EXPLORING ENVIRONMENTAL COMMUNICATION: DISCUSSING SYSTEMS CONCEPTS WITH COMMUNICATORS IN BANFF NATIONAL PARK

By

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Abstract

Through examples of ecological or living systems this research project introduced selected systems concepts to a purposely-selected sample of environmental communicators within Banff National Park. Participants’ individual reflections and collective discussions of the systems concepts led them to develop an expanded understanding of what constitutes effective environmental communication. Subsequent changes occurred to the system within which the project took place, including changes to participants, between participants, between participants and their environment, and to the researcher. Research project design reflected the systems concepts being discussed and encouraged participants to freely construct their own experiences. Content analysis enabled examination of qualitative data collected through web-based questions and discussion. Conclusions support that a systems thinking approach can enhance understandings of effective environmental communication, including increasing awareness of looping processes such as feedback, promoting collective action and a sense of community, and developing understandings of connections between ecological systems and social systems.
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Chapter 1 – Exploring Environmental Communication

Project Overview

At this time of global environmental uncertainty I think it is essential that environmental communicators increase their ability to successfully influence the creation of a world where there exists greater awareness, understanding, and action regarding the environment. I believe a systems thinking approach offers insight into what comprises effective environmental communication and that exposure to and discussion of systems concepts can further develop environmental communicators’ understandings of effective environmental communication.

Through this research project I explored how presenting selected systems concepts to a group of environmental communicators might change what these individuals perceive to be effective environmental communication. Additionally, I monitored subsequent changes to participants and to the system that they were a part of. Using examples of the dynamic and viable nature of living systems\(^1\), I introduced systems concepts to a purposive non-probability sample of environmental communicators in Banff National Park. A web-based question and discussion platform facilitated animation of the project. Considered a form of environmental communication, the design of the project aligned with a systems thinking approach and constructivist learning theory.

Within this chapter, I discuss the role of environmental communication and the need for research regarding what is effective environmental communication. In Chapter 2, I present literature supporting a systems thinking approach as a method of advancing our understanding of effective environmental communication. Within Chapter 3, I present

\(^1\) The terms *ecological systems* and *living systems* and will be used interchangeably throughout this paper.
detailed research methodology and in Chapter 4, I present the detailed results of the project, including (a) participants’ initial individual and collective understandings of what constitutes effective environmental communication; (b) discussion of changes to participants’ understandings of effective environmental communication, following the presentation and discussion of selected systems concepts; (c) discussion regarding subsequent changes to participants and to the system they were a part of; and (d) additional findings.

In Chapter 5, I discuss evidence supporting that in addition to changes to the participants’ understanding of effective environmental communication and subsequent change to the participants and the system they were a part of, the presentation and discussion of systems concepts among a group of environmental communicators in Banff National Park additionally led to changes to myself, as part of the same system. I discuss the significance of the results and conclude the project with recommendations for further research.

A Need for Effective Environmental Communication

There is widespread support for the belief that the poor state of the environment is an urgent and essential concern. In a practical as well as a constitutive way, environmental communication is a vitally important method of increasing environmental awareness, understanding, and action. The Global Environment Outlook 3 (United Nations Environment Programme, 2002, p. 1) synthesis report suggests that over the past 30 years, international and local efforts have made great strides to place environmental concerns on the agendas of governments, businesses, and individuals. However, the report stresses “poverty and excessive consumption… continue to put enormous pressure
on the environment,” and as a result “sustainable development remains largely theoretical for the majority of the world’s population” and “the state of the global environment… continues to deteriorate” (p. 1). The report urges that future action must be grounded on “greater provision of and access to information in all its forms” (p. 15) and cites the availability of environmental information as key to enabling stakeholders “to participate more meaningfully in decisions and actions that determine the courses of their daily lives and of those of succeeding generations” (p. 15).

I see environmental communication as not only providing environmental information, but as playing a pivotal role in creating or constituting a world where there is greater environmental awareness, understanding, and action. Cox (2006) defines environmental communication as “the pragmatic and constitutive vehicle for our understanding of the environment as well as our relationships to the natural world; it is the symbolic medium that we use in constructing environmental problems and negotiating society’s different responses to them” (p. 12). Proposing broad tenets of environmental communication, Cox (2007) offers “our ideas, beliefs, attitudes, policies, and practices involving the natural world and environmental problems are mediated by systems of representation - by human communication” (p. 12), and he explains, “as we engage others, our communication mediates [italics original], or shapes, our own and others’ perceptions, beliefs, and behavior toward the environment” (Cox, 2006, p. 13).

I believe the world is in the midst of an environmental crisis and that an understanding of what constitutes effective environmental communication is essential. Having worked in communications, marketing, and media relations in Banff National Park for the past eight years, I have observed it is increasingly a priority of organizations
to communicate to their stakeholders about environmental issues and the organization’s relationship to the natural world. Briggs (2005) indicates, “over the past two decades, communication on environmental values, actions, and performance has become an essential activity of organizations” (p. 85). Carbaugh (2007) suggests, “heuristic explorations in environmental communication are needed, especially those which generate knowledge about communication as it mediates the relationship between people and earth’s places” (p. 72). He argues,

We need investigations that inquire how various means of communication are active in and about our worlds. These will help create better insights about communication, environment, and people, and the ways they are related; these will help nurture a variety of ways people live environmentally emplaced lives; these will offer critical perspectives for living well in places, and expressing all that that entails. (p. 72)

This research project is the kind of investigation that Carbaugh is referring to. It aims to generate insight into relationships among people within Banff National Park, processes of communication, and the natural environment, using a systems thinking approach. Frequently, local environmental concerns inevitably link to large-scale, worldwide problems, so increasing environmental awareness, understanding, and action is not easy. Systems thinking offers a method of approaching complex problems. Discussing the contribution of systems thinking, Kauffman (1980) describes it as “a way of tackling those big, messy, real world problems which don’t fit neatly into various specialities, just at a time when we face a whole batch of problems so serious that they threaten the survival of our society” (p. 1). Capra (2008) maintains, “it is now becoming
more and more evident that the major problems of our time cannot be understood in isolation” (Current world problems section, para. 2) and urges, “we need to learn how to think in terms of relationships, in terms of interconnections, patterns, context…. this type of thinking is known as systemic thinking or ‘systems thinking’” (Systems thinking section, para. 1).

Questions to Explore

This research project draws conclusions in response to the primary research question: When examples of the dynamic and viable nature of living systems are used to present selected systems concepts to a group of environmental communicators, what change, if any, can be seen in what the communicators perceive to be effective environmental communication, and what change, if any, actually results within the system of environmental communication that these communicators are a part of?

To draw conclusions in response to the primary research question the following secondary questions were explored:

1. Prior to presenting project material to participants, what do participants claim to be relevant features of effective environmental communication?

2. Following presentation and discussion of selected systems concepts, when participants’ first description of effective environmental communication is compared to their second description, is there evidence to support that participants’ understanding of effective environmental communication has changed?

3. Following presentation and discussion of selected systems concepts, what different features, if any, are included in participants’ understanding of effective environmental communication?
Following exposure to and discussion of selected systems concepts, what, if any, evidence exists that indicates change has occurred to participants’ understanding of effective environmental communication that has subsequently changed the participants, their programs, and the environment they are a part of?

**Researcher’s Perspective**

I identified environmental communicators in Banff National Park as a rich resource that would enable my exploration of my research questions. I believed environmental communicators in Banff National Park held a wealth of knowledge and experience regarding ecological systems and communication, outweighed only by their passion for and involvement with nature and natural environments. At the same time, I believed environmental communicators in Banff National Park might benefit from the influence of the systems thinking approach presented through the project. Environmental communicators in Banff National Park work within a remarkable mountain landscape recognized for its ecological and geological value (United Nations Educational, Scientific and Cultural Organization, 2008, para. 1-6). This same landscape hosts over three million international visitors per year. I believed the abilities of environmental communicators in Banff National Park, combined with the assets of an exceptional natural setting and vast audiences, put these environmental communicators in an advantageous position to affect positive environmental change within the community and far beyond, and that this position might be enhanced through a systems thinking approach.

Additionally, I initiated this research project with the belief that all communication generated by organizations within Banff National Park could be considered environmental communication. I based this belief on my understanding that
all communication in Banff National Park unavoidably connects to the ecological systems of the local area and beyond. Although I believed all communication to be environmental communication, I understood my participants might not share this perspective and that they might consider themselves to be communicating about the environment or environmental issues only a small percentage of their time. I thought by sharing a systems thinking approach and the idea that ecological systems and social systems are connected, I might foster a tighter link between my participants’ practices and the environment within which their practices occur.

Project Limitations and Delimitations

I aimed to generate deep and intimate discussion of the project material by limiting the number of participants involved in this research project. However limiting the number of participants also restricts generalization of the findings. The project was limited to participants who were located geographically in Banff National Park, had professional experience in the field of communication, and were likely required to communicate about the natural environment and environmental issues within their work. The research design, which unavoidably managed opportunities for participant interaction, also restricts generalization of the findings. My location, a significant distance away from Banff National Park, partially dictated the research design; specifically I was unable to facilitate face-to-face interactions between participants. The web-based design of the research project limited participant interactions, as it was not necessarily a setting in which all participants were comfortable contributing their thoughts. In face-to-face group sessions some participants may have been more willing to contribute, although others may have contributed less. Participants’ interest in the
material and the amount of time they were willing or able to dedicate to the study also restricted interactions.

The difficulty of defining environmental communication and diverse views among participants regarding the role of an environmental communicator, may have also led to inconsistencies in project results. By responding positively to the Letter of Invitation (Appendix A) all participants appeared to agree that their work involved communication that shapes people’s awareness, understanding, and actions regarding the environment. However, the percentage of time participants claimed to spend communicating about the environment and environmental issues in their work ranged between 100 per cent and 5 per cent. All participants worked within the general field of communication, however their professional roles varied, including corporate communications, visitor services, interpretation, and guiding. Participants’ prior understanding of a systems thinking approach also widely varied, ranging from those who taught the subject to those, whom I assumed, had no prior understanding. Although the diversity of participants limits generalization of the project results, I thought the diversity of the group contributed to the richness of the interactions between participants and thus positively contributed to the project results.

Participants’ awareness that they were a small select group, and that their peers and I were reading and analyzing their responses, may also have influenced their contributions and thus project results. I personally knew the majority of participants prior to the project, thus participants’ contributions could have included some bias. Regardless of their actual interest in the materials, participants may have stayed involved so as to not disappoint me, or they may have contributed information they thought I was looking for,
rather than what they themselves thought. Either case may have impacted the validity of their responses. Thus, I acknowledge that I contributed to outcomes of the project along with my participants. I discuss my role in the system created by the project in detail in Chapter 5.
Chapter 2 – A Systems Thinking Approach to Environmental Communication

As stated in Chapter 1, at this time of significant environmental concern, environmental communication is a crucial method of increasing environmental awareness, understanding, and action. I believe it is essential to continue to learn about how to effectively communicate about the environment and environmental issues and I see a systems thinking approach as a way of facing this complex problem.

*What is Systems Thinking*

Systems thinking emerged concurrently within multiple disciplines (Capra, 1996, pp. 17-18) and theorists have adopted it in differing ways. In many scientific fields systems thinking is understood to have arisen from tension between a “mechanistic, reductionist, or atomistic” view and a “holistic, organismic, or ecological” approach (Capra, 1996, p. 17). Typically, a systems approach is a manner of thinking that “tries to capture and explain phenomena and principles of different complex systems” and “aims at illustrating and explaining interrelations and connections between different aspects of reality” (Herting & Stein, 2007, p. 3). Supporting systems thinking as a valuable method of approaching complex problems, Aronson (1996) explains, “systems thinking works by expanding its view to take into account larger and larger numbers of interactions as an issue is being studied” (para. 2). Based on these ideas, I have taken a broad view of systems thinking. I see systems thinking as a method of exploring an intricate problem, such as the problem of making environmental communication more effective, by taking a step back, viewing the concern from a broad perspective, and learning about the issue based on the relationships and connections recognized within it, and the consequences of these interactions.
Using Living Systems to Learn About Social Systems

A systems thinking approach enables the relationships and connections that exist within one type of system to clearly and effectively illustrate the relationships and connections that may exist within other types of systems. Thus, demonstrating how systems concepts and processes play out in living systems can inform our understanding of how these processes also play out in social systems, such as systems of environmental communication. Within his definition of systems thinking Clark (1997) states that, “because the Earth's ecological systems are authentic and practical models of living systems, what we know about how ecological systems function provides us with the best and most comprehensive understanding of how other living systems function” (The systems view section, para. 5), and adds, “systems thinking, then, is applying these principles to increase our understanding of how cultural, economic, political, and organizational systems can be designed to function more effectively” (The systems view section, para. 5). Within this project the ecological system of whitebark pine, including the numerous ecological systems and processes that the tree is connected to, was used to illustrate systems concepts that I thought might inform participants’ understanding of effective environmental communication.

Acknowledging Relationships and Connections

A systems thinking approach facilitates investigation of the complex multitude of relationships and connections that exist within a system, between systems, and between a system and its environment. Capra (1996) describes this “interwovenness and interdependence of all phenomena” (p. 34) as a web of life. My experience with this approach in my own work leads me to believe that environmental communication
programs are more effective when this web of life is acknowledged, when connections and processes existing beyond the immediate setting of the environmental communication programs are considered. Discussing environmental instability in the world, Laszlo (2002) urges:

What we need is a holistic view, a view of the human being as part of her or his community, which is part of its local environment, which is part of its society and culture, which is part of the system of cultures and societies in the human family—which is part of the global environment: of the biosphere. (p. 137)

As a method of highlighting relationships and connections, a systems thinking approach enables identification and examination of interrelationships between local, regional, and global scales. I believe that environmental communication created within the limited context of a single organization or a single issue potentially fails to account for significant interrelationships; interrelationships between the organization, the issue, and the rest of the system of environmental communication. I think environmental communication may be more effective based on a wider grounding. In reference to environmental discourse, Carbaugh (2007) suggests:

…the ability to verbally interpret the larger parcel plods along well behind the rhetoric of the part - as when our terms focus on endangered species over their communities - while in the meantime there is a tragic passing of nature’s larger thresholds, as the ecosystem declines, the climate warms, the water becomes too acidic, and the like. As a result, we stand on the beach staring at a starfish, before realizing we are about to be consumed by a tsunami. (p. 65)
Thus, I believe a systems thinking approach broadens our view of an issue, such as environmental communication, and also pulls an issue together by clarifying how different aspects of the issue might connect, over a variety of scales.

Relevance of Feedback and Structural Coupling

Acknowledging the relationships and connections found through a systems thinking approach can help to highlight the looping processes inherent in systems of communication, such as feedback. Feedback can be considered within systems, between systems, or between a system and its environment. Kauffman (1980) describes feedback as occurring when “information about the output of the system is fed back around to the input side of the system” (p. 5). Negative or balancing feedback provides stability, canceling out changes in the system. Positive or reinforcing feedback promotes change, as it “amplifies or adds [italics original] to any disturbance in the system” (Kauffman, 1980, p. 20).

In relation to environmental communication, I found the idea of feedback as a continuous loop to be of interest. I was interested if individuals and organizations in Banff National Park recognized loops as inherent within the system of environmental communication they were part of. And, if they recognized these loops, I was interested in whether they saw them as occurring on various scales, within local systems or also within larger systems, and whether they saw them as occurring between various entities, between individuals, organizations, and the environment. In my experience, environmental communicators tend to concentrate their efforts on the output of an idea or message, without fully considering processes such as feedback that could inform or improve the communication system. I think an awareness of looping processes such as
feedback is essential to the growth and change of the original idea or message, and that of the messenger, the system itself, and the environment of the system.

Acknowledging the relationships and connections found through a systems thinking approach can offer a framework for understanding how triggers of change within a system, between systems, or between a system and its environment, can affect systems. Capra (1996) suggests that as living systems interact, a system “undergoes continual structural changes while preserving its web-like pattern of organization” (p. 218).

Further, based on the idea of structural coupling, systems are understood to change together, as “individual systems are also part of each others worlds” (Capra, 1996, p. 269). Maturana Romesin (2008, p. 169) explains, that organism and their environments undergo spontaneous congruent structural changes through their recursive interactions. The changes that occur to a system as it changes together with its environment, will continually alter the way both the system and the environment react to future triggers of change. Capra (1996) describes this change in future behavior as ongoing “adaptation, learning, and development” (p. 220).

I found the idea that a system and its environment change together over time, and the idea that the effects of triggers of change also change over time, of interest, relative to the system of environmental communication in Banff National Park. I was curious to learn what environmental communicators saw as influencing their communications about the environment and environmental issues, what might trigger changes to their programs. I wanted to know the goals of their programs, and whether they saw their programs as both affecting and changing together with other systems, such as organizations, human communities, or ecological systems. Following the same ideas, I understand
environmental communication as a potential trigger of change to existing belief systems about the environment. If environmental communication is a trigger of change, I am interested in learning more about how audiences of environmental communication programs might remain the same or establish new or different connections within their environment as a result of environmental communication programs. If environmental communication programs lead to change in audiences, I wonder whether environmental communicators are aware of changes also occurring to themselves, their programs, the system of environmental communication, and the environment. I think environmental communicators who are aware of the reciprocal changes that can be seen as constantly effecting systems and their environments might be better able to design effective environmental communication programs.

In summary, using a systems thinking approach one can consider an issue from a wide perspective and identify relationships and connections that exist. Recognizing and understanding the dynamic nature of systems processes through examples of ecological systems can contribute to greater understanding of social systems. Concepts relevant to systems thinking, such as feedback and structural coupling, highlight how systems change, including change in individual systems, change between systems, and change between systems and environments. Buckley (1967, p. 31 as cited by Monge, 1977) suggests communication and social systems are “characterized primarily by their propensity to change their structure” (italics original) during their culturally continuous ‘life-time’” (p. 21). Monge (1977) stresses, “this emphasis on change is important because it permits the study of communication as a complex adaptive system rather than as a static, enduring structure” (p. 21). I saw the system of environmental communication
in Banff National Park as a dynamic system that constantly undergoes change. I thought that a systems thinking approach could help to identify and expand understandings of the relationships, connections, and dynamic changes inherent in this system. I believed that recognizing systems processes, such as feedback and structural coupling, could increase our ability to make systems of environmental communication more effective.
Chapter 3 – Research Methodology

As a qualitative exploration of how systems thinking may inform environmental communication, I designed this project considering ideas that are associated with a systems thinking approach and a constructivist ideology. As I discuss within this chapter, the way the project was delivered to participants, the way data was collected and analyzed, and the way the overall project was conducted similarly reflect a systems thinking approach and constructivist ideology.

Design and Rationale

Qualitative Exploration

A qualitative exploration was chosen to generate data that would best represent the rich, complex, and context-dependent nature of the human social interactions and changes taking place within this project (Cohen, Manion, & Morrison, 2007, p. 167). Cohen et al. describe qualitative studies as enabling researchers to describe, summarize, and interpret, as well as discover patterns and better understand individuals and groups (p. 461). The qualitative paradigm also permitted me, as the researcher, to acknowledge that I was an integral part of the social interactions and changes taking place. Regarding this naturalistic form of research, Cohen et al. further explain, “Researchers are in the world and of the world. They bring their own biographies to the research situation and participants behave in particular ways in their presence” (p. 171). Complementing the qualitative paradigm, the open-ended questionnaire-style format used aimed to prompt well thought out responses that would build toward a conclusion, while participants explored commonalities that potentially existing between selected systems concepts and environmental communication. Open-ended questions enabled “participants to write a
free account in their own terms, to explain and qualify their responses and avoid the limitations of pre-set categories of response” (p. 321).

*A Systems Thinking Approach to Project Design*

Some of the systems concepts presented to participants within the study also influenced the design of the project. Specifically, the idea of a system and its environment changing together through structural coupling was both analyzed and exemplified. To analyze how the concept of structural coupling might relate to environmental communication I asked participants to consider that both ecological systems and social systems could be understood as constantly interacting with one another. I suggested that these interactions could lead to changes in the systems, and that these changes could determine how the systems would interact in the future. Discussing the development and evolution of living systems, Capra (1996) suggests, “as it keeps interacting with its environment, a living organism will undergo a sequence of structural changes” (p. 220) and that “an organism’s structure at any point in its development is a record of its previous structural changes, and… each structural change influences the organism’s future behavior” (p. 220). By presenting chosen system concepts to participants I created new interactions between the participants, the material, and myself. By encouraging participants to read and comment on each other’s contributions to the project questions, new interactions took place within the environment they shared. Thus, by triggering changes within this system of environmental communicators, the project potentially changed the participants, the systems they were a part of, and the way the participants and the systems would react to future triggers of change, exemplifying the concept of structural coupling.
Constructivist Ideology

The design of the study also related to the constructivist view of learning. Adopting Kauchak and Eggen’s definition, Caine (2004) suggests that constructivism is a “view of learning in which learners use their own experiences to construct understandings that make sense to them, rather than having understanding delivered to them in already organized form…” (p. 2), and he contends “constructivism is the view that is most consistent with the nature of life itself and with the ways in which people, as living systems, learn” (pp. 2-3). In accordance with a constructivist view, the project design facilitated presentation of selected system concepts to participants, and questions and discussions encouraged participants to construct for themselves an understanding of the concepts and then use that understanding to potentially alter their view of environmental communication. Participants interacted as much or as little as they wished, with the material and with each other. Within certain limitations of the system, they freely constructed their own experience throughout the project. Thus, the project encouraged new understandings and interactions and potentially prompted changes in individuals and systems, but the project did not specify or direct particular results.

Project Animation and Data Collection

The Moodle course management system, a free web-based software system (Moodle, 2009b, para. 1), enabled project animation and data collection. Designers of Moodle recognize a constructivist approach to education, acknowledging, “people actively construct new knowledge as they interact with their environments” (Moodle, 2009c, Constructivism section, para. 1). The lesson and forum functions within Moodle enabled the presentation of examples of living systems, the delivery of open-ended
questions and recording of responses, and the creation of an interactive web-based community. Moodle facilitated data collection, including participants’ responses to the Participant Consent Form (Appendix B), responses to the open-ended questions, and discussions and interactions within the forums. Additionally, I recorded data generated through email communication between the participants and myself. All data collected was copied and pasted into a master document using Microsoft Excel, and all files generated were stored solely on my hard drive and backup systems, which were password protected and not linked to any networks. I selected a private web hosting company to host the Moodle system. The values of the company, Canadian-owned HostPapa, aligned with the environmental concerns of the project. HostPapa powers their data centre, servers, computers, and office space with one hundred percent green renewable energy (HostPapa, 2009, para. 1).

Participants and Location

Based on their location and experience the environmental communicators in Banff National Park were considered uniquely suited to provide rich theoretical insight into effective environmental communication. I consider Banff to be an intimate and cohesive community with a global perspective – a small socio-ecological system unusually cognizant of the natural environment and the broader web of systems it is a part of. My experience working with communication professionals in Banff National Park suggested to me that these individuals generally have a strong awareness of the natural environment and a solid grasp of a wide range of environmental issues.

Using a purposive non-probability sample method, I researched and chose environmental communicators as potential participants for the study, based on their
geographic location in Banff National Park, their professional experience in the field of communication, and whether the nature of their work encompassed communicating about the natural environment and environmental issues. Participants’ specific stances on environmental issues were not factors in the selection process. Cohen et al. (2007) support purposive non-probability sampling as a method of deliberately selecting participants from the wider population, specifically including or excluding participants as deemed fit by the researcher (p. 110).

Potential participants contacted were encouraged to supply contact information for additional individuals they believed fit the criteria for the project. In this secondary method of sampling, often termed snowball sampling, participants initially contacted took the role of informants, identifying other individuals who may have qualified as participants (Cohen et al., 2007, p. 116). By using purposive non-probability sampling and snowball sampling and based on the number of individuals working in the field of environmental communication in within Banff National Park, I anticipated recruiting 10 to 15 participants. Within three weeks of the project opening, 12 participants were proceeding with the project, one of which was a result of snowball sampling. Detailed results of the recruitment are included in the Project Conduct section of this chapter.

The initial email communication and the Letter of Invitation (Appendix A), explained to potential participants that (a) respondents would include participants’ peers within Banff National Park; (b) the intent of the project was to deeply inquire and gather meaningful insight regarding effective environmental communication, not to prescribe or evaluate; (c) the project would include individual questions as well as collaborative discussion, thus responses would not be confidential and participants would not be
anonymous from one another; and finally, (d) participants would be given the opportunity to review my analysis and conclusions prior to submission of the final thesis. Given the content of the project material, the nature of the questions, and the participants involved, the data was unlikely to be “sensitive, intimate, or discrediting” (Cohen et al., 2007, p. 65). Thus, the preservation of anonymity between participants was not a concern. As recommended by Cohen et al., participants were informed of their right to withdraw their responses at any point in the project (p. 76) and were informed that no information identifying them would be included within this thesis.

Methods of Analysis

In the following section I discuss the methods I used to analyze the data I collected throughout the four-staged project. In broad terms qualitative content analysis facilitated examination of the project data. To answer research question 1, I used coding and categorization, analyzing data collected in Stage 1 of the project. To answer research questions 2, 3, and 4, I used coding and categorization as well as analytical constructs, analyzing data collected in Stage 2, 3, and 4 of the project.

Qualitative Content Analysis

According to Krippendorff (2004), qualitative or interpretive content analysis involves close reading of small amounts of textual matter, rearticulation of the texts into new narratives, and acknowledgment by the analyst of their own socially or culturally conditioned understandings (p. 17). Content analysis considers words and meanings in context and is highly verifiable, systematic, and transparent (Mayring as cited by Cohen et al., 2007, p. 475). To account for the context of the texts examined within this project, I acknowledged how the texts came to be, what they meant, and what information they
provided or conclusions they supported (Krippendorff, 2004, p. 33). Thus, I considered the research tool used to derive the texts and the meanings and interpretations I attached to the texts, based on my particular background, judgments, and the evidence at hand.

**Coding and Categorization**

Coding and categorization included multiple careful readings of all data from all participants, pulling out words and phrases that related to the research question of interest. I attached codes to the words and phrases, indicating preliminary categories and designating which participant made the comment. I took care to ensure I understood the words and phrases in the context intended by the participant, and grouped and regrouped words and phrases into increasingly descriptive categories. Krippendorff (2004) discusses that units of texts “should not be considered givens.... they emerge in processes of reading” (p. 98). With this in mind, I grouped words and phrases according to the specific questions asked in the project, however I also categorized words and phrases based on meaningful conceptual breaks that emerged through the reading of the texts (Krippendorff, 2004, p. 98). For example, when I analyzed texts to answer the first research question, I likely categorized data stemming from questions regarding the influences on or goals of environmental communication as influences or goals. However, additional categories also emerged, including attributes, approaches, scope, channels, non-effective, and actual messages.

**Analytical Constructs**

I used analytical constructs to structure the comparison and contrast of participants’ initial and later understandings of effective environmental communication, and to facilitate exploration into changes to the overall system and development of
conclusions. Krippendorff (2004) describes analytical constructs as “‘if-then’ statements” (p. 35) and suggests such statements provide rules of inference, linking texts to the answers to research questions. Using this method I read data carefully looking for evidence of participants’ understandings changing, and developed analytical constructs based on the evidence found. Reading the data a second time, I pulled out words and phrases and coded them according to the analytical constructs that applied, and then I further reviewed the data and constructs to draw conclusions. Through this portion of the content analysis I aimed to discover phenomena not observed directly in the texts (Krippendorff, 2004, p. 10).

In conclusion, I approached the qualitative content analysis of all the data recognizing the context of the system within which the data occurred, and the relationships and connections that existed within this system. Krippendorff (2004) reminds us “we no longer measure human communication against the ideal of transmitting information… we inquire into what happens to the relationships between people who converse with one another” (p. xviii). To the best of my ability, I accurately reflected the dynamics of the actual setting of the texts in my conclusions (Cohen et al., 2007, p. 148-149). I aimed for “fidelity to real life, context- and situation-specificity, authenticity, comprehensiveness, detail, honesty, depth of response and meaningfulness to the respondents” (Cohen et al., 2007, p. 149). In reading and analyzing the data a keen awareness of inadvertent responses, inconsistent coding, and ambiguous use of language contributes to the validity of the conclusions (Cohen et al., 2007, p. 490). The direct observational evidence in the form of participants’ quotes that I included, combined with the analytical constructs I developed, illustrate the structural correspondence between the
data and the conclusions, and support the structural validity of the project (Krippendorff, 2004, p. 320).

Project Conduct

In the following section I describe how the project actually unfolded. I discuss my overall approach to the project and the actual consequences of the project’s four stages, including the processes of recruitment, animation, and pilot testing. I also discuss the process of data analysis and the closing of the project.

Overall Project Strategy

The goal of Stage 1 was to obtain data regarding individual understandings of effective environmental communication, prior to presenting participants with the systems concepts, and prior to participants interacting with each other. Following the presentation of system concepts and related questions, the goal of Stage 2 was to generate individual reflection and group discussion regarding how the concepts might apply to environmental communication. Based on additional discussion of the systems concepts and questions, the goal of Stages 3 and 4 was to further explore environmental communication within Banff National Park and to obtain a final description from participants regarding what they thought constituted effective environmental communication. By comparing participants’ initial understandings of effective environmental communication from Stage 1 to participants’ reflections and discussion from Stages 2, 3, and 4, I was able to explore changes occurring to understandings and subsequent changes occurring to participants and the system of environmental communication that they were a part of.
Recruitment

Based on the initial purposive non-probability sample, I contacted 20 potential participants by email and gave them the Letter of Invitation (Appendix A). Through snowball sampling, the potential participants suggested seven additional individuals. Based on suitability for the project, I contacted two of these potential participants. Of the 22 individuals contacted, 14 agreed to participate in the project. Of those that did not agree, two simply did not respond to the email and the remaining six choose not to participate due to time or scheduling restrictions. Once individuals agreed to participate in the project I sent them an email detailing the timing of the project and providing them with access information for the project. I sent subsequent emails throughout the project announcing the availability of stages, citing timing changes, clarifying minor navigation issues, and encouraging and thanking participants for their contributions.

Within three weeks of the project opening to participants, three of the 14 participants discontinued their participation, with two citing time concerns and one claiming a lack of suitability for the study. Noting slow participation in Stage 1, and hoping to ensure 10 to 15 individuals would complete the study, I contacted an additional seven potential participants, of whom one chose to participate, thus 12 participants proceeded with the project.

Project Design Alterations, Animation, and Pilot Testing

For the purpose of the research proposal and ethics review I had completed a draft of the project questionnaire. To conduct the project I adapted the draft questionnaire to the Moodle format, revising and simplifying it numerous times prior to opening it to participants. The first version of the questionnaire set-up within Moodle included 32
questions over four stages. Originally, participants were to access Stages 1, 2, and 3, one stage per week, over three consecutive weeks. Participants were to access Stage 4 three weeks after the completion of Stage 3.

Moodle proved to be a valuable resource for the animation of the project. Installation, design, and editing of the project features in Moodle were straightforward and quick. Moodle is backed-up by a solid network of web-based documentation and user discussion forums. I also attended a MoodleMoot (Moodle, 2009a, para. 1), a one-day conference where users, administrators, and developers gathered to learn about and discuss Moodle. Moodle was advantageous as it enabled me to create an interactive platform in which participants could review information, respond to questions, and participate in collaborative discussions and activities. I thought the disadvantage of Moodle was that it used language specific to an educational setting. I explained to participants that despite the language used I did not intend the project to be a course, I intended it to be a collaborative exploration and a sharing of ideas.

After animating the project within Moodle and prior to opening it to participants, I invited various people to conduct pilot tests. Those that entered the project in its pilot form included two friends, who do not have a background in systems, environmental communication, or research; five students from Royal Roads University, with experience in education, communication, and a systems thinking approach; the head of my program at Royal Roads University; and my thesis supervisor. Based on informative comments I received, I further simplified the material and altered some navigational information. Comments from the pilot testers also increased my awareness of the potential time requirements necessary to participate in the project.
When the first stage of the project opened it was apparent that, although participants had agreed to commit one hour per week to the project, some participants would require more time to contribute, mainly due to their busy schedules. Thus, I made additional alterations and the final study that participants experienced included 25 (reduced from the initial 32) questions over four stages. I opened a new stage every two weeks, consecutively over eight weeks, and the project remained open over a total of 10 weeks.

Stage 1

Within Stage 1, participants completed a Participant Consent Form (Appendix B), described the type of work that they did, and described what percentage of their work involved communication about the environment or environmental issues. Also, participants shared examples of effective environmental communication, factors used to evaluate environmental communication, typical activities performed when designing environmental communication programs, influences on environmental communication, and goals of environmental communication. As participants completed Stage 1, I monitored the time they spent and the amount of data they contributed. Based on this information, I adjusted Stages 2, 3 and 4, including the reduction of the number of questions already mentioned, and simplifying language and extending time allowed for completion. I have included Stage 1 open-ended questions in Appendix C.

Stage 2

In choosing the specific systems concepts to present to participants, and researching the living systems used to exemplify these concepts, I considered many options. Initial versions of the written passages used to introduce the systems concepts
included descriptions of the structures of systems, and specific references to the processes of feedback and structural coupling. Significantly simplified to fit the project’s constraints of timing and depth, the final written passages included an introduction to systems and the ideas that systems are connected and change together. The systems concepts presented were clearly and concisely exemplified using the living system of whitebark pine, a common tree in Banff National Park that participants would be familiar with, as well as other living systems connected to whitebark pine, such as the Clark’s nutcracker. Written passages were designed with the particular audience of environmental communicators in mind, including the assumptions that they would be familiar with and interested in examples of living systems related to Banff National Park, and that they may not have any background in systems concepts. I present the written passages and questions from Stage 2 in Appendix D.

Within Stage 2, I used a ‘question and answer’ forum format to present questions. In this format, each question appears as a separate forum. The participants cannot see what the others have posted until after they have posted their own initial reply to the question. Once they have posted an initial reply they can read the replies of others who have posted before them, and they can add additional comments. I originally chose the question and answer forum format to be able to compare participants’ initial individual responses to their responses after interacting with other participants. Unfortunately, given the limited time of participants, and given their tendency to visit the forum once and contribute a lot of data, but not revisit the forum to read the contributions of others, the question and answer format was not particularly suitable. If there had been more visits to the forum by each participant, the question and answer forum format may have enabled
me to monitor change. However, in these circumstances the format did not promote the interaction of participants, interaction that I believe would have further contributed to change. I discuss this situation further within the Project Specific Recommendations section of Chapter 4.

Based on the limited interaction of participants in Stage 2, I altered the format of the forum questions in Stage 3 and 4, presenting them in a ‘standard forum for general use’. In this format, each question appears as separate forum, but participants can read the replies of others prior to adding their own reply. Also, within the original design of the questionnaire Stage 3 contained a wiki question. The wiki format would have required participants to work collaboratively to describe effective environmental communication, following their exposure to the systems concepts. Based on participants’ limited interaction, lack of time, and some navigational issues, I also chose to present this question as a standard forum for general use.

During Stage 2, I also encountered a situation where, in succession, three participants struggled to answer two particular questions, in which I asked participants to discuss connections between ecological systems and social systems. Although I had informed all participants that I would not contribute to the forums, other than posting the original question, after some time, I posted a response to the two questions to help clarify. I discuss this situation further within the Additional Analysis section of Chapter 4.

Stages 3 and 4

I made few changes to Stages 3 and 4 following the simplifications already mentioned. Throughout the final weeks of the project I changed the forums in Stage 2 to standard forums for general use, thus, participants could review all the contributions of
other participants, regardless of whether they had responded to particular questions. I urged participants to revisit past stages and review and build on each other’s contributions. I have included questions from Stage 3 in Appendix E and questions from Stage 4 in Appendix F.

As mentioned in the Project Design Alterations, Animation, and Pilot Testing section of this chapter, originally the research project was to take place over a total of eight weeks, but as I noticed constraints on participants’ time I extended the length of the stages. Initially timing extensions increased participation and contributions, but as the project moved into final weeks I felt interest lagged. Rather than an energetic collaborative finish, the project closed with only five participants contributing to Stage 4. Overall, I was satisfied with the amount of contributions to the project. However, I think the waning finish indicated that improvements to the research design and methodology could inspire more enthusiastic participation. I provide recommendations regarding the research project design in Project Specific Recommendations section of Chapter 4.

Process of Data Collection and Analysis

Over the 10 weeks of the project, I copied all participant contributions verbatim from Moodle into a master Microsoft Excel spreadsheet. As I entered individual contributions, I read them once, making notes regarding my immediate reactions, particularly interesting responses, and meaningful interactions and linkages between participants. By reviewing the texts during the data collection process, I was able to gain a broad view of the overall data and begin to identify significant features to focus on in my analysis, a process supported by Cohen et al. (2007, p. 184). Once data collection was complete and I had closed the project to participants, I proceeded with multiple further
readings of the data. Guided by my research questions I proceeded with coding and categorization and the development of analytical constructs, as discussed in Methods of Analysis section of this chapter. I present examples of the process of coding and categorization of data from Stage 1 in Appendix G, and of data from Stages 2, 3, and 4 in Appendix H. I present the results of the data analysis in Chapter 4.

Upon closing the project, one of the 12 participants had only completed Stage 1 (Participant N), stating that although they were interested in the project their time commitments restrained them from doing more. Also, one of the original 14 participants that dropped out of the project within the first three weeks (Participant C) completed Stage 1 before doing so. Both of these participants agreed that I could continue to use the contributions they did make as data. Thus, as a test on the reliability of the project’s sample size and my conclusions from Stage 1, I reviewed the contributions of these two participants looking for particular uniqueness or significant divergence from the collective responses of the group. Supporting the reliability of the project’s sample size and my conclusions from Stage 1, both sets of responses fit well within the group’s collective impression of effective environmental communication. As these participants did not contribute to the later stages of the project, I was unable to explore changes to their understandings of effective environmental communication, thus I have included their impressions of effective environmental communication in Appendix I.

I also used certain participant comments to test the validity of my data analysis. While pulling words and phrases from Stage 1, categories developed that I labeled non-effective and actual messages. These categories contained words and phrases participants used to describe environmental communication that was not effective, and actual
environmental messages communicated to audiences. Comparing the words and phrases within these categories to my impression of participants’ understanding of effective environmental communication supported that my analysis was valid. For instance, contributions that environmental communication was not effective if it led to “futility and isolation” or if it was a “list of prohibitions” validated my impression that participants thought environmental communication should be empowering and positive.

I further confirmed the validity of my data analysis by cross-categorizing data. In addition to coding all the data collected in Stages 2, 3, and 4 according to the analytical constructs that applied, I further categorized the words and phrases pulled from this data according to the categories developed in the first research question. Thus, I checked the data from Stages 2, 3, and 4 against the categories of influences, goals, attributes, and approaches. Cross-categorizing the data in this way, I was able further explore how participants repeated and/or expanded on particular aspects of their initial understandings of effective environmental communication in the later stages of the project.

Closing the Project

Prior to submitting the final draft of this thesis I made it available to all of the project participants, and considered and recorded their comments as a form of respondent validation (Cohen et al., 2007, p. 149). The final thesis will be accessible by all participants and submitted as partial fulfillment of the requirements for the degree of Masters of Arts Environmental Education and Communication through Royal Roads University. Cohen et al. (2007) suggest the final stage of qualitative research should “terminate the roles adopted… and bring to an end the relationships that have built up over the course of the research” (p. 185). To this end, after I have submitted my final
thesis to Royal Roads University, I will contact each project participant, thank them for their contributions, and inform them of a donation I have made on behalf of the group, to the Bow Valley Naturalists.\textsuperscript{2} I had not informed participants of my intention to make this donation prior to or during the project.

\textsuperscript{2} The Bow Valley Naturalists are a charitable group in Banff National Park working to increase knowledge of natural history and environmental issues, stimulate an appreciation of nature, and work for the protection and preservation of wildlife, wilderness areas, parks and natural ecosystems (Bow Valley Naturalists, 2009).
Chapter 4 – Discussion of Results

Project results discussed within this chapter include (a) general findings regarding participants’ roles and their audiences; (b) participants’ individual impressions of effective environmental communication; (c) my synthesis of participants’ individual impressions into a collective impression of effective environmental communication; (d) evidence supporting changes in participants’ understandings of effective environmental communication following the presentation and discussion of systems concepts; (e) evidence supporting the claim that changes to participants’ understandings of effective environmental communication subsequently led to changes to the participants and the system of environment communication of which the participants are a part. Additional analysis includes discussion regarding participants’ willingness to share their previous understanding of a systems thinking approach, some participants’ hesitation connecting ecological systems and social systems, and evidence supporting that some participants’ understandings did not change. The chapter concludes with a summary of the project results and conclusions and project specific recommendations.

Project Results

Participants’ Roles and their Audience

Participants who contributed to the project included managers and directors working within prominent organizations with Banff National Park. Participants held positions within communications, marketing, media and public relations, and visitor services departments, and some were interpretive guides. I aimed to balance the selected sample, however, due to availability participants more strongly represented corporate communication settings than environmental interpretation or education settings. The
Participants generally knew and respected each other. Visiting the project website for the first time, Participant N noted, “a lot of old… friends will be meeting up in your chat room” and Participant D commented, “I am happy to be included with such a noteworthy bunch!”

As noted in the Researcher’s Perspective section of Chapter 1, I believe all communication activities within Banff National Park connect to the area’s ecological systems and thus I classify all the communication in the area as environmental communication. I did not expect all participants would hold this belief, and some participants’ responses supported this. Of those who responded, participants noted spending anywhere between five and 100 percent of their time communicating about the environment or environmental issues, with 40 percent being the average. Of those working in seemingly similar corporate communications settings, a wide difference existed in their claims of time spent on environmental communication. Participant H reported “the environment and the issues it raises play a major role in my job”, whereas Participant J and Participant C, reported only spending between five to 10 per cent of their time communicating about the environment or environmental issues. I attributed some responses regarding time spent to participants discerning between administrative or management activities and communication activities, however many participants differentiated between communication and environmental communication. Interestingly, Participant N’s comments supported my belief, that all communication within Banff National Park could be considered environmental communication. Participant N claimed, “100% of my time is dedicated to communications, and all those communications are
about the national park and therefore somehow related to environmental issues (even if we're looking at social issues).”

Participants reported visitors to Banff National Park as the main audience of their communications. The group also reported communicating specifically to children, their organization’s staff and volunteers, government officials and decision makers, and other partner organizations. Primary channels for environmental communication included visitor services; interpretative and hands-on experiences for visitors; mentoring interactions; special events and programs; and marketing and media relations efforts, with an emphasis on e-marketing over traditional print materials.

Individual Understandings of Effective Environmental Communication

Although the sample for this research project was not large, participants contributed a broad range of perspectives of what constitutes effective environmental communication. In this section, using a representative illustration and brief summaries, I present participants’ individual understandings of environmental communication. The illustration and summaries show participants’ understandings of effective environmental communication varied, however participants did not generally contradict each other. The summaries provide a base from which to explore changes to understandings of effective environmental communication.

Figure 1 illustrates three participants’ individual understandings of effective environmental communication. Influences on, attributes of, approaches to, and goals of effective environmental communication are represented by the four portions of the trees, the roots and the three main branches. Various sized circles represent the scope with
which a given participant primarily discussed environmental communication. The broad range of participants’ perspectives is apparent.
Figure 1. Differences in individual understandings of effective environmental communication based on statements of three participants, with circles indicating the general scope of participants’ statements.
The following summaries describe participants’ individual understandings of effective environmental communication.

Discussing environmental communication on primarily a local level, Participant L suggested “corporate will” to be an important influence on environmental communication. This participant believed organizations should “actually practice the policies conveyed” and share mandates and practices with other organizations. Participant L thought environmental communication should include consistent, “extensive information” over an extended period of time, in the “least ‘harmful’ way,” and that it should lead to action being taken because it is felt to be “the BEST thing to do.” Participant L described the goal of environmental communication as “saving the planet.”

Describing environmental communication from a global perspective, Participant B suggested “dialogue or… interaction,” and “hands on learning outdoors” are the best way to change attitudes. Participant B felt environmental communication should create “a sense of wow and care at the same time” through fun and evolving stories. Participant B placed importance on putting stories into context, noting “Nothing in nature happens on its own” and that we should create “bridges between ourselves and nature, so we understand that we are part of nature, you can't separate us.”

Participant A argued environmental communication should “speak in a language and scale that can be appreciated by the audience.” Discussing the topic on primarily a local level, this participant suggested that environmental communication should “positively guide visitors” and by doing so change opinions and actions. This participant thought environmental communication should aim at “enhancing visitor experience,”
instilling in visitors an “appreciation of the importance of the integrity of the environment in which they find themselves.”

Participant D shared a global perspective. This participant suggested that environmental communicators should have “good knowledge of the resources nature provides in the immediate area,” in order to build connections for audiences and ensure the “Timely use of teachable moments.” Participant D strongly believed the ability to inspire and educate audiences was influenced by his/her own “desire to make sure people are appropriately connected to Banff National Park.” This participant thought environmental communication should “inspire others to take actions” and increasingly “appreciate environmental issues of universal importance.”

Participant E thought environmental communicators must know where the intersection is “between what [audiences] value and what is crucial about the issue.” Participant E believed that placing “the audience in context,” and using compelling visuals, imagery, and storytelling, would make environmental communication more effective. This participant thought effective environmental communication engages “both our minds, with facts, and our hearts, with feeling.” Exhibiting a global view, Participant E suggested environmental communication should give “people the tools and knowledge to have a healthier relationship with the natural world, as stewards of and participants in that world.”

Discussing environmental communication on a local level, Participant K suggested an organization’s ability to “find and solicit… partners to help share and champion the message” influences environmental communication. Participant K argued environmental communication should help audiences “reflect on their own goals and
objectives” and make “them want to do more or get more involved.” Participant K thought environmental communication should “provide [audiences] with a sense of place,” making them “aware they are in a national park and World Heritage Site and why that is significant.”

Participant G discussed environmental communication on a local level. This participant thought it important to “Bring partners together to create a bigger noise,” have staff “believe… your message… and see it throughout the company,” and “Put your… business in a positive light aligned with a proactive message.” Participant G believed environmental communication was effective when “people see or learn of something that is happening right in their back yard.” This participant thought environmental communication should “Get people to act or change their behavior,” and suggested, “when people act on something it is the true test of whether a communication is successful.”

Describing environmental communication on a regional level, Participant H emphasized that organizations need to include the environment as a “core business value” and “partner with the communities we inhabit to ensure it stays this way for future generations.” Participant H believed the “history behind the region” and an “awareness of our sense of place should be part of environmental messages, and that in this way an organization would be “taking care of the surroundings in which they operate.” Participant H suggested, “Interest expressed in [an organization’s] programs” as grounds to judge the success of an environmental communication program.

Discussing environmental communication on a local level, Participant M suggested environmental communication should present “Facts not opinions,” should
provide “perspective,” and speak to the “relevance” of an issue. Participant M described effective environmental communication as requiring “an element of optimism and creative thinking that moves toward problem solving and avoids a nihilistic approach.” Participant M suggested environmental communication should support learning “about the environmental issues in all aspects of one’s life.”

Speaking about primarily a local level, Participant J suggested environmental communication should include “practicing and communicating… environment-friendly operating procedures,” and inspiring “employees and business partners to adopt similar practices.” Participant J thought “good photos” and “interviews” should be used and the “ecological footprint” of the program should be considered. This participant suggested “talk about the fragility, strength, complexity, and simplicity of the natural world” and “vivid stories that connect us to nature, and inspire us to protect and respect the world around us” would lead to effective and engaging environmental communication.

Viewing environmental communication from a global perspective, Participant F suggested environmental communication should “connect the individual to their environment in ways that are personally meaningful” and should result “in a change in perspective which leads to a change in action.” For Participant F, influences on environmental communication included personal experience, reading, research, and “Repeatedly walking the area where I am to deliver my messages.” Participant F thought “a young child and… an adult mentor” exemplified effective environmental communication. Participant F suggested, “The task is to think of ourselves as within ecosystems... –Stan Rowe.”
Collective Understanding of Effective Environmental Communication

As shown above, I examined participants’ individual understandings of effective environmental communication, however within my data analysis I also approached this group of environmental communicators as belonging to one system, the system of environmental communication within Banff National Park. As participants’ responses were complementary versus contradictory, I was able to combine participants’ individual understandings to develop a rich and vivid collective description of what constitutes effective environmental communication in Banff National Park.

In this section, I present my impression of my participants’ collective understanding of effective environmental communication through an illustration and discussion. Figure 2 illustrates participants’ collective understanding of the influences on, attributes of, approaches to, and goals of effective environmental communication. The number of participants to mention particular features is included. Circles represent the primarily local scope with which participants discussed environmental communication.
**Figure 2.** Participants’ collective understanding of effective environmental communication, with numeric values indicating the number of participants mentioning particular features, and circles indicating a generally local scope.

*Influences on environmental communication.*

Discussing influences on effective environmental communication participants strongly emphasized the importance of understanding “the audience's point of view” (Participant E) and needing to “find connections that will particularly resonate” (Participant F) with audiences. Participant E warned, “Audiences are bombarded with information” and Participant B suggested, audiences “probably aren't as connected to nature as they used to be.” Another major influence on environmental communication
highlighted by participants was involvement of partners. The group acknowledged the significance of soliciting “partners to help share and champion the message” (Participant K). Many believed it to be important to “work with like minded organizations” (Participant H). Many participants supported Participant N’s suggestion that environmental communication must fit with “Organizational priorities” and that it was dependent on “Available resources,” such as staff time, staff talents, and money. Fewer participants emphasized Participant D’s understanding that the personal desire of the communicator influenced environmental communication. Similarly, few participants suggested the idea that the “the local environment” (Participant F) influenced environmental communication.

*Approaches to environmental communication.*

Discussing effective approaches to environmental communication participants emphasized the need to “reach an audience in as many ways as you can” (Participant G). Participant D suggested environmental communicators should maximize reach by communicating “effectively to the average attendee” and Participant F added that messages should be “reinforced in multiple ways over a period of time.” Many participants supported approaching environmental communication with well-researched key messages. Additionally, participants thought it important to “Develop a plan” (Participant H) and draw on “extensive research and immersion into a topic” (Participant D). Many participants supported Participant L who stressed approaching environmental communication by “Walking the talk,” by organizations actually “practicing… environment-friendly operating procedures” (Participant J) and “taking care of the surroundings in which they operate” (Participant H). Many supported approaching
environmental communication with “a local spin” (Participant G) that “provides vivid stories” (Participant J) and “places the audience in context” (Participant E). Fewer participants noted that environmental communication should be approached by taking people outside, so the “thing described, can also be seen, touched, felt; in sum experienced” (Participant F).

*Attributes of environmental communication.*

Participants highlighted numerous attributes of effective environmental communication. Participants thought environmental communication should be informative and provide a “balanced understanding of the facts” (Participant H). Many believed environmental communication should be empowering and provide information in a highly engaging manner. Most participants agreed with Participant D, who noted environmental communication should be based on “supporting evidence,” and Participant J, who thought environmental communication should include “endorsement by recognized authorities.” Participants suggested, while being concise and “simple to understand” (Participant G), environmental communication should include why something is significant and should reach “people at the moment… where the teaching is relevant” (Participant N). Some supported the notion that environmental communication should be empowering, making audiences “want to do more or get more involved” (Participant K).

*Goals of environmental communication.*

Many participants thought environmental communication should “Get people to act or change their behavior in a way that helps the environment” (Participant G) and make “a significant difference to the visitors experience” (Participant K). Participants
thought environmental communication should “spark awareness” (Participant D) and lead to audiences “developing a deeper understanding” (Participant A) that “results in a change in perspective” (Participant F) and has “lasting effectiveness” (Participant B).

Discussing the goals of environmental communication about half of the participants agreed environmental communication should “connect us to nature” (Participant J), so that audiences “understand that we are part of nature, you can't separate us” (Participant B). Participant E suggested effective environmental communication “helps people to understand their place in the environment.” Additionally, some participants felt environmental communication must send a balanced message regarding use and protection of the environment, or “in terms of visitor experience and ecological respect” (Participant M), and should support an organization’s business and brand identity.

Scope and conclusion.

The majority of participants described environmental communication on a local level. Although this may have resulted from the wording of the questions, I thought a noticeable split existed between those who discussed the local, community-level influences and impacts of environmental communication, and those who exhibited a global perspective. Those who chose a wider view described environmental communication as connected to people, organizations, and processes throughout the world.

Although participants agreed on numerous relevant features of effective environmental communication, data analysis also supported that for some environmental communication was hard to define. Participant F suggested, “I have no succinct examples of effective environmental communication to provide. To describe a single example
would require a book…. The environment is never just one thing…. There is no one way, to convey environmental communication, it will always be multi-modal and it has to be reinforced by prolonged personal experience.” Similarly, some participants noted that seemingly dissimilar examples of environmental communication are often still effective given specific contexts. I also think environmental communication is difficult to define, and I recognize that participants’ descriptions were a snapshot of their understandings at this one moment in Stage 1 of the project. Even given the ambiguous nature of environmental communication, I think as participants read and discussed the systems concepts in the project’s later stages, some participants’ understandings of effective environmental communication changed.

Changes to Understandings of Effective Environmental Communication

Once I had established participants’ individual understandings of effective environmental communication and developed a collective description of effective environmental communication in Banff National Park, I looked for evidence that participants’ understandings changed in the later stages of the project.

I used the following analytical constructs to support my analysis of the changes taking place within Stages 2, 3, and 4. If, following the presentation and discussion of systems concepts, participants (a) changed the scope within which they discussed environmental communication; (b) expanded on initial insights of effective environmental communication; (c) contributed new ideas regarding effective environmental communication; and/or (d) applied a systems thinking approach to expand the collective understanding of environmental communication, then, participants’ understanding of effective environmental communication may have changed. These
analytical constructs are reflected in the following section, within which I discuss evidence supporting that interesting and significant changes occurred to participants’ understanding of effective environmental communication, following the presentation and discussion of systems concepts. Figure 3 represents how these changes altered the collective understanding of effective environmental communication.

Figure 3. Changes to participants’ collective understanding of effective environmental communication.

New audiences, more connections, and broadened perspective.

As participants read about and discussed the system concepts presented, the following evidence suggested they envisioned environmental communication within an
expanded context, they more broadly imagined the audience that their environmental communication might reach, they noted additional connections between their organization’s system of environmental communication and other systems, and they looked at environmental communication from a wider perspective.

As the context of environmental communication expanded some participants identified wider audiences. In Stage 1, Participant J primarily described his/her audience as local, consisting of staff and clients. In later stages, Participant J, described audiences of environmental communication as including “visitors, potential visitors, and residents…, regulatory/community… organizations who are Park stakeholders” and “potentially all Canadians and interested international citizens since this is a national park and UNESCO world heritage site.” Participant G originally cited visitors as the audience for environmental communication and later noted the importance of Banff locals as part of the audience, with the suggestion “When people understand about the place they live, they tend to show more respect for it.”

As they contributed to questions about systems concepts participants noted additional connections they saw as occurring between their system and other systems. After focusing his/her contributions on one or two Banff National Park organizations, Participant L later took a wide stance, noting, “every group within the Bow Valley has connections beyond that may influence their environmental behavior and how it is communicated.” Similarly, discussion of systems concepts led Participant E to explain how recognition of different connections changes his/her conception of environmental communication. Participant E shared,
The interactions I have with local, grassroots environmental organizations keep me connected to both tangible issues and the emotional responses that people have to environmental issues. The perspectives of business interests in Banff add balance to these dialogues. The international branches of my work put local concerns in international context.

Participants considered environmental communication from a broader perspective. They weighed the costs and benefits of looking at the big picture in general and in regard to specific messages. Participant K had primarily described environmental communication as occurring locally. In later stages, Participant K commented, “environmental issues that surround our planet and ultimately [Banff National Park] are many and well-documented…. too often we get bogged down in details and forget the bigger picture.” In Stage 1, Participant D had advocated that effective environmental communication meant communicating the bottom line, or key message. In later stages Participant D expanded this idea, suggesting, “Conveying a message of connectedness between smaller topics and bigger themes is essential in educating people.” Participant M had primarily discussed environmental communication from the perspective of the organization he/she represented, however later added, “The broad perspective must always be maintained. The challenge about communicating about the environment is that it is not just about the environment; it is about economics, freedom, politics and emotion.”

Change one system, and other systems respond.

In Stage 1, describing how to approach environmental communication, participants noted the importance of actually practicing the environmental policies conveyed and reducing an organization’s footprint. Some participants noted the benefits
of forming partnerships and working with like-minded organizations. The following evidence supports that in later stages, the discussion of connections between systems and systems changing together led to expansion of some of these ideas. Participants further explored how organizations might affect each other and wider communities, and how organizations with differing strengths might positively impact each other.

Initially, Participant L advocated that effective environmental communication included organizations leading by example. In later stages, Participant L expanded this idea to include understanding of how systems might change each other. Participant L explained, “If our group saw that another had overcome difficulties and made the concept work, it would make it far more feasible that we would even try it.” Participant L cited the example of an organization that visits his/her organization and brings with them the rigorous environmental standards they have developed. In this regard Participant L commented, “one could liken [that organization] to the Clark's nutcracker…. they are opening seeds and planting them in places they might not otherwise grow.” Participant K had discussed how his/her organization tended to work with a few partners, however later expanded this idea. Participant K suggested, “Anytime a program is successful it brings added awareness and buy-in from the community.” Similarly, Participant E explored the idea, commenting, “Because we are a part of the larger community, anything we do influences that larger community,” and added, “Change one system and the others respond I guess!”

Participants further built on their understandings of organizations impacting each other, through discussion regarding wider impacts of environmental communication. In Stage 1, Participant E discussed how his/her organization works with multiple partners.
In later stages Participant E expanded this idea discussing how, not just partner organizations, but various levels of systems impact each other. Participant E shared, “when a colleague from Calgary came to Banff for a recent conference she commented on how impressed she was with the environmental initiatives both in town and at the [organization],” adding, the colleague “then took home those expectations… where she can make decisions as a consumer and be a vocal advocate for better environmental practices.” Initially, Participant D primarily discussed how an environmental communicator impacts his or her audience, however later explored how systems might positively impact each other on a wider scale. Participant D suggested, “As more people design similar programs to meet common needs in more places, it makes for a potentially larger network of common ideas and visions to share and create improvements to your own... program.”

In addition to exploring how partner organizations affect each other and impact the wider community, participants discussed new ideas regarding how partners with differing perspectives might impact each other. Participant K had focused early contributions on like-minded organizations working together. Later Participant K explained how his/her organization contracts organizations with differing expertise because, “their guides are trained storytellers and experts,” and together the organizations can “develop the content and ensure we are conveying the right messages.” Supporting this idea of partnerships and linking it to systems concepts, Participant F explained, “The relationship between myself and my solo business is symbiotic, or if you prefer synergistic. I offer [a partner organization] a perspective that they cannot obtain elsewhere and they offer me their marketing and organizational resources.”
Structures of organizations and the environment itself.

In Stage 1, some participants noted the motivations of an organization might influence environmental communication and a few suggested the local environment itself might influence environmental communication. In later stages, some participants expanded these ideas and others adopted them as new understandings.

Some participants initially suggested an organization’s values, priorities, and resources could impact the effectiveness of an environmental communication program, however Participant E and Participant M did not. In later stages both of these participants explored how the structure of an organization could impact effective environmental communication. Participant E suggested that the system of environmental communication within an organization effects whether that organization “can be very strict about the kind of messages and programs that are launched” or has “more flexibility in the way they approach things.” Recognizing the structure of systems as a potential barrier to effective environmental communication in Banff National Park, Participant M added, “the system is somewhat contrived as the natural flow is controlled by regulations that limit the flow of ideas and communication within the system” and explained, “communication is enhanced greatly by using websites and yet Banff National Park is restricted by Ottawa in terms of website use.”

Participants’ discussion of systems concepts also led to further exploration regarding the local environment as an influence on effective environmental communication. Using systems concepts discussed, Participant D expanded ideas expressed earlier about how the local environment could influence environmental communication. Participant D explained,
…ecological systems give us signs and tell us… if we take the time to listen!…

how [ecological systems are] doing. Over time, we have… as an organization,
become better at listening and really hearing what the landscape, ecology and the
park has to say.

Participant E had not discussed the local environment as an influence on environmental
communication, however in later stages contributed an understanding of this idea.

Participant E suggested,

…because we altered… ecological systems in significant ways, we eventually had
reason to become more aware of that impact and of the ecological system in
which we operate. As a result, Banff is a more environmentally aware community
than the average, and the ecological systems that surround us are some of the
most studied.

Participant E added, “our programs are affected by and impact themselves the ecological
systems within Banff National Park and beyond.”

Applying a systems thinking approach.

In the discussion above I present evidence that some participants’ understandings
of what constitutes effective environmental communication may have changed through
the presentation and discussion of systems concepts, and for most of these participants I
believe considering environmental communication through a systems thinking approach
was novel. For other participants I think a systems thinking approach was very natural.
Although a systems thinking approach may not have been new to this group of
participants, the discussion of systems concepts led them to apply a systems thinking
approach. By applying a systems thinking approach these participants helped to expand
discussions and the collective understanding of the group regarding what constitutes effective environmental communication. Conceivably these participants also altered their own understanding of environmental communication.

In Stage 1, Participant F and Participant B exhibited strong understandings of systems thinking, and in later stages increasingly employed a systems thinking approach. Building on discussions regarding connections between systems of varying scope, Participant F explained, “rather than narrowing the focus to the issue at hand, we expand our view to include the relevant self-reinforcing linkages so we can grasp something of the system whole. A macroscopic, rather than a microscopic view is required.” Expanding his/her earlier suggestion that effective environmental communication should involve stories and demonstration, Participant B later employed a systems thinking approach to suggest that demonstrating “the life of water… in terms of where it comes from, its route from source to tap to sewer and all the different demands/impacts on it - ecologically, socially and the economics of it,” might lead to more conscious use. Participant B added, “If we don't connect our actions back to the whole, no wonder it doesn't make sense to us or our visitors.”

Participant B and Participant E similarly expanded discussions and added to the collective understanding of effective environmental communication through their contributions regarding context. In Stage 1, many participants deemed it important to provide the context of environmental concerns and communicate a sense of place to audiences. In later stages, Participant B applied a systems thinking approach and broadened the idea of context suggesting, “We need to include time in our stories that we've come from a past that thought this, to what we do now for the future.” Expanding
the idea another direction, Participant E suggested that by knowing the context that one’s audience understands, one could more effectively inspire action. Participant E argued, “behavior change requires appealing to what people already value (putting the issue into 'their system', rather than the other way around)” and added, environmental communicators should “focus on information about places, people, and organizations that… [audiences] would already be familiar with and want to know more about.” Participant B supported these ideas stating, “You want to make sure people feel connected to the material, so you need to answer the ‘so whats’ for them. That means making the connections between your stories/messages to why they should care/be interested.”

Subsequent Changes to Participants and their Shared Environment

Having found evidence that changes occurred to participants’ understanding of effective environmental communication following the presentation and discussion of systems concepts, I analyzed the data looking for evidence to support that the changes that took place regarding participants’ understanding of effective environmental communication subsequently led to changes to participants, changes between participants, and changes to the environment participants share - the system of environmental communication in Banff National Park.

I used the following analytical constructs to support my analysis. If, participants; (a) altered how they defined their personal roles; (b) formed new relationships or changed the nature of their relationships with other systems (other participants, their audiences, their partners, and/or ecological systems); and/or (c) contributed ideas regarding how their environment should continue to evolve and be effective in the future; then, there
was evidence to support that changes to participants’ understanding of effective environmental communication, had subsequently changed the overall system of environmental communication in Banff National Park. These analytical constructs are reflected in the following section, within which I discuss evidence that supports changes to participants’ understanding of effective environmental communication subsequently changed participants themselves and the system they were a part of.

**Personal changes, new relationships, common ground.**

The following evidence supported the claim that as discussions around what constitutes effective environmental communication evolved, participants also changed. Participants described their roles and their places within the system of environmental communication in Banff National Park differently, formed new relationships and connections, and established common ground.

As the only participant to indicate that environmental communication was influenced by his/her own personal desires regarding the environment, Participant D continued to explore personal aspects of environmental communication in later stages, commenting, in the role of “interpreter I am the introducer and highlighter,” as a “guide, I am the deep connector.” Other participants, who initially described themselves using their professional titles and duties, began to describe their roles differently as well. Participant H commented, “I am but one part of a system,” Participant A described, “I form one of the links to our partners,” and Participant E suggested, “my work extends out to the rest of the world.” In Stage 1 Participant L discussed his/her professional connection to environmental communication, in a later stage Participant L shared a more personal connection. Participant L shared, “As I became more familiar with…” [the
organization’s] environmental policies and practices… I began to look more carefully at my personal policies and practices. I enhanced my practices in many ways. I talked about them with others and encouraged others to follow suit…. They crept into daily practice for a lot of people. It spreads like ripples in a pond when you drop the first pebble.”

Over the course of the project, participants formed new relationships and connections between themselves, and some participants saw themselves differently within the system of environmental communication in Banff National Park. Commenting on recently meeting a project participant who prior to the project he/she did not know, Participant L noted, “Ran into someone the other day who is participating as well. Small world!!” Participant E commented, “It was great to feel part of an environmental communicators community.” Participant D commented, “Really appreciated reading everyone's responses and relating my own small role in Environmental Education to the bigger picture” and added that it was “Nice to see such a good cross section of our park community represented and essentially connected into the idea of bringing education to others.” Contributing additional feedback commending the project, Participant D shared appreciation of the project’s “general premise of being part of an environmental educational ‘system’ that evolves to meet the needs of the audience and is evolving in order to incorporate more participants.”

As participants’ understandings of environmental communication changed, participants established new common ground. Evidence supported that participants began to more clearly recognize themselves as part of one system. In the later stages of the project, Participant B shared, “I like the comments I'm reading here,” and Participant E enthused, “I agree again with everything that's been said above and… I really liked it! I
am energized by reading everyone's ideas.” Noting the common ideas of fellow participants, Participant D mentioned in an email correspondence, “its interesting seeing tourism people and education oriented people contributing very similar ideas.”

Participant E elaborated on the group establishing common ground, commenting,

I found it really interesting how, at least in some of the questions, a lot of us were on the same page. I was struck by the shared sense of appreciation that we have for Banff National Park. I shouldn't be surprised - we wouldn't be in this line of work if we didn't care about the place - but sometimes there are so many messages from so many different sources that it seems like we are more disparate than we are. But we seemed to have a lot of common ground about messages, even if the contexts in which we work are varied.

*Strength in diversity, celebrating success, working together.*

As participants’ understanding of effective environmental communication changed they began applying these ideas to the delivery of effective environmental communication within Banff National Park. In this way, participants’ own understandings changed and potentially the system of environmental communication in Banff National Park began to change.

As participants became more aware of being part of the same system and they identified multiple connections as existing within this system, they subsequently discussed factors that could maintain and strengthen the system of environmental communication within Banff National Park. Continuing to explore the benefits and challenges of working with partner organizations, Participant K commented, “within the context of environmental communication in [Banff National Park], it can be difficult to
find a common objective…. it usually comes down to a compromise,” but Participant G argued this point. Building on earlier ideas regarding how partners of differing perspectives might impact each other, Participant G suggested,

…organizations in our environment are often at extremes in terms of what they believe, what they communicate and hope to achieve. The diverse opinions… help to maintain a balance that preserves the area we live in. Acting together this way, achieving a balance, is unique property of our system.

Participant E agreed and offered, “The varying points of view in our system are unusual…. Our diversity though, and the fact that we are different from most other places, are strengths here.”

Further showing awareness of being part of one systems and discussing varying scales of systems, Participants developed the idea that celebrating small successes would make the system of environmental communication in Banff National Park more effective. Contemplating various scales of connected systems, Participant L suggested, “effective environmental communications needs to help people to understand that in small, do-able incremental steps, change is possible. Each and every one of us can contribute to the larger whole.” Participant K agreed, and added “Even though most people recognize we have a long way to go, we've also come a long way already. We should celebrate our successes… while always being mindful that there [is] much more to be done.” And, further applying these ideas to the system of environmental communication in Banff National Park, Participant B commented, “we get bogged down on the big issues and the ‘shoulds’ and forget what we are doing now. I don't think we show off enough all the good stuff that we are doing that is different from other communities.”
Expanding on ideas regarding connections between systems, participants discussed strategies about how to effectively work together. Participant J suggested that among communicators in Banff National Park it “would be well worthwhile to refine and align our non-crisis environmental messaging, and to initiate coordinated outreach projects.” Commending this approach, Participant E offered,

…from a systems perspective, I sometimes feel like there are lots of little systems that are only lightly connected but could help each other to become stronger or more effective if they worked together more closely. On the other hand, every time I talk about coordination I also am reminded that it needs to be balanced with independence among partners. Something between ‘command and control’ and ‘isolated islands’ would be great!

Participant L highlighted benefits of environmental communicators working together suggesting, “we can share vision, and share experiences on what works, what doesn't.” Participant E acknowledged the “value of bringing environmental communicators together to keep the lines of communication flowing” and added, “I think this is a great idea - green drinks for environmental communicators specifically might be fun!”

Finding opportunities and direction through understanding systems.

As participants’ understandings of effective environmental communication changed they subsequently identified additional opportunities within the system of environmental communication in Banff National Park. They specified features of environmental communication they now saw as fundamental to the system.

Based on an expanded notion of environmental communication in Banff National Park as a system, Participant A made new connections and identified new opportunities.
Participant A suggested, “We are beginning to understand the affect our individual actions have on the planet and this is because of a realization of ‘systems’,” and added, “The mountain parks are a great place to make people aware of this. We have glaciers sending water, via delicate eco systems, across the continent to three oceans.” Similarly identifying opportunities through a systems thinking approach, Participant B suggested, “when we are communicating about Banff National Park, we have the opportunity to connect to very park-specific issues, to the issues that everyone on the planet is effected by - e.g. clean and adequate fresh water.” Participant F noted, “Our problems happen when we conceive of nature as other…. We need to move past seeing a river or water as other,” and highlighted the opportunity of getting out onto the river, with the suggestion, “The river itself can speak to them vastly more eloquently than any words or marketing campaign.”

For some participants, changes to their understanding of effective environmental communication further clarified elements essential to the system of environmental communication in Banff National Park. Participant E shared that within Banff National Park “effective behavior change has to be grounded in the realities of what people value now. Not what we hope they'll value more in the future.” Participant E continued, “it is essential to maintain a balance between ‘meeting the visitor where they're at’ - geographically and in terms of what they value and find interesting…. This conversation has really crystallized for me the importance of doing both.” Providing final thoughts about the system of environmental communication in Banff National Park, Participant L argued, it must be participatory and “communicate so that the reader/listener feels as if they are making an important contribution to the whole. That ‘together’ the desired goal
will be reached.” Supporting these ideas, Participant B offered, environmental communication “needs to consider the whole and our connections, where we fit in as a part of it. It must be… inclusive - we are all in this together…. and together we are creating a future - whether intentionally or not.” Participant B added, environmental communication “needs to be integrated into what we generally communicate to our visitors, community and each other…. part of our story.”

Additional Analysis

Through data analysis of the texts I found additional results of interest in regards to my main research question. In this section I discuss how the freedom with which participants contributed previous systems understandings differed, and I comment on the uncertainty with which some participants identified connections between ecological systems and social systems. Additionally, I discuss evidence indicating that some participants’ understanding of environmental communication did not change.

Sharing additional beliefs about systems thinking.

Through my data analysis I found that some participants, whom I was aware had a strong understanding of systems concepts, did not necessarily voice these concepts within their initial descriptions of environmental communication. Given that participants were aware that the aim of the project was to explore how ecological systems and a systems thinking approach might inform the social system of environmental communication, it was interesting that prior understanding of systems was not necessarily apparent.

In Stage 1, Participant G shared a view of environmental communication that focused on how local environmental communication efforts supported by partnerships,
could lead to action and behavior change and benefit one’s organization. In later stages, Participant G describes the environment of his/her organization as including,

> Our employees, our vehicles, our footprint. Our customers. The roads we drive on, the trails we hike on, the animals we hope to see. The forests, mountains, streams and rivers we take photos of…. The inter relationships we have amongst organizations in our environment.

Based on my knowledge of Participant G, this was not new thinking, but this view was not apparent in Stage 1. Similarly, Participant L initially took a pragmatic approach to exploring environmental communication, however in later stages shared clear understanding of and belief in a systems thinking approach, including awareness of how ecological systems could help to explain social systems. Participant L shared, that in conducting an interview some years prior, the interviewee spoke “about the interconnectedness of everything from the bark on a Douglas Fir to the reasons that some coniferous shrubs actually make themselves more prone to become fuel for fires.” Participant L noted that the way the interviewee “described these systems also helped [him/her] to understand similar synergies in business and economics.”

> Uncertainty connecting ecological systems and social systems.

Analysis of the texts also drew my attention to particular questions to which some participants did not contribute. The questions (A3, B3, and C3 in Appendix D) aimed to explore how participants saw the systems of environmental communication that they were a part of as related to, connected with, and changing together with ecological systems. The questions were complex. However, I had shared with participants that the project would explore how ecological systems might help us to understand the social
systems of environmental communication. Also, the questions followed directly after written passages describing systems and environments, using examples of the ecological system of whitebark pine (Appendix D).

Participant responses to the questions included, “I don't think that this is applicable to our operations,” “I'm not sure I'm clear on the question,” and “Not sure about this one!” Another participant showed awareness of a broader environment, excluding ecological systems. That participant stated, “Who and what belongs... everyone has a vested interest in this environment. You have the environmental bodies, citizens-at-large and business.” I found it interesting that these participants did not necessarily make a connection between their organization’s systems of environmental communication and the ecological systems surrounding them, where other participants saw the connection immediately. One of those participants explained, “Banff National Park is connected to a variety of ecological systems, on different scales from the small, unique ecosystems… to regional ones… to larger… to planet Earth!”

Evidence supporting lack of change.

Through my data analysis I also found evidence suggesting that in some cases participants’ understanding of effective environmental communication did not change. In later stages of the project, one or two participants simply restated features of effective environmental communication that they had mentioned in Stage 1, despite questions specifically inquiring about how systems, connections between systems, and systems changing together may be linked to environmental communication. Additionally one or two participants employed terms and phrases typical of a systems thinking approach, however their contributions included contradictory or inconsistent suggestions implying
that they had no prior understanding of the terms, nor had learned them through participation in this project.

Assessing whether change has truly occurred to participants’ understandings is difficult. Participants’ contributions were constrained and directed by the specific questions asked, the time limits of the project, and the limited interactions within the web-based format. Thus, participants’ contributions are those that participants chose or were able to share within the time and setting of the project. Participants’ contributions are a snapshot of their understanding, and the data analysis is my interpretation of that snapshot. Similarly, on the most basic level presenting, discussing, and questioning participants regarding systems concepts, as done within Stages 2, 3, and 4 of this research project, will lead to discussion of systems concepts and imply increased understanding, but may or may not indicate meaningful or lasting change to participants’ understanding. Given the short term of the project, my limited amount of interaction with participants, and an inability to reassess change after an extended period of time, it is not possible to definitively conclude whether lasting change has occurred to the participants, their programs, and the environment they are a part of.

**Summary of Project Results and Conclusions**

Overall the project successfully fulfilled the objective of responding to the research questions stated within the Questions to Explore section of Chapter 1. Participants interacted as much or as little as they wished with the material and each other, thus, within the limitations of the system, participants freely constructed their own experiences throughout the project. The evidence supports the claim that when selected systems concepts were presented to a group of environmental communicators, using
examples of the dynamic and viable nature of living systems, communicators’ perception of effective environmental communication changed, and subsequently the system of which the environmental communicators were a part changed. In this section I summarize and present conclusions regarding the project results.

Through the project I successfully obtained participants’ individual qualitative descriptions of effective environmental communication. I combined the individual descriptions of effective environmental communication, which represented a broad range of perspectives, to generate a rich collective description of what constitutes effective environmental communication within the system of environmental communication in Banff National Park. The collective description includes evidence that participants’ believed that knowing one’s audience and having like-minded organizations to partner with, significantly influences environmental communication. Participants suggested environmental communication should reach as many people as possible, through engaging stories that put environmental issues into context and through organizations setting examples of best practices. Participants stressed that environmental communication should be informative, meaningful, and empowering. The collective description includes evidence of the understanding that environmental communication should connect people with nature so that they see themselves as part of nature. Participants supported the view that environmental communication should inspire action, increase knowledge, enhance visitor experience, and strengthen environmental awareness.

Through the project I presented written passages illustrating selected systems concepts to participants. Guided by project questions, participants individually and
through discussion with other participants, explored how the system concepts might relate to environmental communication. Through qualitative content analysis, I compared participants’ collective description of environmental communication to participants’ contributions and interactions from the last three stages of the project. Evidence supporting a claim that participants’ understanding of environmental communication changed, included (a) apparent changes to the scope within which they discussed environmental communication, (b) evidence showing that participants expanded initial ideas and contributed new ideas, and (c) evidence indicating some participants applied the systems concepts presented.

During Stage 1 participants primarily considered their audience as visitors and discussed environmental communication on a local level. In Stages 2, 3, and 4 of the project participants referenced multiple groups as their audiences, and discussed environmental communication on a global scale. Initially participants primarily considered connections between their own or a small number of Banff National Park organizations, later they considered the impact of and influence on a broad number of organizations and other groups, expanding their initial ideas regarding partner organizations. In Stages 2, 3, and 4, participants contributed and explored new ideas, including how the structure of an organization might affect environmental communication, and how the local environment could be seen as connected to and having an influence on environmental communication. Additionally, in the later stages of the project participants increasingly applied the systems concepts presented. The evidence supports a claim that by applying systems concepts some participants expanded their understanding of context, highlighting the importance of the context that is part of the
audience’s systems, and including elements such as time within the context of environmental communication.

Qualitative content analysis also led to confirmation that as participants’ understanding of effective environmental communication changed, changes also occurred to the participants, to the relationships between participants and other systems, and to the environment of participants. Evidence supporting this subsequent change to the system of environmental communication of which the communicators were a part, included (a) changes in the way participants discussed their roles, (b) changes to the nature of their relationships with other systems, and (c) changes to participants’ views of how the system of environmental communication in Banff National Park should progress.

Where within Stage 1, participants had primarily discussed environmental communication in relation to their professional position or their organization, in Stages 2, 3, and 4, participants shared more personal connections regarding communicating about the environment and environmental issues. The evidence supports a view that in later stages participants had a heightened awareness of being part of a common system. With this awareness came greater recognition of connections to other participants, other organizations, and a wide range of other systems. Where in Stage 1 participants primarily discussed their individual roles in relation to the system of environmental communication in Banff National Park, in later stages participants noted the importance of sharing practices, ideas, and visions among environmental communicators. In later stages the idea of working with like-minded partners shifted to include the idea that the diversity of partners could help to preserve the system. Evidence also supported the position that as participants changed their understanding of effective environmental communication, they
began verbally to recreate the system of environmental communication in Banff National Park. Participants advocated a position that the system should be participatory and focus on the good it does. Evidence supports a claim that participants recognized that systems apparent within Banff National Park could provide rich opportunities for effective environmental communication.

Through additional analysis I found evidence to support a view that environmental communicators who were already well versed in systems theory might not freely share or apply their beliefs to areas such as environmental communication. Evidence also supports a position that a wide gap may exist among environmental communicators who approach environmental communication with the understanding that ecological systems and social systems belong ultimately to one system, and those who may not automatically connect environmental issues to ecological systems. Evidence was also found to support a claim that some participants’ understanding of environmental communication did not change. However, I acknowledge that lasting change in the understandings of others is difficult to definitively confirm.

Thus, considering all data generated and the limited time frame of this research project, the evidence supports a claim that when selected systems concepts were presented to a group of environmental communicators, using examples of the dynamic and viable nature of living systems, communicators’ perception of effective environmental communication changed, and subsequently the system of environmental communication of which the communicators were a part also changed.
Project Specific Recommendations

I believe that within its limited scope the evidence developed through this research project justifies a view that the project was successful in meeting its goals. However, project design improvements could benefit similar projects. I believe the following design changes would facilitate greater participant interaction, increased likelihood to observe lasting change, and enhanced potential for participants to freely construct their experience.

Designed differently the project may have created greater interaction and discussion among participants, and thus may have led to additional change in participants’ understanding of effective environmental communication. Face-to-face focus groups or similar interactive experiences could have inspired more enthusiastic participation. Brown’s work with The World Cafe (The World Café, 2009, para. 1-4) demonstrates the benefits of fostering collaborative learning through face-to-face conversations and constructive dialogue. Greater and more intimate exposure to fellow participants’ views would have increased the amount and the intensity of participants’ experiences, and potentially fostered the construction of new understandings. Similarly, based on the results of this project I recommend that a similar web-based project, should consider the implementation of design changes including the use of standard forums versus question and answer forums and possibly the use of live chats. These changes might enhance participant interaction and lead to more dynamic results.

I also recommend changes to the timing and duration of the project. The project could include follow-up interviews with participants conducted after an extended period of time. This follow-up would enable assessment of the lasting impact of the project on
participants’ understanding of effective environmental communication, on their environmental communication programs, and, possibly clarify effects on the system of environmental communication of which they are a part. The addition of follow-up with participants might also increase researchers’ ability to definitively attribute changes observed to project interventions. Additional refinement and reduction of the number of project questions might enable more in-depth discussions while reducing the time required for participation.

The results also suggest that changes to project design could create an environment in which participants respond to questions and discussion more freely. The results of this study suggest that participants’ tendency to answer questions on behalf of their organizations may have restricted their responses and influenced project outcomes. In an email communication Participant M commented, “I am finding that the questions are much more related to the environment than allow me to make an appropriate response from [my organization’s] position… hence the small number of responses.” I believe the project could have benefited from ensuring participants were aware questions could be answered from a personal, professional, or organizational perspective. For instance, encouraging participants to more freely describe themselves as an environmental communicator rather than describing the type of work that they do (as in Appendix C, question 1), may have led to a wider variety of insights.
Chapter 5 – Evolution of a Researcher

I am a small part of a vast system. The system continues to change and I am part of that change. In this section, as a summary and conclusion, I will discuss how my understandings have changed through this research project, and what I believe to be the significance of changes seen throughout the project. Additionally, I will suggest areas where I believe further research would be valuable.

My Place in the System

I began this research project with a great interest in exploring how an understanding of systems concepts might increase our understanding of effective environmental communication. Considering the current state of the environment (United Nations Environment Programme, 2002, p. 1) and understanding environmental communication as both pragmatic and constitutive (Cox, 2006, p. 12), I believed that learning how to more effectively communicate about the environment and environmental issues to be of great significance. I was interested in whether environmental communicators saw themselves as existing within a web of life (Capra, 1996, p. 34) containing ecological and social systems. I wanted to learn about the relationships and connections that environmental communicators saw as essential to environmental communication. I wondered whether environmental communicators saw systems of environmental communication as static and isolated, or as dynamic and as having multiple influences and far reaching impacts that could loop back and transform the systems themselves. I wanted to learn what constituted effective environmental communication in the system of environmental communication in Banff National Park,
and I was eager to see how discussion of systems concepts might cause this understanding and the system itself to change.

This research project enabled me to invite a group of environmental communicators from Banff National Park to experience a system that I created, a web-based system consisting of information, questions, and forums. I considered the system to be a form of environmental communication. I thought of myself as part of the system and envisioned it connected to other systems. Upon sending the invitation I immediately affected the systems of these environmental communicators, and as individuals and as a group we began to change together. Individually these environmental communicators were free to determine and construct their own experiences within the system I had created. All choose for themselves how much or how little, how enthusiastically or thoughtfully, they would interact with the system.

Similar to my participants, I determined and constructed my own experience as I interacted with participants, read and analyzed their contributions, and developed conclusions. I concluded that many participants’ understandings of effective environmental communication changed throughout the project. I determined participants changed the scope with which they discussed environmental communication, expanded initial ideas and contributed new ideas, and applied the systems concepts presented. Subsequent to their understanding of environmental communication changing, I determined participants changed the way they discussed their personal roles, the nature of their relationships with other systems, and their views of how the system of environmental communication in Banff National Park should progress. Although the
evidence supported my conclusions, I constructed my own meanings, thus others do not necessarily share them.

As I interacted with the system, I also changed. My understanding of looping processes such as feedback changed, I further realized the significance of collective action and systems changing together, and I confirmed my belief that ecological systems can provide insight into our understandings of social systems.

*Expanding Understanding of Feedback*

Through the project I found evidence that among these environmental communicators there was not a strong awareness of looping processes such as feedback, and that these processes are difficult to envision. However, project results suggested that participants’ awareness of being part of a system with multiple connections increased, and with this, I clarified and expanded my understanding of looping processes such as feedback. I consider this to be significant because I believe environmental communicators that see themselves as part of a system and who recognize the influences on and impacts of that system, might be better able to affect change.

As discussed in the Relevance of Feedback and Structural Coupling section of Chapter 2, prior to the project I recognized looping processes such as feedback as essential to the growth and change of environmental communication programs and messages. I believed that understanding how loops of input and output were active within systems was essential to recognizing ways to affect change. The results gathered from Stage 1 of this project suggested that this group of environmental communicators did not necessarily recognize or place emphasis on looping processes such as feedback. Participants emphasized that one’s audience strongly influences environmental
communication, but they did not discuss how environmental communicators could come to know their audiences, and only touched on the basic idea that feedback should be gathered from audiences. Additionally, only a few participants emphasized other influences of environmental communication, such as the diverse opinions of partners, an environmental communicator’s own personal interests, and the influence of the local environment. These results concerned me, as they confirmed my past experiences that environmental communicators tend to concentrate their efforts on the output of program or message, without fully considering processes such as feedback that could inform or improve the communication system.

The results also heightened my awareness that concepts such as loops in systems and processes of feedback are difficult to conceptualize. An exception to the general results and understanding of the group, Participant F shared “Thinking systemically means understanding the complete loop of causality. This understanding mostly exceeds the capacity of individual human minds.” Although I believe many people can understand looping processes such as feedback, this project has increased my awareness of the difficulty of sharing this concept. Interesting as well were results showing that of those participants who I believed understood systems prior to the project, few freely shared this knowledge or catered their understandings to help other participants understand systems concepts. I had thought contributions from those with prior understanding of a systems thinking approach would strongly supplement the information I was providing regarding systems concepts. The results show that this did not occur in a significant way. I see this as a breakdown of information flow between environmental communicators.
Still, given the complexity of the systems concepts presented, results of the project showed that, through discussion of systems concepts in Stages 2, 3, and 4, participants increased their awareness of being part of a larger system, recognized connections to a wider range of organizations, and placed increased emphasis on sharing practices, ideas, and vision between environmental communicators. Further, through reading and analyzing the participant discussions, my understanding of looping processes such as feedback became clearer and broader than prior to the project. I now more clearly see that input from a wide range of organizations, with common or diverse policies and missions, can trigger change in a system of environmental communication. I now place greater value in the idea that environmental communicators should understand the opinions and involvement of partners, as a process of constant adjustment to their system of environmental communication.

Thus, I consider results of the project to be significant because I see them as linked to how environmental communicators might be better able to affect change. The results support a position that these environmental communicators did not necessarily recognize looping processes such as feedback, but through the discussion of systems concepts they more fully realized that they were part of a larger system and more clearly saw the multitude of connections inherent in that system. Some participants more clearly understood that more effective environmental communication could stem from sharing information between partners. By more broadly envisioning the loops of input and output active within and between systems, I increased my awareness of how the opinions and involvement of partners could change whole systems of environmental communication. Discussing how changing information flows can leverage systems, Meadows (1999)
advocates the benefit of, “delivering information to a place where it wasn't going before and therefore causing people to behave differently” (p. 13). Meadows adds, “Missing feedback is one of the most common causes of system malfunction” (p. 13). I believe that by recognizing greater connections and placing more value in the sharing of information, environmental communicators, including myself, come closer to understanding the importance of the looping processes inherent in systems, such as feedback. By further understanding the flow of input and output inherent in systems, environmental communicators can better understand the influences on and the effects of their programs, and will be better able to understand and provide information about the environmental processes and issues in our world.

*Realizing the Significance of Collective Action*

The results of the project indicated that through the discussion of systems concepts participants found more common ground and an increased sense of being part of a community of environmental communicators. Participants’ reactions increased my understanding of how systems concepts relate not just to the actions of individuals or organizations, but also to collective action. I believe this is significant because to achieve environmental change environmental communicators must understand how individual organisms or organizations trigger change, as well as how communities can enact change collaboratively.

Prior to the project, I anticipated that competition between organizations in Banff National Park might affect how participants would respond to questions regarding systems changing together. Although in Stage 1 some participants expressed concerns that environmental programs must support an organization’s brand identity and lead to
increased business, the discussion of systems concepts largely led to conversations supporting partnerships and collaboration between organizations. Participants shared their surprise in having many common understandings and values, and they recognized how both common and diverse interests were assets that could maintain the system of environmental communication in Banff National Park. Even given participants’ diverse interests, the project results support the notion that through the discussion of systems concepts participants saw themselves increasingly as part of a community of practice.

Prior to this project I recognized systems as changing together, however, I did not strongly link this to a sense of community and collaborative action. As I observed participant interactions, I noticed that participants interacting in lively discussions generated new ideas and identified commonalities, where individual contributions not linked to conversations tended to be lost. Prior to the project I understood environmental communication as mediating our environmental awareness, understanding, and action (Cox, 2007, p. 12), however I had not thoroughly considered how the collaborative conversations of groups of people might be considerably more powerful than conversations between individuals. I now further see how the active interactions of community members might more effectively bring forth environmental change.

I think it is significant that through the discussion of systems concepts participants apparently found an increased sense of community, and that it was through discussions between groups that the most change took place. Capra (2008) suggests, “…nature sustains life by creating and nurturing communities. No individual organism can exist in isolation…. Sustainability, then, is not an individual property but a property of an entire web of relationships. It always involves a whole community” (Ecological literacy section,
I believe that through a systems thinking approach, environmental communicators can increase the value placed on maintaining communities and increase recognition of the power of collective action. If this occurs then environmental communicators may be able to more effectively affect environmental change.

_Strengthened Commitment to Using Ecosystems to Inform Social Systems_

The project results showed that many environmental communicators placed value in increasing our connection to nature, so that we can more clearly realize we are all part of one system. The results also raised my concern regarding those environmental communicators who do not readily or normally tie environmental concerns to ecological systems. However, the results of this project suggest that for some of those who did not consider connection to nature to be a significant goal, discussion of systems concepts increased their understanding of connections between ecological systems and social systems. I think this is significant because environmental communicators need to increase their ability to connect people to nature, and project results support doing this through the discussion of system concepts.

I found energizing the number of participants who shared their connection specifically to the environment of Banff National Park and more broadly to all ecological systems. Capra (2008) suggests, “A sustainable human community interacts with other communities – human and nonhuman – in ways that enable them to live and develop according to their nature” (Ecological literacy section, para. 5). Almost all participants contributed some form of environmental concern and many clearly communicated their understanding of the interdependence of ecological systems and social systems. Many participants shared their desire that environmental communication would increase our
connection to nature, helping people “to care about the environment as an extension of ourselves, rather than a 'special interest' or an external object” (Participant E).

The project results also raised my concern because they indicated a gap between environmental communicators who saw ecological and social systems as one system, and those who did not freely tie environmental communication to ecological systems. Some participants recognized organizations as changing and evolving together, but did not immediately recognize how organizations might change together with ecological systems. The idea that people are disconnected from nature is well documented, from calls “to see the needs of the planet and the person as a continuum” (Roszak, 1992, para. 6), to the current push to reconnect children with nature (Louv, 2009, para. 1). Although based on a small sample and thus difficult to generalize, the results of this project support a hypothesis, subject to further investigation, that environmental communicators may not freely connect social systems and ecological systems.

The project results confirmed my commitment to using examples of the dynamic and viable nature of ecological systems to increase understanding of social systems. Through discussion of systems concepts some participants recognized new connections between ecological systems and social systems, and some expanded their understanding of the local environment as an influence on environmental communication. I believe this is significant because I see an understanding that people and nature are part of the same system as essential to increasing awareness, understanding, and action regarding the environment. Discussing the ecologically sustainable development of communities, Marten (2001) states that ecological and community education is vital, describing it as “the ability to think strategically about local ecosystems in terms of the whole system and
connections among its parts – including connections between social systems and ecosystems” (p. 177). I see connection between environmental communicators in Banff National Park and the natural systems that they are part of as essential to the future progression of their system of environmental communication.

**Further Interests and Exploration**

As this research project comes to a close I recognize that my understandings of a systems thinking approach and of what constitutes effective environmental communication have changed. I believe I have expanded my understanding of processes that are inherent in systems, such as feedback and structural coupling. My interest in the relationship between collective action and both a systems thinking approach and effective environmental communication has grown. I am increasingly interested to explore how an understanding of ecological systems can inform our understanding of social systems, and build our connection to nature. Although a systems thinking approach is complex, this project has shown that discussion of systems concepts can lead to changes in understandings of effective environmental communication and subsequent changes to systems of environmental communication. Thus, I think the following areas for further research are of considerable interest and importance.

1. There is a need for further exploration into what audiences of environmental communication understand about systems. Project results support that environmental communication is more effective when it fits into the system of understanding of the audience. Meadows (2001) advocates “Before you disturb the system in any way, watch how it behaves” (Get the beat section, para. 1). Learning what audiences know about
systems will enable environmental communicators to more effectively use a systems thinking approach to increase environmental awareness, understanding, and action.

2. There is also a need for research that shares ideas about the looping processes inherent in systems. As discussed in the Project Conduct section of Chapter 3, within Stage 2 of the project I planned to more literally present the process of feedback as a systems concept to participants. I remain interested in how much environmental communicators understand about looping processes such as feedback, how to best share knowledge about these processes, and how further understanding of these processes can lead to more effective environmental communication.

3. There should be further inquiry into how systems concepts support or complement actions aimed at increasing collaborative action. Through this project I found that a systems thinking approach could promote collaborative action and a sense of community. I believe exploring how the discussion of systems concepts can support the formation and interests of collaborative groups and communities would be valuable.

4. There is a need to investigate how to best communicate a systems thinking approach. The project results suggest that a systems thinking approach can be difficult to communicate to others. I recommend efforts aimed at making systems theory more accessible and understandable. Those with a strong understanding of a systems thinking approach should be encouraged to look for the best ways to mentor others.

5. There should be on-going inquiry into how communication virtually brings forth our world. The results of this project strongly suggest that talking about things brings things to be. The results also support the examination of a claim that environmental communicators could benefit from talking more about environmental
communication. I believe that in order to bring forth a world with greater awareness, understanding, and action regarding the environment it is essential to include the environment in all of our communication.

6. There is a need for further exploration of how a systems thinking approach might inform additional groups of environmental communicators regarding what constitutes effective environmental communication. The project results suggest that sharing a systems thinking approach may change what additional environmental communicators understand to be effective environmental communication, and may bring forth changes within additional systems of environmental communication. As discussed in the Project Specific Recommendations section of Chapter 4, the project could benefit from design changes facilitating additional participant interaction and measuring lasting change. However, I believe projects similar to this one could provide valuable additional insight into a systems thinking approach and environmental communication.

My Concluding Thoughts

As a small act of environmental communication this research project has been both pragmatic and constitutive. A practical description of effective environmental communication was established and, in a broader way, understandings of effective environmental communication were changed. New connections between systems were identified and in some cases created. Change within the system of environmental communication in Banff National Park was discussed and potentially triggered. By triggering change within this system of environmental communication, the project had the capability to change the participants involved, the systems of which they are a part, and the ways they and the systems might react to future triggers of change. Although the
changes to individuals were unique, for all participants the project likely changed in some way the manner in which they will react to future disturbances. I believe these changes will play a small part in determining future changes that occur within the system of environmental communication in Banff National Park.

Through this project, I confirmed my understanding that because we are part of the environment, all acts of communication alter the environment and are connected to the environment. Participant F argued, “Whatever environmental communication is it does not fit within the bounds of any bureaucracy, that has yet existed. If environmental communication is to have any value, it will have to escape the bounds of little boxes, and even big books.” I agree with these comments. I feel that environmental communication is not static; it is in everything we say and all our actions. However, I strongly advocate that there is value in gathering environmental communicators together to further describe, define, and understand environmental communication. I see value in trying to fit environmental communication into a variety of boxes, as by doing so I feel we will further learn about environmental communication, about ourselves, and about the environment of which we are a part. I am motivated to find a way to continue the discussions initiated by this project. I hope that the relationships that personally and professionally grew out of this research project will continue and become richer.

This research project triggered changes within me. The contributions of every participant contributed to these changes and these changes will be significant in determining how I move forward. One thing I have become quite certain of is that looking to the ecological systems that we are a part of to increase our understanding of other systems is the place to start. Carbaugh (2007) shares,
We must not forget that our verbal imbrications are in some sense secondary translations of other natural systems of expression, from rocks and rapids to ravens. And we must become better attuned to those other expressive systems, to what each is saying to us, in its own way, and then we might learn to speak better, in our own words, on its behalf, as a result of this process. (p. 68)
References


Appendices

Appendix A: Letter of Invitation

Exploring Environmental Communication Informed by Systems Thinking
March 31, 2009
Letter of Invitation

Does your work involve communication that shapes people’s awareness, understanding, and actions regarding the environment? Are you interested in the dynamic and enduring nature of ecological systems in Banff National Park? Would you like to be a part of a collaborative discussion regarding effective environmental communication within Banff National Park? If so, I would like to invite you to be part of an exciting research project.

The objective of the project is to gather your insights regarding perceptions of effective environmental communication. For the purpose of this project you and a small group of your fellow environmental communicators in Banff National Park will be presented with material illustrating the dynamic and enduring nature of ecological systems, which will be used to introduce selected systems concepts. Open-ended questions and discussion will be used to explore the applicability of these concepts to environmental communication, and you will work collaboratively to create a description of effective environmental communication.

This project seeks to generate ideas and insight into what comprises effective environmental communication; it does not intend to prescribe particular methods or judge the validity of current practices. Honesty, open-mindedness, and critical thinking are deeply valued and greatly appreciated. The results of this project are intended to contribute to the growth of the field of environmental communication, which I feel plays a pivotal role in creating a world where there exists greater environmental awareness, understanding, and action.

You have been chosen as a potential participant because of your geographic location in Banff National Park, professional experience in the field of communication (whether in an office or on the trail), and the likelihood that your work requires you to communicate about the natural environment and environmental issues. Individuals participating in this project will include your peers. Participants will be recruited regardless of their organization’s specific stance on environmental issues.

All interaction for the project will take place and be recorded within a web-based questionnaire and discussion system. Beginning approximately April 12, 2009, the project will consist of four stages. The first three stages will take place over three consecutive weeks, and over that time will require one or two hours of your time per week. The concluding stage, three weeks after the end of the third stage, will require one additional hour of your time.

Given the collaborative nature of this project, you will know who the other participants are. Therefore, your contributions will not be confidential within the context of this project. Following the conclusion of the project you will be encouraged to share ideas stemming from the project, but will be asked to maintain the anonymity of all the other participants involved, and to refrain from attributing ideas or discussions to particular individuals unless someone specifically requests an acknowledgement.
You are not obliged to participate in this project and if you choose not to participate your choice will remain confidential. If you do choose to participate in this project, you are free to withdraw at any time without prejudice. If you choose to withdraw you will be immediately removed from participation within the web-based system and any input you have provided will be maintained in confidence or deleted if you prefer.

This project is part of the requirement for my Masters of Arts degree in Environmental Education and Communication, at Royal Roads University. As part of this project I will be compiling a thesis report in which I may use your responses, in summarized or verbatim form. Within my thesis participants will remain strictly anonymous and you will be referred to only by pseudonym. Prior to submitting my thesis to Royal Roads University, you will be given the opportunity to review my analysis and conclusions. My final thesis will be submitted to Royal Roads University and a copy of it will be published. A copy will be housed at Royal Roads University, available online through UMI/Proquest and the Theses Canada portal, and will be publicly accessible. Access and distribution will be unrestricted.

Please feel free to contact me at any time should you have additional questions regarding the project and its outcomes. I can be contacted by email at [email address]. My credentials with Royal Roads University can be confirmed by contacting Dr. Rick Kool, Program Head Environmental Education and Communication, by email at [email address].

If you would like to participate in this research project please respond to this email before April 9, 2009. Within the body of the response email please provide me with your:

Name:
Preferred email address:
Daytime telephone number:

If you know of any other individuals in Banff National Park who fit the criteria of this project and who you feel may be interested in being involved, please provide me with their:

Name:
Email address:

Sincerely,
Pamela Challoner
Appendix B: Participant Consent Form

Participant Consent Form

As discussed in the Letter of Invitation for this research project, I am carrying out this project as part of the requirements for the degree of Masters of Arts in Environmental Education and Communication at Royal Roads University. Neither this project nor I are affiliated with any other organization. If required my credentials can be confirmed by contacting Dr. Rick Kool, Program Head Environmental Education and Communication, Royal Roads University, by email at [email address].

The following statement constitutes an agreement between you and I indicating your willingness to participate in this project, the objective of which is to gather insight regarding perceptions of effective environmental communication. For the purpose of this project you will be presented with material illustrating the dynamic and enduring nature of ecological systems, which will introduce selected systems concepts. Through open-ended questions and discussion on this web-based system you will be invited to explore the applicability of these concepts to environmental communication. Based on this, and together with other project participants, you will be asked to collaboratively describe what you understand to be effective environmental communication.

This project seeks to generate ideas and insight; it does not intend to prescribe particular methods or judge the validity of current practices. Honesty, open-mindedness, and critical thinking are deeply valued and greatly appreciated. Please be aware that the research intends to inspire positive collaboration between participants, however there is a possibility that you may disagree. Should you find someone’s opinions to be different than yours, courtesy and respect will be expected.

The project consists of four stages. The first three stages will take place over the next three weeks, and over that period will require one or two hours of your time per week. The concluding stage, three weeks after the end of the third stage, will require one additional hour of your time.

Given the collaborative nature of this project, you will know who the other participants are. Therefore, your contributions will not be confidential within the context of this project. Following the conclusion of the project you will be encouraged to share ideas stemming from the project, but will be asked to maintain the anonymity of the other participants involved and to refrain from attributing ideas or discussions to particular individuals, unless someone specifically requests acknowledgment.

Throughout the project your responses will be recorded electronically through this web-based system. As sole administrator of the system I will indefinitely retain access to the raw data generated. Any raw data that I copy from the system will be stored solely on my hard drive and backup systems, which are password protected and not linked to any networks.

As part of this project I will be writing a thesis report in which your responses may be included, in summarized or verbatim form. Within my thesis your identity will remain strictly anonymous and you will be referred to only by pseudonym. In preparing my thesis the raw data may be discussed with my Thesis Supervisor and with the Program Head at Royal Roads University, but personal participant information and raw data files will not be copied or shared with these individuals. Prior to submitting my thesis to Royal Roads University, you will be given the opportunity to review my
analysis and conclusions. My final thesis will be submitted to Royal Roads University. A copy will be housed at Royal Roads University, available online through UMI/Proquest and the Theses Canada portal, and will thus be publicly accessible.

You are not obliged to participate in this project. If you choose not to participate your choice will remain confidential. If you choose to participate in this project, you are free to withdraw at any time without prejudice. If you choose to withdraw, you will be immediately removed from participation within this web-based system and any input you have provided will be maintained in confidence or deleted if you prefer. To withdraw at any point during the project, please contact me by email.

If you wish to obtain any additional information about this project prior to proceeding, or if at any time you have additional questions regarding the project and its outcomes, please contact me at [email address].

By selecting the first button below and proceeding with this research project, you are giving your free and informed consent.

Please make your selection, click the 'Save my choice' button, and then use the navigation bar to return to the 'Topics' page to proceed to Stage 1.
Appendix C: Stage 1 Open-Ended Questions

1. Please briefly describe the type of work that you do, including what percentage of your current work involves communication about the environment or environmental issues.

2. Based on your professional experience, please share two or three examples of effective environmental communication. Examples can be from your own organization or another organization.

3. Please provide two or three factors you might consider when evaluating the effectiveness of an environmental communication program.

4. Please describe two or three important influences on the environmental communication programs you produce.

5. Please describe two or three typical activities you might perform when designing and delivering a new program that involves communication about the environment or environmental issues.

6. Please describe what you feel to be the role or purpose of environmental communication.

7. Please pull together some of your thoughts from the previous questions, by writing a four to five sentence description of what you feel to be effective environmental communication. Include any further thoughts regarding the relevant attributes and goals of effective environmental communication, and feel free to include additional examples from your work.
Appendix D: Stage 2 Passages and Questions

What is a system?
Visualize a whitebark pine tree in Banff National Park. Pale grey bark extends from its roots up its trunk and along its branches. Large branches separate into clumps of small branches covered in long green needles. The needles nest chunky pinecones, containing the tree’s seeds. All of these individual parts of the whitebark pine exhibit different properties. Dense roots anchor the tree, enabling it to grow on steep, exposed high elevation slopes; thick branches shelter the ground surrounding the tree, retaining essential moisture by slowing snowmelt; and small seeds hold the genetic material of the tree, allowing it to one day reproduce itself. Knowledge about the parts of the whitebark pine increases our understanding of the tree, but to know more about a whitebark pine one could learn about how the roots, branches, and seeds work together as a ‘system’, and about the other ecological systems that are part of the ‘environment’ of the tree.

The whitebark pine helps to illustrate that a ‘system’ can be understood as a collection of interrelated elements seen by an observer to function as a whole. Regarding something as a system allows an observer to perceive it as exhibiting properties that are different than the properties that would be exhibited by a collection of parts. How a system is defined depends on how it has been described by a particular observer.

Systems can be seen as containing smaller systems and as existing within larger systems. Systems can be seen as existing within particular environments; environments that are systems, and that consist of smaller systems. Considering a living thing, such as a whitebark pine, as a system that exists within a particular environment, such as an ecosystem, can increase our understanding of how that living thing changes and sustains itself.

The concept of systems can also be applied to social systems. People and their ideas can be seen as systems that are dynamic and enduring, and that exhibit different properties than simply a collection of individuals. A group of people or an organization can be understood as a system that exists within a larger social system or environment.

A1. Communication about the environment may be a small or a large part of your work. You may work mainly on your own, or you may work within a large organization. Regardless, please take a moment to imagine yourself as part of a 'system' of environmental communication. In a few sentences, please describe this system of environmental communication, including some of the people, programs, relationships, and processes that make up the system.

A2. Please list and briefly describe one or two examples of smaller systems, that you might consider to exist within the system of environmental communication that you have just described.

A3. Now imagine the 'environment' that the system of environmental communication that you are a part of exists within. Please describe who or what you see as belonging to this environment. Consider both the social and the ecological aspects of this environment.

A4. The roots, branches, and seeds of a whitebark pine act together as a 'system' to give the tree unique properties, such as the ability to withstand harsh alpine conditions.
Please discuss how the elements of the system of environmental communication that you are a part of, might be seen as acting together to give the system unique properties.

Connections between systems

Visualize a whitebark pine and you may also see the tree’s frequent visitor, the Clark’s nutcracker. Clark’s nutcrackers thrive on whitebark pine seeds, which are high in protein. With their long sharp beaks the birds are able to break open the tree’s cones to reveal the pine seeds inside. Transporting the seeds in pouches under their tongues, Clark’s nutcrackers are able to bury seeds in numerous caches throughout the forest to be retrieved later. Clark’s nutcrackers are amazingly skilled at returning to retrieve their caches, but any seeds left unfound are likely to grow into whitebark pine seedlings. Whitebark pine trees actually depend on this connection with Clark's nutcracker. Whitebark pine cones do not break open easily, and the seeds inside are not of a shape or form that allows them to be distributed by the wind. The connection with Clark's nutcracker enables the tree's cones to be broken open and the tree's seeds to be distributed to locations where they will be viable.

Seeing a whitebark pine as a system highlights that the parts of the tree work together in order for the tree to produce seeds and reproduce itself. Seeing a whitebark pine as a system also shows that it is only through connections with other systems in its environment, such as a connection with Clark’s nutcracker, that the tree is able to remain viable.

Connections can be recognized within individual systems, between systems, and between systems and their environments. Learning about whitebark pine by seeing it as a system that connects with other systems and with its environment helps us to learn about the whitebark pine in context rather than in isolation.

Both ecological systems and social systems can be seen as existing within a complex web of connected systems. Social systems, such as an organization’s system of environmental communication, can be further understood by expanding one’s view of the system to account for a greater number of connections. For example, organizations can be seen as connected with other organizations, with human communities, and with ecological systems.

B1. Similar to the relationship between whitebark pine and Clark’s nutcracker, a connection between two organizations can be understood as a connection between two different systems. Please list a few organizations that you see as connected to your organization’s system of environmental communication and briefly explain the nature of this connection.

B2. Further to the connections with other organizations, there are likely also connections between your organization’s system of environmental communication and human communities within and beyond Banff National Park. Please list a few of the human communities that you see your organization’s system of environmental communication connected to, and discuss the nature of the connection.

B3. In addition to human communities, connections can also be recognized between your organization’s system of environmental communication and other ecological systems within and beyond Banff National Park. Please discuss what other
ecological systems you see your organization’s environmental programs connected with and briefly explain the connection.

Systems and environments changing together
Based on the previous two sections we can now visualize a whitebark pine as a system, not simply a collection of branches and cones, and we can see it as connecting with other systems, including reliance on a creative bird. So what about the Clark’s nutcracker, and all the other ecological systems that are connected with the whitebark pine, the systems that are a part of its environment?

As the whitebark pine evolves so do the other ecological systems connected with it. After a fire or an avalanche has changed a landscape whitebark pine is one of the first trees to grow. The tree’s roots stabilize the slopes, its upswept branches reduce the rate of snowmelt, and the area is made viable for seedlings of lodgepole pine and Engelmann spruce. As whitebark pine flourish so do red squirrel, grizzly and black bear, gorging on whitebark pine seeds helps to ensure these species will be able to sustain themselves through their winter hibernation. And, as whitebark pine in a forest age, the trees become more susceptible to infestation, so various insects and fungi have their time to thrive, while they aid in the decomposition of the tree.

Thus, the ability of whitebark pine to change and endure, is affected by, but also affects other ecological systems and the environment. The whitebark pine, the birds and the bears, and the rest of the forest all change together, as they are all part of each other’s worlds. Visualizing an ecological system as a web of parts and connections that evolve together can serve as a model for better understanding how social systems also evolve together.

C1. Your organization’s system of environmental communication can be seen as connected with and thus changing together with other social systems. Please share and discuss an experience where your organization's system of environmental communication and another organization or human community have had a reciprocal influence on each other, where if the connection continued, the systems might be described as evolving together.

C2. Considering that social systems can be seen as connected and as changing together, please comment on how the goals of an internal environmental communication plan, designed for the good of your organization, might or might not overlap with the goals of an environmental communication plan designed for the good of the community.

C3. Your organization’s system of environmental communication can also be seen as connected with and thus changing together with ecological systems. Please share and discuss an example of how your organization may have influenced an ecological system, and how this might have changed how both the ecological system and your organization evolved together.
Appendix E: Stage 3 Questions

1. Imagine you are designing an environmental communication campaign aimed at increasing awareness, understanding, and action regarding water conservation. Please comment on how the effectiveness of the campaign might, or might not, be increased by describing some of the ‘systems’, both social and ecological, associated with the issue.

2. Imagine you are creating a monthly e-newsletter to increase understanding among your stakeholders about interactions with wildlife. How might your awareness of connections between organizations, human communities, and ecological systems influence the content that you include in the e-newsletter?

3. Imagine that through an environmental communication program, an organization in Banff National Park succeeded in generating interest in a carpooling program. Considering the idea of systems evolving together, how might that organization's success affect the potential success of a similar program initiated by your organization? What affect might these successes have on other systems over time?

4. Speaking about environmental communication, Donal Carbaugh suggests “…the ability to verbally interpret the larger parcel plods along well behind the rhetoric of the part - as when our terms focus on endangered species over their communities.” He comments, “…as a result, we stand on the beach staring at a starfish, before realizing we are about to be consumed by a tsunami.” How does this quote fit with your experiences communicating about the environment and environmental issues?
Appendix F: Stage 4 Questions

1. Please provide a description of what you feel is effective environmental communication. In the process of answering I encourage you to comment or build on each other’s responses.

2. Within this research project we discussed ecological and social systems, how these systems are connected, and how they can be seen as evolving together. Out of the ideas brought forward (through the written passages, questions, and contributions of your fellow participants), which did you find most interesting in relation to your work within Banff National Park?

3. The system of environmental communication in Banff National Park can be seen as a dynamic network of small systems that are connected and that have evolved together. What do you see as essential to ensuring that the system of environmental communication in Banff National Park is effective into the future?

4. Please contribute and discuss any further thoughts here. Please include your overall impression of this research project. Alternatively, feel free to email me directly with your comments.
Appendix G: Stage 1 Coding and Categorization

*Capital letters following words and phrases specify participants.

Influences

**Audience**

audiences – N

audience's frame of reference – E

[audience] well-informed about an issue – E

How much context do they need in order to understand – E

what do I want the audience to think, feel and do? – B

think about it from their side too – B

Relevance [to target market] – K

what are the barriers to the desired attitudes & behaviours – N

assessing one's audience – D

background of the group – F

catering a potential program to their needs – D

Assessment of my audience – D

considering my target audience – D

Assess the visitors – M

Determine the target audience(s) – N

knowing more about them [audience] first – D

understand the audience's point of view – E

What do they [audience] value – E

test my ideas out on someone who might fit my audience – B

How much context do they [audience] have or need – E

Where is the intersection between what they [audience] value and what is crucial about the issue – E

Using language that is familiar to the group – F

speak in a language… that can be appreciated by the audience – A

speak in a… scale that can be appreciated by the audience – A

find connections that will particularly resonate – F

link to other experiences – F

soft approach… communicating Park values of interest to media – C

Ability to have key national park messages further communicated through travel media – C

We're an information society – B

we are all bombarded with lots of details – B

know a little about a lot of different things – B

shorter attention spans – B

Audiences are bombarded with information – E

people don't spend as much time outdoors as they used to – B

they probably aren't as connected to nature as they used to be – B

**Partners**
Partners - who is involved – H
what other organization do – J
talk to others – B
generate our… business partners – J
can we find and solicit other partners to help share and champion the message – K
similar programs or activities that mentored my decisions to pursue this career – D
Are we working from the same page [as partners] – H
Industry - how are we perceived – H
Community - what is their stake in the outcome – H
What do they [community] expect from us – H
industry benchmark by which other hotel operators measure themselves – H
booth showing examples of our green mandate – L
explain this mandate – L
communicating the [companies’] mandate and practice – L
communicates the success of the program – C
partnerships and close working relationships – H
work with like minded organizations – H
promote our efforts through the partnerships we develop – H
Bring partners together to create a bigger noise – G
partner with the communities we inhabit – H
community programs – H
stakeholder relations – H
partnership building – E
having everyone in town buy into the message and help share it – K
Sit down with partners – H
meeting of the interested parties – K
ensure everyone is on the same page – K
jointly develop a tactical to-do list – K
may or may not include partners, third party delivery – N
with partners – A
partner projects – A
ambassadors – H
international network of mountain organizations – E
managing people, money, and relationships with external stakeholders and partners – N
Ensure that all team members or contractors understand the nature in which these
important underlying messages must be delivered – A
connect these organizations… with resources – E
share information, provide mutual support – E

Corporate Will
corporate will – L
Organizational priorities – N
meets the broad goals of the organization – N
Round table discussion on how a new environmental communication will benefit DBT – G
how it will create buzz around our company – G
team must be behind your message – G
engage our own employees – J
information needs to be something that helps staff and businesses to reflect on their own
goals and objectives – K
core business value – H
Do we set the bar high enough? – H
[corporate] priority outcomes – N
Relevance [corporate] – K

Resources
Resources – N
Available resources (staff time, staff talents, & money) limit what we can do – N
cost effective – G
Research what the cost savings will be to [company] – G
Reach – K
limited budget – K
only one employee – K
Sustainability – K
sustainable in the long-run – K
Opportunities that arise – N
serendipity factor – N

Feedback
Feedback from participants – K
take that feedback – B
Review archives for past activities that may have an effect on your desired outcome – H
Encourage participants of our programs the opportunity to provide feedback about how
we can make the program better – K
how I will evaluate it – B
encourage employees… to suggest improvements – J

Local Environment
local environment – F
this place deserves nothing less than the very best and should be treated as such – D

Personal Interest
personal and strong desire – D
self reflection – D
how I hope to appear – D
role I want to play in getting them inspired or educated of a particular topic – D

Approaches

Maximize Reach
Reach: how many people "get it" – N
multiple exposures to the message – N
multi-platform deliveries – C
multi-modal – F
Reach – K
reaches people – N
[connection] - [people have to] easily find your medium – N
communicate effectively to the average attendee – D
communication that represents people and activities – M
Considering non-english traveller communication – C
designed for multi-level interest – C
consumable manner – A
reinforced in multiple ways over a period of time – F
reinforced by prolonged… experience – F
All of the advertising for Conferences for at least 1 1/2 years was focused on this
message – L
no one way, to convey – F
needs to reach people at all three levels: feeling, thinking, and doing (aka: affective,
cognitive & conative; OR attitudes, beliefs & behaviour - N
reaching a key segment of the Banff population – K
Determine the most appropriate media for delivery – N
over time – N
reach an audience in as many ways as you can – G
how many people a program reaches as a key criteria of its success – K
broader audience can comprehend the issue – C
Distribution of the message – G
given the determined method – B

Walk the Talk
practicing… communicating about effective environment-friendly operating procedures – J
Walking the talk – L
actually practice the policies conveyed – L
policies and practices that reduced the impact of meetings and conferences on the
environment – L
continues at the property level – H
the right way to do business – H
inspire our employees and business partners to adopt similar practices – J
reduce our footprint L
recycling – L
strict standards of operating a business in this unique setting – H
taking care of the surroundings in which they operate – H
Are we leaders? – H
consideration of ecological footprint – J
[your team] they have to believe what your message is, and see it throughout the
company – G
least "harmful" way of transmitting the information – L
in mission nor [or] vision – L
new strategic initiatives – L
day-to-day operations – L
[while walking the talk] Showing some form of measurement of practices - L

**Research Key Messages**
key theme & messages - N, D
tactical-to-do list – K
what's the most important problem to address – N
what are your objectives – N
centralizing all main points to the one BIG theme – D
establish the key environmental messages – A
discuss the objective of the program – K
Develop a plan – H
ensure key messages were delivered – H
key messages - B, H
one main idea – D
common theme – D
teachable "bottom line" – D
What is my point – E
visualize my program or product early on and refine it as I go – B
Researching – F
extensive research and immersion into a topic – D
reflection on what I know about the topic – D
updating myself of new developments – D
Understand… the situation – N
analyze the situation – N
make sure I know what I'm to talk about – B
consulting a specialist – C
gather information from source research – J

**Provide Context**
tied to context – F
Placed in context? – E
places the audience in context – E
local – G
have a local spin – G
people see or learn of something that is happening right in their back yard – G
[E]Cer must have] good knowledge of the resources nature provides in the immediate area – D
using local resources – D
Our issues are complex and many have a long history, and so it's important to always put the story into context – B
perspective – M
provide participants with a sense of place – K
greater appreciation for the place – E
awareness of our sense of place – H
Explained the history – E
history behind the region – H
preferably tell about a long-term impact – J
demonstrate the long-term value of these procedures [environmental operations] – J
Nothing in nature happens on its own – B

Creative Visuals and Imagery
compellingly visual – E
good photos – J
people see… something that is happening – G
Impact – N
it [website] used art, music… to engage my heart as well as my head – E
songs, colorful costumes and exaggerated actions in their acting – D
visual manner – D
images of wildlife – C
colourful images – E
imagery – E
flare for the humourous – D
where's the fun? – B
creative moment – B
demonstration works well – B
"matchstick" demo to describe the concepts of prescribed fire, FireSmarting, and forest fuels – B
Creativity – E
creative thinking – M
does not fit within the bounds of any bureaucracy – F

Build the Story
it [website] told stories – E
narrative – B
storytelling to engage my heart as well as my head – E
people stories – J
tell a story – J
provides vivid stories – J
story – B
stories – E
channel - treat it as an evolving story – B
build the story as it evolves – B
use a metaphor – E
interviews – J
make sure the foundation is there [for the story] – B

Take People Outside
outdoors – B
authentic nature experience – B
take people outside – B
in context… thing described, can also be seen, touched, felt; in sum experienced – F
The real teaches way more than I can – B
reaches people… in the locations where the teaching is relevant – N
Repeatedly walking the area where I am to deliver my messages – F
[consider] audience… location of delivery – D
[ECer must have] good knowledge of the resources nature provides in the immediate area – D

**Attributes**

*Factual and Informative*

factual – E
Facts: Are they accurate? – E
Facts – M
Are my facts straight – E
supporting evidence – D
well researched – E
Credibility – D
Integrity – M
provide the facts and information – E
Up to date? – E
endorsement by recognized authorities J
with facts – E
degree of objectivity – M
balanced understanding of the facts – H
Bring balance to the conversation – H
grounded in fact – J
reading – F
extensive information on our website – L
Stronger knowledge – D
pool of resources to dip into – D
be prepared for any question or scenario – H
[ECer must have] good knowledge of the resources – D
completeness of information – J
providing information – K
getting them … educated of a particular topic – D
information – D
information sharing – E
argument internally consistent – E
in-depth knowledge – C
stakeholders and all leave satisfied they have the answers – H

*Relevant and Meaningful*

Relevant- E, A
Relevance – M
Relevant to audience – G
relevant to our target market – K
made it meaningful to me – E
personally meaningful – F
meaningful politically – E
asks "so what?" – B
DEPTH: to what extent do they "get it" – N
STRENGTH: how deeply do they "get it" – N
Communicates why one should respect the speed limit – C
why is it a problem – N
provide info to people about why bear jams are dangerous for bears – N
and why that [being in a National Park and Heritage Site] is significant – K
ensure that they know why we shouldn't feed wildlife, pick the flowers, etc – K
Explained the significance – E
timely – D
timely and spontaneous basis – D
reaches people at the moment and/or in the locations where the teaching is relevant – N
Timely use of teachable moments – D
passionate – D
passion – D
personal passion – D
touches the heart, not just the mind – B
with feeling – E
personal experience – F
Personality – D

Clear and Concise
understand – N
apprehensible at a glance – E
universally understandable – D
simple to understand – G
Understandable – C
understand what I am trying to say – E
Clearly presented? – E
Clear – C
simple exercise – B
simplistic – D
lack of jargon – J
digestable form – A
clear examples – J
really hear – N
succinctly presently [sp. presented] – E
Concise – A
Concrete, particular – F

Engaging
Engaging – K, D
highly engaging manner – D
engages… our hearts – E
engages… our minds – E
interesting to read – E
[people have to be] attracted to your message – N
engage – A
engage the reader/viewer/listener – J
positively engage visitors – A
Exciting – D
[use idea that] visitors to a park like banff have questions or curiosity of simple topics – D
compellingly [visual] – E
[issue] new to them – E
what is new at the time – E
something different or new to say – E
latest information – E

Empowering
empowered the audience – E
empowering – D
Empowerment – B
simple to take action as an individual or get on board – G
encouraging – L
encourages us – E
provides people with tools – E
reward and congratulate visitors for visiting – A
humans CAN do good things for the environment – N
we CAN make a difference – N
[information] makes them want to do more or get more involved – K
Inspires – J
inspiring – D
Enthused – D
inspiration – D
inspires your heart – B
motivation – D
getting them inspired …of a particular topic – D
encouragement of people – M

Positive
positively influenced – A
seeks to provide positive guidance – A
seek to positively guide – A
[contributes] towards hope – N
element of optimism – M
feel like it's the BEST thing to do - L
Goals

Connect with Nature
connection – B
builds definite connections – D
think in terms of "we" vs "them" – B
we're all in this together, in this time as well as all time – B
connect us to nature - J
making them feel they are in relationship with these things – E
bond with Nature – F
The task is to think of ourselves as within ecosystems... —Stan Rowe – F
Whether the universe is atoms or a system, let this first be established: I am part of the whole, which is governed by nature. —Marcus Aurelius, Roman Emperor and Philosopher – F
The original source for the word religion is re-iligio's, meaning to bind or tie together. The message of ecology is that we are bound together, in our bodies and our fates. - Martin Luther King – F
aimed... towards greater connection to and caring about nature – N
[see into] relationships between living things and their environments – N
connected... feeling – N
To create the bridges between ourselves and nature, so we understand that we are part of nature, you can't separate us – B
helps people to understand their place in the environment – E
helps people to understand... ultimately ourselves – E
connecting fire to creation of habitat for bears and increasing their connection to fires and bears – D
connect the individual to their environment in ways that are personally meaningful – F
[aimed] towards overcoming 'systems blindness' – N
eco-centric systems thinking about nature – N
to care about the environment as an extension of ourselves, rather than a 'special interest' or an external object – E
If environmental communication is to have any value, it will have to escape the bounds of little boxes, and even big books – F
So that they can see themselves as being experiencing in a living context – F
desire to make sure people are appropriately connected to Banff National park – D
hope to foster this belief in others about Banff and special places in general – D
emotional bond [with nature] – F
revealed... the depth of complexity and life that is invisible to the uninformed eye – E
talks about the fragility, stength, complexity, and simplicity of the natural world [that connects us] – J

Action/Behavior Change
action – M
[future] behaviours – N
contributes towards a social norm of responsible actions – N
result in behavior change? – E
that you feel like it's the BEST thing to do – L
why would you behave in any other way? – L
motivated to act – G
people act on something – G
help people… do -- differently than they did before – N
Get people to act or change their behaviour in a way that helps the environment – G
actions that are consistent with these things [connected/caring feeling… eco-centric systems thinking] – N
inspire others to take actions on environmental issues – D
encourage employees to adhere to environmental policies – J
Action is taken by the audience – C
peoples… actions changed – A
positively motivate action – A
change in action – F
Results in audience taking action or a change in behaviour – G
make it socially acceptable and EASY (affordable, convenient) to do the right thing – N
to make better and more informed decisions about our actions in relation to the environment – E
encouragement of people to be involved in a responsible way in respect to the environment – M
courage environmentally-friendly policies and practices in other organizations – J
inspire our employees and business partners to adopt similar practices – J

Encourage Learning
encourages them to learn more – K
learn – B
education – D
build knowledge – K
help people… think… -- differently than they did before – N
Educate – G
to provoke and motivate others to think – D
inspires… your mind – B
Encourage learning while enjoying the parks – M
continue to learn about the environmental issues in all aspects of ones life – M
getting them … educated of a particular topic – D
encouragement for visitors to learn about the parks – M
[contributes toward] understanding – N
future understanding – N
developing a deeper understanding of the National Park – A
fostering… understanding – A
understand what is being communicated – E
Understanding – K
To have our travellers understand that they are visiting a protected landscape during their vacation – C
helps people to understand… how their actions impact that environment – E
key all aspects are presented in a clear matter that your audience will understand – H
mandate of Parks Canada; Protection, Experience and Education – M

**Enhanced Visitor Experience**

enhancing visitor experience – A

[make] made a significant difference to the visitors experience – K

[understand] that it can be a rich experience other than a tourist centre – C
to be like role model interpreters or experiences – D

single transformative experiences – N

childhood formative experiences – N
terribly memorable experiences – N

Ability to influence a rich, educational travel experience – C

[during the event] take a deep breath, close your eyes or have a quiet moment – B
give them the space to have a personal experience – B

audience to learn from each other or themselves vs me – B

enjoying the parks – M

Promote responsible use the National Park – A

responsible enjoyment of the environment – A

visitor experience and ecological respect – M

mandate of Parks Canada; Protection, Experience and Education – M

**Awareness and Appreciation**

gain a better appreciation of living in a national park – K
to more greatly appreciate environmental issues of universal importance – D

simple appreciation of the issue – D
to provoke and motivate others to... appreciate environmental concepts more – D

take the opportunity to... appreciation of the importance of the integrity of the environment in which they find themselves – A

awareness – H
generating more awareness – D

create awareness of key park messages – K

make visitors aware of the natural environment – K

build... awareness – K

spark awareness – D

make visitors / residents aware they are in a national park and World Heritage Site – K

make an important point – N

Alert people to a problem in the environment – G

demonstrate value of environmental policies and practices – J

**Impact and Influence**

Impact – G

impact on the audience – E

a sense of wow – B

get their attention – N

touch a cord with the audience – G

lasteffectiveness – B

things stick with people – B
communication endures – F
remember – N
retain it – E
[future] attitudes – N
help people feel... differently than they did before – N
peoples opinions... changed – A
results in a change in perspective – F
Influence – K
positive influence on what kind of kids they became – B
convince people – N
change attitudes – B
fostering support [influencing] – A
to lay the foundations in people [leading to awareness & action] – D
inspires awe and wonder – J
to connect with younger park audiences – D

Better Decision-making
people need to make informed decisions about managing environmental impacts – E
problem solving – M
to make better and more informed decisions about our actions in relation to the
environment – E
give people the tools and knowledge to have a healthier relationship with the natural
world , as stewards of and participants in that world – E
courage employees... to suggest improvements – J
[feedback] - USE it when it comes time to make a decision – N
Utility... extent to which a program could be used to influence decision makers – E
implement it? – E
appearing helpful – A

Caring and Conservation
a sense... care – B
inspire us to protect and respect the world around us – J
caring feeling – N
helping to maintain the enviroment for future generations – A
sustainability and conservation in mountain places – E
saving the planet – L
help people care about land, water, air, wildlife – E
...widening our circle of compassion to embrace all living creatures and the whole of
Nature in its beauty. -- Albert Einstein – F
to care about the environment – E
taking care of the surroundings in which they operate – H
balance [conservation and use] – K
visitor experience and ecological respect – M
mandate of Parks Canada; Protection, Experience and Education – M

Business and Branding
Put your own business in a positive light aligned with a proactive message – G
Interest expressed in programs – H
Package offers seen through to the booking stage at the property level – H
Foster an understanding for the unique nature of Banff National Park that supports
[companies’] brand identity – A
branding – C
sustainable and equitable mountain development – E
balance [conservation and use] – K
Promote responsible use the National Park - A

**Scope**

*Local*
[most examples local] local – G, B
in our backyard – H
community – N

*Banff and Jasper, Regional*
through Banff National Park – M
within the National Park – A
Bow Valley and Jasper region – H
National Parks (Banff & Jasper) – H
Regional – B, N

*Global*
national – B
international network – E
throughout the world – M
around the world – H
universally understandable – D
wide variety of visitors – C
Murray Darling (sp?) basin in Australia – E
mountain places - E

**Audience**

*Visitors*
park visitors – K, A, D, M, C
guests – E
public – J, M
individuals - E, G
consumers – C
future generations - H, A
not passionate environmentalists – A

*Children/Youth*
kids – B, F, D
university field class – B
through AB school system – N
Blackfoot youth – F

Staff/Volunteers
staff - L, B, J, N
seasonal front line staff – K
volunteers – B
front line staff – C

Organizations/Partners
businesses – K
organizations – E
international network of mountain organizations – E
partners – N
professionals – B
stakeholder – J, N
meetings/conference clients - L

Government
government – M
decision makers – E
commitee work – M, N
Parks Canada officials - M, N

Channel

Visitor Services
direct contact – A
visitor services – A
visitor centres – A
Information… Services – N

Interpretation/Mentoring
heritage interpretation – D
guided walk… with a local guide – E
We stopped on the side of the road and he pulled out binoculars so we could watch – E
young child and an an adult mentor (eg. going fishing with Grandpa) [mentoring
relationships] – F
Interpretation Services, Outreach – N
interpretive component at the Lake Louise Gondola – M
direct contact – A
face-to-face interaction – A
dialogue or some interaction – B
down to earth… interaction – A
Conversation – L

*Hands-on Experiences*

hands-on – N
real work with meaning – N
hands on learning – B
create hands on experiences and opportunities – B
pitch-in events for litter picking, weed pulling – N
going fishing with Grandpa – F
initiatory "Spirit Quest" experiences of Blackfoot youth – F
childhood formative experiences – N
single transformative experiences – N
extremely memorable experiences – N
authentic nature experience – B
Effective for others who see volunteers or hear/learn about them – N

*Special Events/Programs*
special events – A, N
annual staff information event – L
booth showing examples of our green mandate – L
Tourism / Promotions – N
samples of bio-degradable dinnerware – L
recognizes businesses and individuals who have done extraordinary things – K
program – A
Leadership Development programs – F
staff orientation program – K
programs… themed around Leadership and social sustainability – F

*Marketing/E-marketing*
multiple media – N
advertisements – H
social influence marketing – C
Tourism / Promotions – N
multi-platform deliveries ie., interactive displays – C
website - L, E, J, C
HTML - e-mail – L
e-marketing – C
blogs – C
other electronic forms – L
print – L
word oriented – B
signage – C
publications – J
small piece, printed on 100% PCW paper and with vegetable inks, with a limited print run – L
brochures – C
direct mail – H
collateral delivery – A
charts and tables – E
television – M

**Media Relations**
media - J, H
media relations – C, N, J, H

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**Non-effective**

list of prohibitions – M
warnings about damaging trails – A
threatening – N
"this is something you MUST do, because we tell you so." – L
rely on feelings of guilt to prompt action – A
warning of the consequences – A
didn't share any solutions – E
complex issue – C
too data heavy at the end and was confusing – E
NOT to create print pieces – L
oversimplifies an issue to the point of inaccuracy – E
one way information flow – B
opinionated perspective – M
opinions – M
nilistic approach [general mood of despair] – M
rather than futility and isolation – B
alienate – A
never give the impression that properly behaved visitors and residents are not welcome anywhere in the park – K
not fun – B
jumping to the latest update – B
dreadfully dry – E
Appendix H: Stages 2, 3, and 4 Coding and Categorization

*Capital letters following words and phrases specify participants.

[ ] Denote researchers notes.

Common Ground and Banff National Park (BNP) Solutions

more comprehensive Bow Valley initiatives that cover a larger segment of the population - L [wider connections across BNP]
every single bus entering Banff be on the same ecological wavelength?? - L [working solutions BNP]
only be possible through federally managed/legislated work - L [working solutions structure]
if practical, it would be well worthwhile to refine and align our non-crisis environmental messaging, and to initiate coordinated outreach projects - J [BNP solution]
I love the idea of a more coordinated approach to non-crisis environmental messaging in Banff. - E [working solutions BNP]
Best approach to impact this "environment" would be for each organization to concentrate on its audience/stakeholders, using aligned messaging. - J [working solution, BNP]
work around aligning key messages and reponsibilities for crisis communications, including environmental issues - J [no change re: dynamic of partners but new re: BNP]
So when we are communicating about Banff National Park, we have the opportunity to connect to very park-specific issues, to the issues that everyone on the planet is effected by -- e.g. clean and adequate fresh water. - B [opportunity BNP]
To change a self-organizing system (like a human body, a city, a corporation or an economy), rather than narrowing the focus to the issue at hand, we expand our view to include the relevant self-reinforcing linkages so we can grasp something of the system whole. A macroscopic, rather than a microscopic view is required. Most of our means to accomplishing change do not take into account these large messy loops of self-reinforcing behaviors; they use a mechanical kind of logic, this is why they usually fail. We force change rather than create it. - F
To trigger or to lever change a complex system, we need to look "where a small shift in one thing can produce big changes in everything." - F
We are beginning to understand the affect our individual actions have on the planet and this is because of a realisation of 'systems'. The mountain parks are a great place to make people aware of this. We have glaciers sending water, via delicate eco systems, across the continent to three oceans. This flow also created social systems. You need to understand this whole system so that you read more than a paragraph of the story - A, [apply to BNP]
Even though most people recognize we have a long way to go, we've also come a long way already. We should celebrate our successes… while always being mindful that there much more to be done. I think we get bogged down on the big issues and the "shoulds" and forget what we are doing now. I don't think we show off enough all the good stuff that we are doing that is different from other communities. - B [for BNP]
That we create opportunities for those of us working within the Park (but not necessarily FOR the Parks) can work with each together to communicate effectively…. I feel it would be helpful to meet up with others who are responsible for communicating environmental messages so that we can share vision, and share experiences on what works, what doesn't. - L [for BNP]
within the context of environmental communication in BNP, it can be difficult to find a common objective. As a result, it usually comes down to a compromise - K [impact]

Relationships and Common Ground in BNP

this is really interesting… I like your point here and am inclined to agree. - E [relationship]
Good points... In both roles the connections you make to these people can (positively) impact areas outside the national park by creating responsible, environmentally aware citizens. - G [relationship]
I like the comments I'm reading here. - B [relationship]
I agree with... - E
I'm dwelling a bit on the time thing here after attending the Joanna Macy workshop last week. - B
fascinated to learn how much emphasis is placed on environmental communication in the school system - L
I agree with everything that has been said so far. - E
A general appreciation for the fact that interpretation plays a key role in enhancing awareness of ecological and social systems. The general premise of being part of an environmental educational "system" that evolves to meet the needs of the audience and is evolving in order to incorporate more participants. - D [changing together recognition of systems]
I found it really interesting how, at least in some of the questions, a lot of us were on the same page. I was struck by the shared sense of appreciation that we have for Banff National Park. I shouldn't be surprised - we wouldn't be in this line of work if we didn't care about the place - but sometimes there are so many messages from so many different sources that it seems like we are more disparate than we are. But we seemed to have a lot of common ground about messages, even if the contexts in which we work are varied. - E [similar to - D]
I like what I've read here and it makes me think - B
I agree again with everything that's been said above and… I really liked it! I am energized by reading everyone's ideas. - E
value of bringing environmental communicators together to keep the lines of communication flowing. I think this is a great idea - green drinks for environmental communicators specifically might be fun! - E
Really appreciated reading everyone's responses and relating my own small role in Environmental Education to the bigger picture. Nice to see such a good cross section of our park community represented and essentially connected into the idea of bringing education to others - D
I enjoyed reading everyone's thoughts too. It was great to feel part of an environmental communicators community - E
Partners Awareness and Broader Connections

system of environmental communication in which I operate is a bit like two overlapping spheres, or maybe overlapping onions - E [wider connections - awareness]
our information on environmental issues that we deliver comes from a variety of sources - G [wider connections]
learning opportunities for our staff regarding the environment. These could brochures, websites, newsletters or best practices we find amongst other companies - G [wider connections]
It requires all elements of the communication environment to deliver clear messages (not in a preaching manner rather a common sense manner) to produce a positive reaction from recipients. - A [wider connections awareness]
Who & what belongs...everyone has a vested interest in this environment. You have the environmental bodies, citizens-at-large and business. - H [wider, not ecological]
This environment would be made up of all visitors, potential visitors, and residents of Banff National Park/Bow Valley, all regulatory/community etc organizations who are Park stakeholders --potentially all Canadians and interested international citizens since this is a national park and UNESCO world heritage site. This environment is so diverse and far flung I'm not sure it can be described as a system at all. - J [wider connections – question of understanding systems]
my organization creates a forum where different partners with different backgrounds are working together to achieve a common objective - K [wider connections awareness]
Our organization's system of environmental communication is connected to many others, locally and beyond. - B [wider connection awareness]
The environmental issues that surround our planet and ultimately BNP are many and well-documented. - K [awareness]
I think that this [systems] approach is becoming more important as we globalize - A [impact of connections]

Partners and Impact of Broader Connections

If one part of the system is weak or breaks down, the entire system and it's components function less - D [impact of connections]
Our regional system is impacted by the Parks Canada ecological integrity policy - E [impact of connections]
The environment in which I work is populated by governments, intergovernmental organizations, international NGOs, grassroots NGOs, and various information networks, as well as individuals. I see a disconnect between the larger, policy-oriented groups at the international level (governments, IGOs) and the grassroots. The links between what happens 'on the ground' and what policies are made nationally and internationally, even provincially, are difficult for me to see from where I sit. I sometimes feel like they operate as if they are separate environments when they are not. - E [impact wider connections & structure]
what happens within our walls is often influenced by those who use our facilities for special events or meetings. We learn, at least temporarily, from these visiting groups
about environmental practices. I'm thinking specifically of Mountain Culture, at The Banff Centre. They have developed a rigorous standard of practice to keep their activities "green" and bring those standards with them, if a host facility doesn't already have practices in place. One could liken Mountain Culture to the Clark's nutcracker, in a way. They are opening seeds and planting them in places they might not otherwise grow. - L [impact of connections]

But every group within the Bow Valley has connections beyond that may influence their environmental behaviour and how it is communicated. - L [impact of connections]

one person can begin a process that has far-reaching effects. That one individual brings a level of involvement and commitment that spreads. - L [impact of connections]

We work with the [international environmental] organizations as a way to improve business practices and educational opportunities for our guests. It is a win/win for all. - H [impact of connections]

On the front line our teams at our visitor centres operate closely with PC to provide sometimes differing sometimes overlapping messages. We try to maintain an open dialogue in order that messages relating to the environment, that are relevant to the park information that we supply, are conveyed. - A [impact of connections]

The other way to see change and causality is to understand the way in which causality flows in living systems. A→B→C→D and back to A. This means that change in living systems is iterative, recursive, tautological and paradoxical. A changes D and D changes A. - F [impact of connections – feedback]

I will never forget an interview with [a speaker] about the interconnectedness of everything from the bark on a Douglas Fir to the reasons that some coniferous shrubs actually make themselves more prone to become fuel for fires. The way in which he described these systems also helped me to understand similar synergies in business and economics. - L [impact of connections]

We are beginning to understand the affect our individual actions have on the planet and this is because of a realisation of 'systems'. - A [impact]

I think systems thinking helps to convey messages of interconnectedness. - L [impact]

For every action, there is a reaction. - L [impact]

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**Partners and Strength of Diversity**

All have differing views and points of reference. In terms of bringing everyone together you need to have clear and concise goals and objectives. You need to present a balanced approach. All the while you understand that not everything you do will appease the masses. - H [diversity]

I sometimes feel like there are lots of little systems that are only lightly connected but could help each other to become stronger or more effective if they worked together more closely. On the other hand, every time I talk about coordination I also am reminded that it needs to be balanced with independence among partners. Something between 'command and control' and 'isolated islands' would be great! - E [working solutions, diversity is strength]

But a little time needed to pass, and some leaders from other restaurant properties had to take the plunge first, before the [organization’s] reluctant parties were willing to play along. It's human nature to wait until someone else takes the first step on a potentially
risky or thought-provoking venture. But once the process was demonstrated to be successful and easily accomplished, then things began to roll. So "weathering" the storm of harsh conditions can apply to social as well as financial pressures. Working together as partners adds strength - L [diversity adds strength]

Each stakeholder comes to the table with their own ideas, values and ideals. It is critical to address each as it will aid you in achieving a desired outcome. One stakeholder can stand firm and show partners why they hold the position they do. This allows for the opportunity to showcase the varying rationales. - H [diversity – benefits]

The interactions I have with local, grassroots environmental organizations keep me connected to both tangible issues and the emotional responses that people have to environmental issues. The perspectives of business interests in Banff add balance to these dialogues. The international branches of my work put local concerns in international context. They remind me what 'the rest of the world' is dealing with, and provide a policy framework against which I can compare our own issues here in Banff. - E [diversity]

The organizations in our environment are often at extremes in terms of what they believe, what they communicate and hope to achieve. The diverse opinions found in our environment help to maintain a balance that preserves the area we live in. Acting together this way, achieving a balance, is unique property of our system. - G [diversity – strength]

The varying points of view in our system are unusual, as are the relative levels of influence of the different parties who hold those points of view. The more time I spend working with people in other places, the more I realize how unusual Banff is. Our diversity though, and the fact that we are different from most other places, are strengths here. - E [diversity – strength]

The system I'm a part of brings together many different goals and objectives from many different sources, but all with an eye to what the end goal is - K, [diversity – strength]

While the department… hosts this project, we rely on other… partners to build and maintain the communication technology… to share information. In turn, we maintain the relationships with organization and people that supply this information, and we provide help to those orgs and people who wish to share their knowledge. We wouldn't be able to host the… project without this support. Hiring software developers to do the same work… would be prohibitively expensive. - E [diversity - strength]

other organizations that we depend on - E [diversity – strength]

The relationship between myself and my solo business is symbiotic, or if you prefer synergistic. I offer them a perspective that they cannot obtain elsewhere and they offer me their marketing and organizational resources. - F [diversity- strength]

It doesn't have the budget or the manpower to do many things on its own. Its all about developing those partnerships. A good example, is [the program]. We contract the Interpretive Guides Assoc to facilitate the program since their guides are trained storytellers and experts. The two organizations work closely together to develop the content and ensure we are conveying the right messages. - K [diversity – strength]

Walk the Talk, Change One and Others Respond

If our group saw that another had overcome difficulties and made the concept work, it would make it far more feasible that we would even try it. - L [diversity]
There always has to be someone who is willing to go first, and lead the way - L [diversity]
Anytime a program is successful it brings added awareness and buy-in from the community. - K [diversity or impact]
I can see one organization's success generating momentum for another organization to do the same - E [diversity]
I know the organics program at the [organization] means that our office (a smaller system in the larger… system) now recycles organics also. Similarly, the larger awareness, resources and expertise around waste management in the Bow Valley enabled colleagues of mine… to launch a program last year that diverted more than 90% of the [event’s] waste out of the landfill. Change one system and the others respond I guess! - E [diversity – changing together]
good role models and seeing it somehow in action so you want to be part of it or will encourage others to - B [diversity – changing together]
As more people design similar programs to meet common needs in more places, it makes for a potentially larger network of common ideas and visions to share and create improvements to your own carpooling program if you know there are many other similar program designers and operators to consult. The larger and more networked an idea becomes creates a bigger pool of resources to draw from and make a program even more successful than can be done alone. - D [diversity or changing together/common ground],

Research Key Messages

Taking a complex issue like water conservation and breaking into smaller easier to understand components. – K
new and recent research findings – D
You have to break a problem into bite-sized pieces. - E [systems applied]
Consistency: cite the same stats, or relay the same strategies, to build (through repetition) the desired result. - L

Place in Context and Connections

From an ecological standpoint, water is a natural system from which to draw easily understood comparisons. From a social standpoint, it might be very interesting to communicate how one's geographical location and relative economic position affects access to water. - L [impact of connections – applied]
I am inclined to believe that making ourselves part of the 'water 'system' - socially and ecologically - will increase awareness and understanding of the issue. - E [impact]
…who suggested that awareness and understanding were one thing, but promoting action (behaviour change) was another. She recently attended a workshop that was built around research showing that behaviour change requires appealing to what people already value (putting the issue into 'their system', rather than the other way around). - E [impact]
get people to think about where it comes from and what it takes to get that water to your tap and what happens to it after it leaves your home, maybe there would be more conscious use. - B [impact]
I think it's very important to include upstream and downstream sources and draws on our water. That people downstream depend on our wise use too. - B [impact]

A campaign about water conservation would be effective by finding key ways to relate it back to the audience through tying into their basic and daily lives and how their systems might be affected by the absence or restrictions of water. - D [impact]

People are more likely to be interested in information that is connected to them in some way - E [impact]

would probably try to focus on information about places, people, and organizations that my readers would already be familiar with and want to know more about - E [impact]

You want to make sure people feel connected to the material, so you need to answer the "so whats" for them - B [impact]

making the connections between your stories/messages to why they should care/be interested - B [impact context – not new for - B]

The more they can see that is relevant to them -- such as effecting their families, neighbourhoods, habits, the better. having some shared in the first person might help, especially if it's someone they know or can identify with. I think you need to put the messages into context of where they are, e.g. a community adjacent to wildlands, and how they interact - B [impact in context, and storytelling]

The immediate benefits have to be personal, then the bigger benefits fall into place -- less cars on road, less pollution.... - B [impact in audiences’ context]

The challenge is to avoid thinking that one knows it all without having the perspective that allows for continuing learning. The broad perspective must always be maintained.

The challenge about communicating about the environment is that is not just about the environment; it is about economics, freedom, politics and emotion. - M [impact of connections]

I think this also comes back to not seeing whole. If we don't connect our actions back to the whole, no wonder it doesn't make sense to us or our visitors. We need to round out our stories to reflect this. We need to include time in our stories that we've come from a past that thought this, to what we do now for the future, etc. - B [impact context]

Participatory: communicate so that the reader/listener feels as if they are making an important contribution to the whole. That "together" the desired goal will be reached. Not that "you" will do it, or "they" will do it, but that together everyone will achieve the goal. - L [impact partners]

The communications needs to be set in the context of our daily lives, in this place and time. It needs to consider the whole and our connections, where we fit in as a part of it - B [impact, context]

inclusive -- we are all in this together. and together we are creating a future - whether intentionally or not. - B [true impact of connections]

we were invited to look at situations through "ancestor eyes" or "future generations" which was very powerful. Our actions (yesterday and) today are shaping tomorrow's future and what this means for our children who will live in it. - B [impact connections changing together]

Many visitors to the park want to believe that they are being environmentally responsible and are therefore a good audience to influence. Everyone can be positively communicated with on this subject if they feel that they are already doing something right - A [impact fitting into audience context]
If their actions are not taken and if collective actions are not taken on a topic, that consequences can be negative. - D [impact of connections]

contextualize the environmental issue in a way that is meaningful to the audience - E [impact context – talk of connections]

It might not be enough for people to know they are part of a larger whole. Until we've all 'gone metric' then effective behavior change has to be grounded in the realities of what people value now. Not what we hope they'll value more in the future - E [impact context] the communications needs to be integrated into what we generally communicate to our visitors, community and each other. By this I mean, it's part of our story. And the story should be engaging if we want people to adopt and adapt it as their own. It puts the messages we want to deliver into context. It provides foundation for the issue or message we want to deliver. - B [impact, connections, context]

Too often we seem to want to go right to the issue without providing the context to understand it in or have a sense on appropriate actions to take - B [impact context]

I think it is essential to maintain a balance between 'meeting the visitor where they're at' - geographically and in terms of what they value and find interesting - and providing the extra context required to deepen their knowledge and thereby appreciation for the Park. This conversation has really crystallised for me the importance of doing both. - E [impact context]

So, for example, if we want people to stop picking wildflowers at the Peyto Lake lookout then we need to both educate them about the fragility of alpine flora: the length of time they take to grow, how extraordinary their life cycle is, the ways they cope with cold weather, that picking the bloom off some flowers actually kills the whole plant, etc. But we also need to find out what those visitors value - and it may have nothing to do with anything ecological. Maybe they value 'fitting in with the locals' more highly than 'saving alpine plants'. - E

When developing education programs, I of course have personal topics I care passionately about but I always look for a bigger "So what" message in conveying my environmental topic to the audience in general. I try to convey the importance of my topic to a bigger theme it is a part of and how the strength of the whole depends on the strength of each individual part. Conveying a message of connectedness between smaller topics and bigger themes is essential in educating people. People do not always remember specifics, but they do remember main points and feelings from the bigger picture more often. - D [impact context]

**Local Environment and Interrelationships**

Our employees, our vehicles, our footprint. Our customers. The roads we drive on, the trails we hike on, the animals we hope to see. The forests, mountains, streams and rivers we take photos of on tour. The inter relationships we have amongst organizations in our environment. - G [wider connections – ecological]

advocacy issues and the tourism product are never disassociated from the environment - M [wider connections awareness – ecological]

Provides base knowledge for guides to communicate about our social and ecological environment... Provides information on management of ecological and human aspects of the physical environment. - G [wider connections – ecological]
I don't think that this is applicable to our operations - A
At a basic level, our programs are affected by and impact themselves the ecological systems within Banff National Park and beyond. Our activities consume energy and resources, they have a carbon footprint. - E [wider connections – ecological]
we're connected to all of the ecological systems - D [wider – ecological]
we're dependent on all ecological systems, but as a park interpreter I am the introucer and highligher. As a guide, I am the deep connector - D [wider – ecological]
Pass it on Card - We donate funds to the Water Keepers Alliance when this card is redeemed. They aim to protect different watersheds including those outside of Banff National Park. The atmosphere - We just switched to biodiesel. It's less harsh on the air and air knows no boundaries. - G [wider – ecological]
Banff National Park is connected to a variety of ecological systems, on different scales from the small, unique ecosystems, such as thermal springs on Sulphur Mountain, to regional ones -- Central Rockies Ecosystem to larger -- Saskatchewan River Basin -- to planet Earth! - B [wider – ecological]
That the responsibility for safe interaction with wildlife, for example, isn't just the responsibility of one person, but the responsibility of us all. - L [connection with ecological]
balance the different viewpoints, using examples of both human activities and environmental concerns - K [awareness or ecological]
Our problems happen when we conceive of nature as other. - F [impact]
We need to move past seeing a river or water as other. In a very literal sense water is us - F [impact]

*Corporate Will and Structure*

messages that come from a "higher power" - L [structure]
they could be the leader - L [structure]
the 'system' of environmental communication in the two organizations has some effect on the way they behave? The federal government can be very strict about the kind of messages and programs that are launched. The Town on the other hand, seems to have more flexibility in the way they approach things. They seem to have more freedom to experiment with the messages they send - E [structure]
Stakeholders - that would be one of the "smaller" systems…. - each party is their own system - H [structure]
If the larger system at work are those that are considering the park from the big picture perspective…. Then I'd argue the smaller system are all the individual components that spread those messages. - K [structure]
Therfore the system is somewhat contrived as the natural flow is controlled by regulations that limit the flow of ideas and communication within the system. For example, communication is enhanced greatly by using websites and yet Banff National Park is restricted by Ottawa in terms of website use. - M [structure]
to be effective, we must practice effective internal communications first, aligning our key messages, and giving our communications tree strong roots. - J [structure]
Having tried carpooling on an individual level for a short period, I know the idea could have been more workable if a larger entity was behind the movement, with more options for drive-share situations. - L [structure]
would require a position, almost a policy statement, that would dictate the interaction between organizations, human communities and eco-systems. – M

The environment in which I work is populated by governments, intergovernmental organizations, international NGOs, grassroots NGOs, and various information networks, as well as individuals. I see a disconnect between the larger, policy-oriented groups at the international level (governments, IGOs) and the grassroots. The links between what happens 'on the ground' and what policies are made nationally and internationally, even provincially, are difficult for me to see from where I sit. I sometimes feel like they operate as if they are separate environments when they are not. - E [impact wider connections & structure]

**Personal Role and Understanding of Self**

I am but one part of a system - H [wider connections]
I form one of the links to our partners - A [wider connections]
I am part of a team - C [wider connections]

my work extends out to the rest of the world – E
within [the] system, and within a larger community system of organizations – J
My position within the EC system is that of the communicator - D [more broad]
As a hiking guide, I become increasingly connected as a hike or trip progresses.

Immersing in natural surroundings, taking in the sound of a stream or marsh, etc – D
As I became more familiar with the environmental policies and practices at [the organization], I began to look more carefully at my personal policies and practices. I enhanced my practices in many ways. I talked about them with others and encouraged others to follow suit. I saw other departments at the [organization] begin to take notice and look at environmentally-friendly practices as more than just "corporate speak" or "good for the company." They crept into daily practice for a lot of people. It spreads like ripples in a pond when you drop the first pebble. - L [personal change]

**Systems Changing Together**

Our bureaucratic organization tried to conduct the first critical public event in traditional fashion of talking at people, without allowing opportunities for the public to connect and share their opinions in the many ways most comfortable to them. Members of the committee challenged our approach, and we used their suggestions and had a much better outcome with that first event. This began the integration of the committee into how we managed the issue, creating a functioning system. Our effectiveness was especially evident regarding our ability to communicate as a whole committee, as well as to the public, resulting in a much more flowing, dynamic process versus a traditional product. - B [systems changing together]

Both [organizations] have made significant progress toward environmental goals in the past few years. Because we are a part of the larger community, anything we do influences that larger community. So, for example, when a colleague from Calgary came to Banff
for a recent conference she commented on how impressed she was with the environmental initiatives both in town and at the [organization]. Then took home those expectations to back Calgary, where she can make decisions as a consumer and be a vocal advocate for better environmental practices. - E [systems changing together]
The Town of Banff, for example, altered the ecological systems of the Bow Valley in very significant ways. It altered wildlife movements. Our fire suppression measures altered the forest regime. Our predator control measures altered predator-prey systems, which in turn had impacts on forest health, which in turn impacted wetlands. Yet, because we altered the ecological systems in significant ways, we eventually had reason to become more aware of that impact and of the ecological system in which we operate. As a result, Banff is a more environmentally aware community than the average, and the ecological systems that surround us are some of the most studied systems in western Canada, if not Canada as a whole. - E [relationships between]
Our organization has had tremendous impact, positive and negative on the ecological systems of the park. In early years, management practices of eliminating predators, suppressing wildfires to often and others of similar scope are now widely recognized to be wrong or lacking the information and knowledge we have today. I believe the ecological systems give us signs and tell us....if we take the time to listen!......how it's doing. Over time, we have...as an organization, become better at listening and really hearing what the landscape, ecology and the park has to say…. As the ecological systems of BNP changed and gave us signs to look for, we got better at knowing what to look for and how to respond. - D [relationships between]

Other

effective environmental communications needs to help people to understand that in small, do-able incremental steps, change is possible. Each and every one of us can contribute to the larger whole. – L
it's a lot more engaging to talk about the starfish - something tangible that everyone can picture in their minds - than coastal ecosystems, which is something more conceptual. I guess, like everything else, it's just a matter of balance – E
complexity involved in the challenge of communicating about the environment and communication in and of itself – M
Appendix I: Additional Participant Summaries

As Participant N and Participant C did not contribute to the later stages of the project, I was unable to explore changes to their understandings of effective environmental communication, thus I have included their impressions of effective environmental communication here.

Participant N suggested environmental communicators should aim to “reach people at all three levels: feeling, thinking, and doing.” Participant N expressed the need to “Determine the most appropriate media for delivery” and noted environmental communication can come in many forms, including “single transformative experiences,” “childhood formative experiences,” or “hands-on, real work, with meaning.” This participant suggested environmental communication must meet “the broad goals of the organization” and that “Available resources (staff time, staff talents, & money)” influence what can be done. Participant N argued that environmental messaging should help audiences understand that “humans CAN do good things for the environment,” in such a way that people can “USE it when it comes time to make a decision.” Participant N believed environmental communication should aim “towards greater connection to and caring about nature, and towards overcoming ‘systems blindness.’”

Participant C indicated that environmental communication should be “designed for multi-level interest” and use “multi-platform deliveries” with the aim that a “broader audience can comprehend the issue.” Participant C also noted that different audiences require different approaches. This participant noted that environmental communication should provide “in-depth knowledge,” if necessary based on information obtained by “consulting a specialist,” and should include information on the “success of the program.” It should be clear and understandable, make use of images, and lead to “Action [being] taken by the audience.” This participant’s responses suggested environmental communication to be successful when “our travellers understand that they are visiting a protected landscape during their vacation,” when they understand “that it can be a rich experience other than a tourist centre,” and when the communication is able to “influence a rich, educational travel experience.”