

The National Public's Values and Interests Related to the Arctic National Wildlife Refuge

A Computer Content Analysis

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Abstract: This study examined the national public's values and interests related to the Arctic National Wildlife Refuge. Computer content analysis was used to analyze more than 23,000 media stories about the refuge from 1995 through 2007. Ten main categories of Arctic National Wildlife Refuge values and interests emerged from the analysis, reflecting a diversity of values, tangible and intangible, for the national public. The findings suggest that the national public's interest in the Arctic Refuge focuses on protecting the area's wildlife and perpetuating their encompassing natural, ecological processes.



David Bengston in Urho Kekkonen National Park, Finland. Photo by Zuomin Wen.



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Introduction

The Arctic National Wildlife Refuge was first established as a wildlife range in 1960 because of nationwide interest in preserving, as the area's establishing order states, its "unique wildlife, wilderness, and recreational values" (Seaton 1960). The area's preservation was first proposed in a 1953 magazine article titled "Northeast Alaska: The Last Great Wilderness" (Collins and Sumner 1953), and numerous subsequent media accounts generated the widespread public interest in the area that led to its establishment. Previous refuge system units had been established for the more pragmatic purpose of conserving specific resources; the Arctic

Refuge was distinctive in its purpose: "to preserve...values."

In 1980, the Alaska *National Interest* Lands Conservation Act (ANILCA) doubled in size and redesignated the area, affirming the strong national interest in this area and its unique values (emphasis added). ANILCA also contained a provision, Section 1002, mandating study of the refuge's coastal plain for potential oil and gas development, making the Arctic Refuge the subject of one of the nation's longest and most contentious environmental debates. The controversy has generated thousands of media accounts, including numerous books, TV documentaries, magazine features, newspaper articles, opinion pieces, and letters to the editor.

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This outpouring of public interest in the area and its future is unusually voluminous for such a remote and lightly visited place.

But what specifically is the *national interest* in the Arctic Refuge? What values does the refuge possess for its largest constituency—those who don't live nearby and will never visit, but nonetheless care about its management and future? The refuge's administrators and planners need reliable information about the values and interests of this hard-to-reach constituency if stewardship is to include the national interest. This is of particular importance now, as the Arctic Refuge is involved in a major planning process, including revision of its Comprehensive Conservation Plan (CCP). As mandated by ANILCA, the CCP will "identify and describe...the special values of the refuge" (ANILCA Section 304[g][2][B]) and will specify the programs for maintaining these values. But identifying the values of the nonvisiting but interested national public is a methodological challenge.

The main objective of this study was to describe the values that the national public holds for the Arctic National Wildlife Refuge, specifically those values related to the refuge's legal purposes, as expressed in media accounts of the area from 1995 through 2007. We define environmental values as relatively enduring conceptions of what is good or desirable about the natural world (Bengston 1994). It should be noted that identifying support for or opposition to oil development on the coastal plain of the refuge was not a study objective. Oil development is not related to the refuge's purposes, and the Fish and Wildlife Service planning process will not address it—only Congress can decide this issue. Therefore, this study focuses on values related to the ref-

uge's purposes, responsibilities, and mandates.

We examined the national public's values and interests in the Arctic Refuge using an innovative but proven research tool, the InfoTrend computer method (Fan 1988), to analyze a large volume of media articles discussing the refuge. Media articles about a subject reveal the attitudes and underlying values of a wide range of stakeholders. They are expressed in straight news stories in which reporters summarize diverse perspectives and quote many stakeholders, in feature articles that explore the subject in depth, in travel articles that present firsthand accounts of visitors, in letters to the editor in which citizens express their deeply held concerns, and in opinion pieces that represent a wide range of viewpoints. Communications and public opinion research has repeatedly confirmed that media both reflect and help shape public attitudes and beliefs about a wide range of issues and serve as a valid indicator of public attitudes toward these issues (e.g., Burgess 1990; Cockerill 2003; Elliott et al. 1995; Fan 1988; McCombs 2004).

Data and Methodology

The data consisted of media stories about the Arctic National Wildlife Refuge found in the LexisNexis (LN) online commercial database. The stories were retrieved from the LN "US Newspapers" and "Magazine Stories, Combined" online libraries, which together include almost 2,000 magazines and newspapers from across the United States. After removing stories related to but not specifically about the refuge, a total of 23,525 stories were retrieved between January 1, 1995, and December 31, 2007, as relevant to the refuge. Among the remaining stories, paragraphs were

eliminated if they were irrelevant. For example, stories about presidential candidates' views on a variety of issues sometimes included just one or two paragraphs about the refuge, and the other paragraphs were irrelevant to this analysis and were deleted.

Identifying and coding expressions of Arctic Refuge values in these stories was also performed using the InfoTrend method, which has been used to successfully predict public opinion, attitudes, beliefs, and values based on analysis of news media accounts on diverse issues (e.g., Fan 1997; Fan and Cook 2003; Bengston et al. 2001; Shah et al. 2002). This method involves the creation of customized "lexicons" or sets of words and phrases related to concepts of interest (in this study, a wide range of topics associated with the Arctic Refuge). A detailed set of computer instructions called "idea transition rules" are then developed that specify how various concepts represented by the lexicons are combined to score for new concepts (in this study, the specific refuge values and interests to be coded are shown in figure 1).

An example of the coding process may be helpful. One of the categories we coded for was Wildlife Conditions of Concern, which captures expressions of an ecologically informed value of wildlife in the context of the Arctic Refuge. Wildlife Conditions of Concern includes wildlife-related behaviors (e.g., hibernate, mating, migration), conditions (e.g., diversity, endangered, populations), life cycle (e.g., survival, mortality, recruitment), and habitat (e.g., calving grounds, feeding ground, winter range). These expressions relate to the ecological context and patterns of life of wildlife. Consider the following paragraph, which expresses Wildlife Conditions of Concern:

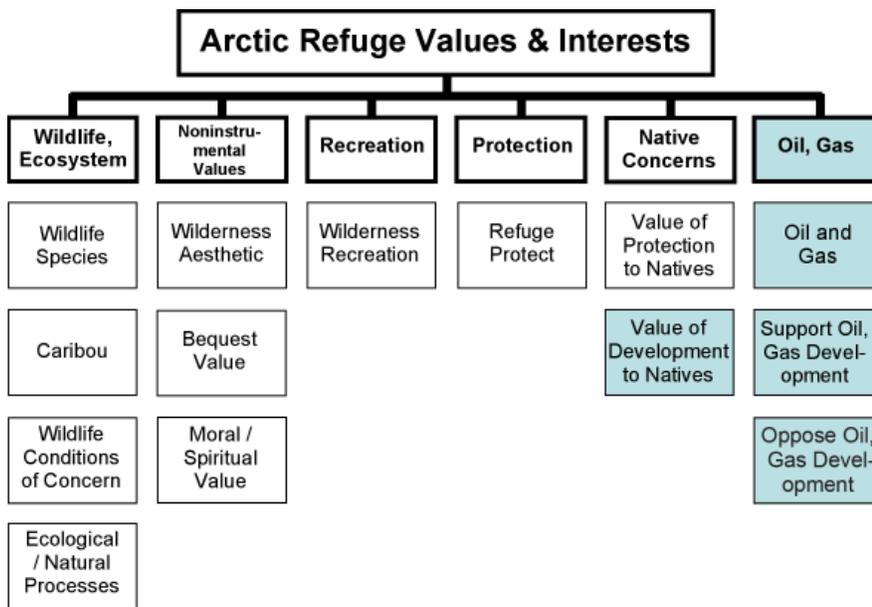


Figure 1—Categories of Arctic Refuge values that were identified and coded in this analysis. Shaded categories are not related to the refuge's purposes as identified in the refuge's 1960 establishing order, PLO 2214, and the Alaska National Interest Lands Conservation Act (ANILCA) of 1980.

The protections are abundantly justified. The Arctic National Wildlife Refuge, a land of mountains, marshes, rivers and plains, is home to an enormous herd of caribou that travels hundreds of miles from the Porcupine River area of Canada to the coastal plain to *give birth* each spring. The 150,000-member porcupine herd *migrates* to the Refuge because it provides just the right mix of food and open *habitat* where the animals can be on the lookout for *predators*. (emphasis added) (*Tampa Tribune* 1997, p. 18)

In this paragraph, the terms *caribou* and *porcupine herd* were included in a large lexicon of Arctic Refuge “Wildlife” terms that included both general references to wildlife and specific species found in the refuge. The terms *give birth*, *migrate*, *habitat*, and *predator* were all included in a lexicon of wildlife-related terms labeled “Affects Wildlife.” An idea transition rule specified that if an “Affects Wildlife” term appeared in the same paragraph as a “Wildlife” term, and in a paragraph

that mentioned the Arctic Refuge, this was counted as an expression of “Wildlife Conditions of Concern.”

The accuracy of coding was significantly increased by use of a lexicon of “irrelevant terms” to disambiguate words and phrases that would otherwise code inaccurately. For example, phrases such as *bear the burden*, *brought to bear*, and *Moose, Wyoming* (a town where refuge founders Olaus and Mardy Murie lived) were included in a large set of irrelevant terms and deleted from the analysis so that the words *bear* and *moose* in these phrases don't code inaccurately as expressions of wildlife species.

Development of the coding system was an iterative process involving continuous testing and modification of lexicons and idea transition rules by applying them to random samples of text. Throughout this process, the coding was assessed for accuracy and comprehensiveness and modified as required. Once the coding system was comprehensive, a formal validity checking process was conducted through careful examination of a

random sample of coded stories to determine the accuracy of the computer coding. Final accuracy rates were in excess of 80% for all coded concepts, a common standard in content analysis (Krippendorff 2003).

RESULTS

Arctic Refuge Values and Interests

Ten categories of Arctic Refuge values and interests related to refuge purposes emerged from analysis of the media articles (see figure 1). The categories shown in figure 1 were not predetermined, but emerged from the analysis of news stories. Virtually all discussion of the values related to refuge purposes was positive, i.e., almost no one is opposed to wildlife, natural beauty, or the other values. Even those who argue in favor of oil drilling often implicitly or explicitly acknowledge the value of caribou or other wildlife as they make the case that drilling for oil *will not harm wildlife*. The following paragraphs describe each of the 10 categories and provide an example of a quote from our stories for each category.

- 1. Wildlife Species** captures all discussion of specific wildlife species (including caribou), as well as general references to wildlife in the refuge. The importance and value of wildlife is often stated or implied in paragraphs expressing this value: “The Refuge is home to some of the most diverse and spectacular wildlife in the arctic” (Current Events 2001, p. 1).
- 2. Caribou** is the iconic species of the Arctic Refuge. We therefore coded separately for caribou in order to gauge how much of the overall wildlife-related discussion about the refuge revolves around this one species: “This wildlife refuge is very important to many animals that live there, such as the Porcupine Caribou Herd” (Biaggio 2001, p. 5).

3. Wildlife Conditions of Concern captures expressions of a more ecologically informed concern for wildlife related to the importance of ecological context, life cycle, and requirements of wildlife: “The coastal plain of the Arctic Refuge represents roughly 5 percent of the North Slope, yet this area is a critical calving ground for the Porcupine River Caribou Herd” (Wright 1999, p. 7B).

4. Ecological/Natural Processes includes expressions of a wide range of ecological values and interests related to ecological conditions, components, systems, natural processes, and ecosystem services. For example, “The coastal plain and arctic foothills of the disputed area contain a number of arctic and subarctic ecological zones that provide a vast richness of plant and animal diversity not found in most other areas of Alaska’s North Slope” (Levendosky 2001, p. 6B).

5. Wilderness Aesthetic value captures expressions of the scenic beauty, wildness, and naturalness of the refuge, i.e., a valued condition of the landscape as essentially free of the human intent to alter, control, or manipulate so that natural processes continue with little or no anthropogenic influence: “But for much of the public this ‘American Serengeti,’ as environmentalists call it, represents an ideal of natural wildness that must remain pristine” (Knickerbocker 2005, p. 2).

6. Bequest Value is the importance of leaving wildlands as a natural legacy to pass on to future generations, as illustrated in the following quotation: “Failing to protect our remaining natural heritage is a gravely unpatriotic act...and I

urge Sen. Ensign to act patriotically by protecting the Arctic National Wildlife Refuge for America’s future generations” (Whitehorse 2005, p. 10B).

7. Moral/Spiritual Values are deeply held connections with or obligations to nature. Environmental philosopher Mark Sagoff notes that we value nature morally when we regard it with love, affection, reverence, and respect (Sagoff 1991), e.g., “That place is a sacred, spiritual place.... It shows me a divine oneness, a unity and power to the universe” (Dial 2001b, p. 1K).

8. Wilderness Recreation includes three related dimensions of recreational value related to the refuge. First is the wide range of recreational activities that visitors engage in. Second, Wilderness Recreation captures expressions of the “experience dimensions” or psychological, experiential elements that wilderness recreationists value (e.g., solitude, adventure, challenge, discovery, self-reliance, freedom, and a frontier experience). Finally, this value category also captures the often profound impacts that wilderness experiences have on visitors (e.g., a “once-in-a-lifetime” or “soul-stirring” experience), e.g.: “Because the Refuge offers such great hiking and floating, Dittrick leads his birding trips using rafts, kayaks and backpacks... says Dittrick, ‘the fact that we’re totally dependent on ourselves up there can make for a life-changing experience’” (Dial 2001a, p. E10).

9. Refuge Protect captures general expressions of the perceived need to protect, preserve, or conserve the Arctic Refuge. Such statements are most often made in the context of proposals for oil drilling

on the coastal plain: “The Arctic Refuge coastal plain is ripe for decisive executive action. Like many conservation issues, this one has been kicking around for decades, and polls show that most Americans want it resolved in favor of preservation” (Drabelle 2000, p. B2).

10. Value of Protection to Natives captures discussion of protecting the traditional cultures, lifeways, and subsistence uses of indigenous peoples who use the Arctic Refuge: “Fourteen Gwich’in communities jointly passed a resolution in 1988 to prohibit development and protect the 123,000-member Porcupine Herd. Caribou play a central role in their cultural and spiritual practices, and they rely on the caribou for the bulk of their diet” (Taliman 2002, p. A1).

Four additional categories are shown in shaded boxes in figure 1, which express the potential benefits of extracting petroleum resources on the refuge’s coastal plain. These categories were coded but are not examined in this article because they are unrelated to refuge purposes as identified in the refuge’s 1960 establishing order and the ANILCA of 1980. It is interesting to note, however, that the ratio of expressions related to support or opposition to oil and gas development in the media slightly favored opposition (52 to 48%), which is similar to most opinion polls on this issue.

Additional Values

In addition to the 10 main categories of refuge values and interests that were coded in this analysis, we observed but did not code several other, less frequently expressed values. First, the importance of migratory bird populations originating in the

Arctic Refuge to people in other regions across the United States was expressed, as in the following example: “Why does this matter to people in the Midwest? The wilderness belongs to all Americans.... We Midwesterners are active birdwatchers and are interested in the welfare of the 180 species that nest on the coastal plain, including snow geese, peregrine falcons, sandhill cranes and golden plovers” (Swan 1999, p. 14).

Second, the “existence value” of the Arctic Refuge was also observed but not formally coded. Existence value refers to the benefit people receive from simply knowing that a particular environmental resource exists, even though they may never visit or use the resource: “Reese, 86, has never been to the Arctic National Wildlife Refuge and has no plans to go, but she cherishes it anyway” (Foster 2001, p. 6D).

Finally, we observed expressions of the “symbolic value” of the Arctic Refuge. To some, the Arctic Refuge is a symbol of freedom like the Statue of Liberty or the American flag, a symbol of our nation’s frontier history and cultural heritage, or a symbol of human humility and restraint toward wildlands: “ANWR, he said, was also a symbol of freedom, the ‘freedom to continue, unhindered and forever if we are willing, the particular story of planet earth unfolding here’” (Goodman 2001, p. A14).

Frequency of Expression of Values and Interests

Figure 2 presents the frequency of expression of the 10 Arctic Refuge values and interests related to the refuge’s purposes (the nonshaded boxes shown in figure 1). Refuge Protect—expressions of the importance of protecting and preserving the Arctic Refuge—was the most frequently

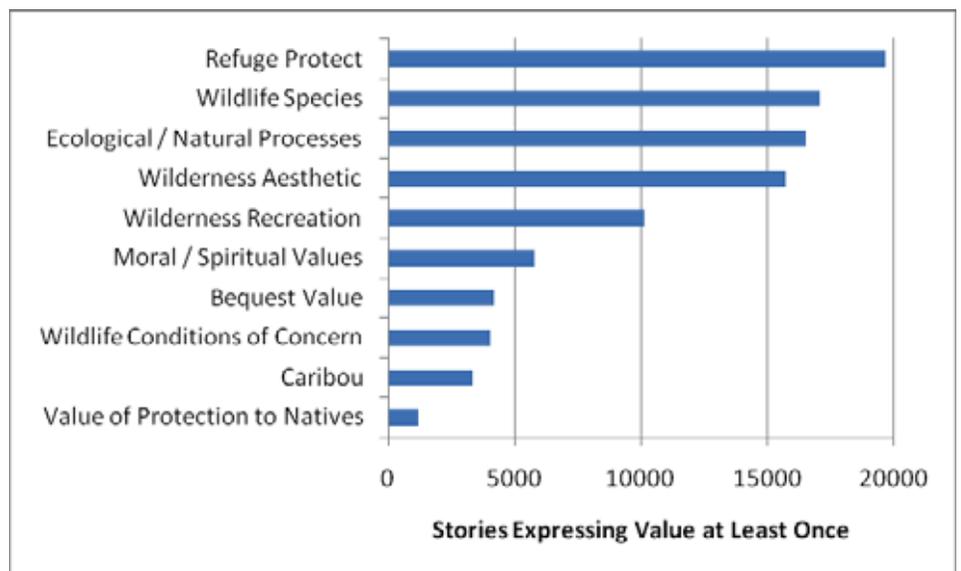


Figure 2—Number of stories expressing Arctic Refuge values related to refuge purposes at least once.

expressed value. Expressions of Refuge Protect were sometimes general, without specifying what should be protected or why, but more often they were linked with other specific refuge values such as wildlife or natural beauty, as in the following example: “There are millions of Americans who want to protect the Refuge’s beauty, solitude and spectacular wildlife” (Feathers 2005, p. F3).

Wildlife Species was the second most frequently expressed value related to refuge purposes (figure 2), closely followed by Ecological/Natural Processes. The diversity of wildlife and large number of species are widely discussed in articles that go into any depth about the refuge, as are descriptions of the Arctic and Subarctic ecosystems and their ecological importance.

Next in frequency was Wilderness Aesthetic value. The natural beauty and dramatic features of the refuge (i.e., valuing the condition of the landscape as wildland undisturbed by anthropogenic influences) are extensively expressed in media accounts. This indicates the prominence of the beauty of the refuge in the public’s appreciation of it, including the aes-

thetic effect of naturalness and wildness inherent in this category.

Wilderness Recreation was discussed as an important use of the Arctic Refuge, although this category was not as frequently expressed as the most commonly expressed values, likely due to the small number of visitors. Moral/Spiritual Values and Bequest Value were also not expressed relatively often, but they are often deeply personal and strongly held values. Research in decision making has shown that people are often reluctant to express values involving moral and ethical considerations (such as Moral/Spiritual and Bequest Value) in discussions of trade-offs with other values (Hanselmann and Tanner 2008).

Wildlife Conditions of Concern consisted of expressions of a more ecologically informed discussion of wildlife, such as wildlife-related behaviors, conditions, and habitat. This value was expressed relatively infrequently, perhaps due to some overlap with the more general and much more frequently expressed value Ecological/Natural Processes. Caribou were the most frequently mentioned individual species but were discussed infrequently

relative to the comprehensive category Wildlife Species. This may indicate that many people value and are concerned about all species in the refuge. Finally, the Value of Protection to Natives was prominent enough to merit categorization, but was the least frequently expressed value related to refuge purposes.

We also analyzed the co-occurrences of values in order to better understand the context for and interrelationships among refuge values and interests. A co-occurrence of two values meant that a story had at least one paragraph scored as expressing both values. Three pairs of co-occurrences stood out as the most prominent. Among the 23,525 stories scored as unambiguously discussing the refuge, these co-occurrences were:

1. 7,687 for Refuge Protect and Wildlife Species (32.7% of all 23,525 stories),
2. 7,634 for Refuge Protect and Ecological/Natural Processes (32.5%), and
3. 7,093 for Wildlife Species and Ecological/Natural Processes (30.2%).

Therefore, Refuge Protect, Wildlife Species, and Ecological/Natural Processes were the most prevalent values found together. Then there was a drop to 6,606 for the co-occurrence of Refuge Protect and Wilderness Aesthetic value (20.3%), after which there was a gradual decline in co-occurrences for other pairs of value categories. These data suggest that for the public, wildlife, ecological, and aesthetic values are the most prevalent reasons for protecting the refuge. (See Bengston and Fan [2009] for details of the co-occurrence analysis, including a more finely grained examination of value co-occurrence.)

Conclusions and Implications

Prior to the 1953 publication of “Northeast Alaska: The Last Great Wilderness,” (Collins and Sumner) the area now encompassed by the Arctic National Wildlife Refuge was of concern to few people outside of the Gwitch’in and Inupiat Natives who inhabited the region. Media accounts of the area during the seven-year campaign to establish the refuge, subsequent accounts focused on expanding it through ANILCA legislation, and more recent media stories discussing the issue of whether the refuge’s coastal plain should be made available for or protected from oil development have brought the area to national attention.

Textual accounts such as those analyzed here, often accompanied by photographic and artistic representations, as well as television coverage, films, and other media, have led a large number of Americans to value the refuge in a variety of ways and to become interested in its future.

The Arctic Refuge has a large, broadly based, mostly nonvisiting constituency who value the area in many ways, both tangible and intangible.

This study enables Fish and Wildlife Service administrators and others concerned with the refuge’s stewardship to better understand this national interest in the area as specified in ANILCA, and to meet the act’s mandate to “identify and describe the special values of the refuge.” It provides understanding of the public’s perception of the refuge’s founding purpose: “To pre-

serve unique wildlife, wilderness, and recreational values.” Although the majority of media accounts analyzed were written in response to the oil development issue, our concern was not which position, if any, the author took. Rather, our focus was the underlying refuge values or conditions perceived to be available or at risk.

The study reveals that the national public holds a diversity of values for the Arctic Refuge. Many values are tangible (e.g., wildlife and ecological) and instrumental (e.g., related to recreational or subsistence use); others are intangible and noninstrumental (e.g., aesthetic, bequest, and moral/spiritual). Although the research placed recurring values and objects of interest related to the refuge into discrete categories, examination of the coded text and the co-occurrence analysis reveal how interrelated many are. Valuation of caribou, for example, is closely linked to the maintenance of natural ecological processes and a wilderness aesthetic, and significantly associated with recreational and Native use.

Not surprisingly, the attribute of this wildlife refuge that showed the highest level of expression was Wildlife Species. Somewhat surprising, however, was the fact that expressions of the Ecological/Natural Processes value were nearly as great. Also, nearly as high as Wildlife Species was expression of Wilderness Aesthetic, which captured the often poetic descriptions of the naturalness and wildness qualities represented by the more scientific Ecological/Natural Processes values. This indicates that public valuation of the refuge’s wildlife extends beyond the welfare of individual animals and their population numbers. Of central importance is the natural context in which wildlife occurs.

The most frequent expression among all categories was Refuge Protect. The values Wildlife Species and

Ecological/Natural Processes showed the strongest and nearly identical level of co-occurrence with Refuge Protect, followed by Wilderness Aesthetic. These data suggest that the most prevalent motivation for supporting protection of the Refuge is protection of wildlife and perpetuation of the natural processes in which they occur, whether expressed in ecological/scientific terms or more generally as naturalness and wildness. Supporting this conclusion are the values most associated with Bequest Value, the belief that the Refuge should be a legacy passed on to future generations. Articles expressing Bequest Value most often referenced Wilderness Aesthetic and Ecological/Natural Processes, followed by Wildlife Species value.

One of the most apparent implications of these data for management is that the national public's interest in the refuge's wildlife would be best served by maintaining the natural roles, interactions, and population dynamics of all species. It suggests that establishing target population levels or altering species' numbers through habitat manipulation, predator control, or other techniques may be at variance with the reasons the national public values the refuge's wildlife.

Although 43% of the articles expressed the value of Wilderness Recreation, its frequency of expression was significantly lower than Wildlife Species (72%), Ecological/Natural Processes (70%), and the Wilderness Aesthetic (67%). Similarly, Wilderness Recreation value co-occurred with Refuge Protect considerably less than half as often as these values. Although experience dimensions such as adventure, challenge, and exploration were often mentioned, more associated with Wilderness Recreation was the value Ecological/Natural Processes, closely followed by Wildlife and the Wilderness Aesthetic.



Figure 3—Sheenjek River Valley. Photo by Jeff Jones.

The refuge's Existence Value was more often expressed implicitly than explicitly, its nature precluding development of a lexicon and computer rules for accurate coding. If it were more amenable to computer content analysis, perhaps Wilderness Recreation could be characterized as largely a vicarious value. That is, most often enjoyed by those who imagine themselves visiting, or finding satisfaction in just knowing a place providing opportunities for immersion in the natural world exists.

In summary, the Arctic Refuge has a large, broadly based, mostly nonvisiting constituency who value the area in many ways, both tangible and intangible. Wildlife—all species, in their natural context—are most highly valued. Nearly as highly valued are the refuge's uninterrupted natural processes, whether conceived through the scientific concept of ecology or more generally as the wilderness aesthetic. Recreation, Bequest, Moral/Spiritual Values, Existence, and Symbolic values associated with the Refuge are closely linked to these predominate values.

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