

*The Psychology of Photographic Imagery in
Communicating Conservation*

*contributed to
The International League of Conservation Photographers*

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*by
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D) INTRODUCTION

This paper had an unexpected but welcome origin. In advance of the 8th World Wilderness Congress (held in Anchorage, AK, in October 2005), I was asked by Cristina Mittermeier to provide insight as a conservation psychologist to a series of questions she and others were posing, in anticipation of the soon-to-be formed International League of Conservation Photographers (ILCP). One of the purposes of conservation psychology is to put the tools and findings of psychology in the service of conservation practitioners, and this project fit that mission perfectly (for an overview of the Conservation Psychology, see Saunders, 2003, available at: <http://www.humanecologyreview.org/102.htm>). Indeed, Conservation Psychology and Conservation Photography share the same mission-focus. So I was happy to oblige. What this document provides is an interpretation of, and response to, the questions that were posed, in the form of a distillation and explanation of what psychology says about the use of images--especially still photographs--in conservation work.¹

Unfortunately there is little direct empirical research that addresses, in a psychological way, the impacts of nature or environmental photography. But psychology is a vast discipline because its specialties cover multiple levels of the organization of human behavior, from the neurological to the cultural-psychological. While no one psychologist can stay current in all these areas, I have nonetheless attempted here to provide a multi-leveled presentation of relevant up-to-date findings and concepts that can illuminate the questions posed. In as much as my academic appointment and much of my teaching and reading are in the broader area of environmental studies (particularly psychology, education and philosophy), I will also draw on this knowledge where appropriate. Some of the material transfers readily from other problems familiar to conservation psychologists. In other cases, I have gone to current literature to find answers. There will inevitably be gaps and over-simplifications in my account--I have no doubt missed some relevant findings, theoretical differences, and many other matters. But I believe what I have presented is a reasonably good representation of current knowledge. I urge colleagues in psychology who know better to contact me, or better yet to undertake their own contributions to this area of urgent need.

For the practitioners who are the intended audience--the photographers, editors, and others who are concerned with the use of still images for conservation communication--I hope this document strikes a balance between practical usefulness and providing deeper

¹ I will not address the questions precisely as they were asked, but in a parallel fashion. The original questions were:

1. Why are still images such powerful tools for communication?
2. How does imagery serve to connect people's emotions to environmental causes?
3. Is viewing images enough to inspire people to protect the treasures of the natural world?
4. Is there public interest in articles dealing with the less well-known and less charismatic species?
5. How can we creatively tie the lesser known and lesser charismatic species to influential stories?
6. What is the public's reaction to the publication of strong documentary images that depict the realities of environmental degradation?
7. Do we have a responsibility to show the public the human footprint? How can this be best done?
8. How do we entice photographers to create images of environmental degradation?

insight. It will not give a detailed how-to or set of simple guidelines for taking or choosing pictures. The photographers and editors are the experts at that. Rather, it should provide a check on assumptions used everyday by this audience. That is, in some cases the findings reported may confirm professional belief, and in some cases they may challenge it. Hopefully in either case the reader will gain a deeper, more current, and complete understanding of the underlying "why and how" imagery in communication. The fundamentals are fascinating material for those interested in vision. And, there are important insights that may enlighten and hone visual communication practice. The multi-leveled nature of the study of human psychology complexifies and enriches the answers to apparently simple questions. My bias is toward grasping and trying to convey that complex richness; I readily acknowledge that the results could be thick going at some points. Hopefully the introductory "recommendations" before section smooth the way, and the return in terms of insight makes it worth reading on.

A) A disclaimer on visual intelligence

First, a statement that is part disclaimer and simultaneously introduces a concept. Psychology frequently reveals individual differences in traits or abilities, and visual ability certainly is an example. In psychologist Howard Gardner's theory of multiple intelligences, he includes visual abilities under a broader category of *spatial intelligence* (Gardner, 1983; 1999), and argues that it is a distinct form of cognition involving co-occurring abilities such as the capacity to conjure up and transform a mental image, to produce a graphic likeness of an object, and so on. People of high versus low visual ability are easily separated by perceptual tests, and visual-spatial abilities may be selectively harmed or spared in various brain injury or disease conditions. Thus it appears to be a distinct form of mental process.² Now, the irony: this paper is a verbal message written (in all likelihood) for a visual audience! Assuming this, the reader may very likely feel that what is being revealed at some points is something that is entirely self-evident to him or her. I have no doubt that I am far less sensitive a viewer and creator of images than many photographers and other visual artists, and I have great admiration for their inimitable abilities. Though my father and mother both studied art, and my father was a life-long professional photographer, not so much of that bent is expressed in me. To be clear: I have no intention of talking down to my audience, or belaboring the obvious. If that seems to be the case at some point, please remember my intention is rather to share information that may help explain or articulate something that may be very familiar or unexamined. I am sure few outside the human sciences concern themselves with the flood of research relevant to taken-for-granted acts like seeing. One value research can bring is to serve as a reality check for those who are exceptionally talented, lest they easily presume their perceptions and judgments are like those of their audiences (indeed they may be; or they may not). Hopefully a little greater understanding and vocabulary are both intellectually satisfying, and practically useful. (I should make the same sort of disclaimer for readers who are conservation advocates, whose real-world skills and professional insights I greatly admire and which cannot possibly be substituted with academic psychology.)

² Visual-aesthetic intelligence can be cultivated in anyone through experiences that heighten appreciation and ability to interpret works of art. Curricula, such as Project MUSE (for Museums Uniting with Schools in Education), and MOMA's Visual Thinking Curriculum have been developed to foster such learning.

The text is organized according to main questions posed by the ILCP, and their sub-topics. Where possible, I offer tentative recommendations, based on the literature presented.

B) Are still images powerful tools for communication?: Evidence from the past and from practitioners

The questions posed to me by the ILCP are underlain by an assumption that still images are powerful tools for conservation communication. In the bulk of this paper, separate sections will explore if, why, and how this may be the case, and conditions which may affect the powerfulness of images. Before launching into that exposition, however, it will be useful to briefly review the historical and anecdotal case for the power of conservation images. While this material is not derived from psychological study, it helps establish *that* images can be very important, and it helps identify some factors that need deeper examination. It has been treated in depth by others, so what follows is just a review to establish that photographs have been used, sometimes pivotally, in successful conservation campaigns.

The most compelling evidence from history and practical experience consists of stories about particular decision-makers (individuals or groups, including whole publics) being influenced to make critical decisions on the basis of photographic evidence of phenomena, such as natural areas, of which they were not previously aware or knowledgeable.

Early examples include the role of photographs by Carleton Watkins and Eadweard Muybridge in the preservation of Yosemite in 1864, and those of William Henry Jackson in the designation of Yellowstone National Park in 1872, as reviewed by Ketchum (1981); Hales (1988); and Roberts (2005). A recent scholarly book by Dunaway (2005) has elucidated the works of Herbert Gleason in pushing for the preservation of Bryce Canyon. In 1909, Gleason also illustrated with Houghton-Mifflin's publication of Thoreau's *Journal* with photographs, and used them to mobilize public sentiment against the damming of the Hetch Hetchy valley in California's Yosemite National Park. In this effort, he teamed with the Sierra Club. Dunaway (2005) also examines the impact of films by Paul Lorentz and Robert Flaherty in communicating the human causes of the dust bowl, floods, and other calamities of the 1930's.

As traced by Ketchum (1981) and others, Ansel Adams collaborated with the Sierra Club in its legislative work, starting with Adams lobbying Congress in 1936, and then using his book, *Sierra Nevada: The John Muir Trail* to push for the designation of Kings Canyon National Park in 1940. Secretary of the Interior Harold Ickes, moved by Adams' book, then assigned Adams to photograph national park scenes around the nation. For the Sierra Club, the Kings River Canyon multi-media effort set the mold for later land preservation battles (Turner, 1991, cited in Roberts, 2005). Subsequently, in the late 1940's the Sierra Club used films and photography--in a book, direct mail, *Life* and *National Geographic* magazines, and full-page major newspaper ads-- to stop the Colorado River Storage Project's plans to dam the Green River at Echo Park, which

would have flooded Dinosaur National Monument (Rothman, 1998; Roberts, 2005). This was a pivotal win that corrected the earlier precedent of Hetch-Hetchy's national park status being overridden by water development. After the production in 1960 of the celebratory *This is the American Earth*, the Sierra Club initiated the Exhibit Format book series, starting in 1962 with Eliot Porter's *In Wildness the Preservation of the World* (Turner, 1991; Roberts, 2005; Dunaway 2005). Under the leadership of David Brower, the Sierra Club produced almost 20 volumes, often coinciding with particular preservation battles, most notably the 1964 Wilderness Act itself.

The use of photography in preservation has not been restricted to North America. Starting in the late 1960's, first Olegas Turchanas, and then following in his footsteps, Peter Dombrowskis, contributed crucial photographs to the struggles to stop dams and preserve land in the Australian state of Tasmania, culminating in 1983 (Millwood, 2003).

More contemporary examples include Robert Glenn Ketchum's 1986 book, *Tongass: Alaska's Vanishing Rainforest*. This national forest was unknown to most Americans, but the book generated awareness in Congress and the public about the large federal subsidies flowing to the Alaska forest industry, at a cost to untouched national lands. In 1990, Congress passed the Tongass Reform Act, preserving a million acres. Threats continued, however, and Ketchum again used photographs to draw attention to the influence of the timber lobby (Ketchum, 2005).

The group Conservation International has embedded their state-of-the-science reports on the world's biodiversity hotspots in colossal photographic books illustrating these plants, animals, systems, and the people that depend on them (e.g., Mittermeier et al., 2004; Mittermeier et al., 2005). These books have persuaded decision makers in Mexico (Gil, 2005) and other countries around the world to set aside preserves. Recently, the "Megatransect" trek by ecologist J. Michael Fay across the Congo basin, documented photographically by Michael Nichols and publicized in *National Geographic*, was instrumental in convincing the president of Gabon to set aside 11% of his country, creating 13 new national parks including areas threatened with logging (Moran 2005). Such cases could be multiplied. Publication and sales figures for books, calendars and prints of nature photos would demonstrate at least a demand for nature imagery, if not a link to conservation.

It has been established that conservation professionals regard photographs as indispensable in their work. The Nature Conservancy has highlighted their use of photographs, in their book *In Response to Place: Photographs from the Nature Conservancy's Last Great Places* (2001). Linda Roberts (2005) conducted case-studies of the use of photographs by 13 conservation groups in the southwest U.S. She identified three kinds of purposes of photographs through interviews with staff of these groups:

- to illustrate, give examples and facts, document, decorate
- to inspire, fill with emotion, arouse, elicit action
- to promote the organization, popularize, publicize

Roberts found that all the groups considered photographs important for a range of their goals, and they identified various presumed routes by which photographs have an effect.

Roberts' findings will be used later in this report to give a practical organization to some of the psychological findings.

II) IMPORTANCE OF HISTORICAL AND COMMUNICATIVE CONTEXTS

Recommendation 1

Any conservation communication effort should be based on careful analysis of the social communicative situation and the characteristics of the intended change agents. Tools such as interviews and focus groups with intended audience members to find out the meanings of alternative image strategies, study of the history of the issue, institutional analysis to determine which audiences can influence the issue and in what ways should inform this analysis. The context-sensitive nature of communicative work implies that conservation photographers need to become well-connected, constantly-learning, and long-term strategic partners of conservation efforts.

Although the specifics of the successful historical uses of photography briefly summarized above vary, they help make a larger point about social, political and cultural factors that condition and interact with psychology. Most obviously, photographs seldom worked in isolation, but were embedded in political campaigns. The campaigns and the actors defined the issues and the narratives into which the photographs fit and played their particular role. Several points derive from this overarching significance of social context.

First are the social-historical preconditions for action for nature preservation, in whatever specific form this occurred. The preconditions could be as narrow as the existence of a single persuadable decision maker such as a president. Or the social preconditions may be broader such as in democratic societies. In the case of the U.S., conditions developed over the course of more than two centuries, and stemmed partly from scientific, artistic, literary and social movements in other Western countries (Nash, 1989). The influence of Romanticism and Transcendentalism in shaping these movements as reactions to emerging mass industrial society was significant. By the mid to late 19th Century, when photography was poised to make its contributions, both resource conservation and aesthetic/preservation movements were becoming widespread. These movements framed humans relations to nature in distinctive ways. Preservationism motivated setting aside parks for the recreational enjoyment of newly urbanized (and generally wealthier) people, and it gave rise to the institutionalization of wilderness, first in the 1920's, with the USFS internal administration of "primitive areas" and later in the 1964 Wilderness Act that enshrined the idea that untouched nature deserves to be left that way. Turn-of-the-century conservationism was characterized by the idea of sustainable extraction of public natural "resources," managed by scientifically informed professionals. These movements emerged as part of the progressive / populist period of 1890-1920 where collective action for public-interest causes was widespread and supported by strong ideologies of the common good. Changing settlement patterns throughout the 20th century were pivotal in these changes. Also of significance were preconditions such as increasing public education and the mass dissemination of imagery in print media and silent or narrated film.

Punctuated by the two World Wars, conservation and preservation incrementally extended their spheres of influence during the first half of the 20th Century. In the second half, environmentalism emerged in response to ecological ideas, new industrial threats to health, increased demands for amenities such as outdoor recreation, and notably the new mass media of radio and television. In the context of the divisive social movements of the 1960's, environmentalism was a common-denominator--indeed bipartisan and inter-generational--uniting theme (Dunlap and Mertig, 1991). In the later decades of the 20th century, struggle and backlash on the national level, and broader sustainability movements on the international scene, propelled environmental concerns. Emerging electronic media have shaped the communicative environment of political campaigns, including use of imagery of a variety of new types. Changing patterns of political ideology, institutional dominance, re-negotiation of the roles of scientific and other elites, media ownership and advertising markets, fragmentation of news sources, and increasing ethnic diversity all play into whether and how any message in any (or multiple) media has an effect (Wasko, 2004).

An example of the media strategy developed in the 1970s and 1980s is that of Greenpeace, arguably the first environmental group to effectively use the modern mass media to dramatic effect. In 2005 world-wide major media advertising expenditures were US\$ 404 billion, growing at 5% / year, average (zenithoptimedia.com). While no single ad may be responsible for a given purchase, marketers realize that repeated and compelling imagery is powerful in conveying their messages. Greenpeace founders included people with media skills who realized this too and were not going to let their cause be left out. Crucially, they fit their messages to the needs of the information sector: they created and documented "spectacles" that would, when filmed and edited into a compelling news-hour segment, capture the public's attention (Michael Karlberg, personal communication). This fit the media industry's need to deliver to advertisers a large audience at low cost. Key elements were images, and moral scripts (e.g., David v Goliath). Greenpeace proved very effective in advances such as whaling restrictions (Weyler, 2004).

What these examples should highlight is not just that imagery is effective, but that to be effective the context in which images are to be used must be carefully studied. For any given issue, an empirical analysis of the social and political forces involved is necessary in order to determine which audiences can play which influential roles in the conservation outcome. These audiences' views must then be understood and addressed in conservation messages or other forms of involvement. The messages must then be delivered through whatever media are most effective.

A contrasting example to the Greenpeace's successes in the 1980s is the carefully constructed use of imagery in a campaign to designate the Entlebuch area of Switzerland as a U.N. Biosphere preserve (Backhaus, 2006). This effort was unusual among Biosphere preserves because it was a local bottom-up initiative, not an administration-down one. In the recent past, the people in the area had been subjected to a heavy-handed wetland regulatory regime, and they were shy of government-sponsored nature protection. Thus the organizers were careful to determine what would be appropriate imagery for the campaign, and sought extensive feedback from audiences. Given the

diverse uses of the land area (industry to wilderness) in Entlebuch, and given the need to honor the local origins of the initiative, the organizers chose images representing various land uses, only a minority of which were of untouched nature. They also highlighted in imagery the diverse faces, perspectives, occupational and class backgrounds of the people of the region who supported the preserve concept. To do otherwise, they found, would have run afoul of the spirit of the public meetings and other forums that built precariously at first on people's emerging voices and sense of trust. In the end this visual strategy, crafted in close harmony with the actual society's dynamics so as to cement the cooperation of the local population, may have been important in the projects' success (Backhaus, 2006). This example is an excellent reminder of the prerequisite need to carefully characterize the history and full communicative context and social dynamics in the conservation situation. We cannot assume that our personal aesthetic tastes or passions for certain strategies--perhaps appropriate in other settings--will be the right ones in every conservation effort.

As recent controversies over protected areas demonstrate, the history of U.S. conservation efforts outlined earlier cannot be a model for conservation in other contemporary societies. Nor can images or the campaign plans into which they fit necessarily replicate the experience of wilderness preservation in the U.S. A widespread effort to reconceptualize nature protection and its relation to human societies is occurring today (see later section). It is imperative that the social context of conservation be understood afresh and in detail, as the Entlebuch example demonstrated.

Underlying this imperative is an important social psychological concept: *that the individual's behavior is strongly shaped by his or her social context*. Backhaus (2006) points out that the significance of an image is not determined by the intent of its producer, but by individual viewers' beliefs, values and positions, which are in turn shaped by widely shared or contested meanings of images in the person's society. The main conclusion from this is that any conservation communication campaign should be based on a critical analysis of its historical and social-political context, as well as of individual factors. The political dynamics need to be analyzed: who has decision making power? Who has influence over the decision? What is the nature of the social/political context? Is it adversarial or collaborative? What is its history, and how is it viewed by different groups? Has a coherent change strategy been formulated, and who are its key actors? What is the level of broad public awareness, if the public is an important target? What segments of the public may have differing views, and need to be addressed differently? How do people in the relevant groups respond to different image strategies? How do they view the source of the images? Such questions can be addressed by institutional analysis, interviews, focus groups and surveys, sampling of media and asking peoples' reactions to it, and other approaches.

Finally, a most salient point--evident in all the successful historical examples--is that providers of imagery cannot find their most effective use without close partnerships with the organizations promoting the campaign, or the various parties involved. Conservation photography means committing to being a learner and participant regarding the relevant systems, issues, and actors. Solo or detached actors are likely to have the best possible

impact only by accident, or by the wise intervention of someone who understands the dynamics of the situation.

III) THE USE OF STILL IMAGES TO SIMULATE EXPERIENCE

Recommendation 2

Still images readily make sense to the visual system, and are rapidly processed mentally in terms of their meaning to the viewer. Still images offer some advantages such as chances for repeated and prolonged examination and thus more detailed retention. The use of highly visually or behaviorally salient stimuli is a priority strategy for drawing a viewer away from the viewer's immediate goals, potentially freeing attention for the new stimulus. The dominance of vision, however, is dependent on individual traits and on the perceptual task in question, and still images lack many dimensions of direct experience. Providers of images also lack control over many factors that determine image memory and meaning, including particularly the viewer's intentions, experience, beliefs, attitudes and values. Visual imagery alone constitutes effective communication only when many other factors can be assumed, which will be the case only with very well known audiences. Generally, not "conservation imagery" but "conservation messages" should be the aim, using multiple media, avenues, and messengers, and based on fresh research into one's audience. This section's summary provides more specific ideas.

Among the goals listed by the 13 organizations studied by Roberts (2005) were several that suggested they believe that photographs can simulate for the viewer the actual experience of the scene or object pictured. For example, here are some of the goals the organizations listed in their use of images:

- Next best thing to visiting
- Create familiarity with a site
- Create a lasting impression
- Create connection to a place
- Explain 'why' without words
- Show land from various perspectives
- "Help Easterners visualize the West"

Similarly, at the 8th WWC, it was asked why images are powerful tools for communication. It may be true that images can help accomplish the things listed above. Indeed, many believe images are humans' dominant sense. The psychologist Rudolf Arnheim argued in his book, *Visual thinking* (1969) that vision is the most important part of our sensory system and is the basis of all thinking. According to Epstein (1994), "people's behavior and attitudes are governed by a cognitive system that is more responsive to pictures than to words" (p. 711). Ornstein and Ehrlich (1989) similarly argued that we are a visual-dependent species. Our arboreal primate origins are responsible for our high visual acuity and hard-wired 3-dimensional visual processing. Chemical sensations (smell and taste) are relatively less important for us. A recent study illustrated the difference by comparing human to guinea pig retinal bandwidths, and found a 10-fold difference: 8.75 megabits for humans vs. 875 kilobits for guinea pigs (http://en.wikipedia.org/wiki/Visual_perception).

Visual dependence has important implications for conservation psychology: If we do not see something, it is less likely we will respond to it. This is most clearly the case with objects that are outside our un-aided visual scale, such as chemical pollutants or the biosphere itself (Winter, 1996), but it is also true of places and things we have simply never visited. A caveat needs to be introduced, however, because of individual differences among people, as evidenced by sensory learning styles. Some people are relatively more attuned to auditory or to tactile-kinesthetic information than to vision. And it may be the case that Arnheim and others have overstated the importance of vision for "all thinking." A better understanding of visual experience and perception, as well as perception in general, will help us understand the basis for the power of images (when such power exists); the limits of imagery; how imagery interacts with other forms of intelligence; and how to make imagery most effective.

Is a photograph of nature the "next best thing," or is it really quite different? The nature of visual experience is a long-debated topic which remains somewhat enigmatic even with sophisticated current research. Before examining that research, a more conceptual analysis may be helpful in characterizing the nature of still images. Most obviously, a photograph is static and two-dimensional. You can't move through or touch the scene. The experience, unless augmented, lacks other senses, time, action, and sequence. These elements can be suggested to some degree by blur, or by providing a series of images for example, but in comparison to a concrete experience, or to a moving picture with replayed sound, or to a theatrical enactment, an animation or a virtual-reality set, a photograph seems less full and compelling.

Visual thinkers may disagree, however, and one could appeal to ordinary experience to argue that still images provide an approximation of direct experience. Copious studies on visual learning and advertising make it clear that a message accompanied by a photograph or other image captures attention and conveys meaning differently than words alone (Solomon 1992). For example, verbal messages heighten ratings of a product's functional aspects, whereas visual ones affect aesthetic evaluations. The strongest effects come from combining images and text such that the picture relates strongly to the words. Written words also require more effort to process, and thus are more effective when the viewer is highly motivated. Also, verbal material "decays" more rapidly in memory. By contrast, images "chunk" information, taking less effort and time and potentially enhancing recall. On the other hand, visual images are weaker at conveying factual information (Solomon 1992).

So seeing is closer to experiencing than words alone, for at least some subject matters, and for many viewers. But, surprisingly, a recent study showed that subjects who studied text plus static illustrations retained and could apply concepts about dynamic processes (such as ocean waves) significantly better than did those who studied text and viewed moving animations of the processes (Mayer et al. 2005). So it may be that still images have advantages over more complex visual stimuli, in some cases. What accounts for these advantages afforded by vision?

A) Visual sensation and perception

To understand how the visual system functions on still images, we will take a large digression to review current understandings of visual sensation and perception. For quick review, the eye focuses light on the retina, which turns light into neural impulses and performs the first stages of processing on those signals. Further processing occurs in the lateral geniculate nucleus, and the primary and secondary visual cortex of the brain. Further cognitive and emotional processing involves other major areas of the brain. More will be added to this basic description as we proceed.

At first blush, the biology of perception would not seem to favor looking at static two-dimensional objects. Recent theory and findings look at vision in terms of active organism-environment adaptation. Vision is an ability shared across a wide phylogenetic range, with various specializations adapted to particular environmental challenges clearly evident. Humans evolved from arboreal primate ancestors who acquired binocular vision for navigating their close-to-far three-dimensional environment. Visual-spatial skill probably continued to be at a premium in the roving hunting/gathering social groups of early hominids and humans.

Our visual system evolved for a world of movement and motion. In a non-obvious way, action gives rise to perception, rather than only perception making action possible, the common sense view. In a classic experiment, young kittens were placed in one of two treatment conditions when their eyes opened a few days after birth. Some kittens were harnessed to little wagons that they hauled around as they navigated their environment. Other kittens were paired with the wagon-pullers, by being secured in the wagons. Thus both kittens had a similar visual input, but very different motor experiences. After a few days, the all the kittens were allowed to roam. Those who had been pulling the wagons navigated easily, but the ones which had had passive experiences bumped into things-- they had not learned to see (described in Humphrey, 1984). Thus, perception is possible when visual information is integrated with knowledge gained by action in the world (O'Regan & Noë, 2001; Findlay and Gilchrist, 2003; Noë, 2005; see footnote 4).

The visual system achieves remarkable economy. Consider the condensation of information achieved by perception. Compare the estimate of human retinal bandwidth cited above (8.75 megabits) to generally accepted estimates of working memory: a person can hold only 4 to 7 "chunks" (more or less complex units of information) in mind at once. Recent research shows that short-term memory (cognition), rather than "upstream" neural visual mechanisms, is the real bottleneck of conscious vision (Maljkovic and Martini 2005). It would seem that our visual experience would be continually bogged down and jolty! Yet our visual experience of the environment is reasonably integrated and coherent. In terms of vision, how does constantly fluctuating and ambiguous light, stimulating the retina, get translated into experience of a continuous, detailed, constant environment?³ And what can this tell us about perceiving static images?

³ There are several competing basic theories of visual perception. "Unconscious inference" theory says that we automatically infer what we perceive from incomplete information. This view is supported by research on visual illusions that reveal the assumptions made by the visual system, and by mathematical models of motion and depth perception. Gestalt theory emphasized perception of organized wholes rather than

Recent research has focused on visual fixations in active vision--in other words, how one's focus jumps around while using vision to interact with an environment. The central area of the retina, called the fovea, has far a denser concentration of receptive cells, especially color-detecting cone cells, offering greater acuity and color richness. However, the photoreceptors respond fairly slowly, resulting in blur at even fairly slow eye movement speeds when scanning a scene. On the other hand, peripheral vision (the retina surrounding the fovea) specializes in simply detecting motion, faces and other high-salience stimuli, as well as in offering lower-resolution colorless vision, especially in low-light illumination. In ordinary functioning, visual stimuli are placed on the fovea in a series of *fixations* separated by jumps or "saccades" between points of interest in the visual field. The eyes are moved so as to scan relevant features of the scene across the fovea in repetitive series of fixations, creating an impression of a sharp image of the whole. In theory, since the whole scene is not sharp at once, information about the scene's details and its elements is stored in mental "object files" in memory, and these files are constantly updated during further fixations. The more repetitions, the more detailed the comprehension and memory for the image (this account will be qualified below). An implication for still pictures is immediately evident: even though vision is adapted to movement and motion, we gain detailed visual sense only by briefly "freezing" our eyes' activity. So, a still image is not foreign to vision, and may indeed be favored because it allows extended bouts of fixations, and the garnering of an optimal amount of detailed information. Moving scenes present a more challenging environment for extracting and thus remembering information.

1) Relation of vision to other senses

It is important to note that vision is of course not isolated from the other senses. In the organism's activities in typical environments, visual sensations are integrated with auditory sense, tactile perception, and motor / proprioceptive (sense of the body's changing configuration and action) sensation--as well as with taste and smell to a lesser degree. Visual-auditory-tactile integration has been demonstrated with very young infants and appears to be hard-wired, as well as to develop. Very young infants, for example, when simultaneously shown two identical but a-synchronous moving images, and only one sound track, will watch the moving image that is synchronized to the sound track, and ignore the other (Stern 1985).

Recent careful studies have attempted to disentangle the relations between the senses in spatial perception in order to show why vision is dominant in navigation and scene perception. Witten and Knudsen (2005), for example, offer experimental data on auditory-visual integration that show vision is dominant in our sense of space not because of a physiological (brain-based) advantage, but because visual information about space is more reliable, and the brain "integrates information in a statistically optimal fashion." That is, information from all the senses is integrated and processed efficiently in the

inference from isolated parts of the visual field. Ecological perception theory emphasizes not the mental inference, but the wealth of information available in the environment, which we pick up; this "realist" view has helped researchers identify what information is available in the environment, and underlies recent advances as discussed shortly. While these are important issues, in the interest of summarizing and applying a range of recent research the discussion in this paper will not dwell on disputes between large-scale theories.

brain; when the task is spatial, since visual information is on average more reliable for spatial information, it is given a preference. Interestingly, vision seems to enhance haptic (touch) perception, even when the touched objects are not visible (Newell et al., 2004) (looking towards what you are doing helps you accomplish a task with your hands even if your hands are occluded from sight!). An argument could be made that we are auditory-dependent for social information: it may be the case that for social communication, vision is relatively less important than verbal hearing, though normally both are employed. Helen Keller, who of course was blind, once commented that she felt lucky to have lost vision and not hearing, because she believed that losing the latter would have left her more socially isolated.

2) *The nature of visual perception*

An old and fundamental question in perception research concerns the relationship between the thing perceived and the perception of the viewer. To what extent is perception something inferentially constructed "in the head," versus how much is it a reality-based representation? Still much in debate, evidence is emerging for something closer to the latter view. Again, cross-modal studies are giving insight. When moving through an environment, primates are able to keep track of the position of objects they have passed and that are no longer in view, as demonstrated by their ability to accurately direct their eyes to remembered targets. This ability is called "visuospatial updating." Experimenters have also rotated scenes, displaced them laterally relative to the head, and in other ways changed the scene. But the subject can account for all these changes, still accurately looking toward remembered targets (Li & Angelaki, 2005). This ability requires integration of visual with non-retinal signals. Particularly, proprioceptive sense and vestibular information (from the labyrinths that detect changed position in space, balance, acceleration, and so on) are integrated into the organism's ability to maintain a coherent sense of the self's position within the visual environment (Li & Angelaki, 2005).

Further, Liu and colleagues (2005) argue that the visual spatial reference system is tied not to the eye and physiology but to a scene-based coordinate system. It is plausible that it would be otherwise--that the brain is processing information based on the retinal positions of stimuli. Indeed, retinal position is preserved in the connections of neurons in "downstream" processing of visual information in the cortex, so we might expect a retinal-based coordinate system for spatial perception. To mention just one piece of evidence, however, if the system was retina-based then we would notice small displacements of dots presented to successive fixations. That experiments show we cannot do so suggests that visual perception is representing a scene which is constantly updated and organized according to visual coordinates in the scene (Liu et al., 2005). The findings discussed here support a general view of perception advanced by James Gibson, and referred to as the ecological theory of perception (Gibson, 1986; Reed, 1996), and the promising revolutionary approach of O'Regan and Noë (2001).⁴ One implication this

⁴ In an important and detailed paper accompanied by critical commentaries, O'Regan and Noë (2001) argue against a (traditional) mental-representational view of vision: "Instead of assuming that vision consists in the creation of an internal representation of the outside world whose activation somehow generates visual experience, we propose to treat vision as an *exploratory activity*.... The central idea of our new approach is that *vision is a mode of exploration of the world that is mediated by knowledge of what we call sensorimotor contingencies*. We show that problems about the nature of visual consciousness, the

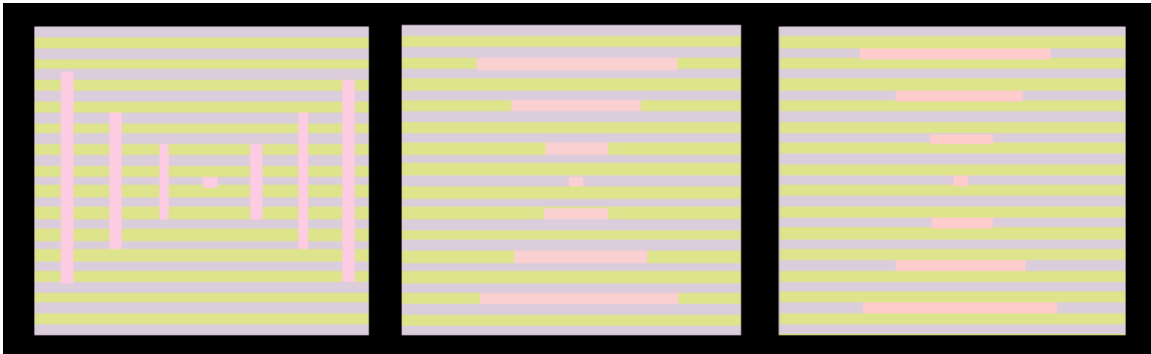
view, as supported by evidence of "active vision" discussed above, may be that the very nature of perception facilitates scene recognition across different kinds of representations of scenes, such as real versus image representations.

Nonetheless, the camera, which seems to represent literally, provides a poor model for the visual system. Indeed, that it seems to us as if the eye represents mechanically (faithfully) reveals how removed from awareness is the actual processing of visual information (as Bateson (1972) pointed out, to add too much monitoring (or awareness) of low-level functions to a hierarchical system would quickly bog it down). Rather, a wide variety of processing rules, many of them top-down (and thus not mechanical but meaning-driven), have been revealed.

Visual stimuli are processed at many levels physiologically, starting with the retina's many types of cells that integrate between the basic receptor cells. The visual system detects objects by registering their edges or borders by identifying contrasts. It exaggerates contrasts by means of excitation or inhibition of "bipolar" cells. The perception of depth is hard-wired into how the brain processes the slightly different viewpoints of the two eyes, as exploited by stereoscopic apparatuses and displays. The visual thalamus and visual cortex contain several types of cells and cell arrangements for object perception. Some tracts of cells in the thalamus detect simple shapes such as edges and bars. The ability to maintain constancy of object perception in different positions or as a scene moves across the visual field is accomplished by more complex cell types and arrangements. Different sets of neurons in the visual cortex are specialized for contour, color, position, features and types of objects, and movement. That movement is processed as a special function suggests that its absence (for example in a still image) is not a foreign condition to the visual system, with all due regard to the fundamentally "active" orientation of the sensory system.

A dramatic example of top-down processing and the non-mechanical nature of perception is provided by the phenomenon of chromatic induction. Color is not an inherent quality of light. Light has wavelength; color is a perceptual phenomenon. For example, the pinkish bars in the diagram below are all actually the same hue. Their apparent differences stem from the color of the bars adjacent to them; thus the eye induces the color.

qualitative character of visual experience, and the difference between vision and other sensory modalities, can now, from the new standpoint, all be approached in a natural way, without appealing to mysterious or arcane explanatory devices" (O'Regan and Noë, 2001, p. 940, emphasis in original). As a simple example, visual percepts are affected by eye blinks, but auditory stimuli are not. The theory is that the brain signals do not themselves carry 'visual' or 'auditory' labeling, but that the brain sorts out contingencies of this sort, integrating the inputs that share contingencies into coherent visual experience. Other contingencies are determined by the visual attributes of objects -- consider the differences between touching versus seeing a hold-able 3-dimensional object: Blind people whose sight has been restored report being dumbfounded at the sight of small photographs of faces, since they are not able initially to integrate their experience of the contingencies of touching a face with the experience of seeing such a small representation of one. While not without problems, O'Regan and Noë (2001) provide an exciting theoretical shift that suggests the world serves as its own representation, and what is learned is how the rules of the different senses interact with its features.



A more revealing example of top-down processing is apparent in the figure also. Note that the center square in each pinkish set of bars is surrounded by green bars, and so should appear to be the same hue as the other center squares, according to chromatic induction. That each square appears the same hue as the other bars *in its own set* reflects the way the visual system has organized each set into a coherent object with consistent properties. Here, the higher level perceptual unit (the set of bars) is determining the properties of a lower level (component) unit, an example of top-down processing. (You can verify this demonstration yourself by viewing the above image at 5x or more the normal size; you'll see that all the sets of bars are the same hue.)

Several principles of top-down perception were described by the Gestalt school (from German for “form” or “organization”) after 1910 by Max Wertheimer, Kurt Koffka and Wolfgang Köhler, who “concluded that human perception in general imposes its own order and dynamic organization upon the individual ‘elements’ of sensation” (Fancher, 1990, p. 172). Their principles are familiar to visual artists (see e.g., Zakia, 1975), and include: perceptions of wholes rather than parts; grouping of elements according to proximity, similarity, closure, common movement, good continuation, and good form; figure-ground relationships, and perceptual sets. The latter refers to both perceptual and conceptual preparedness to perceive a scene globally according to our experience and expectations. Certain rare brain-injury cases have shown further that object identification per se (given the key pieces of sensory information) is carried out by unique sets of neurons in cortex.

B) Visual system represents objects and scenes in meaning

Automatic top-down processing is some of the evidence that makes it clear the visual system *does not produce a faithful copy* of the external scene. Rather, it renders visual space in a medium of *meaning*. This is shown in studies where subjects are able to register the “gist,” overall spatial layout, and object identity of a scene rapidly -- in the first 120 milliseconds of viewing it, *even before* the first fixation (Potter & Levi, 1969; Beiderman, 1981; Tatler et al., 2005). Subjects do not register “lower-level” components or details first, but rather these global, meaning-laden qualities.

Interestingly, part of this story was unraveled beginning with an intriguing finding that both humans and monkeys could identify (categorize) natural scenes or objects such as an animal, trees or food in an “ultra-rapid” fashion, the underlying brain processing

happening in as little as 150 milliseconds (Thorpe et al., 1996; Fabre-Thorpe et al., 1998). It turned out, however, that the same speeds were possible for humans categorizing images of "modes of transport" as for scenes of animals (VanRullen & Thorpe, 2001). From the vision science point of view, this was interesting because such complex images presumably should require more mental processing to categorize than "simple" or synthetic stimuli like letters produced by computers. More recent studies using "natural" scenes including automobiles and other "everyday" stimuli have contradicted that earlier view that such complex natural stimuli cannot be processed without concerted attention. (Interestingly, artificial computer vision-system algorithms have great difficulty categorizing natural scenes). In fact, subjects in the recent studies were given a visual task that tightly occupied their central vision and attention. Then, in the periphery of their vision, they were shown a "natural" scene, for just 27 milliseconds and asked to categorize it (animal or not animal); their success rate was high - about 75% (Li et al., 2002). But they performed poorly on this "dual" task experiment when the brief peripheral stimulus was a simple artificial object (determining whether a rotated letter was a T or an L). Most tellingly, when the T or L was presented upright, in its familiar orientation, the subjects could rapidly categorize them also (Li et al., 2005). (Other experiments ruled out other confounds). Thus the familiarity of the stimulus seems critical. Other studies have showed that recognition of less familiar or synthetic objects depends on deliberate attention (VanRullen et al., 2005). The central importance of these studies is that everyday visual perception is highly mediated by higher conceptual categories (processed in associative cortex brain areas); objects or scenes that are familiar and meaningful are "recognized earlier, learned faster, and [require] less attentional resources" (Li et al., 2005, p. 921).

Further illustrating the role of cognition, it has been shown that our intentions and the behavioral relevance of a scene are integrated into perception at a basic level. This is shown for example in studies of orienting, or what a person attends to in a visual scene. In *endogenous orienting*, attention is voluntarily directed to an object based on our current behavioral goals. We might be searching traffic ahead, scanning for a lost object, a word on a page or a face in a crowd, or some other goal-driven activity. On the other hand *exogenous orienting* occurs when our attention is reflexively drawn to an object because of its sensory salience (Yantis and Jonides 1990). In the former endogenous case, cognitive centers of the brain are illuminated in functional MRI imaging studies. Most tellingly, however, in the latter case (exogenous or stimulus-driven orienting process), cognitive mediation is called upon only when the stimulus has behavioral relevance (Kincade et al., 2005). For example, another's face pointed in our direction from the peripheral visual field will attract our attention and spark an inquiring attitude. This illustrates cognitive mediation due to possible relevance for our behavior--we immediately wonder why the person is looking at us. Both strategies might be relevant for viewing photographs.

Social and cognitive factors may strongly influence the processing of visual information. This is illustrated by studies of "cuing." As we noted above, conscious attention and short-term memory are limiting factors, so we cannot remember accurately all we see. Since scene details and non-salient elements may be poorly represented in visual memory (mental imagery based on sensory experience), they are readily affected by "cuing." For

example, "leading" questions can easily get eye witnesses to recall features that were not in fact present in the scene witnessed. Their susceptibility to this is influenced by several factors, such as mood (people in negative moods are less susceptible to misinformation), and people are not aware of these influences (Forgas et al., 2005). Thus, the way an image is remembered is influenced by non-visual information. In another sort of cuing, subjects' knowledge of not only the content but the *context* of a scene helps them visually search more efficiently (Neider and Zelinsky, 2006). Most everyday environments are rich in high-level contextual cues that are used rapidly to cognitively guide visual searching. The implications for photographs include how much context is provided, and how much that context is understood (or not) to viewers. The photographer has some control over one but not the other.

Before moving on, some further speculations may be based on the above findings about orienting and cuing. Endogenous orienting is relevant when the viewer has intentionally chosen the image (perhaps a book of photos) to view, with a goal of entertainment, enjoyment, or gaining information. Exogenous orienting may be of importance in situations where the aim to "grab the person's attention." People will pay most attention if what they see might affect them. It may be possible then to add more to the message, tapping other kinds of concerns. Self- and other-focused concerns will be discussed more below in the section on emotion. On the other hand, much visual art, including photography, seems geared to work by an exogenous route by sheer visual stimulation. Such images--whether they grab attention through formal or content qualities--rely on an exogenous perceptual route that is not driven by the self's immediate goals. They might thus catch the viewer in a more psychologically "open" moment (however brief), and thus foster an attitude of intrinsic interest toward the object represented (see below on aesthetic emotions). Viewing a scene via a photograph--that is, in a more decontextualized and behaviorally neutral setting than the actual scene--might also increase the chances intrinsic interest.

C) Summary: The case for still image potency

One of the motivating questions here was to understand at a basic level whether (and if so, on what basis) still images (photographs, particularly) are especially compelling, and particularly if they can simulate experience. More will be added to this question in subsequent sections, but a number of points can be distilled from the above current research on visual sensation and perception:

- The visual system is based on retinally "fixing" samples of a scene. And processing of movement is neurologically separate from other scene features. Thus, a still image is not foreign at all to the visual system despite the dynamic, active nature of visual perception.
- Still images provide the opportunity for multiple fixations, and thus greater detail perception and memory retention of the scene than moving images.
- Innate or well-learned natural objects and scenes are processed exceptionally fast by vision.
- Exogenous orienting (grabbing the attention) by the use of highly visually stimulating or behaviorally salient stimuli is a priority strategy for drawing a

viewer away from the viewer's immediate goals, potentially freeing attention for the new stimulus.

- Endogenous orienting depends more on the viewer choosing, because of their own goals, to view a scene. Product images that appeal to goals such as aesthetic enjoyment, intellectual curiosity, entertainment, social status, and so on, are examples aiming at this type of attention-direction.
- If a viewer is motivated by their own goals (including as experienced emotionally) to gain information from a scene, he or she will rapidly process the image in those terms.
- *The gist and meaning of an image are of primary significance in visual perception.*

Several factors qualify this importance of vision:

- Although powerful, still imagery is less immersive than direct experience or multi-sensory media. Still images may be sufficiently unlike natural stimuli we evolved to process that viewing, enjoying and getting information from photographs may be a *learned* achievement. Individuals vary in their visual powers and skill, based on endowment, practice and instruction.
- Vision is a dominant sense not precisely innately but depending on whether it provides the most salient and reliable information for the perceptual / cognitive task in question. This appears to be the case with spatial perception, but for social-cognitive tasks, it is probably co-dominant with other senses. The balance of sensory inputs provided by the environment affects dependence on vision also.
- Cognitions -- a person's thoughts, knowledge of objects and contexts, beliefs, concepts, expectations, attitudes, goals, values, and so on, have strong influences on perception because they define "meaning" and they direct attention toward behaviorally relevant stimuli. They guide visual behavior from the top down. Generally, artists producing images for viewing by others have little or no control over remote specific viewers' intentions, experience, knowledge and the social interpretative frameworks that shape the significance of the scene.
- Repeated viewing and thus increased familiarity by the audience of one's messages and imagery are important but costly in the competitive and increasingly viewer-selected media environment.
- As discussed elsewhere here, an implication is to conceive of one's work not as producing conservation photographs or images, but rather conservation messages using multiple images and media and considering various aspects of the communication context.

IV)THE USE OF STILL IMAGES TO EVOKE EMOTION AND MOTIVATE ACTION

Recommendation 3

Emotion is tied closely to vision and combines thought and feeling. Emotions are generally adaptive and allow a quick appraisal of the import of a stimulus for a person's key goals. Emotions mobilize or arouse the body, and may lead to expressive/communicative or practical action. Imagery with emotional import is processed very rapidly, and is likely to be evocative but not directive-- so other inputs are necessary if the viewer is to be guided toward a specific action. Several kinds of emotion are relevant to conservation: self-focused positive emotions or feelings experienced in relationship to nature or images of it (some of positive effects may not be experienced in awareness); other-focused positive emotions such as care and connection towards other living things or systems may be highly selective (love, connection), or more "equal opportunity" (wonder, respect); other-focused negative emotions include sympathy, concern, anger, sorrow, and other emotions when another is harmed or treated unjustly. Also to consider are relational and aesthetic emotions that are stimulate both self- and other-oriented values. Nature imagery may derive its emotional import from what it means for the person's relations with other people as much as from the natural object itself. Many variables affect the emotions a person will have toward a scene, including particularly how he or she construes the meaning of the scene and relationship to it. In short there are many positive ways imagery may work to stimulate emotions. Special care is called for, however, regarding emotions that are self-focused and negative, such as might occur in response to imagery that is guilt-inducing, shocking, threatening or disturbing. When people are aroused emotionally, the autonomic nervous system dominates their functioning and self-preserving behavior may dominate. If arousal is lower, the cortex (associative, thinking areas of the brain) is aroused, and adaptive response is more likely (even here, however, chronic negative arousal may be problematic). Threatening images cause people to appraise the level of threat and their ability to respond to it. If the latter is low relative to the former, then "emotion-focused coping" results rather than a problem-solving response. This is usually not desirable. Threat messages have been shown to be ineffective unless they convey not just the possible harm, but a convincingly high probability it will occur. Highly disturbing imagery has the potential to generate reactions similar to PTSD, including distancing responses. If the communicators' intent in using disturbing images is to stimulate empathically motivated helping responses, they need to ensure that a number of preconditions are present or else such responses will not be likely. Of concern are the dynamics of "moral exclusion" which may be motivated by the need to distance oneself from the disturbing images, or from being implicated in their cause. The inclusion of nature in the sphere of morality is still emerging in American culture. Suggestions are included here for communicating about "charismatically challenged" species also. General recommendations for using highly emotional images are to research the target audience's response, appeal to their known values, explain the threat and the solution and to address HOW the audience can help.

Among the goals listed by the 13 organizations studied by Roberts (2005), several highlighted emotion and motivating action. For example, here are some of the goals the organizations listed for their use of images:

- Evoke a favorable emotion
- Stir excitement
- Remind people of the value of an area
- Show and report damage
- Educate about threats
- Show devastation and restoration
- Inspire action
- Promote legislation
- Obtain support or funding

In addition, the conservation photographers asked how imagery connects emotion to environmental causes, whether images can inspire people to protect nature, and how people react to depictions of the unpleasant or threatening realities of environmental degradation.

A) Overview of emotion

Psychology has a rich and complex literature on emotion. I will briefly review some of the converging aspects of this work that set the stage for understanding how vision and visual imagery work in communication.

Emotion, also referred to as “affect,” comprises several phenomena, including emotions, moods, sentiments and affective traits (Ben-Ze’ev 2000). Moods and emotions describe a person only if he or she is having them presently, whereas sentiments and traits typify the person because he or she is likely to have them. Like sentiments, emotions are felt toward a specific object (a person or situation). All of these affective phenomena combine three essential components: an evaluative judgment (good or bad; I like this, or I don’t like this), a particular qualitative feeling (such as those designated by familiar labels like love, hate, etc.), and an arousal component (which varies from very low to very high). All the affective types are potentially important in conservation communication, but here I will focus on emotions, which are typically brief, vary in intensity, and are accompanied by some degree of physiological arousal.

Traditionally emotion is regarded as fickle, irrational, insubstantial, and potentially misleading and dangerous. Recent psychological work on emotions paints a less biased picture. Emotion involves both evolved and learned or habituated responses. This is partly why emotion was classically regarded as less than fully reflective and rational. Early psychological work on emotion stressed its structured aspects, but now the predominant view of emotion is the “functional” account (Lazarus 1991), emphasizing how emotion is—in fact must be—adaptive and flexible. A principle finding is that emotion is in fact information-dependent. A given emotion requires cognition, although the processing of information may be so fast as to seem almost automatic. But the common observation that one’s emotion changes if information changes reveals a cognitive element is present. For example, if one has suffered and looks for a cause, if no agent of the harm can be identified, one feels sorrow. But if a blameworthy agent is

assumed or known to exist, then anger is the likely emotion, even if these two cases are the same in all other ways.

According to Lazarus (1991), when an event happens, the person performs a rapid *cognitive appraisal* of the situation vis-à-vis the self's core values and relationships: "What does this mean for me?" We integrate our perception of the present event with our long-term memory and beliefs. Whether the result of this information processing is positive, neutral, or negative, will determine the evaluative tone of the emotion. This basic evaluative reaction is called "primary appraisal." Emotion also serves a mobilization function: the person gets physiologically aroused, and begins attempting to regulate or cope with both his own response as well as the situation. The decision about what action to take is a slower cognitive step, and is called "secondary appraisal." Third, emotion serves a communicative function, in the form of bodily and verbal expression and action readiness (or its absence, depending on how the person regulates his or her aroused state). Communication is essentially social, implies an audience or potential audience, and is the main route by which emotions achieve social influence. This is expectable because many of our important goals in life (about which we get emotionally worked up) depend on others to be fulfilled.

In a larger sense, emotion is more functional and adaptive than the traditional view had it. Emotion-evoking situations are often uncertain, high-stakes, and demand a quick response (for example to another's words or acts). Slow cognitive processing may not be an option, and emotion may provide the most workable response. In short emotions are cognitive, motivating, communicative, and adaptive, and play these functions primarily in the person's perceived social context.

B) Emotion and imagery

There are intimate connections between vision and emotion. Vision is an important route by which information is obtained, and then rapidly evaluated for relevance to the person's goals. An emotion may be the result, if there is high relevance. Recall from our preceding discussion of vision that vision represents information as meaning, and that the "gist" of a scene is processed very rapidly. Recall also that high salience objects may be defined not only by visual qualities but by their relevance to the person's goals and/ or behavior.

Studies have elucidated the links between vision and emotion. Researchers have found that cognitive appraisal of stimuli can occur below the level of conscious awareness, as when subjects are shown images too briefly to register in awareness, but prefer them later over others that were not displayed (this preference derives from people's predictable positive emotional evaluation of stimuli that are familiar). This is termed the "mere exposure effect," and it has been shown to depend on cognitive processing, however brief or unconscious (Zajonc 1980). Emotionally charged visual information is encoded in and retrieved from long-term memory more efficiently than emotion-neutral information (Hamann, 2001). And the higher the arousal level of a scene, the higher the rate of accumulation of information in short term memory (Maljkovic and Martini 2005). Maljkovic and Martini (2005) also found that the evaluative meaning of a scene had a differential effect on the rate of encoding of information in short term memory.

Information from positive and neutral scenes accumulates in memory at a constant rate, whereas information from negative scenes is encoded slowly at first, then increasingly faster. Presumably, negatively appraised scenes arouse a stronger response because they may have more impact on the person's survival or other goals. This may be part of the subjective experience of being "overwhelmed" by strong negative imagery.

Imagery alone is likely to be evocative but not directive. In other words, an emotionally potent image arouses emotion but it does not communicate what to do. Both aspects actually depend on the viewer's beliefs, interpretations, and existing values. So if the image arouses feelings that affirm values, the person will feel positive emotions, but if it threatens their values, the emotions will be negative. What the viewer *does* in response to the image will depend on the viewer's secondary appraisals, which will take into account his or her context and other priorities. The point is again that images alone communicate a full message only depending on the viewer's completion of the message--an uncertain outcome.

C) Emotions and imagery: self- and other- centered emotions, positive and negative

For the purpose of thinking about emotions and imagery for conservation it is probably important to consider the different ways that different emotions may be relevant. We might first consider strongly self-focused emotions, versus other-focused emotions. Within either of these groupings we might further consider positive versus negative appraisals.

Self-focused emotions relevant to nature, on the positively evaluated side, might include a sense of welfare derived from recognition of our economic or ecological dependence on nature, or a sense of thrill in participating in an activity that occurs in nature, or where nature affords a challenge. A number of positive emotions to nature may be hard-to-articulate because we may lack a language for them, or because they are not culturally marked and shared. One role of psychology (as well as of the humanities) is to help detect and describe these emotions. One example we identified in a study of emotional reactions to zoo animals was a feeling we lacked a name for, so we called it "sense of special privilege." Many people reported they felt this when viewing the animals (Myers, Saunders and Birjulin, 2004).

In other cases, there are positive affective reactions to natural settings that occur without our being aware precisely why we have the reaction. One example is how nature relaxes and restores us psychologically and physiologically. Viewing a fish aquarium can lower stress before doctor or dentist appointments (Katcher et al., 1983), and natural views from a hospital room increase recovery success and lower stress (Ulrich, 1984, 1993; Ulrich & Lunden, 1990; Heerwagen, 1990). Stephen and Rachel Kaplan (1989; Kaplan 1995) have described how sustained "voluntary" or directed attention leads to fatigue and the inability to concentrate. Natural settings and scenes help restore the capacity for directed attention by providing a sense of being away, of feeling one is in an extensive area, of having one's attention *involuntarily* directed to non-threatening objects, and by a match or compatibility between the person's goals and the setting. Landscapes that have good levels of "coherence" and "complexity" (as opposed to being too simple or too confusing)

are engaging and invite exploration and provide this restorative experience (Kaplan & Kaplan, 1989). There is some evidence that these reactions may be broadly shared, but probably not universal because there may be significant learned components. For those who have learned the association between nature and this restorative response, however, it is plausible that viewing photos of nature, particularly when under the person's control and when there is a substantial variety and extent of images to peruse, may evoke similar feelings and psychological benefits. Especially in an attention-fatigued society, the restorative effect may account for a large part of the enjoyment people derive from viewing nature imagery. This use of nature imagery would be supported by Zillmann's (1988) mood management model which "predicts that people choose media that are likely to affect their mood positively" (MacBeth, 2004, p. 207).

On the self-focused negative emotional side, threats associated with nature include not only natural objects perceived as disgusting, fearful, or threatening (thunderstorms, carnivores or other "biophobic" objects (Öhman 1986; Ulrich, 1993)), but also threats to our survival that stem from our own actions, as in imagery of devastation where the human consequences are highlighted. I will have more to say about fear, below.

Other-focused positive conservation emotions include what have been termed "biophilic" emotions, or feelings guided by biocentric values that acknowledge the welfare or rights of a natural entity for its own sake rather than as it serves human ends. These emotions include love, respect, concern, and attraction. The basic emotion here is care, a prerequisite to other-oriented action.

In the study of people's emotional responses to three different animals in a zoo environment, colleagues and I discovered two psychologically distinct kinds of biophilic emotions. "Highly selective" emotions included "sense of connection," "love," and "amusement." Subjects in the study reported these feelings at significantly different levels in response to the three animals: gorillas (highest), okapi (middle), and snake (lowest). A large number of other variables produced differences in these emotions too, suggesting they are endowed by most people only when many conditions are fulfilled. For the luck few animals, in the right circumstances, this is great, because these emotions correlate highly with concern and wanting to preserve the species. For the un-loveables, of course, it is bad (but not surprising) news. On the other hand, we also identified what we called "equal opportunity" emotions: wonder and respect. Happily these were also correlated with wanting to save the animal, and were experienced with much less selectivity. They suggest an excellent route for preservation of the "biophilically challenged" (Myers, Saunders and Birjulin, 2004).

Other-oriented negative emotions include sympathy, fear for the other's welfare when it is threatened, and indignation, anger, or sorrow when harm occurs—or regret, shame or guilt if one has been an agent of harm and appraises it negatively. Actually, shame and guilt are better regarded as a self-focused emotions, and therein lies their potentially problematic nature in conservation messages. Guilt makes us concerned about ourselves rather than the situation; it doesn't instruct us on what *to* do, only what was wrong, it provides no clear remedy, and indeed the self-inflicted inner pain of guilt can be taken to "compensate" for the wrong rather than encouraging action or change.

Intermediate between self- and other-focused emotions are several important subtleties of the emotions. These include relational emotions, aesthetic emotions, and socially-mediated relations to nature. Philosopher Nel Noddings has explained three aspects of the caring relationship: the person is open to the other's needs, truly puts the other's needs first, and senses acknowledgement by the recipient, in terms of its gratitude or flourishing (Noddings, 1984). That is, the most psychologically compelling care is really a relational emotion. Thus messages that evoke the responsiveness of nature to human caring may have special emotional power for those disposed to care for nature.

Aesthetic experience is both self- and other-focused. Aesthetic enjoyment is gratifying and self-oriented. Some of what is discussed as biophilia (Kellert & Wilson, 1993) are positive emotions that may have survival value, such as attraction to water features and savannah-like landscapes providing views and refuges. Traditional beauty values include color, pattern, form, harmony, radiance and so forth, but how does this transfer to valuing the thing that displays them? Aristotle referred to the "beauty of interest," and Kant characterized the aesthetic encounter as a kind of "disinterested interest" (Arler, 2006). The idea here is that one may approach the art object without a preconceived idea of what one wants from it, and an interest arises as a consequence of the encounter. The sublime, discussed in a later section, is clearly a form of aesthetic experience associated with nature in our culture. Kiestler (2005) has argued for a notion of diversity as sublime, as defined by Kant.

Aesthetic enjoyment has a particularly dependent relationship to the qualities of the object appreciated. If the object is not well-treated, the enjoyment is threatened. Some philosophers have analogized from our system of values and institutions surrounding works of art as a conceptual model for species preservation (e.g., Russow, 1981). Studies of the importance of the aesthetic appeal of a species in determining public support for protecting it have provided mixed results. Analyzing 1980 data on Americans, Kellert (1996) found that aesthetics was important in predicting protection, but size, phylogenetic closeness to humans, and capacity for feelings, thought and pain were more important. Czech et al (1998) similarly found that ecological importance and rarity were the two most important factors in which species received protection, while attractiveness and body size were the two least. Nonetheless, aesthetics may still be important, just not relative to other, especially utilitarian, factors; psychological instruments for studying this topic are also under-developed.

Biophilia may be experienced as other-oriented, and psychological studies suggest aesthetic values may in fact be a developmental bridge from human-centered to biocentric caring (Kahn, 1999). But the contrary is also possible: that the aesthetic object will only be valued for the gratification it provides. In that case the person still might, or might not, take action to preserve the object. Additional more other-centered emotions may need to be evoked in order for aesthetic appreciation to blossom into other-oriented caring and concern.

Nature may be emotionally relevant as a part of a social transaction involving it. Since emotions are so strongly related to human social psychology, it would not be surprising if

a majority of emotion related to nature has social origins. For example, if one gains social approval for an activity in nature (including, for some groups at some times and places, the exploitation of nature), this can lead to a positive emotion. Or, the motivations for tending one's residential landscaping may include managing others' perceptions of one's social status and identity as much as connecting with plants. The emotions *expressed* in relation to any event say something about the relationship between the people present as much as they do about the person's response to the event itself. Elation at the summit may be as much about camaraderie as about aesthetic rapture. These examples highlight how the positive or negative emotional meaning of nature is a socially-mediated, interpreted, psychological phenomenon. This is not to diminish the increasing evidence from psychology about positive and intrinsic human relations to nature, but just to recognize the social nature of much emotional life.

Note that the self- and other-focused emotional patterns above have been discussed in terms of responses engendered by the natural object or scene. A given scene might consistently provoke one or the other kind of emotion across most people. But research has shown that people vary in their propensity to think in an egocentric versus an other-centered fashion. Psychological research has found consistent individual differences in people's values: some show egocentric (focused on self-interest), others humanistic (focused on other humans), and others biocentric (focus on nature) values (Stern & Dietz 1994; Schultz 2001). Thus, embrace of biocentric values may be an example of an affective trait; whether susceptibility to similar reactions to nature imagery is an individual variable also has not been the focus of research so far.

D) Psychology of threatening or disturbing imagery

Environmental communications have often employed shocking, fear-provoking or other disturbing imagery in an attempt to spark concern. In discussing this, I will discuss the psychology of arousal; threat-appraisal and coping responses, and look at the conditions for--and forces acting against a desired empathic response and action based on it.

1) Arousal and "shock value"

Arousal refers to the person's physiological and cognitive levels of activation (recall the "mobilization" function of emotion). Arousal is related to learning: at very low or high levels, learning or adaptive response is limited. At medium levels, attention, comprehension and memory are enhanced (Berlyne, 1960). The idea behind communicative strategies that rely on "shock value" is presumably not just to arouse people gratuitously, but that the viewer will be motivated to notice, learn or even act as a response. In thinking about this it is helpful to distinguish between emotional arousal (also called autonomic, and arising from the limbic system in the brain), and cortical arousal (Routtenberg, 1968; 1971). Cortical arousal draws on the brain's neocortex and involves selective attention or alertness to expected events, recall of relevant information, and preparation for response - in a word, thoughtful arousal. Conservation challenges, psychologically, usually involve cortical arousal: to become alert to them requires thinking about events and conditions that are remote, not intuitively threatening, and so forth. Education strategies that rely on generating cortical arousal should have a good chance of being able to generate adaptive responses, although chronic cortical arousal

may have stressful effects. (This latter condition may typify dedicated conservationists who are continually reminded of threats, but do not believe they have been handled (Pantesco, Harris & Fraser, 2006). Some conservation communicators eschew the educational route and (perhaps unconsciously motivated out of their own chronic distress-- Pantesco, Harris & Fraser, 2006) attempt to arouse others via the autonomic arousal route, inducing highly charged emotional reactions. The potentially negative consequences of emotion-focused coping are discussed below.)

2) *Threatening imagery*

The use of vivid imagery of environmental damage to make risks more apparent was advocated by Hardin (1969). In this case, the threat is to the self. This strategy has been used widely for a number of other behaviors such as drinking and driving, delinquency, and health behaviors, and is well-studied. In general the studies have found such imagery to be ineffective. These strategies are often ineffective because they focus only on the severity of the negative consequence of the behavior. While such consequences can produce fear, people need to believe that there is a high probability of the negative consequences actually occurring before they act preventatively (Gardner and Stern, 2002). Thus credible information on the high probability of the negative consequence needs to be verified and communicated.

Threatening imagery can be understood in the broader perspective of protection-motivation theory, which extends the work of Lazarus to include emotion, stress and coping (Lazarus, 1966; Rippetoe and Rogers, 1987). According to this theory, when a threat is perceived the first step is “threat appraisal”: Are valued goals threatened by a high severity and high probability event? Depending on the answer, the threat is appraised as high or low. Next, the person appraises their own ability to respond (“perceived response efficacy”) and the costs and benefits of doing so. This “coping appraisal” results in either a high or low sense that one can cope with the threat.

The combined results of these two appraisal steps results in a choice of coping strategy. If the threat is low, the person is unlikely to produce a coping response regardless of high or low resources for coping. If the person perceives both high threat and high coping, they will approach the situation in a problem-solving fashion, assessing and deploying resources to deal with the threat, making changes, and acting as needed. If, however, the person perceives high threat and believes they have low coping ability, they will use emotion-focused coping. In emotion focused coping, the person tries to lessen or tolerate fear, anxiety, and helplessness by emotional means such as avoidance, denial, wishful thinking, religious faith, fatalism, and normalization / desensitization (believing the situation is normal and tolerating fear). These emotions are self-protective and self-focused. Fear and personal distress prohibit empathy (Eisenberg et al., 1994). Emotional coping strategies may also be adopted by large numbers of people, who then may reinforce them. They generally work against individual or collective problem solving.

The implications for conservation imagery that attempts to convey a threat to the viewer's self-interest are that the *probability* of damage or harm should be communicated, as well as the severity. Additionally, the message should address self-efficacy by emphasizing what can be done, and the effort required, and the likelihood of success. If realistic self-

efficacy on the part of the audience is likely to be low, rather than communicating the threat, it would be better to first intervene with the community or audience in a way that increases coping and problem-solving resources. Only when preconditions for adaptive response are present, and when specific threats are anticipated by the audience, are emotionally shocking or threatening messages likely to be effective. An analogy of a successful simple system might be the use of fire drills associated with fire alarms. Systematic, targeted campaigns by cognitively prepared and devoted writers, with feedback of results, such as that employed by Amnesty International, might be a more sophisticated example. Both examples prepare the responders to respond, develop skill in responding via practice, and deliver feedback on the success of the effort.

3) *Disturbing imagery*

Images that depict emotionally disturbing harm to another person, animal or environment appear to have been potent tools in conservation communication. In this case, the threat is not to the self or is only indirectly to the self. Rather there has already been damage to someone or something else. The communicator's intention might be that the viewer will generalize from the harm to another and perceive a potential threat to his or her own self-interest; in this case these images are instances of the threat psychology discussed above. My focus here, however, is on the psychology of viewing harm to another, with the intent of evoking anger, sympathy, and action on behalf of the other.

This communicative intent is more complex than it appears. The intent most likely includes eliciting more than a spontaneous "gut level" response to the image; it entails a particular moral narrative structure, which viewer and communicator co-construct (narrative is discussed at greater length below). I will consider a couple of layers here: the "gut level," and the more specific aim of sympathy, anger and action.

If one restricts analysis to just the "gut level" response, there is a high probability that images of bloody, dead, damaged or disfigured faces or bodies (of animals or people), overtly violent acts against sentient beings, dramatic disorder, and other such stimuli will be disturbing and will provoke autonomic arousal. Such images are highly salient, are taken into memory at a fast rate, arouse us physiologically, and leave strong memory traces: they may be impossible to forget. Among the immediate emotional reactions may be revulsion and disgust. These are not pleasant emotions, and most people do not want to experience them for long. They evoke self-oriented protective responses, such as turning away, shutting eyes, avoiding the scene. There is probably significant individual variation in whether this kind of response occurs.

It is not unlikely that viewing highly disturbing images may generate at least mild symptoms characteristic of post-traumatic stress disorder (PTSD). Reactions to traumatic events include recurrent visions of the scene, anxiety, nightmares, sleep disorders, and emotional numbness (see http://www.ncptsd.va.gov/topics/cog-emo_procsing.html). From studying real-life trauma victims, psychologists recognize a variety of ways in which people can become habituated to such events and their reactions become attenuated. For such people, more exposure to the imagery may enhance these defense mechanisms, creating less adaptive responses.

To the extent that images simulate contact with a real victim (or site) of violence, it is worth considering that they may evoke "second-hand" or vicarious post-traumatic distress reactions such as those suffered by personnel who witness real victims (human or animal) of violence, or who provide medical or counseling services to them. Such professionals must defend against overwhelming reactions on their own part. Speaking in the context of trauma therapists (a possible but extreme analogy to our case here), Herman (1992) noted "The therapist, like the patient, may defend against overwhelming feelings by withdrawal or by impulsive, intrusive action. The most common forms of action are rescue attempts, boundary violations, or attempts to control the patient. The most common constrictive responses are doubting or denial of the patient's reality, dissociation or numbing, minimization or avoidance of the traumatic material, professional distancing, or frank abandonment of the patient" (quoted in Ruzek 2006). Such reactions may not seem plausible in a person simply viewing photographs (unless the images re-stimulate a prior PTSD reaction), but mild reactions like avoidance may be very likely.

Short of traumatic reactions, there is also the danger that such imagery may further social desensitization. According to one school of thought about morality, moral emotions are central in moral functioning. But moral emotions also respond to social norms. The belief this is true underlies some people's anxiety, for example, that over-exposure to guns and violence in the media may decrease moral inhibitions against real-life violence, as well as decrease moral sensitivity to victims of real violence. Correspondingly there may be an increase in the "virtue" of emotional "toughness," fatalism, habituation to and normalization of violence and other defensive responses to the violence (see Kagan 1984).

4) *Empathy and the scope of justice*

Obviously, these are not the kind of reactions photographers intend viewers to have to such imagery, but communication is not at all immune to unintended negative consequences! What *is* probably intended is an other-focused emotion which Hoffman (1985; 1994) calls empathic distress or awareness of another's distress, and, in consequence, a helping response. Hoffman's research shows that these empathic distress and helping do correlate. Empathic distress diminishes in intensity when one helps, but continues at a high level when one does not help (Hoffman, 2000).

Empathic distress, as well as concern and moral outrage, are emotional responses to actions people perceive as unfair or harmful. But this perception is not simply a visual experience; it is a cognitive-emotional-moral narrative construction. The preconditions of this response include that:

- one believe the victim actually suffered and the instance was either severe or pervasive and not isolated
- one believe the victim is innocent and in other ways not deserving of the treatment received
- the action was intentional or signified a lapse of obligatory care
- there is some identifiable agent (whether an individual, group or institution) that is blameworthy
- the agent is deemed capable of moral judgment (is not insane or incompetent), even though they may be morally corrupted or perverted

- the victim has moral standing, or belongs to a group the person considers within the "scope of justice"

Thus for conservation messages to have the intended effect of evoking anger, sympathy, and action, these preconditions must be established. Either they may already be present in the minds and hearts of the viewers, in which case the message is simply activating a set of values already in existence (see Schwartz on "norm activation," 1977), or the communicator must establish them. Depending on the audience, and the kinds of contacts and messages possible with them, this may be more or less difficult. Can credible claims be made that the conditions above are satisfied? Can the viewers' difficult emotions be recognized and validated? Can contrary constructions of the issue be countered? Can moral redress be shown to be available, possible, and verifiable, so as to encourage its pursuit? Are action steps available? Will the audience experience positive emotions associated with making a difference? The task here is one of moral persuasion, an important art, and one in which imagery can play a role, but a carefully deliberated one. Even "hard hitting" images need to be analyzed for their nuanced meaning in the context of the moral narrative that is constructed.

Not infrequently in human history--and present--wrongs are committed because the above conditions are blocked or absent. Social psychologist Albert Bandura (1990, 1999) examined this in his theory of moral disengagement. Bandura suggested that several mechanisms may be at work when inhumanities are perpetrated. These mechanisms include: 1) mentally re-construing the actions as good by moral justification, drawing advantageous comparisons, and euphemistic labeling of harmful conduct; 2) minimizing, displacing, or denying personal responsibility; 3) disregarding or distorting harmful consequences; 4) marginalizing the victims by blaming or dehumanizing them. Agnew (1998) theorized that these processes are at work in the abuse of animals, and Vollum and colleagues (2004) provided evidence from criminal animal abusers supporting this.

In a line of research focusing on Bandura's fourth mechanism, Opatow (1990; Opatow and Weiss, 2000) has studied the dynamics of "moral exclusion," and has shown that nature is often morally excluded from people's scope of justice. In other words, she has psychologically measured people's levels of what philosophers have conceptualized in terms of moral considerability. Exclusion or non-considerability means that "those who are morally excluded are perceived as nonentities, expendable, or undeserving. Consequently, harming or exploiting them appears to be appropriate, acceptable, or just" (Opatow 1990, p. 1). When nature is excluded, one of the primary preconditions for empathic distress-driven response is undercut. Unfortunately, many cultures do not effectively encourage the inclusion of nature in the moral community. Such inclusion has been gradually evolving through moral struggle over the past two centuries in the west (Nash, 1989). Not surprisingly, "viewing natural elements -- species, habitats or commons -- as having standing in our moral community not only challenges core moral beliefs, but it also challenges individual and group identities" (Clayton and Opatow 2003, p. 299). Thus, not only may nature be excluded, but "environmentalist" or "rancher" may also become (mutually) morally excluded social identities, as evidenced in the "resource wars" of the contemporary western U.S. and elsewhere. If the "environmentalist" is in the position of being the messenger in such a case, the message will almost certainly be discredited too.

Some animals are more likely to be included in the scope of justice than others. One important psychological explanation for exclusion or inclusion is the "similarity principle," which holds that people tend to give more consideration to others who are perceived as similar to them (Plous 1993). For example, gorillas are perceived as very similar to humans and are attributed complex thoughts (Eddy, Gallup and Povinelli 1993), by both Americans and Japanese university students (Nakajima, Arimitsu and Lattal 2002), whereas further from human-like animals are attributed less and less mentality and feeling. In a study looking at several factors that influenced high schoolers' inclusion of a Bombardier beetle (*Brachinus*) in the scope of justice, Opatow (1994) found that attributing the beetle high (versus low) intelligence predicted *exclusion* rather than inclusion. Subjects who were led to perceive the beetle as more complex (another aspect of similarity) included the beetle in the scope of justice, but did not also believe it should be protected. On the other hand, subjects who saw the beetle as more in greater *need* of a land area than were humans did include it in their scope of justice. Finally, when the beetle was presented as offering high *utility* to humans, the high schoolers tended to feel it should be protected, but included it in the scope of justice at a lower rate. This research suggests that when people perceive another entity as similar to themselves, and/or in greater relative need (even when in competition with humans), they extend the moral consideration to it. And the entity's usefulness gives a strong motivation to protect it, though not for its own sake. The implications for visually and narratively presenting other species should be clear.

While on the topic of the "charismatically challenged," there are some data available to suggest the degree of support and interest from the American public for stories about such creatures (this was a question from the conservation photographers). The 2002 *Americans and Biodiversity* study (Biodiversity Project, and Belden Russonello & Stewart, 2002) compared results from 1996 and 2002 to search for trends. Here are the results for two key questions. Respondents were asked how strongly they agreed or disagreed with these statements:

"It is not worth the cost in jobs to save endangered species like spotted owls and snail darters."

	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
1996	17	25	27	26
2002	12	20	28	35

"The world would not suffer if some species, like poison ivy and mosquitoes, were eliminated."

	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
1996	29	20	23	23
2002	22	16	26	30

Note that majorities were on the "disagree" side of the fence (favoring biodiversity) in most cases, and that the proportions had increased over the 6 years covered by the data,

even for the undesirable organisms in the second question. These responses are probably underlain as much by anthropocentric concerns as biocentric ones, plus a fair level of ecological literacy. At least they suggest that a majority of the public may be quite open to information that strengthens or builds on the ecological and intrinsic value of less-known and less-charismatic species. For a substantial portion of the rest, however, these organisms are clearly excluded from consideration. But there are encouraging indications for a developmental potential during childhood to see even a fear-producing animal such as a bat as morally deserving (Kahn et al., under review).

E) Need for understanding audience reactions

Since the communication of threats and disturbing images is vulnerable to psychological pitfalls, and since emotion is a powerful component of much conservation imagery, preliminary audience research is essential. Emotion plays a huge role in advertising (Agres, Dubitsky and Edell, 1990), and advertisers of course do extensive research to be sure the image will resonate as intended with the target audience. They also screen for potential backfires and unintended consequences. At a minimum, focus groups should be used to identify powerfully positives, to gauge audience responses, to plumb the potential negatives and reduce emotion-focused coping, and to create an effective moral framing and voice for the message. Further considerations concerning the beliefs or cognitions of viewers will be discussed below.

F) Motivating action

Finally, the culmination of this section on emotional aspects of imagery addresses the desire of communicators to move their audiences beyond emotional reactions to action. Even more so than in the preceding discussion, this clearly calls on far more elements of the communication than imagery, and on many other actions of the person than viewing. This will become more apparent in the next major section as well.

Imagery does play a central role in emotion and motivation because it can make an idea or conflict more concrete. Many ideas in conservation pertain to little-known, remote or abstract entities, and without visual imagery or direct experience, descriptions of these will lack "reality" to all but those closely involved. Such reality is a precondition for mass mobilization.

But an image alone will not motivate action unless other preconditions besides concreteness are met. The message must enlist interest through connection to emotions and values on the part of the audience (Lippmann, 1922). Thus the task is to understand one's audiences' values and appeal to them, or else to figure out how moral suasion may be used to broaden those values. There are, of course, many actions a conservationist might desire to motivate in others, ranging from adopting low-impact and/ or seemingly "easy" behaviors by individuals, to complex, extended and potentially high impact actions of decision makers, or wider collective groups.

A workable minimal set of criteria for an effective message is offered by the Biodiversity Project. They point out that a message is not just a slogan or image, but a "paragraph" that communicates in these ways (Biodiversity Project 2002):

- The audience's known values are appealed to--not changed, but put in practical context
- The threat and responsible party are described
- A solution is provided
- An action to take is described

Persuasion theory (Cialdini, 1985; 2001), and social marketing (McKenzie-Mohr, 1999; <http://www.cbsm.com>) provide more extensive concepts and tools for designing highly targeted behavior change campaigns. In accordance with the finding that Americans express strong environmental values and broadly support environmental policies (Dietz et al., 1989; Kempton et al., 1995; Gardner & Stern, 2002), but fail to act on them because of obstacles, these approaches require the communicator to determine an audience's perception of possible obstacles such as unfavorable social norms (i.e., "but everyone is doing it [the undesirable action]"); lack of services or infrastructure; disincentives, lack of incentives, or inappropriately high incentives; high costs; lack of information on alternatives, distrust of information sources, and other factors. (Note ecological knowledge is not necessarily a critical factor in such behavior-change campaigns.) When values are a limiting factor, one can try to change them, but it is probably more immediately effective to understand and couch one's message within the value frameworks of a culture, as Schultz and Zelezny (2003) demonstrate for the case of United States culture (which is individualistic, but not exclusively so).

Other action-approaches emphasize the role of informed and concerned citizenship for the common good. These approaches look at action as requiring knowledge of the issue (other actors values, interests, and positions); motivation in the form of self- or other-oriented values (such as a feeling of connection to nature); knowledge of ecological processes; a strong sense of self-efficacy or feeling one can make a difference; and knowledge and skill in personal and/or political action strategies. This approach depends much more on a democratic process of issue definition, prioritization and problem solving than the more top-down approaches of social marketing. While this seems like an indispensable long-term route, Americans have a mixed record when the relevant attitudes are measured. In 2002, 61% of Americans thought of themselves as sympathetic toward environmental concerns, but 20% were neutral, 5% unsympathetic, and only 12% called themselves active environmentalists, similar to other survey findings (Biodiversity Project, and Belden Russonello & Stewart, 2002). Change on this level will probably proceed only through many agents of social change, including the most face-to-face such as schools and political organizing, as well as mediated routes. (See <Monroe, 2003>, for an overview of these strategies.) Again, conservation photographers can leverage their impact, by partnering with political advocacy groups.

In reality, every attempt at change by motivating participation and action depends on social mobilization work. There is little doubt that imagery can play a role, but as noted earlier in the examples provided by Backhaus (2006), the history of Greenpeace and many other historical examples, the best role for imagery depends on the political and

communicative context, and will not be apparent without one becoming fully immersed in the issue and conducting careful and critical analyses of the overall goals and context, with other actors' help.

V) USE OF PHOTOGRAPHS TO CONVEY INFORMATION OR CREATE MEANING

Recommendation 4

A viewer's interpretation of the meaning of an image, including whether it is received as bearing factual information, is mediated by the person's network of mental representations about the contents of the image. Conservation photography images have the potential to influence people's ideas about nature and our relationship to it, but such ideas vary in how easily they are to change: ideas acquired early in life, those associated with "protected values" (moral values people are unwilling to trade off); over-arching frameworks; and publicly-espoused views may be hard to change, whereas ideas are more likely to be adopted if they are consonant with other beliefs, if they are received in a new environment, and if peers, trusted figures, or charismatic leaders espouse it. Visual information is integrated with verbal information in the brain, but the visual coding system is distinct and differently structured than verbal language. Some useful concepts for understanding how images attain power are: distillation, impact, endurance, conviction, and concretization. Together they suggest that images are most powerful when they serve as metaphors for highly important values or ideas in the audience. There seems to be no simple or universal visual semiotics, but rather images are interpreted within both the nonverbal and verbal networks of meanings which cultures and individuals possess. These beliefs also include beliefs about images, and these may dramatically influence the ways people respond to photographic or other images. The use of photographs as evidence of reality for example, includes a number of critical beliefs about photographs. When images are used in a campaign, audience beliefs, as well as the ways that specific text and image work together, need to be carefully researched. Conservation photographers should be cognizant of the debates and emerging new meanings about the human relationship to nature, a discussion which they may influence. Imagery may play a critical role in re-defining the conservationist image of nature as one that positively includes people. Finally, messages should consider the narrative nature of much human thought. Features of narrative that make it compelling are that it includes existential and moral themes, plot with tensions (and perhaps resolution), characters, and emotional hue. Characters are of greatest importance because they serve as recognizable targets for deeper identification by the viewer with the issues at stake. Narrative may provide the richest contextualization of meanings in which photographs may achieve more determinate and effective communicative ends. Pictures, with their evocative potential, and story with its directive import, together make a powerful combination.

Returning again to Roberts's (2005) study of the use of photographs by conservation organizations, we can identify several of their goals that pertain to how photographs can provide information or meaning -- in psychological terms, to cognitive goals.

- Increase awareness; Get attention
- Document projects; Give evidence; Establish baseline; Present best briefing papers
- Tell a story; Personalize an issue
- Show people as part of solution

The photographers at the 8th WWC also wanted to know things like how to use influential stories as vehicles for increasing interest and concern about lesser-charismatic species or places. Implicit in this collection of "cognitive" concerns are a wide array of factors. Not all can be discussed here, but some important perspectives will be shared.

We have already encountered the cognitive dimension in every major section above. To summarize some main points: Psychological research has made it clear that the visual system itself is mediated from the top-down in ways we didn't expect 20 years ago: it represents visual information in terms of its meaningfulness to us. New, unfamiliar visual information requires attention to process for meaning, whereas familiar and meaningful visual stimuli are processed almost instantaneously. In terms of emotion, the "appraisal" process, even if seemingly automatic, includes a cognitive assessment of the relevance of an event or scene for our central concerns, whatever those are, or however they arose (including through evolutionary pathways as well as life experience and habits). We have also stressed that the person's social context will have large influences on his or her interpretation--a cognitive act--of imagery and messages.

A central concept of cognitive psychology is that of mental representation. A variety of kind of representations exist in the mind, including concepts, theories (networks of concepts), stories, and cognitive skills (procedures). And of course the content (subject matter) of these representations encompasses everything in the individual's experience, including concepts about the self, significant others, other people as groups and in general, society, topics learned formally or informally, language, images, media, the universe, what just happened 5 minutes ago, and so on. Peoples' representations about any given part of their experience may be more or less extensive, complete, accurate, refined, and inter-connected (providing a sense of "comprehensiveness" such as characterizes religions or ideologies). Moreover, people hold concepts *about* their concepts (meta-cognition). Representational systems are often hierarchically organized; an important implication is that the higher-level "framing" of a message often trumps lower-level information such as facts. Although the role of metaphors and framing in messages is as old as Aristotle's Rhetoric and has received much attention in cognitive psychology, its role in political messages has been highlighted recently. The reader is well advised to refer to Lakoff (2004), and the Frameworks Institute (<http://www.frameworksinstitute.org/>) for useful thought-pieces and applications. To this of course needs to be added broad linguistic and cultural belief systems that may affect all of the above pervasively. Obviously, the field of cognitive psychology is vast, encompassing many topics such as the nature of representation, attention, memory, comprehension, mental categories, the nature of thought or information processing, development, cognitive style, cultural psychology, conceptual change, and on and on. In understanding a conservation message, all of these facets may be engaged.

People's concepts (here also called beliefs) are a chief concern in conservation because they are the pre-existing meanings with which conservation messages interact. One form of interaction is when a message is in harmony and reinforces a belief (or gains strength because it is in agreement), whereas another form is when (in the present society) a belief is inappropriate, or even hindering toward a conservation effort. While some authors have argued that a thorough-going change in our society's conceptual system or worldview is necessary, others have pointed out that worldview (at least as represented by religious beliefs) is a weak force in environmental (or other) behavior, and that several other determinants of behavior need to be addressed (Gardner & Stern, 2002). Many examples exist of changing specific behaviors when the obstacles to change were accurately identified and addressed (see case studies at <http://www.cbsm.com>).

The debate just alluded to suggests it is useful to distinguish beliefs according to how difficult they are to change. A society-wide worldview shift would no doubt be very difficult to accomplish quickly, except under extraordinary circumstances. Cognitive change is relatively easy during child development, and successively more complex concepts are acquired. For this reason, education is clearly an important arena for conservation. An interesting facet of cognitive development that has emerged in the last 20 years, however, is that in several domains of experience (such as physical phenomenon (the movement of objects), biologically "natural" kinds (categories of creature), and the minds of other people, children by the age of about 5 years have reliably created a set of "naïve" concepts, based on experience and probably also on some innate dispositions of the mind. These concepts prove robust, durable--and strikingly incomplete and even inaccurate. These early-forming representations resist change, and are often retained into adulthood. The mind is in some respects highly conservative. Only formal schooling that challenges such specific naïve beliefs and helps the learner construct new more adequate understandings generates lasting change for such concepts (Gardner, 1999).

Besides these developmentally robust concepts, other factors may determine the difficulty of changing a belief. Beliefs that are hard to change include those associated with "protected values" which people are reluctant to trade-off, such as absolute moral values (Tanner & Medin, 2004), or with over-arching religious or worldview frames, or those that an individual has publicly declared, or which are central to one's identity. Individual differences play a role too: those with rigid temperament are less likely to revise their ideas. On the other hand, beliefs are easier to change when the person is in a new environment; when he or she is surrounded by peers of a different persuasion; when a person undergoes a shattering experience; when information comes from a trusted source; when the belief is consonant with and not threatening to the person's sense of identity; or when the person encounters a luminous personality bearing a relevant message. Changes in ideas, particularly comprehensive ones, may not be lasting. Sometimes sweeping changes may be experienced and proclaimed by someone, only to later be abandoned out of disappointment when the rest of the world doesn't change (Gardner, 2004, pp. 61-62).

Gardner (2004) proposes that artists change other's minds by introducing new ideas. It is less meaningful to speak of them introducing theories, and they seldom have great

resources with which to influence others. But they do alter minds, via ideas, in three ways: 1) by "expanding our notion of what is possible in an artistic medium" (think of the modernist movements in many areas of art); 2) "artists change minds by employing themes that rarely if ever had been the subject of art" (as in Cunningham's abstracted play with bodily forms); and 3) "artists help us to understand, and indeed help us to define, the spirit of an era" (Gardner, 2004, pp. 122-123). While Gardner's discussion of artists' influence is largely confined to how they influence their own domain, it should be noted that some artists do interact with the events of the world around them. In light of discussion below about the changing symbolic meanings of the human relationship to nature, it can be hoped that conservation photographers may play a role in helping define the emerging spirit of our era.

A) Visual and verbal symbolic systems

Visual artists probably know intuitively (and from training) that visual information and imagery are mentally processed differently than verbally-coded information. Indeed, according to *dual symbolic coding theory* (Paivio, 1989; 1991), the brain includes distinct verbal and non-verbal symbolic and associative systems. These systems are independent, but partially interconnected. This has been well established by studies of how different brain areas specialize in one or the other. Specifically, the left hemisphere of the brain is dominant in processing speech, in episodic memory (memory of events and stories), in comprehension, and specializes in processing digital signals--that is, numbers and words. The right hemisphere (posterior portions especially) specializes in face recognition, spatial pattern or scene recognition, navigation, noticing fine details, nonverbal sounds, and analog or holistic signals or symbols (some of these capacities also reside in the left hemisphere). The distinctions above hold true across sensory-motor modalities; thus there is a brain basis for the theory that visual information is processed by a non-verbal symbolic system. As discussed earlier, the verbal and non-verbal systems are not independent, but interact: people incorporate and make sense of both kinds of information at once, often depending on the task at hand, and the context.

Notwithstanding claims that there exists a "visual language," the visual symbolic system is not structured like verbal linguistic systems with their formal syntaxes and networks of denotative meanings. This is not at all to say that visual symbols lack meaning, but that visual symbols work within their own networks of associations and assumptions. Yet theoretical attempts in visual studies (not psychology), do not appear to have converged on a clear conception of visual semantics (a vocabulary of determinate meanings of images); rather the problem seems to be at an impasse, with at least half a dozen vying and incomplete attempts to systematically account for the meaningfulness of imagery (Elkins, 1998). This is not to say the field lacks stimulation; the debates give rise to some remarkable insights (and at times endless abstractions, or exaggerations-- take for example assertions such as: "Sight ... requires so little energy to function... that it permits our minds to receive and hold an infinite number of items of information in a fraction of a second," from Dondis, 1973, p. 2). The discourse in visual studies is so full of ideas with psychological implications that it may be some time before these ideas are tested with the methods of psychology; other ideas can already be dismissed (for a rich

anthology on visual culture, see Mirzoeff, 1998). For the present, I will take a basic approach to discussing symbolism and meaning of visual images.

Several cognitive qualities of images work together in the complex process of how meaning is conveyed (list and quotes from Green, 2000, pp. 20):

- **Distillation:** A successful image economically represents and "condense[s] an array of experience into a singular expressive [unit]." As an example, Green (2000) gives the "this is your brain on drugs" image of an egg being fried.
- **Impact:** The relations depicted visual may vividly convey a moral wrong, a striking scene of beauty, or a nuance of relationship with a force that verbal description would lack.
- **Endurance:** The effects of an image may be long-lasting, either because its coding in memory is accompanied by a large emotional component, or because of its repetition or predominance in media. Green (2000) uses Nick Ut's photograph of a fleeing nude Vietnamese child and other villagers as having defined the war in the consciousness of many who knew the war only second hand.
- **Conviction:** Simply put, seeing is believing for many, particularly for those who approach images uncritically. Thus a single image may outweigh any number of words.
- **Concretization:** Imagery makes the abstract visible, and thus concrete. Enlisting the brain's capacity to visualize is accomplished not only through imagery but also through metaphor, and other devices of language (Green, 2000).

Together, these abstract qualities describe the ways that images may be cognitively powerful.⁵ Concretely, these qualities are attained by the meanings viewers associate with the images' contents, as well as by formal properties of composition, medium, size, emotion-evoking hues, etc. They suggest that the most powerful images will not merely represent but serve as metaphoric distillations of potent notions and values closely held, though perhaps inarticulately, by the intended audience.

Taken alone, an image has a certain degree of cognitive indeterminacy. While it may seem like some images have a universal meaning, meaning actually depends on interactions of the image with the visual symbolic coding system, as well as with other meanings that are coded verbally. For example, it would seem that certain visual stimuli, such as bodily or facial nonverbal expressions in photographs have universal meanings (i.e., based on the work of Ekman & Friesen, 1969, on facial expression). However,

⁵ Sontag (1972) had some interesting comments that qualify the cognitive nature of photographs. Among her acute observations on photography, she noted that photographs bear a formal resemblance to poems. Both, she argued, share a "commitment to concreteness." Both also take an object out of the continuity of space, time, and the humanly constructed meanings in which it exists, inevitably *decontextualizing* it. This discontinuity is selective, as any poet or photographer knows: what specific aspect, angle, mood, etc. is to be emphasized in the editorial act of selection? What is left out, what included? Some abstract art notwithstanding, there is a further similar step in both arts. Sontag argued that the poet or photographer takes the decontextualized object and reconstructs a "compensatory unity" of it (Sontag 1972, p. 96). Both the selective decontextualization and the synthetic wholeness-creation are guided by the subjective aesthetic tastes of the artist. These tastes, as we noted above, are partly individual, and partly shaped by the person's embeddedness in their cultural and historical period.

Barnes and Sternberg's (1989) study showed that people are not universally able to decode manifest (surface level) nonverbal emotion cues from photographs. While some images may have universal meanings, this would be very difficult to determine empirically. Visual symbolic systems are partly shared within a culture and partly idiosyncratic. Either way, the necessity of interpreting them is demonstrated over and over in everyday life: the meaning of an image depends on what the viewer brings to it. Think of, for example, an image of hurricane devastation: knowing it is from Katrina adds a complex background that "changes" the meaning of the image. Or consider the intense controversy engendered by published caricatures of the Prophet Muhammad (Kimmelman, 2006).

The latter case highlights the differing assumptions about the status of images themselves, and how this cognitive factor affects the meaning of an image to a viewer. In the case of the Prophet Muhammad, as well as in some other meaning systems, it is blasphemous or immoral to represent certain objects visually or particularly in photographs. Likewise, members of modern societies may hold one or another folk myth about photographs. On the one hand, people may view photographs through a "symbolist folk myth" that holds the photograph by itself means nothing until interpreted, bearing no necessary relation to the events portrayed. On the other hand is the "realist folk myth" which treats the photo as a veridical copy of "reality." Versions of this belief may admit of a greater or lesser degree of influence on the photograph by the circumstances and relationships in which it was taken, and of distortion, editing, etc, but the core belief is that what is shown does or did exist, and that the photograph is more accurate than other forms of copy. Besides having been asserted by various commentators, the existence and prevalence of the "realist folk myth" has been supported by empirical research on people's beliefs and attitudes toward photos. But other studies have suggested that rather than a simple dichotomy between these two myths, instead people hold the "symbolic" myth towards photographs in general, but switch to the "realist" myth regarding an actual photographs. (See Cronin, 1998, for a discussion of the issues and findings.)

The "realist folk myth" is of particular relevance for evidentiary or documentary uses of photographs. Photographs can show what has not been known, seeming to release the viewer from being the "prisoner of their own experience." As part of the "realist" view, photographs are held to be more trustworthy than other more easily manipulated visual media. Even more so, this can be seen by contrast to a verbal claim, which children learn by age in their development of a theory of other minds can be deceptive. But verbal claims can be challenged and tested because they are explicit, and can elicit counter arguments, whereas images and emotional appeals can be doubted but do not assert so much as invoke (cf Gardner, 2004 p. 122). For visually sophisticated individuals (and in a culture of visual irony), however, the documentary status of photographs has long been in doubt. Abuses of photographic evidence have added to this. And the ability to unnoticeably digitally alter photographs probably increases skepticism of the literal truth of photographs. (Emerging computer programs that can detect even subtle manipulations of digital image files may spur a spy versus spy cycle.)

If communicators wish to counter the doubts surrounding still media as evidence, they will probably need to adopt, and make known their use of, strict protocols for the

handling of recording media and images (such as those of *The National Geographic*, as discussed at the 8thWWC symposium). Further, if they want to convince skeptics, the message will have to include redundancies, multiple sources of evidence, reporting of independent verification, and so forth. In other words, to successfully win an argument defining the case about some condition of reality, particularly a contentious one, a photograph has never been more help than a bald assertion, but it plays its role in a network of logical and methodologically tested claims. For example, Project Lighthawk does not only provide photos of excessive clear cut forests from the air, but it makes these available to groups that provide the verification of location, timber sale violations, unsustainable forest policy, and so on. Moreover, Lighthawk and partners --armed with a full file of the facts--take decision makers themselves up to have look. If documentation is the aim, first-hand experience is likely to be more cognitively compelling. (See Burke, 2001, for a scholarly discussion of image as historical evidence, including how, historically, such images were offered with text justifying and interpreting the scene..)

B) Nature in the visual symbolic code

The visual symbol system is strongly influenced by culture. Of most relevance for conservation photography are the symbolic meanings of natural objects and scenes in a given culture. There are large literatures on this for some societies, and virtually nothing for many others. A brief comment will be added here pertaining to Western societies and especially the U.S. by way of illustration of the issues. In the U.S. (and some other Western countries) a visual aesthetic of nature arose coincident with Romanticism and the preservation movements, as mentioned much earlier. This symbolic nature aesthetic is characterized by the notion of the *sublime*. Dunaway (2005) describes the sublime as "associated with the sacred, with the experience of stepping outside of historical time, [and] of fleeing the ordinary to find the extraordinary." Nature, especially dramatic landscapes, at the turn of the preceding century, was perceived by many as providing this particular kind of awe-inspiring and transcendent experience. A excellent web-based presentation by Gene Hargrove includes text and images that trace the historical development of this and related conceptions of nature ("Why we *think* nature is beautiful," <http://www.cep.unt.edu/show/>). This conception of aesthetic nature has had a pervasive influence on much nature photography (as well as wilderness policy, recreational pursuits, real estate values, and much else).

The 1990's and 2000's, however, have witnessed an emerging deeper probing and attempts to re-frame the human relationship to nature. In the visual domain, Dunaway (2005), for example, explores an "ecological sublime" exemplified by Elliot Porter, and an "intimate sublime" illustrated by the works of Charles Pratt, including his illustrations for the 1965 edition of Rachel Carson's *The Sense of Wonder*. A recent trend is to place decisively humans back into nature. This is a trend with high relevance for conservation because it promises to draw on anthropocentric pro-environmental values such as legacy values, experiential values, existence values, prudential values and social identity values more strongly than approaches emphasizing strictly the intrinsic values of nature. (See Norton, 2005, for a discussion). Placing humans back in nature can be seen as a response to one of the perceived deficits of "environmentalism," which was the result partly of environmental ideologies and partly as a result of the success of environmental backlash

movement's success in promoting the idea that environmentalism is anti-people. For conservation forces to effectively counteract this characterization probably requires a whole new imagery symbolically coding the benefits we derive from nature and our positive place in it.

That the American public does feel motivated to protect nature by intrinsic values is revealed in the responses to the Biodiversity Project's (Biodiversity Project and Belden Russonello & Stewart, 2002) survey. Respondents were asked, "which of these six reasons is the most important reason for you to care about protecting the environment?" Response categories and percentages are given below:

Responsibility to future generations: 39%

Nature is God's work: 23%

Protect balance of nature: 17%

Respect nature: 10%

Appreciation of beauty: 6%

Protect natural history 4%

Notably, the top category is anthropocentric, but it also acknowledges multiple values that are to be passed on.⁶ Religious conceptions rank second, and prudential values (protect the balance we depend upon) ranks third. Intrinsic values account for 14%, and aesthetic values only 6%. This would suggest that photographs of nature's beauty must be contextualized in a larger set of symbolic meanings for them to be persuasive to many people. It also might suggest that the ever-spiraling attempts to capture a yet-more-perfect or novel picture of a natural scene, object, or animal, may be beside the point.

Given the emerging trend in thought and imagery to relocate people in nature, it is worth considering the psychology of viewing pictures of people. Whereas purely natural scenes may be evocative, and require interpretation in terms of the symbolic meanings of nature, viewing images that show evidence of people, or people themselves, is psychologically more complex. This is because the viewer is provoked to interpret not just the scene, but the mental and intentional states of the people in the scene, as well as their relationship to nature and to the photographer and the self. Emerging work on empathy and "mirror neurons" suggest that processing of human emotional bodily expression may be automatic, but that empathic responses also depend highly on thoughts and interpretative "perspective taking" (Preston & de Waal, 2002).

I found no direct research on the psychology of viewing people in nature, but other areas of inquiry suggest some of the complexities. Work on wildland recreation has long focused on user conflicts, suggesting that the presence of other people in nature can be unpleasant (for instance conflicts between apparent allies like river kayakers and rafters, or walkers and dog owners). Similarly, work on "limits of acceptable change" in wilderness management shows how tolerant or intolerant park visitors are of alterations produced by other users or by managers. Other humans act in nature, and we process the results not only vis-à-vis how we think nature should be, but also according to our social

⁶ Note that "responsibility to future generations" makes future generations the bearer of value, and is thus altruistic. A more self-interested expression is "legacy values," which implicates one's own self-worth deriving from one's actions, as viewed by future others. The psychology is different, and perhaps stronger for North Americans whose values are more individualistic.

categories. Even just seeing a person in a nature photo, particularly if it shows the persons' face clearly, elicits variable interpretations from different individuals. For example, recent work has shown that there are differences in how quickly men versus women pick out faces displaying particular emotions from a group of faces. Men located angry faces faster than women; and women picked out happy, sad, surprised and disgusted faces significantly faster. Faces of angry men were located faster by both sexes than were other faces. This research hints that it may be more psychologically loaded and complex to view pictures of people in any setting than to view nature alone. Humans will quickly scrutinize and appraise the attractiveness, facial and bodily nonverbal expressions, clothing and appearance, social group, other personal traits, and the implications of the actions of other people for the viewer's values. This suggests the need to be very careful about picking images with people for conservation messages. If the audience's responses to very specific details of the humans depicted are well understood, however, there may be great power in visually appealing to cherished values in the viewer, allowing the viewer to identify or empathize with the humans depicted, as well as countering the well-promoted impression of conservation as anti-people.

C) Narrative thinking and conservation messages

One might think of narrative as at the far end of the spectrum of communicative modes from vision. Stories are written or told verbally, and occupy time, unlike photographs (or at least a single photograph). At the 8th World Wilderness Congress, parallel to the symposium on Conservation Photography was an ironically separate symposium on wilderness writing. But of course narrative and imagery work together. Moving or temporal visual media such as film convey narrative very powerfully. Nor should narrative be thought of as opposed to science; many a natural science concept has been taught through the telling of stories about scientific discovery or application such as conservation, often partly via imagery. One reason to look at narrative is because photographs can help tell one. But a more fundamental reason is that from a psychological point of view, *narrative is an extremely powerful way that the mind organizes information*. Understanding a little about it may go a long way to making more compelling conservation messages that integrate both image and story.

Narrative has been analyzed in many ways from many disciplines. In the following I will draw on three quite different sources: novelist E. M. Forster's (1927) *Aspects of the novel*; Polkinghorne's *Narrative knowing and the social sciences*; and Satterfield and Slovic's *What's nature worth?*, as well as some others. I will present several aspects of narrative and highlight their role in communication.

First of all, narrative implies time. Minimally, merely two photographs with (or even without) a temporal relationship may suggest a story. A story can be one thing happening, then another, then another, then another; simply a sequence of connected events that goes on without end. The connections can be supplied almost wholly by the viewer. Photographs may represent this, but the problem, in essence, of representing a dynamic sequence in time by using space is fundamentally difficult, presenting the viewer with several interpretive challenges (Burke, 2001, p. 143). "Every picture tells a story," and "a picture is worth a thousand words," but *which* story and which words? Possible tools are

sequences or narrative strips of photographs over time (as in re-photography projects, or photojournalism), or extracting smaller scenes out of a wider vista. In either case, photographs can provide vivid concrete impressions, an overall sense, and details that verbal reports of the events narrated would miss. Ultimately, for most effective story telling, however, a combination of verbal and visual media is likely to prove most compelling (given technologies that can deliver both to the audience).

A more developed narrative introduces the audience to a problem which unfolds with complications, vivid action, tensions, concrete details, and an outcome. (Not surprisingly, but easily overlooked, a reader's dislike of the outcome inclines them to dislike the story overall (Monroe & DeYoung, 1994).) The plot brings suspense, uncertainty, or a sense of mystery that pulls the reader along. Of course there may be sub-plots, intersections, surprises, temporal displacements and so forth. In a story, as in real life, we do not know the full meaning of any given instant until later, sometimes much later, when its consequences and significance have unfolded, or when we look back on it knowing things we could not have known at the time. All of this holds people's interest; their "episodic" memory of the events encodes many details and facts which would be utterly boring to learn in a rote fashion. Our minds do so because the features of a narrative invest its world with significance.

Significance comes in part from the characters, which are also essential to narrative structure. Characters let us *identify* (or dis-identify) with someone in the narrative's world with a particular stake in it, and thus become invested in the outcome. Characters relate to the setting, populate it, make it come alive. Identification with a character within the issues or themes of the story is absolutely essential to effective communication. Forster (1927) points out that characters may be "flat" or "round": they may be fairly undeveloped and simply serve to help the plot move along, or the reader may get to know them in depth, including their varied relationships, inconsistencies, nuanced reactions to diverse events, and inner or even unconscious thoughts. Round characters occur in novels and great films and account for the deeply humanizing experience of the narrative.

More subtly than just in terms of plot or story line, significance comes from the themes developed in the narrative. The themes are what link the human actions and events into a whole. The themes, of course, may be as varied as human experience and imagination, and give narratives their expansiveness. Forster (1927) claimed that fantasy and prophecy within a novel provide a sense of universal or spiritual dimensions. More generally, the "emotional hue" of a story may suffuse it subtly and with nuance. Emotions (as discussed above) relate to values, to what matters to us, and stories thus allow the articulation of values in a full-bodied personal emotionally compelling way. Narrative expresses value as lived not merely as rationalizations (Satterfield & Slovic, 2004). The values may take the form of central moral dilemmas that are explored by the characters and plot. Other themes may relate to comprehensive worldviews and their consequences, individual or group identity, historical or cultural differences, and so on. Nature writing of course has its own long history as a genre of narrative that has "humanized" nature and natural science, but new twists continue to arise, such as the recent emergence of the realistic "wildlife crime mystery thriller novel" genre.

This very brief attempt to impressionistically characterize narratives and the ways they provide rich contexts and containers of meaning for people is meant to point towards possibilities for using conservation images in concert with other media in fully developed narrative contexts. Sontag (1972), coming at photography with a strong literary background, was very uncomfortable with what she saw as a photograph's ability to radically decontextualize a scene from its narrative (or historical) setting (including the perspectives of the actors in that setting), which alone gives the scene its full meaning. She seemed to assume that people accept the "realist folk myth" referred to above, and did not consider photographs used with other media, or in settings where relationships preserved critical context. (She liked family snapshots more than other uses of photography because the way they are socially shared preserves the context which a lone or artistic photograph loses).

While Sontag's views may have been over-simplified, conservation communicators would do well to consider the importance of context and the efficacy of narrative in conveying it whole-bodied. More like photo-journalism, conservation books combining images with text could not only tell the story of threatened, or saved, places or species, but could go further to portray the complexities and stakes in some of these situations. Key characters could humanize (or other-species-ize) different perspectives. Animal protection organizations have been keen to identify the features of an individual animals' stories that most movingly personalize their mission and successes. Similarly, conservation organizations' fundraising letters follow a nearly-rote pattern of story telling. Much more than this may be possible. As mentioned much earlier, it probably will depend on conservation photographers becoming intimate and long-term allies in specific conservation sites and battles. Then they will know, indeed be part of, the great narratives being enacted. Pictures, with their evocative potential, and story with its directive import, together make a powerful combination.

VI) ETHICS AND IMAGERY

Recommendation 5

An ethical obligation to communicate about environmental degradation can be held to exist if several conditions are satisfied, including: a scientific case for the existence of a high probability threat to a high priority value(s) (and/or, alternatively, the valid application of the precautionary principle); a social system where open communication is a central part of an adaptive response, and no overriding higher priority threat to that system pre-empts the need for limited response resources; and the ability of viewers to respond to the threat, to at least some degree. If resources are limited, some kinds of environmental information should be given higher priority for specifically visual communication, because of the latter's effectiveness. The decision to do more than "inform," i.e., to advocate, should be made by individuals after consideration of vying value claims, justifications, risks, and perspectives. It may also be legitimate, or not, to forgo activism. The ethics of imagery per se include special considerations related to various forms of distortion, including: defamation, misconception, sensationalism, coercion, offensiveness, invasion and doublespeak. Disciplined self-examination regarding such issues is assumed to be part of professional practice.

One of the questions posed to me by the ILCP was explicitly ethical: "Do we have a responsibility to show the public the human footprint?"⁷ The primary question is one of moral obligation: Do conservation communicators (here particularly photographers) have a specific responsibility? This is a question of "ought," not one of psychology, although psychological concerns bear on it. Further, in as much as I teach environmental ethics, and have long studied the problems of how such ethics develop psychologically, I am equipped to help give shape to an answer to this question. In my view, the answer cannot be entirely generic, however, because it is posed in the context of visual communication. So, I will also offer ideas from colleagues who have analyzed some of the special dimensions of ethics in imagery. Hopefully what I offer will add to the discerning and reflective discussion that conservation photographers are already engaging in about this question.

A) The general case

First, in general, do those with knowledge of the environmental threats to humanity's (and other living things') future have an obligation to communicate that knowledge? The question contains several assumptions, and if all are substantiated, a "Yes" is indicated. First, is it factually the case that a given threat exists? This is a scientific question, and often the initial answer is that indeed environmental threats are well established. It gets murkier, however, when one also wants to know the exact cause of the threat, the magnitude of the harm at stake, and the probability of that harm occurring. Often the research is ambiguous, partly because the real situation may be extremely complex. It may not be necessary to know the exact cause, however, to justify action, if the consequence of not acting is high enough. This is an application of the "precautionary

⁷ Some of the material already presented responds to the further question of "How can this best be done."

principle," which shifts the burden of proof to those proposing something that might be harmful to prove it will not be. Another question that falls outside science is the relative priority of several threats: which should be dealt with first, given limited resources? Sometimes they are not competing, or a solution that addresses more than one can be found. But other times we have to choose. Here too, science should be consulted: it is not uncommon that the public and media prioritize actions that are not urgent (but have attained high public profile, i.e., recycling), or that are not highly effective. For example, it is often more energy-efficient to upgrade to cleaner more efficient large consumer items than to "sacrifice" by decreasing use of an old device, even though the latter has been promoted. Another question related to priority is practicality: what is the cost of the particular action, and what are the trade offs of pursuing it? Common examples include heroic cleanups of areas that are modestly contaminated areas that are unlikely to become residential. Should this costly action be taken instead of preserving nearby threatened natural habitat?

Assuming a strong factual or scientific case can be made that a high magnitude, high probability, high priority threat exists, and that correctable causes are identified and feasible (or that uncertainty calls for the application of the precautionary principle), there is then the ethical assumption embedded in the question: Given such knowledge, is there an *obligation* to communicate? In general, most ethical philosophies would agree there is, unless there is some overriding competing obligation. In a democracy, where choices should be made by the people, there are few things that could override the obligation *to communicate* the threat. The only candidates would be some competing threat to the integrity of the democracy that should be given precedence. Such competing threats should be subject to careful critical analysis. "National security" has recently provided a bad example of overriding of fundamental principles by derivative ones. One plausible candidate that might justifiably override conservation would be political corruption that renders the whole system unresponsive. Under such circumstances, given limited resources, a fundamental flaw in the system might override allocating all resources to specific external threats, but only until the flaw is fixed. Presently, there are constituencies fighting on both environmental and governmental reform fronts, and little indication that the best balance of efforts has been, or can be, struck.

There are certain aspects of conservation communication which imagery, from a psychological point of view, is especially suited to convey, and these should perhaps be considered priority uses. Humans' perceptual and cognitive systems are limited in ways that imagery can help alleviate. Visual imagery may help: with problems of forgetting (shifting baselines / generational amnesia) by documenting over time; with the difficulty of seeing connectedness in dispersed, remote or larger- or smaller-than human scale systems; with the fact that we do not know about and thus cannot appreciate that which we have not experienced. In another sense, discussed in earlier sections, communicators feeling an ethical obligation to communicate should also be mindful of the capacities of their audiences. "Ought" implies "can" to some degree, and if the audience gets the message there is a dire or disturbing threat, but they cannot effectively respond to it, the ultimate result may be emotion-based coping and disempowerment.

One might well go further, however, and ask, assuming the scientific case and so on are established, do not one's obligations extend beyond communicating, to taking action? Of course, communication is action, deliberately or not. So this question might best be posed as advocacy communication, and/or taking practical steps in addition to such communication. Sometimes one's position in the issue's landscape is such as to rule out too strong of an advocacy stance, as many scientists and journalists feel about their roles. In other cases, the individual will have to deliberate on whether further activism is an obligation, or a lesser, discretionary ethical act, or merely a personal choice. Some study in environmental and social ethics may be recommended to consider the justifications available to support activism on behalf of a livable world. They include prudential values, obligations to future generations, environmental and social justice, human health, economic viability, preservation of essential ecosystem services, option values, existence values, aesthetic values, educational values, transcendence values, pragmatic values, and democratic values (all of the foregoing being anthropocentric in nature); as well as biocentric values including the cases for moral standing of organisms, populations, species, ecosystems, landscapes, and the biosphere.

It may be legitimate to forgo activism if one's talents are uniquely suited to just one part of the action (such as creating images), so long as there are others to play the complementary roles. This requires, however, more than a self-reflective exercise. What if there were thousands who feel their talents are creating images, and they will leave the use of those images (as well as all the other jobs in a hotly contested issue) to the (hypothetically) mere hundreds of others willing to undertake this more onerous work? McKibben (1997) went so far as to propose a moratorium on wildlife photography, saying we should leave nature alone except in overriding circumstances where the bank of existing images was not sufficient for a specific fight. Besides highlighting the possible hypocrisy of impacting nature to save it, he saw that the key lack in progress on the environmental front is not from lack of imagery, but lack of other types of roles and resources. Clearly, the spirit animating the ILCP responds to this by putting photographers in partnership with groups running coordinated effective campaigns. In that case, the different jobs needed to improve policies, including all the diverse ways an individual artist wants to undertake, are open. As someone at the Conservation Photography symposium said, the need may not be for conservation photography, but for photographer conservationists.

To some the forgoing ethical analysis may seem to address questions that are too self-evident to bother with. To others, it will have barely scratched the surface. The point should probably be that one should be prepared to give sound ethical and practical justifications for one's actions as a conservationist.

B) Ethics of imagery

Once one does embark on the route of visual communicative activism, another set of ethical considerations arises, ones pertaining to the ethics of the use of images. What ethical guidelines (beyond the prudential ones relating to not being discredited) arise in the use of imagery? Here it is probably important to start not with the somewhat qualified view of the power of images presented in this document, as much as with awareness that

an image can be extraordinarily powerful, at least for some people in some circumstances, but sometimes for many people. Further, we should be aware that in wanting to advocate with images, practitioners are acutely aware that the media environment is saturated, and therefore there is a drive to be competitive in using any and all means to get one's images and messages noticed. I make these suggestions to highlight the understandable temptations to push the limits of ethics in images. It is of course all too human to easily see the distortions in the visual practices of one's opponents compared to seeing them in ones' own work. But brutally honest self examination (hard though it is) and the moral highroad trump being exposed as violating ethical expectations any day.

A vocabulary of ethical issues in the use of images is provided by Green (2000, pp. 21-22). The use of images becomes questionable in:

1. Defamation: "Defamation occurs when questionable images that have the potential to discredit their subjects are printed, often without the express permission of the person displayed" (Green, 2000). The key here is on "questionable" and "potential." There are clearly cases where defamation is justified, but that must be established and documented on the basis of more than images, with their powers as mentioned before of distillation and endurance.
2. Misconception: This relates to bias in coverage that perpetuates incorrect stereotypes about certain groups (e.g., that blacks constitute most poor in the U.S.; that Islamic people are terrorists; that environmentalists are extreme). In nature photography, it may also include flawed conceptions of the state of nature, and of the extent nature of human-environment interdependence (not the wilderness variety, but the 'front country' and neighborhood varieties).
3. Sensationalism: Displays of extremism on the parts of both pro- and anti-environmental parties may have the perverse effect of glorifying and encouraging such actions by others. It also diverts attention from the mundane but pervasive everyday actions that in their cumulative impacts bear great responsibility for degradation. And many will see through it and dismiss it as extreme.
4. Coercion: The media critic Barry (1997) "accused advertisers of being 'a potent economic force without a social conscience' who 'exploit basic human needs by indirectly promising human fulfillment through the use of a product that may have the reverse effect in reality'" (quoted in Green, 2000). Communications about the environment may not on the face of it seem coercive, however the environmental backlash movement has been built on exactly that portrayal of environmental policies. An image can coerce by condemnation, association, and defamation. Critical analysis of ends and means is called for.
5. Offensiveness: The content of imagery can be morally or aesthetically offensive. Clearly, the boundaries of what is offensive are controversial, and free expression laws in the U.S. guard most content but constrain the circumstances and ways it can be shown. Aside from the highly complex legal aspects of this question, from a communication standpoint, it messengers should be aware that receivers are likely to overlook the content and focus judgment on the messenger instead. There is no clear line here, just an issue to be reflected from multiple points of view by the makers of images.

6. Invasion: "Taking" and/or publicizing images may raise privacy issues. Even in cases of celebrities and public locations, the content of what is captured in imagery may be regarded as an ethical matter despite widespread acceptance. In conservation imagery, the inclusion of people doing actions they may feel should not be invaded should be considered.

Green (2000) proposes a methodology for consumers of images to use in analyzing controversial images. It includes analysis of motives, information, bias, context, and critical evaluation. In the case of all the kinds of potential problems listed above, there is no black and white. It is simply that makers of images are well advised to consider and weigh these questions well, lest they be caught up in controversy (which, of course, may be the intent--all the more reason to think through goals and tactics first).

Rutledge (1994) highlights the problem of doublespeak in persuasive communication. Visual doublespeak is "the use of images that pretend to communicate but really do not; images that make the bad seem good, the negative appear positive; images that shift and avoid responsibility; images used to mislead, deceive, or obfuscate the truth" (Rutledge, 1994, p 205). Burke's (1969) primary concern is to prepare people to detect double speak. According to Burke the doublespeak meaning of an image can be assessed through attempting to identify five features. First, the viewer identifies Burke's main features *within* the image (Burke, 1994, pp. 209-213:

- Act: The intrinsic act is the action portrayed in the image.
- Scene: The setting of the act (very broad or very narrow)
- Agent: The one who performs the act; the intrinsic agent is the one performing the act in the image
- Agency: The means whereby the images is accomplished
- Purpose: The motive for an act, the reason it is undertaken.

Secondly, the context is considered. What makes an image what it is, is not the content alone, but the context, including decisions by editors, and how well informed they were and their intentions (Becker 1998, p. 93). The meaning of a use of visual images "arises in the organizations they are used in, out of the joint action of all the people involved in those organizations, and so varies from time to time and place to place" (Becker 1998, p. 84). Accordingly, Burke's (1969) scheme applies the same five features listed above to the "*extrinsic*" aspect of the image--that is, to the context of its creation. Here the creator and the viewer/critic must review the external purpose, actors, scene, and so on. Then one is in a position to assess the doublespeak: is there consonance between the internal and extrinsic acts and purposes? Or do disconnects reveal a deceptive hidden agenda, perpetrated by means of imagery that says a very different thing?

Part of professional practice is the critique by oneself and others of one's well-intentioned works for the existence of these easily "overlooked" aspects of manipulation in the use of imagery. These are essential to the communicative and rhetorical integrity of

communicating conservation.⁸ Particularly when one is engaged in persuasive, rhetorical and advocacy communication, where the aim is to exercise power, as conservation photographers may aim to do, these questions bear careful scrutiny.

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⁸ There are several other ethical issues for conservation photography which I will not deal with here; these pertain to impacts from photographic processes, and from the life-cycle impacts on nature of taking pictures. Little systematic quantitative information (e.g. fully developed life-cycle assessments) seems to be available on these questions.

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