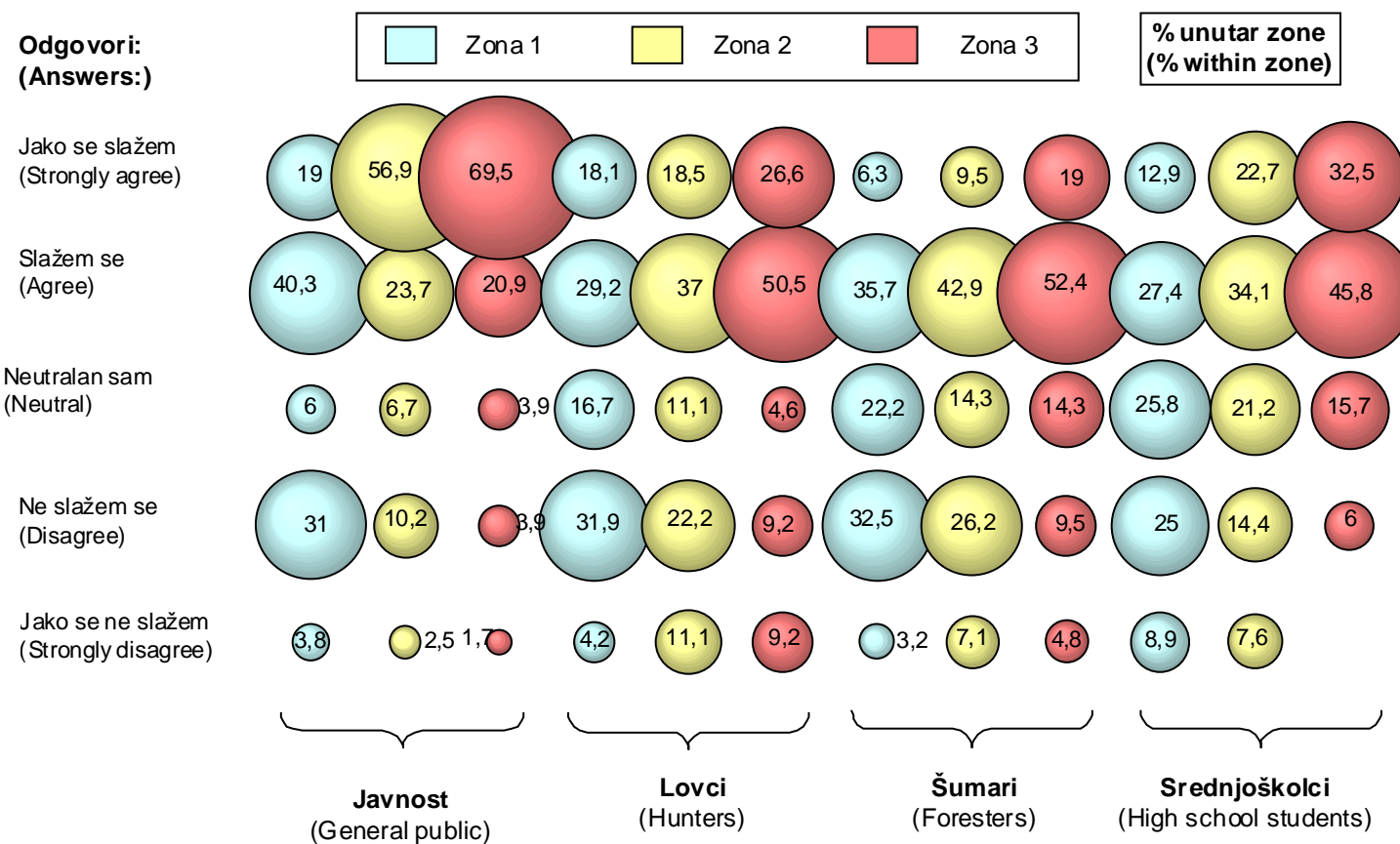
Wolves occasionally kill livestock. The number of domestic animals killed per year depends on many factors, some of which include livestock preventative measures used, wild prey availability, sheep density, and perhaps wolf density. In Yellowstone National Park, where there are about 150 wolves (comparable population to Croatia), there have been less than 70 livestock losses over a three-year period. In Croatia, particularly in Dalmatia, livestock losses have been considerably higher; as much as 85% of the wolf’s diet appears to be domestic livestock. The magnitude of the wolf-livestock depredation issue in Croatia and many parts of Europe is huge from a North American perspective, and yet compensation is paid, and general public attitudes remain positive toward wolves but sympathetic toward the agricultural community. Several items in the

questionnaire explored beliefs, affective aspects of attitude, and behavioral intention related to livestock issues. The following figures present the results from these items.

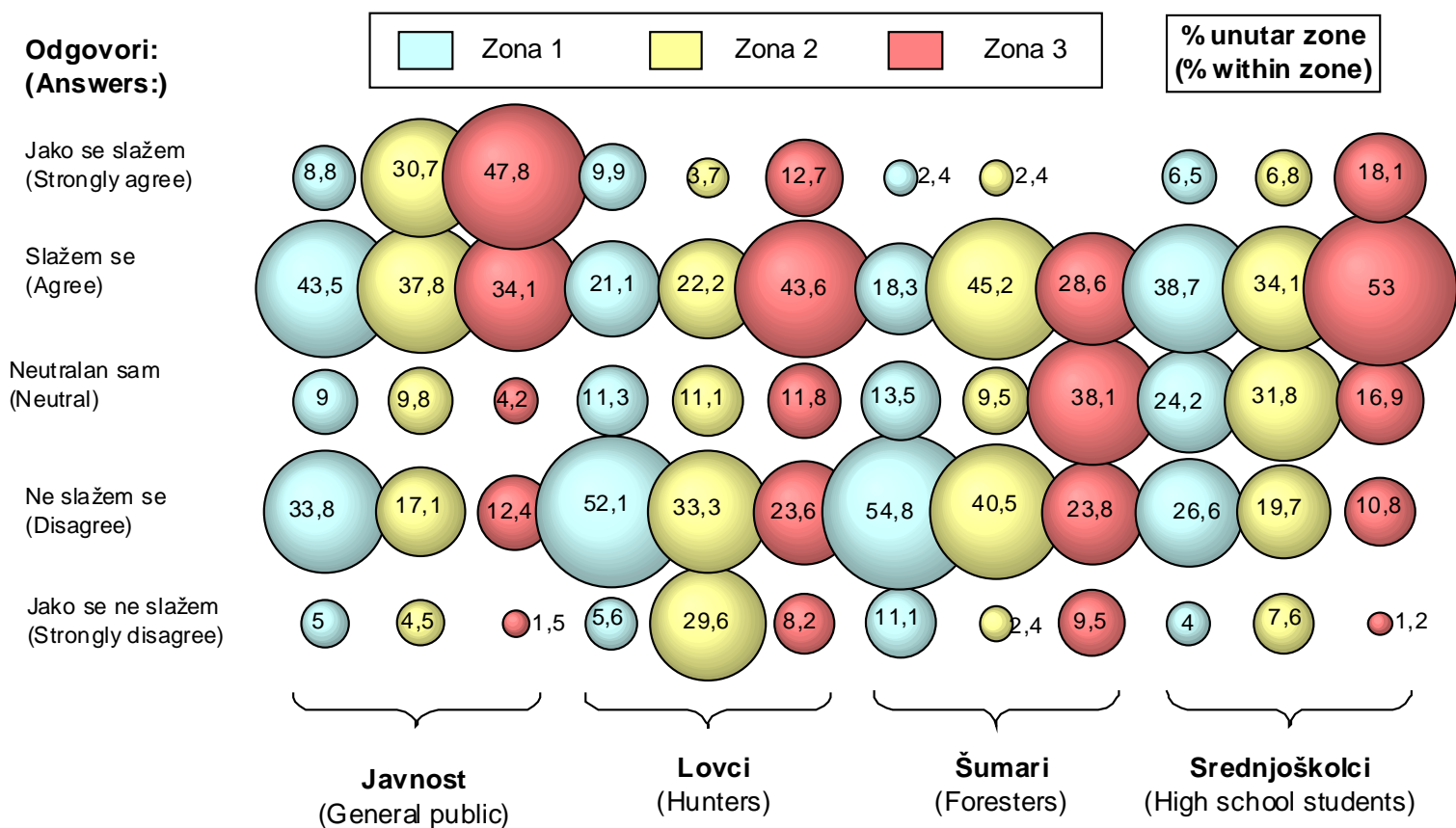
Most respondents in all groups and across all zones strongly agreed that wolves cause significant damage to livestock (Figure 53). The strongest agreement came from the residents of Dalmatia (over 90%); less agreement was found in Gorski kotar (59%).

General public residents particularly Dalmatians have several strong beliefs about wolf behavior in sheep areas. Most residents of Dalmatia (82%) and most students of Dalmatia (71%) believe that in regions where wolves live in close proximity to livestock, they feed primarily on domestic animals (Figure 54). Such

**Figure 53: Vukovi nanose velike štete na domaćim životinjama. (Wolves cause abundant damages to livestock.)**



**Figure 54: U područjima gdje vukovi žive u blizini domaćih životinja, njihova glavna hrana su domaće životinje. (In areas where wolves live near livestock, their primary food is livestock.)**



feelings while still dominant in Gorski kotar (52%) and Lika (69%) are considerably less strong. There are many examples in Europe and worldwide where wolves can exist close to livestock areas without ever causing any damage. If Croatia considers a zoning system, this may be an item that will need to be addressed in a communication campaign. If many residents feel wolves can never coexist near sheep then potentially there could be very few areas where the general public could perceive having wolves.

Similar to other European countries, local, regional and national newspapers frequently cover stories of sheep and goats killed by wolves in Croatia. The effect of this news coverage is unknown on public attitudes toward wolves, and public beliefs about the number of sheep actually lost per year due to wolves. Wolves have killed more livestock in Dalmatia than in Lika or Gorski kotar. Actual numbers of livestock killed by wolves varies per year and are difficult to find. In an effort to understand public perceptions or beliefs about such losses, residents, and all interest groups were asked: “wolves kill sheep and goats only if there are not enough deer and other wild game”. From Figure 55 one can see a diversity of responses to this item from the

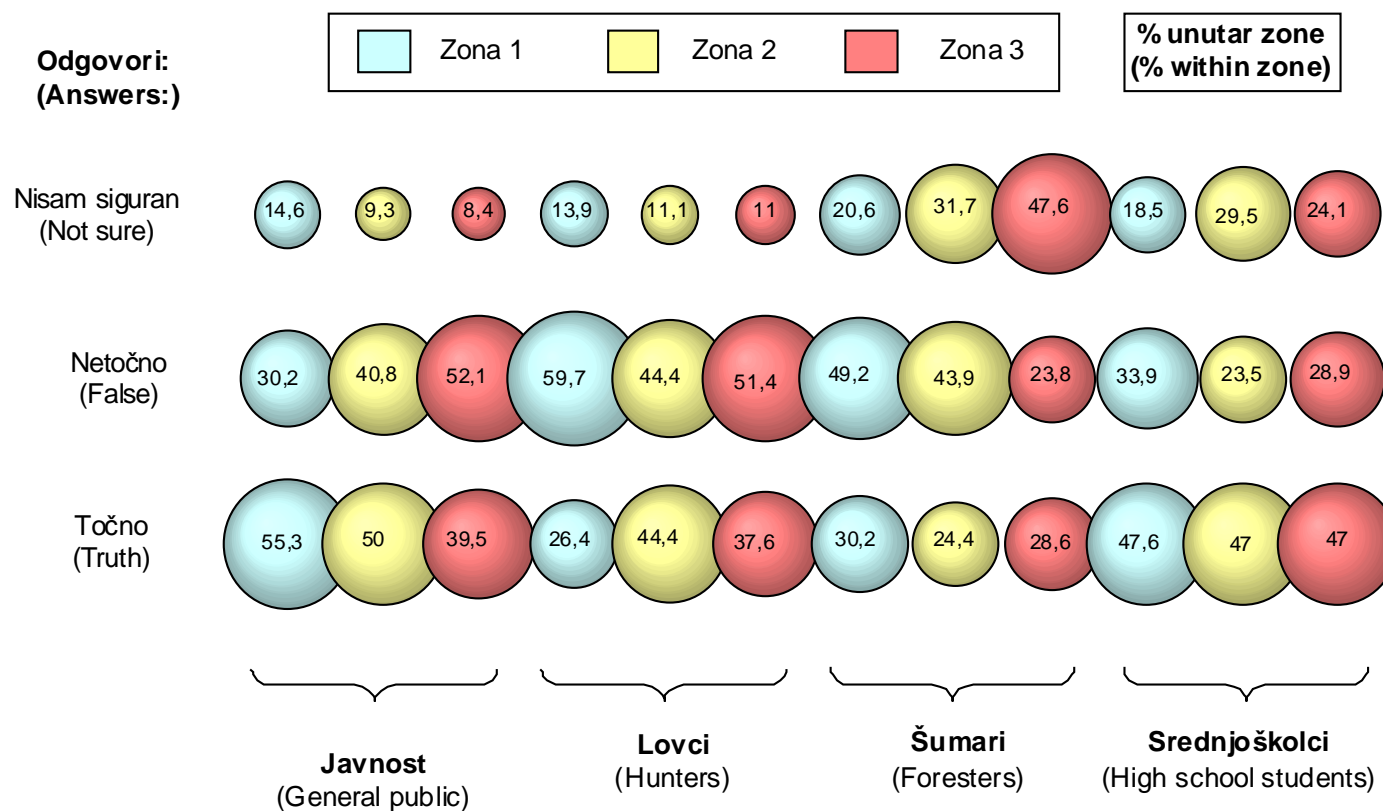
various interest groups. The pattern suggests that this belief item is not clear-cut for most respondents. This issue of why wolves attack livestock is debatable. Biologists have discussed if the number of wolf attacks on sheep are related to prey density. In some areas like in Dalmatia region of Croatia, where wild prey is scarce and sheep density is higher than in surrounding areas, wolves do attack and survive mainly on sheep. Yet there are areas where wolves have lived with abundant prey, and still attacked sheep. It seems there is a general agreement that wolves occasionally attack sheep even when there is abundant wild prey available.

The last 10 items focus on management issues related to addressing wolf-livestock conflicts and obtain behavioral intention information from respondents (what will residents support and/or oppose if proposed in a management plan?). Most respondents in all groups and across all zones strongly supported killing the wolf or wolves responsible for attacks on sheep. Least support for killing the problem wolf came from the students (Figure 56).

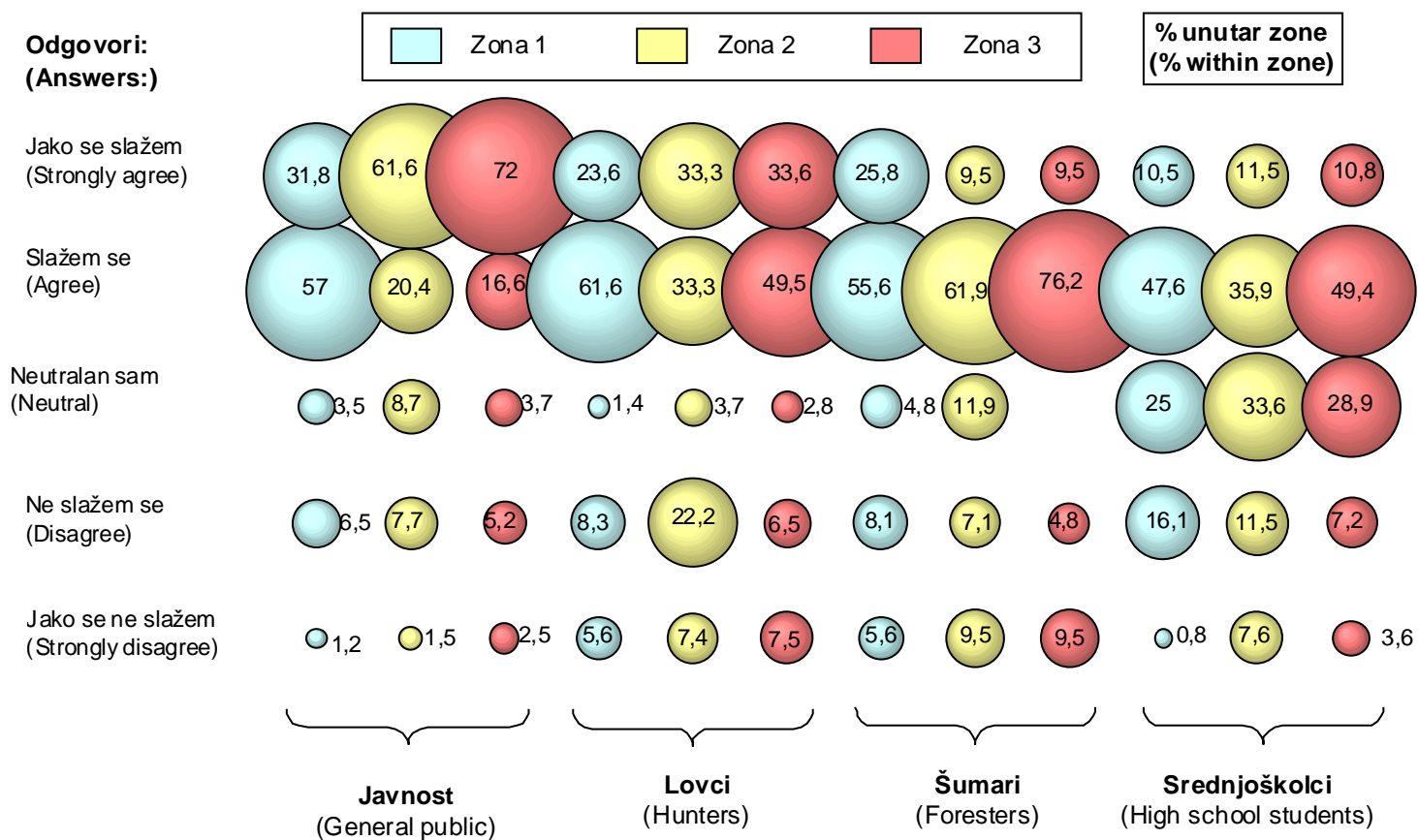
Most residents in Gorski kotar (61%) and Dalmatia (55%) and many in Lika (42%)



**Figure 55: Vukovi kolju ovce i koze samo ako nema dovoljno jelena i druge divljači. (Wolves kill sheep and goats only if there are not enough deer and other wild game.)**



**Figure 56: Ako bi određeni vuk ubijao stoku, složio bih se sa odstrijelom te problematične životinje. (If a wolf killed livestock, I would agree with killing this problem animal.)**



strongly agreed or agreed with the statement: “I would be willing to contribute financially to a compensation program for farmers for their loss of animals due to wolves” (Figure 57). Hunters and foresters were divided in their feelings toward contributing money toward compensation for farmers. Many students expressed support and a willingness to contribute to a compensation program for farmers.

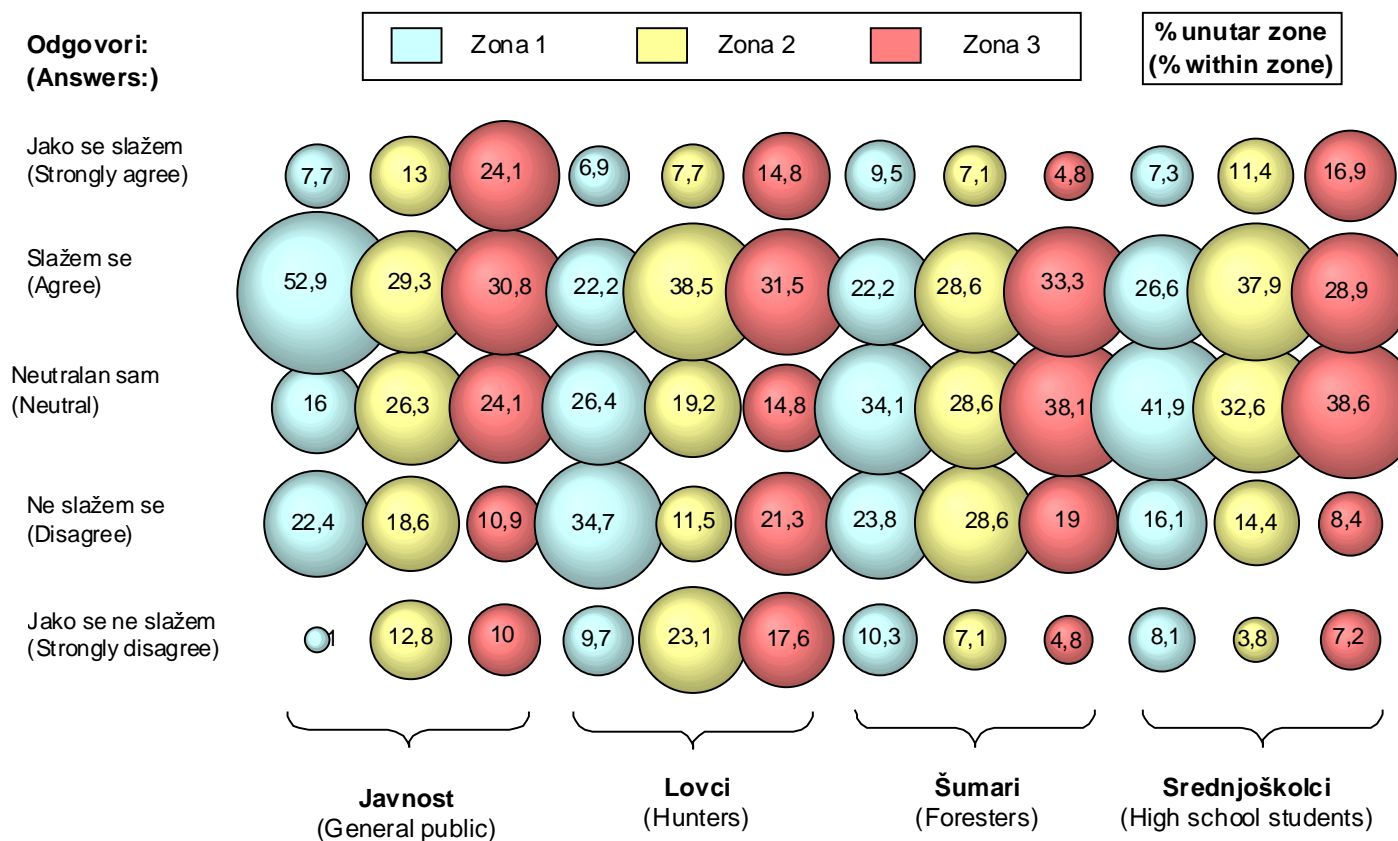
The Large Carnivore Initiative for Europe (LCIEE) has suggested that livestock owners receive a fixed subsidy for living in a carnivore zone rather than compensations for each loss caused by carnivore attacks. Residents were asked whether: “livestock owners should receive money for living in a zone where there are wolves, instead of receiving compensation for losses caused by wolf attacks.” Most residents in the three-zone area supported the idea (Figure 58). And while differences had occurred between the general public from each zone on many attitudinal items, concerning this issue approximately 61% of all general public residents across all groups supported this idea. In France, the general public did not support the idea. This suggests the need to develop different solutions for different places and the

importance of listening to the various publics and testing possible solutions.

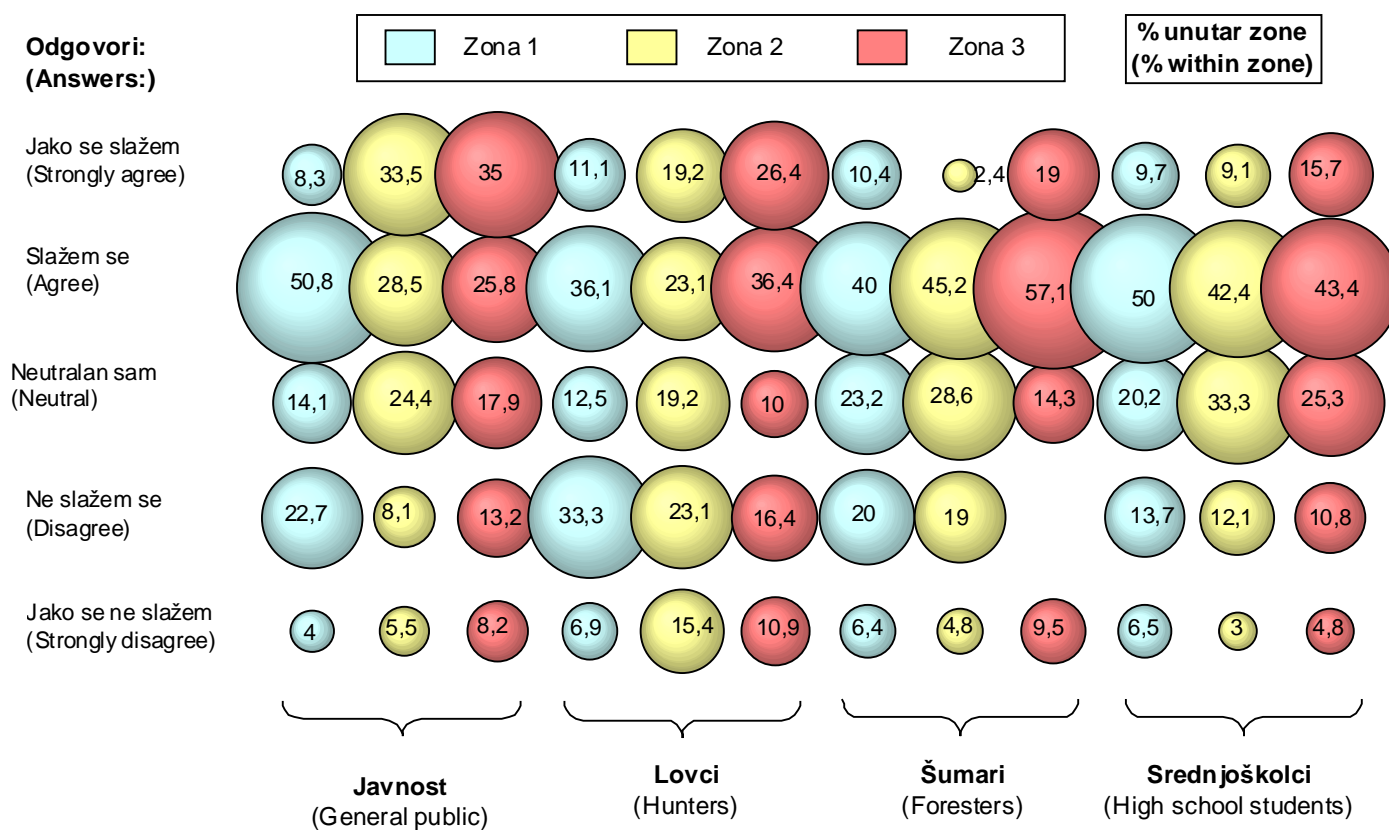
Another suggestion by the LCIE is to offer compensation for damages to only those livestock owners who use methods in an effort to prevent livestock losses. In two provinces (Savoie and Des Alpes Maritimes) in France, most residents support this statement. This is interesting because in Croatia support is much weaker for this idea. The general public across the three zones are almost equally divided on the issue (Figure 59). The majority of hunters and foresters seem to oppose the idea. Students seem to support the idea, although many have also stated neutral responses.

More than 90% of general public residents in all three zones strongly believe that livestock owners who lose animals because of wolf attacks should receive compensation (Figure 60). When asked about using their taxes toward paying compensation for damages caused by wolves, feelings were not as strong as before (Figure 61). Opposition to the idea was evident from students; hunters and foresters were divided on the issue.

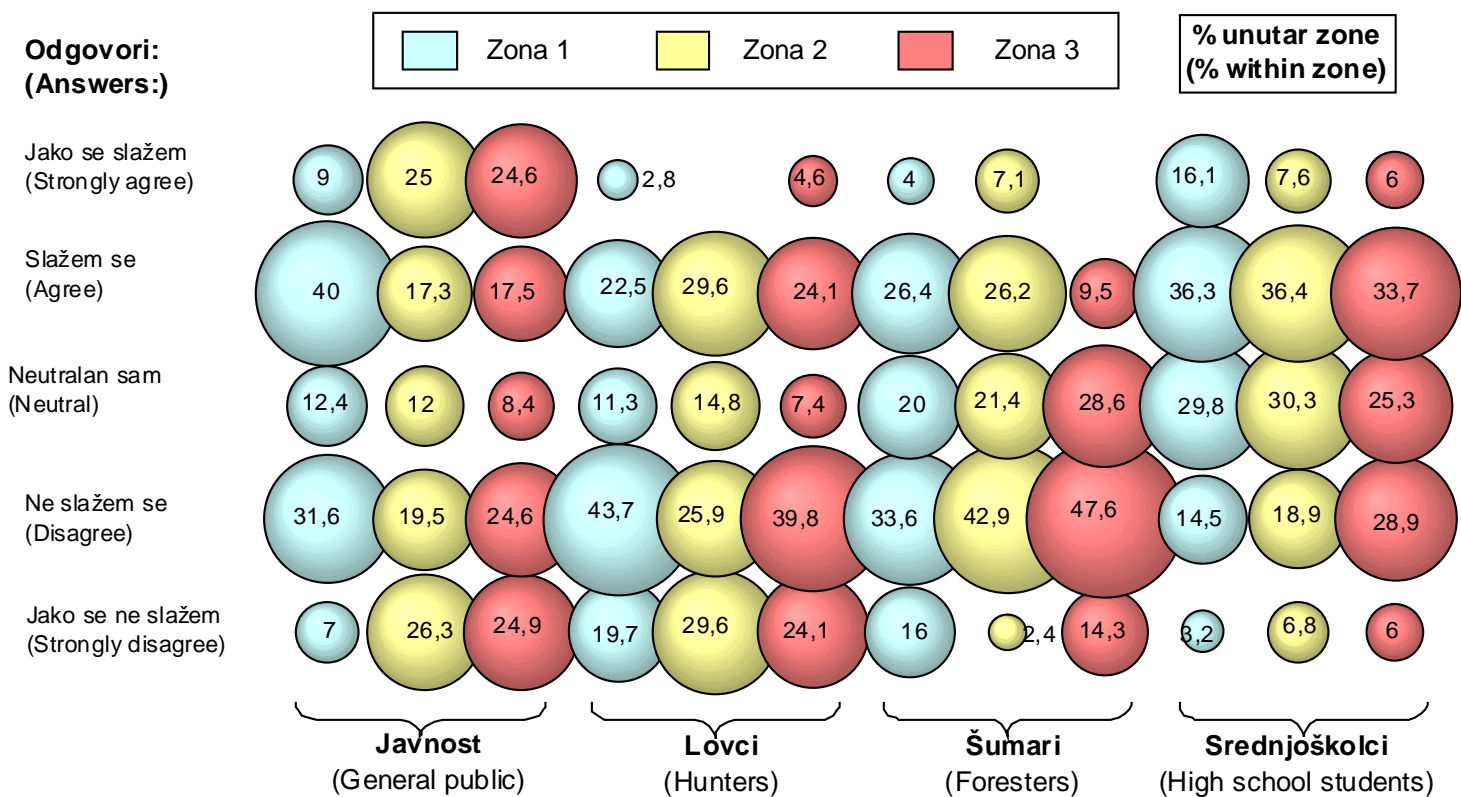
**Figure 57: Rado bih dotirao sredstva u fond za naknadu šteta stočarima. (I would be willing to contribute money towards a compensation program for farmers for losses due to wolves.)**



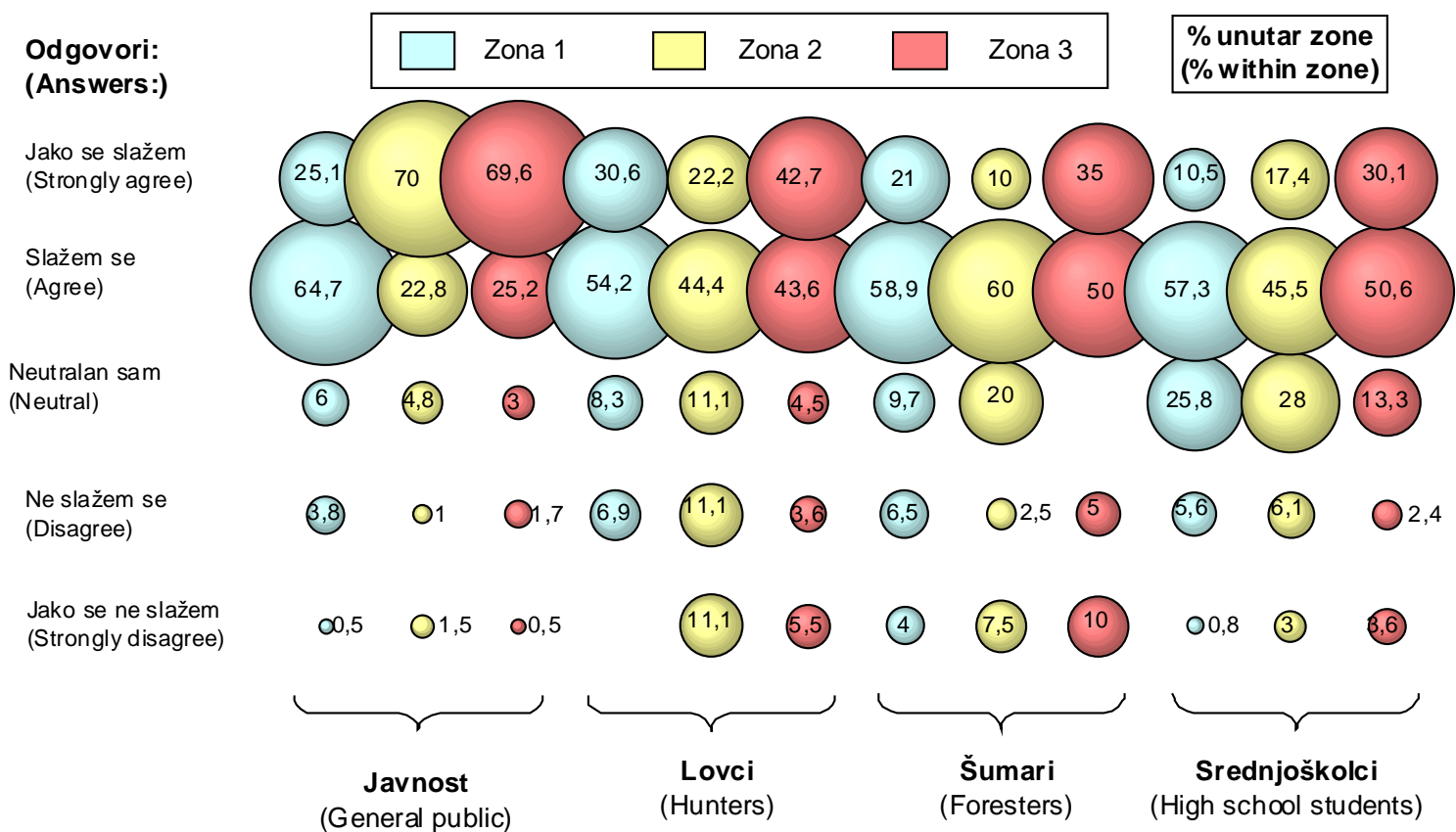
**Figure 58: Stočari bi, umjesto naknada za štete, trebali primati premiju za stočarenje u području gdje ima vukova. (Livestock owners should receive money for living in a zone where there are wolves, instead of receiving compensation for losses that wolf causes.)**



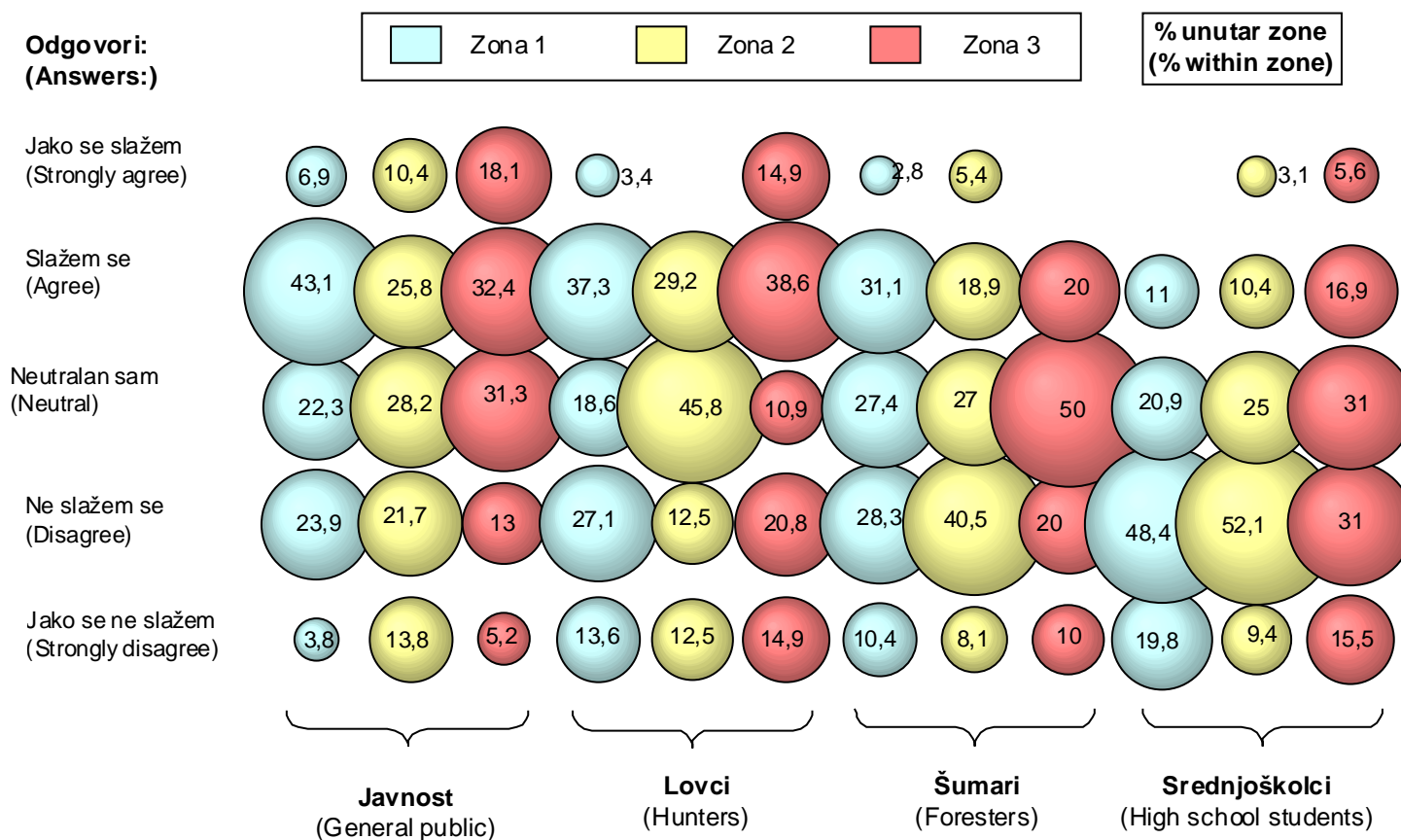
**Figure 59: Stočari ne bi trebali primiti naknadu za štetu koju su nanijeli vukovi, ako nisu koristili metode prevencije nastanka šteta. (Livestock owners should not receive compensation for damages caused by wolves if they do not use methods to prevent damages.)**



**Figure 60: Stočari bi trebali primati naknadu za štete na stoci koje im nanose vukovi. (Livestock owners that lose livestock due to wolf attacks should be compensated.)**

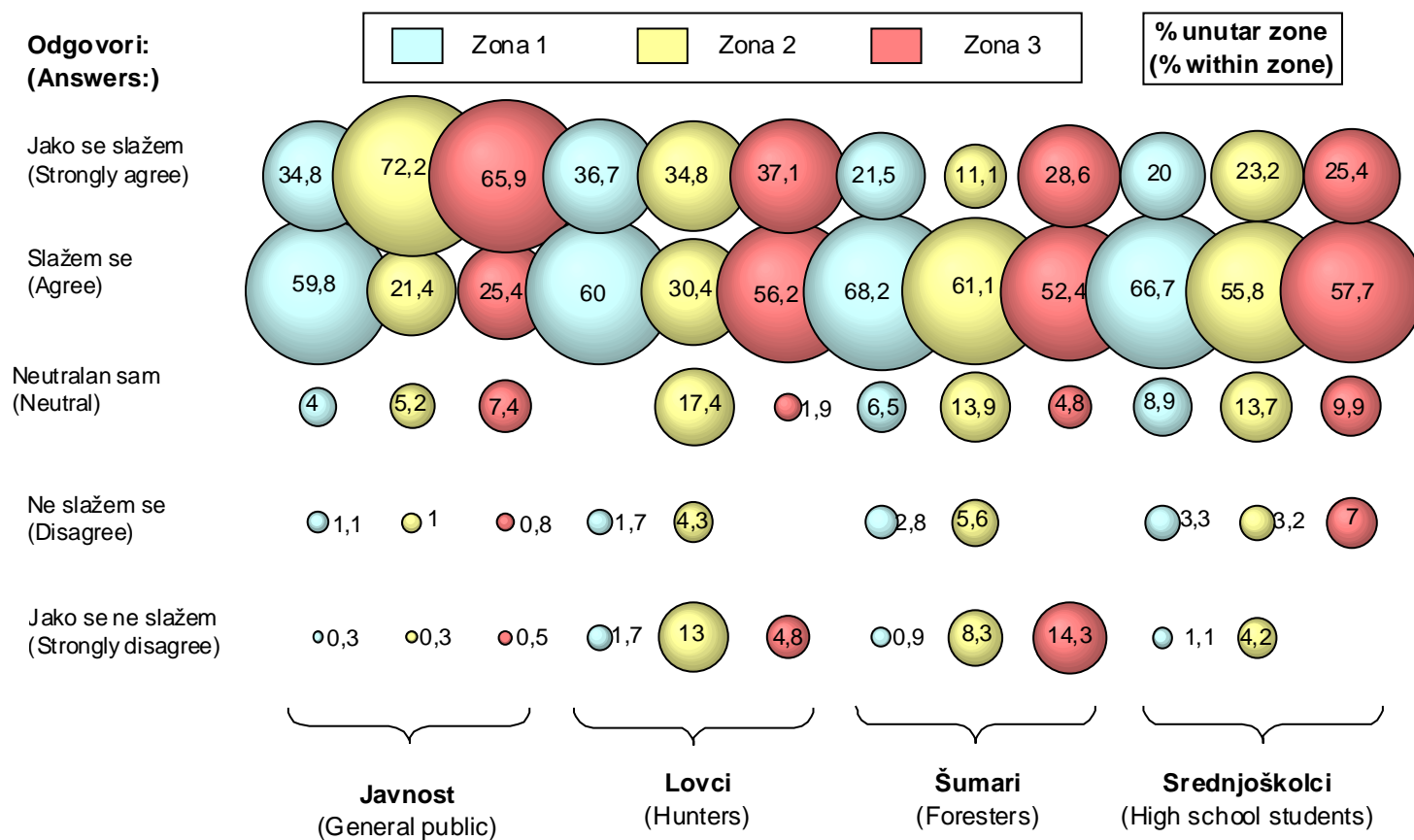


**Figure 61: Htio bih da se moja porezna davanja koriste za plaćanje naknada stočarima za štete uzrokovane vukovima. (I would like my taxes to be used toward paying compensation for damages caused by wolves.)**

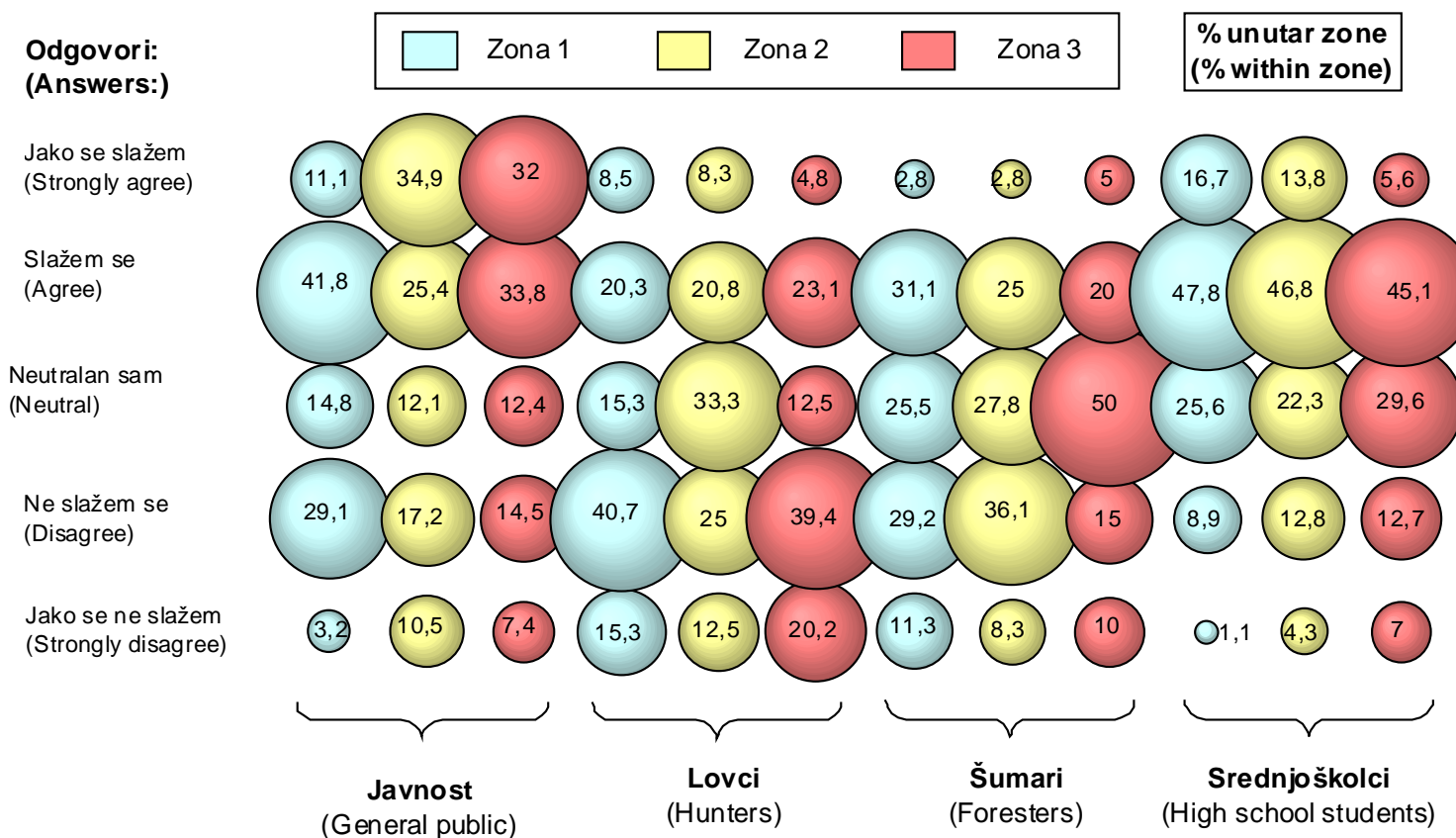




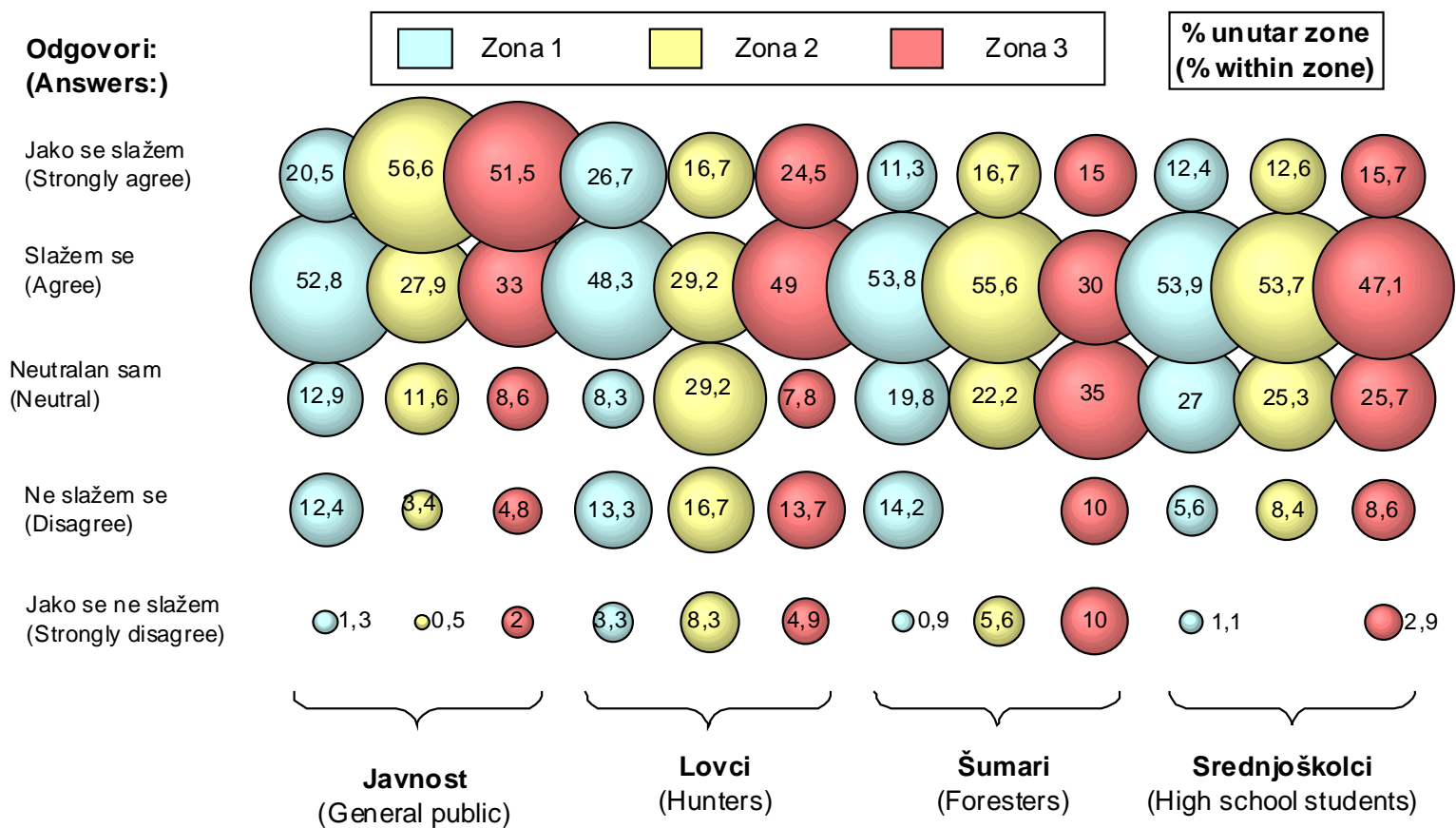
**Figure 62: Država bi trebala plaćati naknade stočarima za štete uzrokovane vukovima. (Administration should pay compensation to livestock owners who lose livestock to wolves.)**



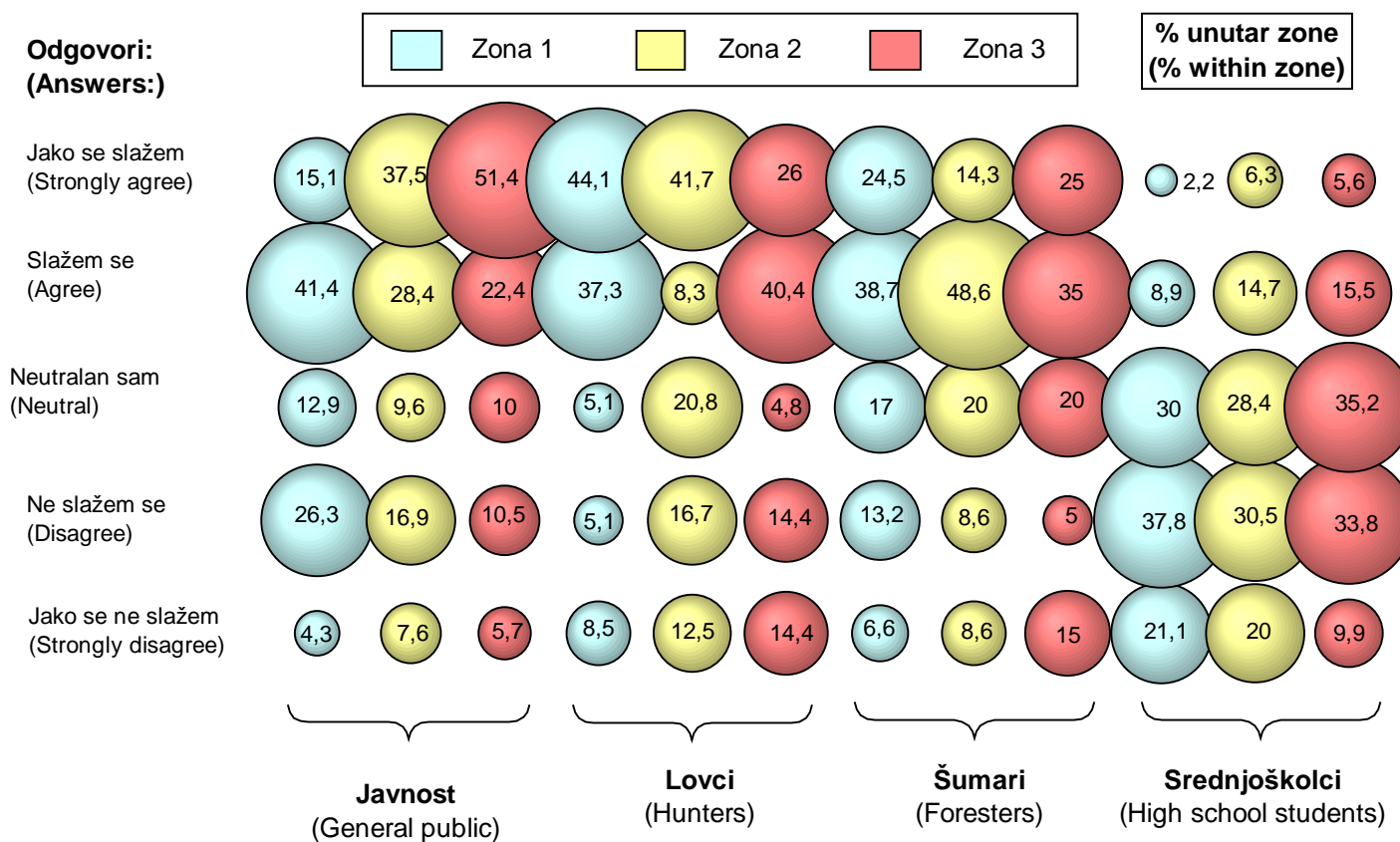
**Figure 63: Stočari bi obavezno morali plaćati osiguranje stoke od vučjih napada. (Livestock owners should be required to buy insurance for protection against wolf attacks.)**



**Figure 64: Država bi trebala platiti osiguranje stoke od vučjih napada. (Administration should pay for this insurance for livestock.)**



**Figure 65: Trebalo bi odobriti odstrijel vukova u području Gorskog kotara/Like/Dalmacije. (There should be authorized wolf hunts in region of Gorski kotar/Lika/Dalmatia.)**



Outside of Yellowstone National Park, USA when a confirmed wolf attack on livestock has occurred, a private environmental group, the Defenders of Wildlife, pays the compensation directly to the farmer. This action has helped address the concerns of using government dollars to fund wolf management issues. Costs of the wolf restoration effort was the most important reason why people opposed wolf restoration in Yellowstone National Park, so when an environmental group through private donations started to pay compensation, many people switched to support the wolf restoration effort. Residents were asked if the Administration should provide compensation to livestock owners who suffer damage to livestock caused by wolves. An extremely large percentage (over 90% of the general public) believed the Administration should provide this compensation (Figure 62).

Another issue that is being debated across Europe is having livestock owners be obliged to attain insurance in order to

insure protection against wolf attacks. Most general public respondents in Gorski kotar (53%), most Lika residents (60%), and most Dalmatia residents (66%) believed that livestock owners should purchase some form of insurance. Hunters and foresters tended to be less supportive of the idea (Figure 63). Most respondents also believed that the administration should pay this insurance on behalf of the livestock owners (Figure 64).

The last item in this section asked residents whether a wolf hunt should be authorized in their region. In previous items residents had expressed opinions about hunting as a management tool for the wolf, but by placing this question with the livestock items the question allowed for a sense of how attitudes may be influenced upon thinking about livestock issues. It does not seem that the item had any special effect; respondents remain consistent with a willingness to have a hunting season on the wolf but ensure its existence (Figure 65).

### ***Qualitative results based on Common Ground Matrix (CGM)***

While several meetings occurred throughout the project with the interest groups involved in the HD study, data

from individual interviews were specifically collected from five organizations: biologists/research

scientists, Croatian Forestry, Ministry of Environmental Protection and Zoning (formerly State Directorate for Protection of Nature), Croatian Hunters Association, and the Mountaineering Association (Nature Protection Commission). These organizations were asked about the key issues facing wolf management from their perspective, the role they felt they could play in the wolf management issue, what other groups they believed should be involved and key solutions. The idea of the CGM method is to present the results of the matrix back to the interest groups with the key issues down the left hand side and only numbers (no group labels) across the top of the CGM. Each group now within the same room is asked to try to find itself on the CGM. As each group examines the CGM in an effort to locate his/her group, they realize that this is not an easy task as many concerns are shared. By summing the number of Xs or check marks in this case across the CGM, it is possible to identify the issues that all groups believe are important. By summing the check marks down the columns, it is possible to identify how narrow or broadly focused a group is. With only a few groups and having only a few issues mentioned by each group, the full effect of the CGM process for Croatia is not as clear as seen

in other countries. By involving more interest groups and having further discussions, the benefits of such an exercise will be more apparent.

Given these above considerations, Table 16 presents the results of the CGM. Five key issues were found to be common with the five interest groups:

- Status of wolves (should be protected by hunting law)
- Lack of good biological data on wolf-prey interactions and numbers
- Poor preparations for livestock protection
- Need for better education of people about wolves
- Need for more efficient damage compensation measures in place

At least two groups of the five interviewed identified these above issues. Presentation of these results back to the individual groups and the results from the general public should be one of the first steps toward getting groups to work together to understand and address wolf management in Croatia. For successful engagement of these interest groups in a meaningful public involvement process, that may include a communication and public

Table 16: Common ground matrix.

Key Issues	Interest group					Total
	Biologists	Foresters	Ministry of Environmental Protection and Zoning	Hunters	Mountaineering Association (Nature Protection Commission)	
Status of wolves (protection)		✓		✓		2
Impact on prey		✓				1
Poor biological data		✓			✓	2
War consequences (abandoned livestock)		✓				1
Attitudes of people	✓					1
Poor preparations for protection			✓		✓	2
Education of people	✓		✓			2
International pressure (Bern Convention)			✓			1
Damage compensation		✓	✓	✓		3
One-sided decision making				✓		1
<b>Total</b>	<b>2</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>16</b>

awareness component in the future, it will be important to demonstrate listening first before informing. We are born with two ears and one mouth, and we should be listening at least twice as much as talking. These groups have expressed these issues and these issues should be the starting point for discussion and for the development of communication messages that would be targeted to these interest groups. Reporting back the results of this listening exercise and exploring the challenges and opportunities within each of these issues should be the first steps with all groups. Such a follow-up exercise will clearly demonstrate a willingness to listen first.

The CGM revealed that administrative organizations (Croatian Forestry and Ministry of Environmental Protection and Zoning) tended to identify the largest number of issues. The foresters identified the most issues at five. In contrast, some groups (biologists, mountaineering association) were more narrowly focused mentioning just two key issues, while

### ***Agricultural issues***

Agricultural issues can be summarized by:

- Livestock depredation concerns including the impact of the direct loss

Croatian hunters highlighted three issues. More detailed interviews with these organizations and with more of their members through a focus group format would generate more issues and information; this may be something to do in the near future. In total, the five groups identified ten issues. These issues could be grouped into four key areas:

- Agricultural/livestock issues
- Communication/understanding people
- Biological issues
- Legal/political issues

The structure for a communication plan and public involvement process with the interest groups lies in the understanding of the beliefs and attitudes underlying these four areas. Of these four general issues some are more important than others, and even within each area, importance of issues needs to be prioritized by listening again to the specific groups.

of sheep to wolves, the fear that losses will only increase, and the impact of



wolf attacks upon the entire flock health

- Need to develop efficient damage compensation measures for livestock losses – fair pricing and efficient processing of claims
- The effects of war continue to influence agricultural issues. For example, there is abandoned livestock and issues of who and how such livestock be managed need to be addressed.
- Lack of knowledge and preparedness about livestock preventative measures against wolves. Need to be trained and build capacity in understanding and addressing wolf-livestock conflicts.

Some of the agricultural/livestock issues are larger in scope than wolves and wolf management. Issues of compensation and abandoned livestock need to be addressed through a consensus approach with all interested parties. Beyond these factors mentioned, research from other parts of Europe suggest that shepherds and the agricultural community in general are under stress from a variety of factors. Some of these include uncertainty about the impacts of common agricultural reform policy, issues related to integrating into the European Union, and pastoral lifestyles.

Communication issues for Croatian interest groups within this area of agricultural/livestock issues may do best to concentrate on wolf-livestock preventative measures and compensation issues.

In addition when about communicating about wolves to the agricultural community, managers may do better to design persuasive messages that place the agricultural community and wolf conservation advocates on the same side against a common enemy. For example, pastoral lifestyle and wolves are threatened by development pressure and changing land use. The general public appears sensitive to many of these agricultural concerns, but they do want to see coexistence occur between wolves and people. Sharing experiences and examples of agricultural practices in large carnivore zones (eg. Carpathian Mountains in Romania) will help address the concerns mentioned by the Croatian interest groups. Further HD work is needed in this area to obtain scientific and representative data of how widespread amongst the agricultural community are these key issues and concerns.

## ***Communication / Understanding people***

In all HD in large carnivore projects, perhaps the most important and most common issue mentioned by interest groups is the lack of communication both between themselves and other interest groups, and between themselves and government agencies. Many groups indicate that a forum for such discussion to even occur doesn't exist. Other groups suggest that mistrust and previous histories between themselves and other interest groups and with government agencies make it challenging to begin talking and listening unless an independent facilitator is involved. Our HD study in Croatia has created a safer environment for all groups to share ideas and begin working together, and in many ways we have acted as that independent facilitator.

Communication involves listening as well as informing. From the CGM exercise concerns expressed focused upon lack of knowledge the general public has about wolves, and the need to better educate and address the myths about wolves held by the public. Indeed the quantitative results do confirm that public knowledge levels are low about various aspects of wolf

biology. The other related concern was one about hunter and shepherd attitudes toward wolves; these attitudes were perceived by one group to be quite negative. Results from the quantitative and representative data suggest that on many issues attitudes are quite positive toward wolves, however, there are some areas of concern that need to be addressed.

Another communication concern mentioned was the belief that decisions regarding wolf management tended to be one-sided, meaning that decisions tended to be primarily based upon protection-oriented attitudes without consideration of utilitarian attitudes. All groups suggested that this HD study could contribute to a more consensus-based decision-making process rather than the traditional one-sided decision-making of the past.

While wolf management in Croatia remains complex, there is a growing realization from all involved that any conflict between groups can only be addressed through a willingness to listen to other points of view, and the only way to effective wolf management lies in the

ability to work together toward a common vision, goals and objectives. All groups expressed interest in the nature of this human dimensions study and believed having an independent individual or group working toward understanding the views

### ***Biological issues***

The key biological concern expressed was the lack of good scientific data. All groups realized the importance of reliable and valid data concerning basic wolf biology. There is a need to better understand wolf-prey relationships and livestock preventative measures to minimize damage to livestock by wolves. Without data on numbers of wolves and their possible impact, it is a challenge to design an effective management plan.

The lack of a strong biological knowledge base in the public could be affecting attitudes toward the species and toward possible management approaches. For example, those respondents who believe that there is a rapid wolf reproduction rate, may support more control measures in an effort to control wolf numbers. Likewise, beliefs that wolf success rates (50-100%) of killing wild prey are high, may lead to additional beliefs about availability of wild

of all groups (pro-wolf, anti-wolf and indifferent) was needed; many mentioned that this HD study was an effective and safe way to start the communication process.

prey for personal use (hunting). These beliefs could prompt stronger attitudes against wolves and their management. It may be important to communicate biological messages to address these points. Messages that link breeding behavior and facts about the high mortality rates of pups could be useful in the debate about wolf management approaches. Linking a discussion with the impacts of what may happen when individual animals are killed that are not causing a problem could also be enlightening; data from North America suggests that killing key individuals within a pack can cause instability within the pack and may lead to a pack shifting to easier prey (ie. domestic livestock). Sharing examples of how wolves when put under extreme hunting pressure will have more members of the pack breed, and when the pack structure is affected by the killing of a key individual how the rest of the pack may turn to

livestock to survive, could be useful messages that also allow for engagement on issues such as illegal killings. In general though, the results from the CGM suggest that biological messages are just one area for communication and that to be most effective most interest groups will

### ***Political / Legal***

Two key issues identified through the CGM were grouped as political issues:

- Status of wolves (particularly a concern for current protection declaration)
- International legislation/international pressure from the Bern Convention

Many groups feel that the decision to have wolves made completely protected did not involve them. Most respondents do not support complete protection of the wolf and most would like to see the status changed to allow a specific hunting season on wolves.

Concern was also expressed about international legislation. Groups were concerned about the implications of the Berne convention and questioned what

need to discuss the other issues mentioned. Without addressing all these issues attitudes may not be influenced. As is the case so often in wolf management the issues of most importance to people are more socio-economic and political in nature.

flexibility if any they had to manage wolves. Zoning may be a possible approach to reducing wolf-human conflicts in Croatia, the challenge of course is defining the zones.

The CGM as its name suggests does identify the key issues of concern to the majority of groups and to individual groups. This information allows managers to specifically design persuasive messages that are on topical issues of high importance to a particular interest group. The exercise also allows managers to explore geographic differences amongst the interest groups and across zones, thus allowing for the design of different messages to the same target group that may exist in a different part of Croatia wolf range. Finally, the CGM offers managers direction on which groups have

many concerns and thus need more time being heard. A communication officer can then divide his/her time visiting various

groups based upon the extent of concerns for each group.

### ***Using CGM to explore key groups and roles of various interest groups***

Understanding key issues is one of the strengths of applying the CGM process. It is also used to identify from each interest group's perspective which groups should be involved in the decision-making and what role or roles should they play in the management of wolves.

Table 17 summarizes the key issues discussed in the previous section and presents the groups that should be involved from each interest group's perspective. The table also illustrates the role each interest group feels they can play in wolf management. All groups stated that farmers, hunters, foresters, and scientists/biologists should be involved in some aspect of wolf management. Agreeing upon who should be involved in decision-making is a major first step and all groups agree on these groups.

Foresters see their role in wolf management two ways. They believe they can help in controlling or decreasing the wolf population if this decision needs to be

implemented. Foresters also believe they can balance between economics and protection where other groups may omit the economic argument, thus being able to reach a more effective decision. Hunters also feel their contribution can be in helping control the number of wolves. The former State Directorate for Protection of Nature stated that they should have a lead role in wolf management, but at the time the agency did not have a Minister so they believed they were limited in how affective they could be. They also believed at that time that nature and wolf management were not high government priorities. Since the interview, however, the new government has shown interest in the environment and Croatia's wildlife. A new Ministry of Environmental Protection and Zoning has been created and wolf management remains an important issue for the Ministry. The Mountaineering Association indicated an interest and willingness to participate with wolf research/ fieldwork. Finally, the biologists/scientists see themselves as

**Table 17: Key issues, interest groups and their roles using a CGM approach.**

	KEY ISSUES	GROUPS INVOLVED	ROLE
FORESTERS	<ul style="list-style-type: none"> <li>➤ Status of the wolf – should be protected by hunting law.</li> <li>➤ <b>Impact on prey (50% reduction); less opportunities to hunt.</b></li> <li>➤ Data: biologist’s estimation was too low, limited to one area (1995).</li> <li>➤ War consequences: abandoned livestock.</li> <li>➤ Livestock damage: not a big issue in the north.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Farmers/rural population</li> <li>➤ Hunters</li> <li>➤ Foresters</li> <li>➤ Environmentalists/biologists</li> </ul>	<ul style="list-style-type: none"> <li>➤ Controlling wolf population (decreasing #).</li> <li>➤ Foresters balance between economics and protection (biologists neglect economic value).</li> </ul>
STATE DIRECTORATE FOR NATURE CONSERVATION	<ul style="list-style-type: none"> <li>➤ Attitudes of people.</li> <li>➤ Decisions need to be made quickly – no time to prepare public.</li> <li>➤ Did not realize implications of protection.</li> <li>➤ Education: poor people don’t know about role of wolf in ecosystem.</li> <li>➤ <b>International pressure (Bern convention).</b></li> <li>➤ No government policy to help rural people (only old people stayed in the areas).</li> </ul>	<ul style="list-style-type: none"> <li>➤ Hunters (owners of hunting grounds and common hunters).</li> <li>➤ Livestock owners.</li> <li>➤ Foresters</li> </ul>	<ul style="list-style-type: none"> <li>➤ Should have a leading part, which they have only on paper (don’t have a Minister (government representative)).</li> <li>➤ Education (need to think long term) but nature is not government’s priority – cannot afford nature (poor country).</li> </ul>
HUNTERS	<ul style="list-style-type: none"> <li>➤ <b>Decision-making: one-sided decisions by scientists/biologists.</b></li> <li>➤ Status of the wolf – should be protected (controlled) by hunting law.</li> <li>➤ Damage compensation – both livestock and game losses due to wolf attacks.</li> </ul>	<p>Decision makers:</p> <ul style="list-style-type: none"> <li>❖ Rural people</li> <li>❖ Hunters</li> <li>❖ Foresters</li> </ul> <p>Data suppliers:</p> <ul style="list-style-type: none"> <li>❖ Scientists/biologists</li> </ul>	<ul style="list-style-type: none"> <li>➤ Controlling # of wolves.</li> </ul>

Human Dimensions in Wolf Management in Croatia

	KEY ISSUES	GROUPS INVOLVED	ROLE
MOUNTAINEERING ASSOCIATION (Nature protection commission)	<ul style="list-style-type: none"> <li>➤ Poor preparations for wolf protection.</li> <li>➤ Data: not enough research done.</li> <li>➤ Attitudes of people (result of the first two).</li> </ul>	<ul style="list-style-type: none"> <li>➤ NGO's</li> <li>➤ Government</li> <li>➤ Foresters</li> <li>➤ Biologists</li> <li>➤ Hunters</li> <li>➤ Veterinarians</li> </ul>	<ul style="list-style-type: none"> <li>➤ Help on wolf research fieldwork.</li> </ul>
BIOLOGISTS	<ul style="list-style-type: none"> <li>➤ People – hunters and farmers attitudes.</li> <li>➤ Education: people don't know why it is important to protect wolves.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Hunters</li> <li>➤ Farmers</li> <li>➤ Biologists</li> <li>➤ Sociologists</li> <li>➤ Government</li> </ul>	<ul style="list-style-type: none"> <li>➤ Give facts and offer solutions.</li> </ul>

The most important issue.

providing the best scientific advice available for interest groups to base decisions. By presenting the facts and letting the interest groups, through a facilitated discussion, add values to those facts a successful management plan will occur. Biologists state that they would like to offer focus to the discussion and work

towards solutions. It appears that all groups if pulled together around a common table and lead by an independent facilitator/HD specialist could each make a valuable contribution to addressing and understanding wolf management in Croatia. There is a need to get all interest groups thinking about common solutions.

### ***Using CGM to explore possible solutions Implications of findings for future wolf management***

Communication could be described as the process of sending a message and having it received, understood, and then listening to the response or feedback from the recipient of the message. That message should not be targeted too high or too low or on information that is not directly related to influencing attitudes and behavior change. As we are born with two ears and only one mouth we should probably be listening at least twice as much as talking for effective communication. After listening to the key interest groups and the general public regarding their concerns and key issues, then communication occurs when those results are given back to those groups, thus indicating one has received the message and truly has listened. For the various interest groups the results of this study

should be shared with each group. Of particular importance are the results of the common ground matrix that offer a safe starting point to engage all groups. The question should be posed to each group about how they feel the process should continue, if at all. A meeting with all groups in the same room sharing their thoughts in a facilitated discussion may be a starting point. These issues of communication and how to ensure continued involvement in the resource management decision-making process by all interest groups will be addressed later. For now, the key findings and their implications for increasing public awareness and acceptance of wolves are presented.



Addressing the general public and increasing their awareness of wolves and wolf management requires an understanding of the types of messages that can be delivered (value messages and factual messages) and the pertinent topics to address based partly upon the percentage of neutral or unknown

### ***Key findings***

Most general public residents in most of Croatian wolf range are in fact supportive of having wolves in Croatia. And most residents also support maintaining wolves in Croatia for future generations. These findings are made even the more interesting when considering that most respondents had relatively little knowledge about wolves and their presence in Croatia; as knowledge increases attitudes should in fact become more positive toward the wolf. For managers and government officials that truly want to manage the resource for their entire resource constituency, they can move confidently toward conservation efforts toward wolves knowing they have a large amount of public support for such a decision. In fact, Croatian Ministry of Tourism is using the results to promote the wolf from an eco-tourism perspective in

responses to certain items. Those expressing neutral responses may be more easily influenced, positively or negatively, by targeted communication messages. Wording of such items will be important as results indicated how slight changes in wording dramatically change support or opposition to the management approach.

Gorski kotar where attitudes of the general public and interest groups are the most positive toward the animal. This being said, most respondents did feel that some hunting of the species should be allowed; at the moment the wolf remains completely protected throughout Croatia.

Attitudes toward wolves and wolf management in Croatia while generally positive do vary between interest groups and within the same interest group across the three regions used in our HD study. Our results suggest that it is important to consider different management approaches and strategies across wolf range and with different interest groups.

Two important value persuasive messages should be stressed in any communication effort and these may be more important

than even factual messages about wolves. The issue of having wolves for future generations appears important to most respondents. The other issue is one of existence value – having wolves exist in Croatia seems important even if wolves exist elsewhere in Europe. This latter message may be linked with national pride and natural heritage. Wolves and brown bears, another large carnivore, are certainly portrayed as part of Croatia's natural heritage. Both messages would be considered “strong winning” messages in a communication debate. Basically, in communicating arguments for the conservation of wolves, one tries to get messages that are strong messages that also provide little chance for strong counter-arguments. The future generations argument is a good example. Arguing that as a mother raises her children, and these children have a right to see wolves in the future and possibly see or hear wolves in the wild, being similar to a wolf raising her pups and that they too have a right to exist are strong winning arguments. Counter-arguments saying that children or grandchildren shouldn't have an opportunity to hear or see wolves or that pups shouldn't be allowed to grow up are not readily accepted by the public.

Addressing this issue should influence those with neutral attitudes.

Words must be chosen carefully to present to the public. While most residents support wolves for future generations and also healthy populations of wolves in Croatia, opposition was expressed toward “abundant” wolf populations for future generations. And while support for healthy populations does exist in most of Croatian wolf range, there is little knowledge from the general public of actual wolf numbers in Croatia. Many general public respondents overestimated the wolf population. Focus groups could be used to explore what people believe by healthy populations versus abundant populations in Croatia. Such information could be useful in formulating the message concerning numbers of wolves. In addition, explaining numbers in terms of probability that wolves would exist for future generations, or probability of pups surviving should prove useful. Knowledge about the numbers of wolves is directly related to attitudes. Because most respondents believe there are far more wolves in Croatia than actually do exist, communicating accurate numbers should only increase positive attitudes toward wolves especially if the message can be

linked that existing numbers may not constitute a healthy population. Another possible spin on this message is the use of the word “equilibrium” which in past research with other publics has been seen as a positive concept by the public. The concept of wolves being in balance with their prey has been shown to be a positive aspect of having wolves. Choosing words and phrases that ring with the public should ensure an effective communication and awareness campaign.

Many respondents believe wolves have a significant impact on big game animals; most general public respondents and interest groups do support some form of a regulated seasoned hunt of wolves. For many respondents there is a strong opposition though to year round seasons on killing wolves and removal of animals and pups by any available means. It is clear that the Croatian public does want wolves to be a part of the landscape. Managers will need to further explore hunting issues not only with the Croatian hunters association, who have been extremely positive to the HD study along with all interest groups, but also with the other interest groups to ensure they formulate decisions that are representative of the entire constituency.

Respondents are certainly sensitive to the livestock concerns and willing to support this community. This sensitivity toward the livestock community suggests that messages can not be developed by environmental or protection-oriented agencies that are directly seen as against the livestock community as this could result in neutral respondents becoming negative toward wolves and being influenced by the livestock organizations. While livestock operators should be encouraged with this public sensitivity to their cause, most residents do see the need to link payments to those farmers living in large carnivore zones and many support better management and care. Paying subsidies by carnivore zone rather than compensation for animals may be a strong communication message for all groups. Another angle for communication is developing a message that aligns environmental interests and livestock interests against a common enemy. For example, both groups may oppose the loss of habitat and the loss of a traditional way of life caused by urban development or industry. These are again seen as “winning messages”. It is also interesting to note that most residents did not become more supportive of killing wolves after being

exposed to several items concerning livestock-wolf conflicts. This may suggest that some form of management may be supported if put into this light rather than presented as a cull or year round hunt per se. And while the agricultural community should be pleased to hear that the public is sensitive to their traditional lifestyle, the public remains firm that wolves and a pastoral lifestyle will learn to coexist by supporting compensation only to those who are using preventative measures.

Economics is increasingly being used as an argument for promoting the conservation of wolves and large carnivores. Recent reports from the UK, working examples from the Carpathian Mountains in Romania, and recent developments in Croatia all seem to point to the fact that wolves and large carnivores can generate income for local communities in the form of eco-tourism. This all being said, many residents in Croatian wolf range particularly in the south (Dalmatia) do not believe at all that wolves could generate any new income in their area. It will be important to put in mechanisms to assess how eco-tourism changes in Gorski kotar occur as wolf tourism is encouraged. With the results of an assessment and evaluation, other regions may be more

willing to entertain the idea that wolves might generate dollars through an industry built on viewing tracks, scats, and possibly hearing a howl.

There is a definite need for open communication between all interest groups including residents of the three regions. Through informal discussions with respondents, many do believe wolves were actively reintroduced into Croatia. Such responses suggest a behavioral conflict or a lack of trust between organizations. It will be important to build trust, credibility, and an open dialogue on other issues before engaging people about this issue.

Traditionally communication and public awareness programs are built around the presentation of biological facts. The residents do have weak biological knowledge about wolves and increasing their knowledge should increase acceptance of the animal. One of the most important issues here to address is the fear of wolves. The fear to hike in the woods if wolves were present was quite strong amongst residents and interest group respondents. This fear is influenced by over-estimates of a wolf's size and weight, pack sizes, breeding behavior, attacks and perceived high numbers of animals that

exist in Croatia. The objective in communicating about pack sizes, weight and especially wolf numbers would be to create cognitive dissonance in the minds of those respondents holding neutral to negative attitudes. For those respondents

where the conflict lies as a cognitive one these facts should improve public acceptance of wolves, but addressing values in communication messages may be more effective in gaining public acceptance of wolves.

### ***Implications of CGM for communication efforts and future cooperation***

Communication with the general public may take quite a different form than communication with various interest groups. Some of the groups are quite different and yet from all groups there is common ground. All groups share a common willingness to work together and have a common interest in the results of this HD study. All groups appreciated that a neutral party was conducting the study.

While values and biological fact messages will be important in increasing awareness and acceptance of wolves with the general public, key issues to discuss with the interest groups should focus on agricultural/livestock issues, legal/political issues, and keeping lines of communication open. This may mean doing much more listening and less talking with the interest groups. In fact, biological messages were only one of several issues

for discussion mentioned by the interest groups.

Many groups and individuals are interested in learning more about the legal obligations toward wolf conservation and any flexibility in management that may be available. Groups are very aware of the international policies, especially the Bern convention. These legal issues could form an integral part of a communication package targeted to the interest groups. The package does not need to advocate for a certain policy or suggest advantages or disadvantages of a particular policy, it could just help provide information thus increasing the possibility of an informed decision and continued dialogue and openness between all groups.

Training and sharing experiences of livestock damage prevention techniques

preferably shepherds talking with shepherds should be done. Exchange programs to see other areas may also prove useful. Shepherds from Romania may be

## Conclusion

This human dimension in wolf management study with its relatively large sample sizes, quantitative and qualitative approach is the first of its kind in Croatia, and while other studies have explored attitudes qualitatively, the results here offer managers and many interest groups the first quantitative and balanced assessment of public attitudes and beliefs on a nearly national scale, representative of a large segment of society. Given that much of the Croatian wolf range is quite rural it is hypothesized that attitudes in more urban areas may be more positive than those found in Croatian wolf range at this time. In addition, as more awareness material about wolves and their management is made available attitudes should continue to change, more than likely toward the positive. Such quantitative results create a benchmark to measure the effectiveness of future communication efforts and to monitor attitude change as the wolf population grows and policies affecting their

able to share experiences and prove more credible than government communication officers.

management changes. On its own, the results provide direction for communication efforts, the beginnings of a public involvement process with interest groups, an understanding of the reasons behind certain attitudes, and the opportunity to balance extreme viewpoints. The true strength of the study, however, lies in its potential as a longitudinal study that can continue to evaluate and retarget new messages, and address key issues as they arise over time. Human dimensions research is not a one-shot, crisis-driven approach to solving complex issues but a beginning of a process that should see human dimensions integrated regularly into decision-making, thus providing managers with opportunities to better understand the people's needs.

There will be further analysis of the data presented in this report to understand the value and belief systems underlying some of the attitudes. And similar in how one

biological study over one year can't answer all the biological questions, one HD study over less than a year can't address all the social science questions. Wolf management in Croatia and large carnivore management in general will

always remain more a socio-political issue than a biological one, and thus will require significantly better understanding of this human dimension of the wildlife resource management equation.





## **Appendix 1: Questionnaire used to collect data**





Memorial  
University of Newfoundland

### **ATTITUDES TOWARD THE WOLF IN CROATIA**

Memorial University of Canada in cooperation with the Large Carnivore Initiative for Europe and various groups and organization in Croatia is developing a project to try and learn more about wolf area residents' attitudes toward wolves in Croatia. Thank you for agreeing to take a few minutes to answer the following questions about your feelings and beliefs about and behaviour toward wolves. Your answers, combined with those of other respondents, will provide valuable insights into the way people of Croatia feel about wolves and how the wolf should be managed. Each of your responses, whether against, in favour, or neutral, is valuable, and we encourage you to answer all of the questions. Your individual answers will be grouped with those of others, and individual responses will be kept strictly confidential. This questionnaire is totally anonymous. Please answer the questions openly and do not write your name. Thank you in advance for your help with this important program.

Sincerely,

Dr. Alistair Bath  
Project Director

A handwritten signature in cursive script, appearing to read 'A. Bath'.

Aleksandra Majić  
Project Coordinator

A handwritten signature in cursive script, appearing to read 'A. Majić'.

**SECTION A:** The first few questions ask about your feelings toward wolves. Please circle the response that best describes your opinion.

1. Which of the following best describes your feelings toward wolves?
  - a) Completely against.
  - b) Moderately against.
  - c) Neither in favour nor against.
  - d) Moderately in favour.
  - e) Completely in favour.
2. To have wolves in Croatia is:
  - a) good.
  - b) bad.
  - c) indifferent.
3. To have wolves in Gorski kotar / Lika / Dalmacija (in regard to respondent's region) is:
  - a) good.
  - b) bad.
  - c) indifferent.

To continue, we are going to list a series of statements. Please choose the response that best describes your opinion according to the following scale: 1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree.

- |  | Strongly<br>Disagree<br>1 | Disagree<br>2 | Neutral<br>3 | Agree<br>4 | Strongly<br>Agree<br>5 |
|--|---------------------------|---------------|--------------|------------|------------------------|
| 4. It is important to maintain wolf populations in Croatia so that future generations can enjoy them.  | 1                         | 2             | 3            | 4          | 5                      |
| 5. It is important to maintain wolf populations in region of Gorski kotar / Lika / Dalmacija (in regard to respondent's region) so that future generations can enjoy them. | 1                         | 2             | 3            | 4          | 5                      |
| 6. It is important to have healthy populations of wolves in region of Gorski kotar / Lika / Dalmacija (in regard to respondent's region).                                  | 1                         | 2             | 3            | 4          | 5                      |
| 7. We should assure that future generations have an abundant wolf population.  | 1                         | 2             | 3            | 4          | 5                      |
| 8. Whether or not I would get to see a wolf, it is important to me that they exist in region of Gorski kotar / Lika / Dalmacija (in regard to respondent's region).        | 1                         | 2             | 3            | 4          | 5                      |
| 9. Wolves have a significant impact on big game.   | 1                         | 2             | 3            | 4          | 5                      |
| 10. Wolves have a significant impact on small game.  | 1                         | 2             | 3            | 4          | 5                      |

	Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5
<b>11. Wolves reduce populations of roe deer, red deer and wild boar to unacceptable levels.</b>					
<b>12. It is unnecessary to have wolves in region of Gorski kotar / Lika / Dalmacija (in regard to respondent's region) because abundant populations of wolves already exist in other parts of Croatia.</b>	1	2	3	4	5
<b>13. It is unnecessary to have wolves in Croatia because abundant populations already exist in other European countries.</b>	1	2	3	4	5
<b>14. Wolves should be completely protected in region of Gorski kotar / Lika / Dalmacija (in regard to respondent's region).</b>	1	2	3	4	5
<b>15. Wolves should be completely protected in Croatia.</b>	1	2	3	4	5
<b>16. Wolves should be allowed to be hunted in specific hunting seasons in region of Gorski kotar / Lika / Dalmacija (in regard to respondent's region).</b>	1	2	3	4	5
<b>17. Wolves should be allowed to be hunted year round in region of Gorski kotar / Lika / Dalmacija (in regard to respondent's region).</b>	1	2	3	4	5
<b>18. Wolves should be killed by all means including killing pups in dens and the use of poison in region of Gorski kotar / Lika / Dalmacija (in regard to respondent's region).</b>	1	2	3	4	5
<b>19. Wolves keep roe deer populations in balance.</b>	1	2	3	4	5
<b>20. Having wolves in region of Gorski kotar / Lika / Dalmacija (in regard to respondent's region) increases tourism in Gorski kotar / Lika / Dalmacija.</b>	1	2	3	4	5
<b>21. Wolves cause abundant damages to livestock.</b>	1	2	3	4	5

- |  |                           |               |              |            |                        |
|--|---------------------------|---------------|--------------|------------|------------------------|
| <b>22. In areas where wolves live in close proximity to humans, wolf attacks on humans are common.</b> | Strongly<br>Disagree<br>1 | Disagree<br>2 | Neutral<br>3 | Agree<br>4 | Strongly<br>Agree<br>5 |
| <b>23. In areas where wolves live near livestock, their primary food is livestock.</b>                 | 1                         | 2             | 3            | 4          | 5                      |
| <b>24. I would be afraid to hike in the woods if wolves were present.</b>                              | 1                         | 2             | 3            | 4          | 5                      |
- 25. In your opinion, which animal is most dangerous to humans?**
- |            |                        |
|------------|------------------------|
| a) Wolves. | d) Equally dangerous.  |
| b) Bears.  | e) None are dangerous. |
| c) Lynx.   |                        |

**SECTION B:** The next few questions ask about your general knowledge of the wolf. Please circle the response that you feel best answers the question.

1. How many wolves do you believe currently exist in Croatia?. \_\_\_\_\_ wolves.
2. Do you believe wolf numbers in Croatia are:
 

a) increasing.	c) remaining the same.
b) decreasing.	
3. How many wolves do you believe currently exist in Gorski kotar / Lika / Dalmacija (in regard to respondent's region). \_\_\_\_\_wolves.
4. Do you believe wolf numbers in region of Gorski kotar / Lika / Dalmacija (in regard to respondent's region) are:
 

a) increasing.	c) remaining the same.
b) decreasing.	
5. How much does the average adult male wolf weigh in Croatia?
 

a) 1-20 kg	d) more than 60 kg
b) 21-40 kg	e) I don't know.
c) 41-60 kg	
6. There used to be wolves throughout the entire region of Gorski kotar / Lika / Dalmacija (in regard to respondent's region).
 

a) yes	b) no	c) not sure
--------	-------	-------------
7. Wolves are completely protected in Croatia.
 

a) yes	b) no	c) not sure
--------	-------	-------------
8. It is generally true that only two members (one pair) of a wolf pack breed in any one year?
 

a) yes	b) no	c) not sure
--------	-------	-------------
9. How many sheep and goats do you think were killed by wolves last year in region of Gorski kotar / Lika / Dalmacija (in regard to respondent's region)?  
 \_\_\_\_\_sheep and goats.



	Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5
<b>6. We already have enough wolves in region of Gorski kotar / Lika / Dalmacija (in regard to respondent's region).</b>					
<b>7. Livestock owners should receive money for living in a zone where there are wolves instead of receiving compensation for losses that wolf causes.</b>	1	2	3	4	5
<b>8. Livestock owners should not receive compensation for damages caused by wolves if they do not use methods to prevent damages, for example, guard dogs.</b>	1	2	3	4	5
<b>9. Livestock owners that lose livestock due to wolf attacks should be compensated.</b>	1	2	3	4	5

If you *agree* or *strongly agree* with #9, please answer the following questions a) to e). If you *disagree* or *strongly disagree* or are *neutral*, please answer questions in **SECTION D**. Thank you.

a) <i>I would like my taxes to be used toward paying compensation for damages caused by wolves.</i>	1	2	3	4	5
b) <i>Administration should pay compensation to livestock owners who lose livestock to wolves.</i>	1	2	3	4	5
c) <i>Livestock owners should be required to buy insurance for protection against wolf attacks.</i>	1	2	3	4	5
d) <i>Administration should pay for this insurance for livestock owners.</i>	1	2	3	4	5
e) <i>There should be authorized wolf hunts in region of Gorski kotar / Lika / Dalmacija (in regard to respondent's region).</i>	1	2	3	4	5



<b>SECTION D: Your experience, if any, with wolves:</b>
---

1. **Have you ever seen alive wolf in the wild?**  
 a) yes b) no
2. **Have you ever seen a wolf in captivity?**  
 a) yes b) no
3. **Have you ever killed a wolf?**  
 a) yes b) no
4. **On a scale from 1 to 10, how important is the issue of wolf management in Croatia to you personally?**  
 Not important 1 2 3 4 5 6 7 8 9 10 Extremely important
5. **On a scale from 1 to 10, how important is it to you that you keep up to date with the issue of wolf management in Croatia?**  
 Not important 1 2 3 4 5 6 7 8 9 10 Extremely important

<b>SECTION E: With respect to you:</b>
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- I.  
 a) Female  
 b) Male
- II. Age: \_\_\_\_\_
- III. Place of residence (name of village or city) \_\_\_\_\_  
 Place of birth \_\_\_\_\_
- IV. Occupation? \_\_\_\_\_
- V. Did you hunt in 1998?      a) yes      b) no
- VI. If you are a livestock owner, what type of livestock do you have?  
 a) Sheep c) Cows  
 b) Goats d) Horses

**Thank you for your co-operation. If you have other comments on this subject or with respect to the questionnaire, please write them here.**



## STAVOVI O VUKU U HRVATSKOJ

Memorijalno Sveučilište iz Kanade u suradnji s Europskom inicijativom za velike zvjeri i različitim skupinama i organizacijama iz Hrvatske razvilo je projekt kojim nastoji spoznati više o stavovima ljudi prema vuku u područjima Hrvatske koja su ujedno i stanište vuka. Hvala Vam što ste pristali utrošiti nekoliko minuta kako biste odgovorili na pitanja koja se odnose na Vaše osjećaje, vjerovanja i djelovanja glede vuka. Vaši odgovori, u kombinaciji sa odgovorima ostalih ispitanika, pružit će vrijednu predodžbu o tome što Hrvati misle o vuku i kako bi se vukom u Hrvatskoj trebalo gospodariti. Svaki od vaših odgovora, pa bio on protiv, neutralan ili za vuka je vrijedan, te Vas stoga molimo da odgovorite na sva pitanja. Vaši odgovori biti će grupirani sa odgovorima ostalih ispitanika, a pojedinačni odgovori su strogo povjerljivi. Ova anketa je u potpunosti anonimna. Molimo Vas odgovorite na pitanja iskreno i nemojte napisati svoje ime. Unaprijed se zahvaljujemo na Vašoj pomoći na ovom važnom projektu.

Sa šovanjem,

Dr. Alistair Bath  
Upravitelj projekta



Aleksandra Majić  
Kordinator projekta



**DIO A:** Prvih nekoliko pitanja odnose se na Vaše osjećaje prema vuku. Molimo zaokružite odgovor koji najbolje opisuje Vaše mišljenje.

1. **Koji od slijedećih odgovora najbolje opisuje Vaše osjećaje prema vuku?**
  - a) Potpuno sam protiv.
  - b) Protiv.
  - c) Nisam niti protiv niti naklonjen.
  - d) Naklonjen sam .
  - e) Potpuno sam naklonjen.
2. **Imati vukove u Hrvatskoj je:**
  - a) dobro.
  - b) loše.
  - c) nevažno.
3. **Imati vukove u području Gorskog kotara / Like / Dalmacije (odnosi se samo na Vašu regiju) je:**
  - a) dobro.
  - b) loše.
  - c) nevažno.

U nastavku ćemo navesti niz izjava. Molimo da prema slijedećoj ljestvici izaberete odgovor koji najbolje opisuje Vaše mišljenje: 1 = Jako se ne slažem; 2 = Ne slažem se; 3 = Neutralan sam; 4 = Slažem se; 5 = Jako se slažem.

- |   | Jako se<br>ne slažem. | Ne slažem<br>se. | Neutralan<br>sam. | Slažem<br>se. | Jako se<br>slažem. |
|---|-----------------------|------------------|-------------------|---------------|--------------------|
|   | 1                     | 2                | 3                 | 4             | 5                  |
| 4. <b>Važno je održati populaciju vukova u Hrvatskoj zato da bi buduće generacije mogle uživati u njima.</b>  |                       |                  |                   |               |                    |
| 5. <b>Važno je održati populaciju vukova u području Gorskog kotara / Like / Dalmacije (odnosi se samo na Vašu regiju) zato da bi buduće generacije mogle uživati u njima.</b> | 1                     | 2                | 3                 | 4             | 5                  |
| 6. <b>Važno je imati zdravu populaciju vukova u području Gorskog kotara / Like / Dalmacije (odnosi se samo na Vašu regiju).</b>   | 1                     | 2                | 3                 | 4             | 5                  |
| 7. <b>Budućim generacijama moramo osigurati izdašnu populaciju vukova.</b>  | 1                     | 2                | 3                 | 4             | 5                  |
| 8. <b>Bilo da bih imao priliku vidjeti vuka ili ne, važno mi je da oni postoje u području Gorskog kotara / Like / Dalmacije (odnosi se samo na Vašu regiju).</b>              | 1                     | 2                | 3                 | 4             | 5                  |
| 9. <b>Vukovi bitno utječu na populacije visoke divljači.</b>  | 1                     | 2                | 3                 | 4             | 5                  |
| 10. <b>Vukovi bitno utječu na populacije niske divljači.</b>  | 1                     | 2                | 3                 | 4             | 5                  |
| 11. <b>Vukovi smanjuju populacije jelena, srna i divljih svinja na neprihvatljivu razinu.</b>   | 1                     | 2                | 3                 | 4             | 5                  |

	Jako se ne slažem.	Ne slažem se.	Neutralan sam.	Slažem se.	Jako se slažem.
	1	2	3	4	5
12. Nije potrebno imati vukove u području Gorskog kotara / Like / Dalmacije (odnosi se samo na Vašu regiju) zato što izdašna populacija vukova već postoji u drugim dijelovima Hrvatske.					
13. Nije potrebno imati vukove u Hrvatskoj zato što izdašne populacije vukova već postoje u drugim europskim zemljama.	1	2	3	4	5
14. Vukovi bi trebali biti potpuno zaštićeni u području Gorskog kotara / Like / Dalmacije (odnosi se samo na vašu regiju).	1	2	3	4	5
15. Vukovi bi trebali biti potpuno zaštićeni u Hrvatskoj.	1	2	3	4	5
16. U području Gorskog kotara / Like / Dalmacije (odnosi se samo na Vašu regiju) treba dozvoliti lov na vukove tijekom određene lovne sezone.	1	2	3	4	5
17. U području Gorskog kotara / Like / Dalmacije (odnosi se samo na Vašu regiju) treba dozvoliti lov na vukove tijekom cijele godine.	1	2	3	4	5
18. Vukove u području Gorskog kotara / Like / Dalmacije (odnosi se samo na Vašu regiju) treba ubijati svim mogućim sredstvima, uključujući ubijanje mladunčadi u brlogu, te uporabu otrova.	1	2	3	4	5
19. Vukovi održavaju populacije jelena u ravnoteži.	1	2	3	4	5
20. Postojanje vukova u području Gorskog kotara / Like / Dalmacije (odnosi se samo na Vašu regiju) jača turizam u tom području.	1	2	3	4	5
21. Vukovi nanose velike štete na domaćoj stoci.	1	2	3	4	5
22. U područjima gdje vukovi žive u blizini ljudi, napadi vukova na ljude su učestali.	1	2	3	4	5

23. U područjima gdje vukovi žive u blizini domaćih životinja, njihova glavna hrana su domaće životinje.
- |                    |               |                |            |                 |
|--------------------|---------------|----------------|------------|-----------------|
| Jako se ne slažem. | Ne slažem se. | Neutralan sam. | Slažem se. | Jako se slažem. |
| 1                  | 2             | 3              | 4          | 5               |
24. Strah me je šetati šumom u kojoj ima vukova.
- |   |   |   |   |   |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
25. Koja od navedenih životinja je, po Vašem mišljenju, najopasnija za ljude?
- |            |                            |
|------------|----------------------------|
| a) Vuk     | d) Sve su jednako opasne.  |
| b) Medvjed | e) Niti jedna nije opasna. |
| c) Ris     |                            |

**DIO B:** Slijedećih nekoliko pitanja odnose se na Vaše poznavanje vukova. Molimo zaokružite ili upišete odgovor koji smatrate točnim.

1. **Koliko vukova trenutačno ima u Hrvatskoj?** \_\_\_\_\_ vukova.
2. **Mislite li da broj vukova u Hrvatskoj:**

a) raste.	c) ne mijenja se.
b) opada.	
3. **Koliko vukova trenutačno ima u području Gorskog kotara / Like / Dalmacije (odnosi se samo na Vašu regiju).** \_\_\_\_\_ vukova.
4. **Mislite li da broj vukova u području Gorskog kotara / Like / Dalmacije (odnosi se samo na Vašu regiju):**

a) raste.	c) ne mijenja se.
b) opada.	
5. **Koliko je prosječno težak odrasli mužjak vuka u Hrvatskoj?**

a) 1-20 kg	d) Više od 60 kg
b) 21-40 kg	e) Ne znam.
c) 41-60 kg	
6. **Vukovi su oduvijek postojali na cijelom području Gorskog kotara / Like / Dalmacije (odnosi se samo na Vašu regiju).**

a) Da.	b) Ne.	c) Nisam siguran.
--------	--------	-------------------
7. **Vukovi su potpuno zaštićeni u Hrvatskoj.**

c) Da.	d) Ne.	c) Nisam siguran.
--------	--------	-------------------
8. **U pravilu samo dva člana čopora (jedan par) se pare i imaju mlade.**

e) Da.	f) Ne.	c) Nisam siguran.
--------	--------	-------------------
9. **Koliko su ovaca i koza vukovi ubili prošle godine u području Gorskog kotara / Like / Dalmacije (odnosi se samo na Vašu regiju)?**  
 \_\_\_\_\_ ovaca i koza.
10. **Vukovi kolju ovce i koze samo ako nema dovoljno jelena i druge divljači.**

a) Točno.	b) Netočno.	c) Nisam siguran.
-----------	-------------	-------------------

**11. Koliko često su vukovi uspješni u lovu?**

- a) Prilikom svakog pokušaja. d) Jednom od 20 pokušaja.  
 b) Jednom od 2 pokušaja. e) Nisam siguran.  
 c) Jednom od 10 pokušaja.

**12. Koja je prosječna veličina vučjeg čopora u Hrvatskoj?**

- a) 1-10 vukova d) Više od 30 vukova.  
 b) 11-20 vukova e) Nisam siguran.  
 c) 21-30 vukova

**DIO C:** Slijedećih nekoliko pitanja odnose se na Vaše mišljenje o različitim načinima gospodarenja vukom, te na Vaš odnos prema vuku. Molimo da prema slijedećoj ljestvici izaberete odgovor koji najbolje opisuje Vaše mišljenje: 1 = Jako se ne slažem; 2 = Ne slažem se; 3 = Neutralan sam; 4 = Slažem se; 5 = Jako se slažem.

**1. Nemam ništa protiv porasta broja vukova u Hrvatskoj.**

Jako se ne slažem.	Ne slažem se.	Neutralan sam.	Slažem se.	Jako se slažem.
1	2	3	4	5

Ako se **jako ne slažete** ili se **ne slažete**, navedite glavni razlog zbog kojeg ne želite porast broja vukova u Hrvatskoj?

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Ako se **jako slažete** ili se **slažete**, navedite glavni razlog zbog kojeg želite porast broja vukova u Hrvatskoj?

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**2. Nemam ništa protiv porasta broja vukova u području Gorskog kotara / Like / Dalmacije (odnosi se samo na Vašu regiju).**

Jako se ne slažem.	Ne slažem se.	Neutralan sam.	Slažem se.	Jako se slažem.
1	2	3	4	5

**3. Ako bi određeni vuk ubijao stoku, složio bih se sa odstrjelom te problematične životinje.**

1	2	3	4	5
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**4. Rado bih dotirao sredstva u fond za naknadu šteta stočarima.**

1	2	3	4	5
---	---	---	---	---

**5. Imamo dovoljno vukova u Hrvatskoj.**

1	2	3	4	5
---	---	---	---	---

**6. Imamo dovoljno vukova u području Gorskog kotara / Like / Dalmacije (odnosi se samo na Vašu regiju).**

1	2	3	4	5
---	---	---	---	---

- |   | Jako se<br>ne slažem. | Ne slažem<br>se. | Neutralan<br>sam. | Slažem<br>se. | Jako se<br>slažem. |
|---|-----------------------|------------------|-------------------|---------------|--------------------|
|   | 1                     | 2                | 3                 | 4             | 5                  |
| 7. <b>Stočari bi, umjesto naknada za štete, trebali primiti premiju za stočarenje u području gdje ima vukova.</b>                                       |                       |                  |                   |               |                    |
| 8. <b>Stočari ne bi trebali primiti naknadu za štetu koju su nanijeli vukovi, ako nisu koristili metode prevencije nastanka šteta, npr. pse čuvare.</b> | 1                     | 2                | 3                 | 4             | 5                  |
| 9. <b>Stočari bi trebali primiti naknadu za štete na stoci koje im nanose vukovi.</b>   | 1                     | 2                | 3                 | 4             | 5                  |

Ako se slažete ili se u potpunosti slažete sa pitanjem **br. 9**, odgovorite na pitanja **a)** do **e)** Ako se ne slažete, u potpunosti se ne slažete ili ste neutralni, idite na **DIO D**. Hvala.

- |   | Jako se<br>ne slažem. | Ne slažem<br>se. | Neutralan<br>sam. | Slažem<br>se. | Jako se<br>slažem. |
|---|-----------------------|------------------|-------------------|---------------|--------------------|
|   | 1                     | 2                | 3                 | 4             | 5                  |
| a) <i>Htio bih da se moja porezna davanja koriste za plaćanje naknada stočarima za štete uzrokovane vukovima.</i>           |                       |                  |                   |               |                    |
| b) <i>Država bi trebala plaćati naknade stočarima za štete uzrokovane vukovima.</i>   | 1                     | 2                | 3                 | 4             | 5                  |
| c) <i>Stočari bi obavezno morali plaćati osiguranje stoke od vučjih napada.</i>   | 1                     | 2                | 3                 | 4             | 5                  |
| d) <i>Država bi trebala platiti osiguranje stoke od vučjih napada.</i>  | 1                     | 2                | 3                 | 4             | 5                  |
| e) <i>Trebalo bi odobriti odstrjel vukova u području Gorskog kotara / Like / Dalmacije (odnosi se samo na Vašu regiju).</i> | 1                     | 2                | 3                 | 4             | 5                  |

**DIO D:** Vaša iskustva, ako ih imate, sa vukovima:

1. **Da li ste ikad vidjeli živog vuka u divljini?**
  - a) Da.
  - b) Ne.
2. **Da li ste ikad vidjeli vuka u zatočeništvu?**
  - a) Da.
  - b) Ne.
3. **Da li ste ikad ubili vuka?**
  - a) Da.
  - b) Ne.
4. **Na ljestvici od 1 do 10 označite koliko je Vama važno pitanje gospodarenja vukom u Hrvatskoj?**

Nije mi važno. 1 2 3 4 5 6 7 8 9 10 Jako mi je važno.



**5. Na ljestvici od 1 do 10 označite koliko Vam je važno da budete u toku sa događajima vezanim uz gospodarenje vukom u Hrvatskoj.**

Nije mi važno. 1 2 3 4 5 6 7 8 9 10 Jako mi je važno.

**DIO E: O Vama:**

**I.** Spol:

- a) Ženski.
- b) Muški.

**II.** Dob: \_\_\_\_\_

**III.** Prebivalište (ime naselja) \_\_\_\_\_  
Mjesto rođenja \_\_\_\_\_

**IV.** Zanimanje? \_\_\_\_\_

**V.** Da li ste lovili u 1998?      a) Da.                      b) Ne.

**VI.** Ako držite domaće životinje, koje od navedenih vrsta imate?

- a) Ovce.
- b) Koze.
- c) Goveda.
- d) Konje.

**Hvala na suradnji. Ako imate dodatnih komentara glede ankete slobodno ih ovdje napišite.**



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