



# Content Analysis of Newspaper Coverage of the Florida Panther

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**Abstract:** *Populations of large carnivores are declining globally, and analysis of public discourse about carnivores is useful for understanding public opinion and influences on management and policy. Portrayal of carnivores in the media affects public perceptions and support for their conservation. We conducted a content analysis of 513 articles about Florida panthers (*Puma concolor coryi*) published from 2003 to 2006 in newspapers with local circulation in core panther habitat in southwest Florida and papers with statewide circulation to compare the differences in the amount of coverage and portrayals of panther risks to people and property on the basis of proximity of human communities to panthers. Local papers published significantly more news articles and significantly longer news articles primarily about panthers. Articles in local and statewide papers used both episodic frames, which focus on specific occurrences (e.g., a panther sighting or predation) and thematic frames, which focus on general trends (e.g., abundance of panthers over time). Local articles more often emphasized risks that panthers might harm people, pets, or livestock than statewide papers. Our results are consistent with theory that proximity to human–carnivore conflict influences perceptions and salience of risks posed by large carnivores. Most articles mentioned panthers as a secondary topic, which we believe was a result of the relevance an endangered carnivore has in discussions of public land management, development, and regulations in Florida. Claims made by sources quoted in each article had a neutral to positive depiction of panthers, and most quotations were from federal and state agency scientists. We suggest continued use by the media of agency sources provides the opportunity for clear, concordant messages about panther management. Content analysis provides a way to monitor media portrayal of carnivores for consistency with agency outreach goals.*

**Keywords:** carnivore, communication, content analysis, media, panther, public, puma

Análisis del Contenido de la Cobertura Periodística de la Pantera de Florida

**Resumen:** *Las poblaciones de carnívoros mayores están declinando globalmente, y el análisis del discurso público sobre carnívoros es útil para entender la opinión pública y sus influencias sobre el manejo y la política. La representación de carnívoros en los medios afecta las percepciones públicas y al soporte para su conservación. Realizamos un análisis de contenidos de 513 artículos sobre panteras de Florida (*Puma concolor coryi*) publicados entre 2003 y 2006 en periódicos de circulación local en el centro de hábitat de pantera en el suroeste de Florida y en periódicos de circulación estatal para comparar las diferencias en la cobertura y representación de los riesgos de las panteras para la gente y la propiedad privada con base en la cercanía de comunidades humanas y panteras. Los periódicos locales publicaron significativamente más noticias y artículos significativamente más extensos sobre panteras. Los artículos en periódicos locales y estatales utilizaron tanto marcos episódicos, que se concentran en ocurrencias específicas (e.g., un avistamiento o depredación de pantera) como temáticos, enfocados en tendencias generales (e.g., abundancia de panteras*

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en el tiempo). Los artículos locales a menudo enfatizaron los riesgos que las panteras representan para humanos, mascotas y ganado más que los periódicos estatales. Nuestros resultados son consistentes con la teoría de que la cercanía al conflicto humano-carnívoro influye las percepciones y la prominencia de riesgos que representan los carnívoros mayores. La mayoría de los artículos mencionó a las panteras como tema secundario, que consideramos que fue resultado de la relevancia que ha tenido un carnívoro en peligro en las discusiones de manejo, desarrollo y regulaciones de tierras públicas en Florida. Algunas demandas de fuentes citadas en cada artículo dieron una descripción de neutra a positiva de las panteras, y la mayoría de las citas fueron de científicos de agencias federales y estatales. Sugerimos que el uso continuo de los medios por parte de las agencias proporciona la oportunidad para enviar mensajes claros y concordantes del manejo de las panteras. El análisis de contenidos proporciona una manera de monitorear la imagen que los medios dan a los carnívoros y su consistencia con las metas de la agencia.

**Palabras Clave:** análisis de contenidos, carnívoro, comunicación, medios, pantera, público, puma

## Introduction

A major obstacle to sustaining or restoring populations of large carnivores is social acceptance (Enserink & Vogel 2006; Karanth & Chellam 2009). Conflicts between humans and carnivores arise from human perceptions that carnivores threaten humans, livestock, or economic security and limit recreation or land use. Antipredator and antigovernment public attitudes in the United States are associated with failure of efforts to reintroduce large carnivores (Hook & Robinson 1982; Carbyn et al. 1995; Kellert et al. 1996). A review of human-felid conflicts worldwide found that a diverse combination of social and cultural factors affects the severity of conflicts (e.g., frequency of actual or perceived predation on livestock, attacks on people, and killing of felids by humans in retaliation for damages (Inskip & Zimmerman 2009). The financial costs of human-felid conflicts are often borne locally, whereas benefits of conservation may accrue nationally or globally (Treves & Karanth 2003; Shrestha et al. 2006). Reduction of human-felid conflict is a primary concern for conservation of at least 9 felid species worldwide (Nelson 2009).

Successful conservation of carnivores depends on favorable social, political, and ecological conditions (Clarke et al. 1996; Treves et al. 2009). Researchers have called for investment in prolonged public outreach and the engagement of social scientists to study public approval of management tactics (Treves & Karanth 2003); greater use of mass media for public relations to generate and demonstrate public support for mammal reintroductions (Kleiman 1989); and a better understanding of cultural, economic, and emotional beliefs about large carnivores (Kellert et al. 1996). Because news media help establish parameters for public discourse, or how people think and talk about a subject (McCombs & Shaw 1972), understanding the nature of media coverage of carnivore conservation may help scientists and managers perform more effective outreach or management activities.

Relatively few studies of media portrayals of carnivores have been conducted, yet such studies may increase understanding of public perceptions of risk, tolerance of

management interventions, and policy preferences, as well as provide guidance for responding and contributing effectively to media coverage (Wolch et al. 1997; Gore et al. 2009; Muter et al. 2009). For instance, media coverage has contributed to shifting public attitudes toward predators (Messmer et al. 2001), and positive media coverage can be an important component of efforts to conserve or protect animals (Gusset et al. 2008). We analyzed newspaper coverage of the Florida panther (*Puma concolor coryi*), which was listed as endangered under the U.S. Endangered Species Preservation Act (predecessor of the Endangered Species Act) in 1967 and has a recovery strategy that seeks to “maintain, restore, and expand the panther population” (U.S. Fish and Wildlife Service 2008: ix). Over 100 panthers inhabit mainly southwestern Florida (McBride et al. 2008).

Mass-media coverage can influence public understanding, perception, and, potentially, action (Wilson 1995; Boykoff & Rajan 2007). Media professionals decide which topics to cover and how much coverage to allocate to a topic (White 1950; Reese & Ballinger 2001). As a result, the frequency and content of environmental information that reaches the public is determined in large part by the media (Stamm et al. 2000). Mass media is a frequent and pervasive indirect source of information about wild animals (Corbett 1995), and quantity of coverage influences public opinion about an issue’s importance and relevance through the so-called agenda-setting function of the media (McCombs & Shaw 1972; Mazur 1998; Weaver et al. 2004).

The framing of media coverage also can affect public understanding, especially understanding of topics that are not part of people’s daily lives. Framing is the process through which the media selects certain aspects of an issue or event to emphasize in a piece (Entman 1993). A frame, sometimes referred to as a schema, is defined as “the central organizing idea or story line that provides meaning” for an event or issue (Gamson & Modigliani 1987: 143). By emphasizing different aspects of an issue, media coverage may affect public interpretation of the issue. For example, presenting a story from an economic, moral, or conflict perspective may lead the public to

give extra salience to these aspects of the issue and less salience to other aspects (Semetko & Valkenburg 2000).

Framing of different management options can affect risk perception by individuals (Kahneman & Tyersky 1984; Muter et al. 2009). Risk perception is usually related to a frame's valence, or the clear positive or negative depiction associated with the frame (de Vreese & Boomgaarden 2003). Negative interactions between panthers and humans are more likely to generate media coverage (Corbett 1995; Siemer et al. 2007) than are constraints to panther recovery such as habitat loss (USFWS 2008). Media coverage of negative events can amplify perceived risk of harm from an animal species, potentially reducing public support for their conservation (Kahneman & Tyersky 1984; Riley & Decker 2000; Gore et al. 2005).

In addition to frame valence, 2 specific types of frames influence public perceptions: episodic and thematic. Episodic frames convey specific events or characteristics related to an issue, whereas thematic coverage emphasizes longer-term trends or contextual factors (Iyengar 1991). For example, an episodically framed story might focus on the specific details of a panther kill of a domestic animal, whereas a thematic framing of the same incident might focus on the issues of panther decline and recovery and loss of panthers' habitat. Siemer et al. (2007) found media coverage of black bears (*Ursus americanus*) in New York is mostly episodic and does not present an overview of issues affecting the success of bear management (Siemer et al. 2007).

The sources quoted in news stories may also affect public perception of conservation issues. State and federal wildlife agencies often are the sources most frequently quoted about wild animals because of their government authority and availability (Corbett 1995). Sources such as government, special-interest groups, and professional organizations help define a social problem or issue (Spector & Kitsuse 1977). As coverage of an environmental issue continues over time, the sources that reporters quote change from scientists to politicians or special-interest spokespersons (Trumbo 1996).

The level of support for carnivore conservation often differs according to proximity of carnivore and human populations because human communities living closer to carnivores are often exposed to greater risks of predation events and concomitantly have lower tolerance of carnivores (Kleiven et al. 2004). For example, widespread media coverage of 7 fatal attacks by cougars in the western United States (Cougar Management Guidelines Working Group 2005) informed the local public that the number of human encounters with cougars was increasing in specific areas (Riley & Decker 2000). In Florida, wildlife agencies have a mandate to address both local risks of panther predation and statewide benefits of panther conservation. In general, framing of media coverage may differ between urban and rural regions with respect to the reporting of risk (valence), sources, and issues framed

(Tichenor et al. 1980; Burgess & Gold 1985). Survey results generally show less acceptance of large carnivores by rural than by urban residents in the United States (Kellert et al. 1996), parts of Europe (Kaczensky et al. 2003; Kleiven et al. 2004), and tropical regions (Conforti et al. 2003; Treves & Karanth 2003).

We conducted a content analysis of media coverage of Florida panthers in Florida newspapers. We compared articles and opinion pieces on panthers in newspapers with circulation within core panther habitat in southwestern Florida, where livestock predation and panther sightings are concentrated, to those in newspapers published elsewhere with statewide circulation. Public concern for risks to people, pets, or livestock from carnivores appears to increase as proximity of human populations to carnivores increases, and mass media may amplify perceptions of risk (Gore et al. 2009). We examined whether proximity of human communities to panthers was reflected in differences between local and statewide newspapers in their coverage of panthers in terms of frequency, length, type of frame, sources used, and positive or negative valence of claims about and photographs of panthers.

## Methods

Content analysis makes replicable and valid inferences on the basis of data derived from text or images (Riffe et al. 1998). The units of our content analysis were articles, editorials, and letters in 6 newspapers. The newspapers were identified from the member list of the Florida Press Association. We selected 2 newspapers with local circulation in southwestern Florida (Lee, Collier, and Hendry counties), where panthers are concentrated: The News-Press (approximate circulation 73,000) and Naples Daily News (72,000), and 4 papers with statewide circulation, St. Petersburg Times (292,000), Orlando Sun Sentinel (187,000), The Florida Times Union (107,000), and The Miami Herald (173,000). To identify articles, editorials, and letters, we searched for the terms panther, and Florida panther (excluding names of sports teams) in LexisNexis and individual newspapers' electronic search engines. This purposive- or relevance-sample (Krippendorff 2004) search process yielded all articles, editorials, and letters in these papers pertaining to panthers from January 2003 through June 2006 (total 513 items).

We followed standard content-analysis procedures (Krippendorff 2004) and classified the 513 articles, editorials, and letters as either a primary panther article (*panther* appeared in the headline or first paragraph and at least once in the remaining text) or a secondary panther article (*panther* appeared at least once). We recorded word length, areas of emphasis, valence, and presence and description of photographs for both primary and

secondary articles. We classified 11 areas of emphasis: risks of harm to people, livestock, or pets; community or educational events; land development and urban growth; disputed science; regulations or policy; public lands management; recovery and monitoring; natural history; descriptions of panthers in private zoos or centers; descriptions of Florida plants and animals; and miscellaneous. We also recorded areas of emphasis of the 15 press releases distributed from 2003 through 2006 by the U.S. Fish and Wildlife Service (1 press release), U.S. National Park Service (3), and Florida Fish and Wildlife Conservation Commission (4), and 7 joint-agency releases.

We classified the episodic or thematic frame content of primary articles (Iyengar 1991; Siemer et al. 2007). We identified the affiliation of the first and second sources quoted in primary articles and associated directly with claims by verbs indicating a direct quotation, such as *said*, *feels*, or *believes* (Riffe et al. 1998). We identified the valence (positive or negative) of each claim on the basis of Siemer et al. (2007) and de Vreese and Boomgaarden (2003). Additionally, we calculated a mean claim score for each article on the basis of the first 2 claims identified in each article: (1) negative toward panthers or indicated opposition to panthers or panther recovery; (2) either neutral or neither positive nor negative; (3) positive toward panthers or indicated support for panthers or panther recovery. We iteratively developed exhaustive and mutually exclusive (Holsti 1969) classes of areas of emphasis and framing and tested our coding protocol with 30 articles published prior to the study sample. Two research assistants were trained by the principal investigators to code the data. All coding was reviewed by at least one principal investigator, and disagreements were recoded and reviewed again, following procedures outlined by Neuendorf (2002).

We analyzed data with SAS statistical software (SAS Institute 1998) ( $\alpha = 0.05$ ).

## Results

Of the 513 articles, 74% were published in local newspapers and 27% in statewide newspapers. Thirty-four percent of the articles were primary news articles about panthers, 52% were secondary news articles, 5% were primary letters and editorials, and 9% were letters and editorials secondarily mentioning panthers.

### Amount of Coverage

Local papers published significantly more primary news articles about panthers than statewide papers ( $z = 6.27$ ,  $p < 0.01$ ). Of 175 primary articles identified, the mean number of words in primary articles in local newspapers (646 words [SD 393]) was significantly greater than in statewide newspapers (534 words [354];  $t = 2.06$ ,

$p < 0.05$ ). Local papers also published a greater number of secondary news articles on panthers (200 articles) than statewide papers (67 articles;  $z = 8.14$ ,  $p < 0.01$ ); however, the mean length of secondary articles in local newspapers (820 words [408.17]) did not differ significantly from the mean length of secondary articles in statewide newspapers ( $t = 0.47$ ,  $p = 0.64$ ).

The percentage of primary articles in local newspapers that included a photograph (4%) was significantly less than that of articles in statewide newspapers (15%) ( $\chi^2 = 20.39$ ,  $p < 0.01$ ). Few secondary articles included panther photographs, with no statistical difference between local and statewide papers (Fisher's exact,  $p = 0.05$ ).

Of 36 articles that included a photograph of a panther, 58% were attributed to a newspaper photographer or file, 9% to the Florida Fish and Wildlife Conservation Commission or U.S. Fish and Wildlife Service, 6% to a university or zoo, and 26% lacked attribution. Twenty-five percent of local papers and 52% of statewide papers published photographs of panthers with their mouths open and teeth showing. One article in each paper depicted juveniles rather than adults.

### Content and Valence of Coverage

The distribution of episodic and thematic frames was fairly even in primary articles in both local and statewide newspapers. Forty-six percent of primary news articles in local newspapers used episodic frames, and 54% used thematic frames ( $\chi^2 = 0.76$ ,  $p = 0.38$ ). Similarly, 45% of primary articles in statewide newspapers used episodic frames, and 55% used thematic frames ( $\chi^2 = 0.42$ ,  $p = 0.52$ ). The difference in frames between local and statewide newspapers was not statistically significant ( $\chi^2 = 1.01$ ,  $p = 0.32$ ).

Of the 11 areas of emphasis, the percentage of primary articles in 2 categories differed, between local and statewide newspapers ( $\chi^2 = 14.25$ ,  $p < 0.01$ ). A larger proportion of articles (23% vs. 9%) in local newspapers focused on risks of panther attack (i.e., injury or death to people, livestock, or pets), whereas a larger percentage of articles in statewide newspapers reported on panther biology (Table 1). The percentage of secondary articles in local and statewide newspapers differed in one area of emphasis: a greater percentage of articles (47% vs. 12%) in local newspapers focused on land development and urban growth ( $\chi^2 = 36.03$ ,  $p < 0.01$ ).

No significant differences in claim scores were detected between primary articles in local and statewide newspapers. The mean claim score for local articles about risks to people, pets, or livestock from panthers was 2.17 (SD 0.80), indicating a slightly positive portrayal with a tendency to evaluate the frequency or consequence of risk from panthers as low or within the control of people. For example, positive claims focused on the low probability of panthers preying on pets or livestock or held pet

**Table 1.** Frequency of 11 areas of emphasis mentioning panthers in primary and secondary news articles and primary and secondary editorials and letters in local newspapers and statewide newspapers in Florida (U.S.A.) from 2003 through 2006.

	Primary articles (%)		Secondary articles (%)		Primary editorials and letters (%)		Secondary editorials and letters (%)	
	local (n = 129)	statewide (n = 46)	local (n = 200)	statewide (n = 67)	local (n = 16)	statewide (n = 8)	local (n = 31)	statewide (n = 15)
Emphasis								
Risks of harm or death to people, livestock and pets	23	9	—	1	44	—	3	—
Community events and education	13	2	4	16	—	—	—	—
Development and urban growth	15	24	47	12	19	—	42	40
Disputed science	15	11	1	0	—	—	—	—
Regulations and policy (general)	1	—	9	6	6	—	16	27
Public land management	3	2	30	40	—	—	6	7
Recovery and monitoring efforts	13	22	—	—	—	—	—	—
Biology	15	28	—	—	31	75	—	—
Private attractions and centers	—	2	3	16	—	13	6	—
Florida plants and animals	—	—	1	1	—	13	—	20
Miscellaneous	2	—	6	6	—	—	26	7

and livestock owners responsible for securing domestic animals to prevent panther predation. The mean score of articles in statewide newspapers was 2.0 (SD 0.82).

Mean scores for local (2.28 [SD 0.75]) and statewide (2.78 [0.44]) articles about development or urban growth indicated a tendency to support reducing or controlling development to benefit panthers or other animals. Mean scores for articles in local and statewide papers emphasizing recovery and monitoring efforts were 2.36 (0.70) and 2.33 (0.71), respectively. The claim score for articles in local newspapers emphasizing panther biology was 1.72 (0.67). The claim score for articles in statewide newspapers was 2.08 (0.64).

#### News Sources and Agency Press Releases

Federal and state agency scientists composed 74% of sources quoted in local articles and 72% of sources quoted in statewide articles (Table 2). A greater percentage of articles in statewide papers (21%) quoted zoo staff than did articles in local papers (2%) (Fisher's exact,  $p < 0.01$ ).

Of the 15 formal press releases about panthers produced by government agencies in Florida from 2003 through 2006, 7 focused on risks of predation by panthers, 3 on panther recovery and monitoring, 2 on public lands management, 2 on panther biology, and 1 on a community event about panthers.

#### Discussion

Mass media are an important source of information about wild animals for an increasingly urban population worldwide (Corbett 1995). Analysis of media portrayals of carnivores can provide insight into potential strategies for coexistence of carnivores and humans. Most people never will encounter a large carnivore in the wild, making portrayal by the media a key contributing factor in public perceptions about the risks, desirability, and management of carnivores (Zucker 1978). Florida residents are more likely to hear about human-panther encounters from local media than to have a personal encounter or know someone who has encountered a panther. This suggests mass media coverage may serve a social function similar to first- or second-hand sources with regard to influencing attitudes toward risks presented by panthers and other carnivores (McClelland et al. 1990; Riley & Decker 2000).

#### Newsworthiness of Carnivores

Historically, representation of panthers (pumas) in popular and scientific literature was low compared with representation of bears or wolves (Kellert et al. 1996). Yet Florida newspapers published a variety of panther-related articles from 2003 through 2006, which reflects public interest in the topic. Local newspapers in regions inhabited by panthers published a greater number of and longer

**Table 2. Frequency of source affiliations quoted first or second in primary news articles about panthers in local and statewide newspapers in Florida (U.S.A) from 2003 through 2006.**

Source affiliation	Articles in local newspapers (n = 129)		Articles in statewide newspapers (n = 46)	
	%*	frequency	%*	frequency
Federal government	37	46	48	20
Florida state government	33	40	24	10
State & federal government (e.g., state and federal officials)	4	5	—	—
County government	7	9	2	1
Environmental groups	30	37	21	9
Other nongovernmental organizations	6	7	—	—
Universities	7	9	5	2
Primary or secondary schools	3	4	5	2
Developer or builder	5	6	2	1
Citizen or local resident	15	18	7	3
Livestock owner	2	3	2	1
Zoo or wildlife center	2	3	21	9
Miccosukee Tribe member	3	4	—	—
Other	7	9	5	2

\*Percentages for each row refer to the percentage of all local or statewide primary news stories that quote that source affiliation first, second, or both first and second. Column does not sum to 100 because articles quoting people with different affiliations first and second are counted twice.

primary articles about panthers than statewide newspapers, which is consistent with results of other research that suggests the salience of carnivore issues increases as proximity of human and carnivore populations increases (Gore et al. 2009). In both local and statewide samples, however, the preponderance of secondary articles about panthers suggests panthers are relevant to discussions of a variety of conservation and development topics in Florida.

Pictures often are the most prominent aspect of an article and can pull the eye to stories that might otherwise go unnoticed (Stone 1987). Photographs of panthers or other carnivores with open mouths may generate negative reactions and increase public perception of risk (Clayton & Meyer 2009). Although our sample size is small, the statewide papers in our study tended to print photographs of wild panthers with their mouths open and teeth bared, whereas local papers depicted captive panthers with their mouths closed. Less than 7% of the photographs depicted juvenile panthers. The availability of photographs increases a newspaper's likelihood of covering an issue. Photographs that depict attractive attributes of panthers, such as females with young or adult panthers engaging in nonthreatening behavior, could generate different audience perceptions (Corbett 2006; Jacobson et al. 2007; Jacobson 2009). Differences in photographic depictions of animals have been noted in other contexts, such as the greater prominence of photographs of animal trophies in hunting and fishing articles published in rural newspapers than in urban newspapers (Corbett 1995). Providing the media with high-quality images that depict animals in an attractive manner has been associated with public support for conservation of unpopular species. In Texas beautiful images of bats helped transform public perception of a bat roost from nuisance

to tourist attraction (Primack 2010). Agencies and organizations often issue press releases or their personnel talk to media representatives about wild animals; thus, they may influence public perceptions of controversial animals through the words and images they use.

### Emphasis and Frames

Primary articles in local and statewide papers were almost evenly divided between episodic and thematic frames. This contrasts with results from a content analysis of media coverage of black bears in New York, which was dominated by episodic frames (Siemer et al. 2007). Black bears are more common and less wary of humans than panthers. Few people, even long-time residents in core panther habitat, ever encounter a panther; thus, panthers are likely to be represented in general or abstract ways by the media. Because thematic frames represent nearly half of all primary articles, regular press releases updating the public about general trends in the panther population seem to be considered newsworthy by newspaper editors.

Studies of news coverage of state agencies show a strong relation between press releases provided by agencies and subsequent newspaper coverage (Turk 1986). Of the 15 press releases about panthers distributed by government agencies in Florida during our 3-year study, 7 press releases focused on risks of predation by panthers. Of primary news articles in local papers, 30 articles (23%) focused on risk, and in statewide papers, 4 articles (9%) focused on risk, indicating that differences in coverage were not just due to local papers being more likely to carry news stories initiated by press releases than statewide papers. Statewide papers, in contrast, published a greater number of articles about

individual instances of panther mortality than did local newspapers. Both of these topics represent episodic frames. Any reporting on human-panther interaction may suggest to the public that the frequency of encounters is increasing; however, predation events are more likely to affect public perception of risk than are deaths of panthers (Riley & Decker 2000).

Although more articles in local newspapers focused on risk from panthers, claims in both local and statewide papers tended to evaluate risks as low or within the control of people. Perceived risks from animals are a combination of the probability of the occurrence of risk, severity of effects, and level of human dread or outrage associated with the risk (Gore et al. 2009). Residents living both in and outside of core panther habitat perceive low risks from panthers, although a subset of residents in core habitat are less tolerant of panthers (Langin 2007). A limitation of the results of media content analysis is that findings may suggest future shifts in public attitudes rather than current public opinion. Media research suggests the former is more likely because the press has an agenda-setting function (McCombs & Shaw 1972).

Areas of emphasis in secondary articles about panthers provide insight into the social context of endangered carnivore management. Local papers were more likely than statewide papers to publish articles mentioning panthers in the context of land development and urban growth. Perceived conflicts between panther recovery and landowner rights may be at the heart of discussions of options for reconciling development goals with protection of panthers. The relatively high incidence of thematic frames found in newspaper coverage of Florida panthers included broad concepts related to management and policies necessary for panther recovery. This contrasts with the narrow, episodic media coverage of black bears in New York that limited local public dialogue about management options (Siemer et al. 2007).

Social scientists have identified factors influencing whether people like or dislike certain species (Clayton & Meyer 2009), and media portrayal of specific attributes that derive from the words used by sources (e.g., lazy killer, rare beauty) may influence acceptance of management interventions. Researchers credit the quantity and consistency of newspaper editorials in the defeat of California Proposition 197, a ballot measure that would have allowed recreational hunting of pumas, in 1996 (Wolch et al. 1997). In Canada media sensationalism was blamed for generating misleading information about pumas (Lemelin 2008). The quantity and quality of media outreach by agencies or organizations can influence conservation outcomes.

### News Sources

Most primary news stories about panthers quoted either state- or federal-agency scientists. This suggests that re-

porters considered scientists a reliable and accessible source for information about panthers (Corbett 2006) and that public audiences view these sources as credible (Fazio et al. 2001). In contrast to media coverage of many environmental issues in which quotations from scientists decline as the issue matures (Trumbo 1996), the continued dominance of quotations from scientists in our study suggests that technical knowledge is still an important aspect of news coverage of endangered panthers in Florida. Panther habitat on public lands is jointly managed by federal, state, and municipal agencies, making it essential that messages delivered by these sources be consistent in content and tone to maintain credibility.

### Limitations

We focused on only one type of media. Content and tenor of coverage of the Florida panther in other formal and informal media channels, such as television, radio, and internet, may differ from newspapers.

Content analyses are often conducted with articles from a small number of newspapers or other mass media (Krippendorff 2004), yet problems, such as pseudoreplication (Hurlbert 1984), have not received much attention in the communications literature. The concentration of sampling units in a select number of newspapers might ordinarily inflate the influence of individual gatekeepers (e.g., editors and journalists), particularly because press coverage in local and midsize newspapers frequently relies on syndicated news-service sources (Gold & Simmons 1965; Einsiedel 1992). In the 2 local papers we examined, 70 different journalists' bylines appeared in the sample of primary and secondary news stories. Additionally, the gatekeepers in local newspapers often edit, alter, and add to wire stories (Vermeer 2002; Hedrick 2006) and display more independence when covering local concerns (Callaghan & Schnell 2001; Jerit 2006). Thus, even when articles in local or state papers may have been derived from the same incidents or situations, it is likely that the duplication of content and sources was minimal (Kaid & Wadsworth 1989).

One of the main points of a study like ours is to look for potential effects of media coverage and issue framing on media consumers. The fact that the articles in each paper may potentially come from a small group of editors and journalists likely does not attenuate any influence of these articles on consumers. Krippendorff (2004: 99) writes that "analysts must define sampling units so that . . . connections across sampling units, if they exist, do not bias the analysis." Given that the purpose of our analysis was to examine the cumulative content of panther coverage, any connections resulting from the small group of editors and journalists should not bias our results in any meaningful way.

The newspapers we used in this content analysis also did not lend themselves to typical conceptions of

resource differences between local and statewide papers (a potentially confounding variable) because of Florida's large population and regional differences. The 2 newspapers published in southwestern Florida, where panthers are concentrated, *The News-Press* and *Naples Daily News*, have circulations of over 70,000. *The News-Press* was the second heaviest newspaper in the United States on Thanksgiving Day 2008 due to the number of inserted advertisements. This suggests that the local papers may not be more resource-limited or more dependent on wire services or press releases than the statewide papers, as reflected by advertising revenue.

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## Literature Cited

- Boykoff, M. T., and R. Rajan. 2007. Signals and noise. *EMBO Reports* 8:207-211.
- Burgess, J., and J. R. Gold, editors, 1985. *Geography, the media and popular culture*. St. Martins Press, New York.
- Callaghan, K., and F. Schnell. 2001. Assessing the democratic debate: how the news media frame elite policy discourse. *Political Communication* 18:183-213.
- Carbyn, L. D., S. H. Fritts, and D. R. Seip, editors. 1995. *Ecology and conservation of wolves in a changing world*. Occasional publication 35. Canadian Circumpolar Institute, Edmonton Canada.
- Clarke, T. W., P. C. Paquet, and A. P. Curlee. 1996. Large carnivore conservation in the Rocky Mountains of the United States and Canada. *Conservation Biology* 10:936-939.
- Clayton, S., and G. Meyer. 2009. *Conservation psychology: understanding and promoting human care for nature*. Wiley-Blackwell, Boston.
- Conforti, V. A., and F. C. C. de Azevedo. 2003. Local perceptions of jaguars (*Panthera onca*) and pumas (*Puma concolor*) in the Iguacu National Park area, south Brazil. *Conservation Biology* 11:215-221.
- Corbett, J. B. 1995. When wildlife make the news: an analysis of rural and urban north-central U.S. newspapers. *Public Understanding of Science* 4:397-410.
- Corbett, J. B. 2006. *Communicating nature: how we create and understand environmental messages*. Island Press, Washington, D.C.
- Cougar Management Guidelines Working Group. 2005. *Cougar management guidelines*. WildFutures, Bainbridge Island, Washington.
- de Vreese, C., and H. Boomgaarden. 2003. Valenced news frames and public support for the EU. *Communications: The European Journal of Communication Research* 28:361-381.
- Einsiedel, E. F. 1992. Framing science and technology in the Canadian press. *Public Understanding of Science* 1:89-101.
- Enserink, M., and G. Vogel. 2006. Wildlife conservation: the carnivore comeback. *Science* 314:746-749.
- Entman, R. M. 1993. Framing: toward clarification of a fractured paradigm. *Journal of Communication* 41:51-58.
- Fazio, J. R., D. L. Gilbert, and D. Lowe. 2001. *Public relations and communications for natural resource managers*. Kendall Hunt Publishing, Dubuque, Iowa.
- Gamson, W. A., and A. Modigliani. 1987. The changing culture of affirmative action. *Research in Political Sociology* 3:137-177.
- Gold, D., and J. Simmons. 1965. News selection patterns among Iowa dailies. *Public Opinion Quarterly* 29:425-430.
- Gore, M. L., W. F. Siemer, J. E. Shanahan, D. Schuefele, and D. J. Decker. 2005. Effects on risk perception of media coverage of a black bear-related human fatality. *Wildlife Society Bulletin* 33:507-516.
- Gore, M. L., R. S. Wilson, S. Robyn, W. F. Siemer, H. W. Hudenko, C. E. Clarke, P. S. Hart, L. A. Maguire, B. Muter. 2009. Application of risk concepts to wildlife management: special issue introduction. *Human Dimensions of Wildlife* 14:301-313.
- Gusset, M., A. H. Maddock, G. J. Gunther, M. Szykman, R. Slotow, M. Walters, and M. J. Somers. 2008. Conflicting human interests over the re-introduction of endangered wild dogs in South Africa. *Biodiversity and Conservation* 17:83-101.
- Hedrick, J. B. 2006. A content analysis of editorial regionalism in the 1960s: midsize newspaper coverage of *New York Times v. Sullivan* (1960-1964). PhD dissertation. Bowling Green State University, Bowling Green, Ohio.
- Holsti, O. R. 1969. *Content analysis for the social sciences and humanities*. Addison-Wesley, Reading, Massachusetts.
- Hook, R. A., and W. L. Robinson. 1982. Attitudes of Michigan citizens toward predators. Pages 382-394 in F. H. Harrington and P. C. Paquet, editors. *Wolves of the world*. Noyes Publications, Park Ridge, New Jersey.
- Hurlbert, S. H. 1984. Pseudoreplication and the design of ecological field experiments. *Ecological Monographs* 54:187-211.
- Inskip, C., and A. Zimmerman. 2009. Human-felid conflict: a review of patterns and priorities worldwide. *Oryx* 43:18-34.
- Iyengar, S. 1991. *Is anyone responsible? How television frames political issues*. University of Chicago Press, Chicago.
- Jacobson, S. K. 2009. *Communication skills for conservation professionals*. 2nd edition. Island Press, Washington, D.C.
- Jacobson, S. K., M. D. McDuff, and M. C. Monroe. 2007. Promoting conservation through the arts: outreach for hearts and minds. *Conservation Biology* 21:7-10.
- Jerit, J. 2006. Reform, rescue, or run out of money? Problem definition in the Social Security reform debate. *Harvard International Journal of Press/Politics* 11:9-28.
- Kaczynsky, P. 2003. Is coexistence possible? Public opinion of large carnivores in the Alps and Dinaric Mountains. Pages 59-89 in B. Krystufek, B. Flajsman, H. I. Griffith, editors. *Living with bears: a large carnivore in a shrinking world*. Ecological Forum of the Liberal Democracy of Slovenia, Ljubljana, Slovenia.
- Kahneman, D., and A. Tyersky. 1984. Choices, values, and frames. *American Psychologist* 39:341-350.
- Kaid, L. L., and A. J. Wadsworth. 1989. Content analysis. Pages 197-215 in P. Emmert and L. L. Baker, editors. *Measurement of communication behavior*. Longman, White Plains, New York.
- Karanth, U., and R. Chellam. 2009. Carnivore conservation at the crossroads. *Oryx* 257:2287-2295.
- Kellert, S. R., M. Black, C. Rush, and A. Bath. 1996. Human culture and large carnivore conservation in North America. *Conservation Biology* 10:977-990.
- Kleiman, D. G. 1989. Reintroduction of captive mammals for conservation. *BioScience* 39:152-161.
- Kleiven, J., T. Bjerke, and B. P. Kaltenborn. 2004. Factors influencing the social acceptability of large carnivore behaviours. *Biodiversity and Conservation* 13:1647-1658.



- Krippendorff, K. 2004. Content analysis: an introduction to its methodology. 2nd edition. Sage Publications, Thousand Oaks, California.
- Langin, C. 2007. Quantitative study of public support for Florida panther (*Puma concolor coryi*) recovery. MS thesis. University of Florida, Gainesville.
- Lemelin, R. H. 2008. Doubting Thomases and the cougar: the perceptions of puma management in Northern Ontario, Canada. *Sociologia Ruralis* 49:56-69.
- Mazur, A. 1998. Global environmental change in the news: 1987-90 vs. 1992-6. *International Sociology* 13:457-472.
- McBride, R. T., R. T. McBride, R. M. McBride, and C. E. McBride. 2008. Counting pumas by categorizing physical evidence. *Southeastern Naturalist* 7:381-400.
- McClelland, G. H., W. D. Schulze, and B. Hurd. 1990. The effects of risk beliefs on property values: a case study of a hazardous waste site. *Risk Analysis* 10:485-497.
- McCombs, M. E., and D. L. Shaw. 1972. The agenda-setting function of mass media. *Public Opinion Quarterly* 36:176-185.
- Messmer, T. A., Reiter, D., and B. C. West. 2001. Enhancing wildlife sciences' linkage to public policy: lessons from the predator-control pendulum. *Wildlife Society Bulletin* 29:1253-1259.
- Muter, B. A., M. I. Gore, and S. J. Riley. 2009. From victim to perpetrator: evolution of risk frames related to human-cormorant conflict in the Great Lakes. *Human Dimensions of Wildlife* 14:366-379.
- Nelson, F. 2009. Developing payments for ecosystem services approaches to carnivore conservation. *Human Dimensions of Wildlife* 14:381-392.
- Neuendorf, K. A. 2002. A content analysis guidebook. Sage Publications, Thousand Oaks, California.
- Primack, R. 2010. Essentials of conservation biology. 5th edition. Sinauer, Stamford, Connecticut.
- Reese, S. D., and J. Ballinger. 2001. Roots of a sociology of news: remembering Mr. Gates and social control in the newsroom. *Journalism and Mass Communication Quarterly* 78:641-658.
- Riffe, D., S. Lacy, and F. G. Fico. 1998. Analyzing media messages: using quantitative content analysis in research. Lawrence Erlbaum Associates, Mahwah, New Jersey.
- Riley, S. J., and D. J. Decker. 2000. Wildlife stakeholder acceptance capacity for cougars in Montana. *Wildlife Society Bulletin* 28:931-939.
- Semetko, H. A., and P. M. Valkenburg. 2000. Framing European politics: a content analysis of press and television news. *Journal of Communication* 50:93-109.
- Shrestha, R. K., J. R. R. Alavalapati, A. Seidl, K.E. Weber, and T. B. Suselo. 2006. Estimating the local cost of protecting Koshi Tappu Wildlife Reserve, Nepal: a contingent valuation approach. *Environment, Development, and Sustainability* 9:413-426.
- Siemer, W. F., D. J. Decker, and J. Shanahan. 2007. Media frames for black bear management stories during issue emergence in New York. *Human Dimensions of Wildlife* 12:89-100.
- Spector, M., and J. Kitsuse. 1977. Constructing social problems. Cummings, Menlo Park, California.
- Stamm, K. R., F. Clark, and P. R. Eblacas. 2000. Mass communication and public understanding of environmental problems: the case of global warming. *Public Understanding of Science* 9:219-237.
- Stone, G. 1987. Examining newspapers: what research reveals about America's newspapers. Sage, Newbury Park, California.
- Tichenor, P. J., C. N. Olien, and P. J. Tichenor. 1980. Community conflict and the press. Sage, Beverly Hills, California.
- Treves, A., and U. Karanth. 2003. Human-carnivore conflict and perspectives on carnivore management worldwide. *Conservation Biology* 17:1491-1499.
- Treves, A., R. Wallace, and S. White. 2009. Participatory planning of interventions to mitigate human-carnivore conflicts. *Conservation Biology* 23:1577-1587.
- Trumbo, C. 1996. Constructing climate change: claims and frames in US news coverage of an environmental issue. *Public Understanding of Science* 5:269-283.
- Turk, J. V. 1986. Information subsidies and media content: a study of public relations influence on the news. *Journalism Monographs* 100:1-29.
- U.S. Fish and Wildlife Service. 2008. Florida panther recovery plan (*Puma concolor coryi*), third revision. U.S. Fish and Wildlife Service, Atlanta.
- Vermeer, J. P. 2002. The view from the states: national politics in local newspaper editorials. Rowman and Littlefield, Lanham, Maryland.
- Weaver, D. H., M. McCombs, and D. Shaw. 2004. Agenda-setting research: issues, attributes, and influences. Pages 257-282 in L. L. Kaid, editor. Handbook of political communication research. Lawrence Erlbaum, Mahwah, New Jersey.
- White, D. M. 1950. The "gate keeper": a case study in the selection of news. *Journalism Quarterly* 27:383-390.
- Wilson, K. M. 1995. Mass media as sources of global warming knowledge. *Mass Communications Review* 22:75-89.
- Wolch, J., A. Gullo, and U. Lassiter. 1997. Changing attitudes toward California's cougars. *Society and Animals* 5:95-116.
- Zucker, H. G. 1978. The variable nature of news media influence. *Communication Yearbook* 2:225-245.