The Public's Role as Environmental Stewards: A Study of the Idaho Master Naturalist Program

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ABSTRACT

The role the public plays in preserving nature is crucial. To be effective stewards the public must be environmentally literate. Environmental literacy is understanding the biophysical environment to the degree that it leads to the ability to act as environmental stewards. Myriad studies revealed the public has limited knowledge of nature. The Idaho Master Naturalist Program (IMNP) was created to educate the public about nature and advance environmental volunteerism. This qualitative research studied if IMNP was fulfilling its mission to develop a corps of environmentally literate volunteers. The participants were 18 years or older who attended IMNP between 2008 and 2013. The findings were collected using an Internet-based survey, netting a 52.5% response rate. The findings indicated that 79.2% of the participants believed they had received a satisfactory education to be environmental stewards. Nonetheless, the responses showed the need for modifications to IMNP to enhance the participants' experience.

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DEDICATION

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CHAPTER 1

INTRODUCTION

The role the public plays as environmental stewards is crucial. This role was recognized, and its importance was emphasized by George Perkins Marsh in his groundbreaking book, *Man and Nature, or Physical Geography as Modified by Human Action* (Marsh, 1864), which focused on society's responsibility to the natural world. Called the fountainhead of the environmental movement, the book was a scholarly assessment of the impact of humanity on nature (Lowenthal, 2000). Marsh wrote that nature left undisturbed was stable, but after the arrival of humans the harmony of nature turned to discord and required the public to be conscience of its interaction with nature (Marsh, 1864).

Ninety-seven years later, in his seminal book, *A Sand County Almanac and Sketches Here and There,* Aldo Leopold continued this discourse. Leopold stressed the importance of the public's role as environmental stewards and its lack of knowledge of the environment was a calamity (Leopold, 1949). Leopold was influential in pressing for the public to become educated in environmental topics (Cramer, 1998).

This apprehension of the public's limited understanding of the natural world and its critical role as environmental stewards has continued in the 21st century (Coyle, 2005; North American Association of Environmental Education (NAAEE), 2013). As explained by the National Science Foundation (NSF), "In the coming decades, the public will be called upon more frequently to understand complex environmental issues, assess risk, evaluate proposed environmental plans, and understand how individual decisions affect the environment at local to global scales" (Pfirman, 2003, p. 41). A foremost goal of NSF is to elevate the public's knowledge about the environment (Pfirman, 2003).

What does being an environmental steward mean? Environmental stewardship is a voluntary commitment that results in the protection of nature (United States Environmental Protection Agency, 2006). To be an effective environmental steward a person needs to comprehend the natural world: be environmentally literate. Leopold (1949) explained that true comprehension of the environment was an understanding of ecology and respect for the land.

Environmental literacy is having sufficient awareness of and knowledge about nature and the issues related to it to be capable of and motivated to act (Carter & Simmons, 2010; NAAEE, 2013). To better understand environmental literacy, it is important to define the concept of environmental awareness. Blakely (1971), an expert in environmental education, articulated it as cultivation of awareness of self and of the environment and that this awareness would foster environmental stewardship. Environmental literacy is the outcome of an educational program through which the learner progressed from knowledge to actual application (Coyle, 2005).

Adult educator J. Roby Kidd (1959), proposed for learners to develop meaningful concepts they must have a solid base of knowledge from which to operate. Facts must be learned and understood for rational concepts to be formed and the learner to move forward in applying these concepts (Kidd, 1959). As Parsons and Schneider (1974) explained, knowledge and ideas formed the basis of the public's values, which in turn determined its behavior. Moreover, studies showed that knowledge about nature was necessary for affecting positive environmental attitudes and environmental behaviors (Fraj-Andrés & Martínez-Salinas, 2007).

Myriad national and state-wide studies revealed that the public has limited knowledge of nature (Coyle, 2005; Louv, 2005; NAAEE, 2013; National Environmental Education and Training Foundation (NEETF), 2001). NEETF compiled ten years of research in the report, *Environmental Literacy in America: What Ten Years of NEETF/Roper Research and Related Studies say About Environmental Literacy in the U.S.* The study revealed that most adults did not have the knowledge and skills required to make thoughtful decisions regarding the environment. The authors of the NEETF/ Roper Report estimated that only two percent of the adults in the United States were environmentally literate (NEETF, 2001).

Educating adults about nature is a remedy to address the public's dearth of environmental awareness (Mason, 1995). Education could implant information in learners' minds that would then affect attitudes and actions as they moved into wider spheres of environmental stewardship (Clark, 1993). One educational portal used to teach adults about nature is the Master Naturalist Program (MNP).

MNP provides adults the opportunity to learn about nature through science-based courses in a nonformal educational setting (Main, 2004). MNP promoted the interaction of the public

with nature through volunteer activities (Guiney et al., 2006). These activities are a means for the public to be environmental stewards.

The first MNP organization sprouted in Colorado in 1994 in response to the need to educate the public about the environment (Alliance of Natural Resource Outreach and Service Programs (ANROSP), 2013; Kenney, personal correspondence, 2012). Nineteen years later there were 43 MNP organizations in the United States, including the Idaho Master Naturalist Program (ANROSP, 2013). The specific goals of each MNP varied, but the missions were similar: To promote a better understanding of nature through education and involvement in nature-based activities (ANROSP, 2013; Guiney et al., 2006).

MNP organizations are vital, because many governmental and private organizations rely on the public to be environmental stewards (Guiney et al., 2006). The public fulfills an essential role in protecting nature through its work on conservation projects (Guiney et al., 2006; Ryan, Kaplan, & Grese, 2001). The public's responsibility, coupled with its ignorance of the environment, magnifies the necessity for programs like the MNP, and specifically the Idaho Master Naturalist Program.

BACKGROUND

The Idaho Master Naturalist Program (IMNP) was launched in 2008 (Focht, personal correspondence, 2012). Focht developed IMNP as her Master of Science Project in Conservation Social Science in the College of Natural Resources at the University of Idaho (Focht, personal correspondence, 2012). While seeking her degree, Focht worked at the Idaho Department of Fish and Game (IDFG). The impetus for developing the program was Focht's supervisor at IDFG who saw a need to create IMNP to educate the public to be environmental volunteers. Prior to IMNP, IDFG had a volunteer program that lacked an educational component, so the volunteers were limited in what they could do (Focht, personal correspondence, 2012).

Focht and her supervisor were attracted to the MNP format because it included an educational component. Focht explained, "The master naturalist program was unique in that you were educated first and then you volunteered" (Focht, personal correspondence, 2012). They believed a master naturalist program would be an effective process of evolving a group of environmentally educated volunteers (Focht, personal correspondence, 2012).

IMNP is an independent entity sponsored by IDFG, where the state office of IMNP resides. There are nine local chapters across the state managed by volunteers. Volunteers formed each local chapter. The local chapters are required to follow the mission and goals developed at the state office (Focht, personal correspondence, 2013). IMNP's mission is "to develop a corps of well-informed volunteers to actively work toward the stewardship of Idaho's natural environment" (Idaho Master Naturalist Program (IMNP), 2011, p. 3). The goals of IMNP are to: (1) increase public knowledge of natural issues, (2) enhance existing efforts toward conservation in Idaho, and (3) develop partnerships among private, state, and federal government agencies (IMNP, 2011).

The educational component of IMNP consists of a combination of classroom and hands-on activities. The program provides exposure to nature through field trips and involvement in conservation projects (Focht, personal correspondence, 2013). The topics taught include biology, botany, ecology, geology, hydrology, natural resource management, and wildlife. Professionals considered to be experts in their field teach the topics (Focht, personal correspondence, 2013).

When developing the curriculum Focht considered how adults learn. "The thing is to get the master naturalists out there and share knowledge, which is part of adult education, not just to be taught" (Focht, personal correspondence, 2012). The participants receive the written curriculum in the binder and on the CD they receive when joining IMNP. The curriculum is pliable. The local chapters are not required to teach every topic, except for Introduction to the Idaho Master Naturalist Program, and they can add topics (Focht, personal correspondence, 2012).

To receive an IMNP master naturalist certificate, participants are required to complete the initial 40-hours of environmental education and 40-hours of nature-based volunteering. To maintain their certification, the participants must complete eight hours of education each year (IMNP, 2011).

PURPOSE OF THE STUDY

The purpose of the study was to determine if IMNP was fulfilling its mission "to develop a corps of well-informed volunteers to actively work toward stewardship of Idaho's natural environment" (IMNP, 2011). The assessment of IMNP was examined through the perceptions

of the participants of the program, because IMNP's mission is achieved only if the participants are successfully taught about nature and are volunteering as environmental stewards.

SIGNIFICANCE OF THE STUDY

IMNP plays a vital role in the stewardship of the environment by educating adults about nature and motivating them to volunteer. As of 2013, there are no studies assessing IMNP's effectiveness at teaching environmental subjects and promoting volunteering. An evaluation of IMNP provides data that can be used to enhance the experiences of its members, as well as assist other MNP in developing their programs. The data will assist IMNP to see the benefits and shortfalls of its program. The study may also stimulate ideas for the future direction of IMNP and other MNP. The findings of the study add to the dialogue of how to create effective adult, environmental educational programs and increase the public's role as environmental stewards.

RESEARCH QUESTIONS

The following questions guided the study:

1) Did involvement in IMNP increase the participants' attendance in nature education?
2) What was the participants' assessment of the curriculum and teaching methods of IMNP?
3) Did involvement in IMNP increase the participants' volunteering in nature-based activities?
4) What was the participants' assessment of the volunteer program?
5) What influence did IMNP have on the participants and their views of nature.
6) What was the participants' overall assessment of IMNP.

DEFINITION OF TERMS

Adult is a person who is 18 years or older.

Adult Education is the process adults seek to improve themselves or society by increasing their skills and knowledge, and where organizations assist adults in learning.

Andragogy is a teaching method that promotes the learner-centered approach (Conlan, Grabowski, & Smith, 2003).

Comprehension of the Environment is an understanding of ecology and respect for the land (Leopold, 1949).

Environment is the complex of physical, chemical, and biotic factors, such as climate, soil, flora, and fauna, of the earth.

Environmental Awareness is the development of awareness of self, of others, and of the environment with the result that such awareness would foster environmental stewardship (Blakely, 1971).

Environmental Literacy is having adequate knowledge about nature to be capable of, and motivation to pursue, self-directed environmental learning and action (NAAEE, 2013).

Environmental Stewardship means voluntary commitment and behavior that results in the protection of nature (United States Environmental Protection Agency, 2006).

Idaho Master Naturalist Program is an organization that teaches adults about nature and provides them opportunities to volunteer in nature-based activities.

Master Naturalist Program is a mechanism for the public to learn about nature and volunteer in environmental efforts (Guiney et al., 2006).

Nature is the physical world collectively, including flora, fauna, geology, hydrology, and other aspects of the earth, as opposed to human constructions.

Reactive Learners respond to the teacher, which limits the learning to the boundaries shaped by the teacher: the students do not know how to learn but only how to be taught (Knowles, 1972).

Self-directed Learning is self-teaching: the learner assumes responsibility for planning and directing the course of the study (Tough, 1979).

Transformative Learning is learning that induces change in the learner and produces an attitudinal shift that affects the learner's subsequent experiences (Clark, 1993).

LIMITATIONS

Limitations were defined as potential difficulties with the study that were identified by the researcher (Creswell, 2008). The limitations of the study were the following.

1) Emails sent by IMNP were the primary method used to contact the target population to request participation in the study. This method of contact was limiting, because some

email addresses were not deliverable and there was no guarantee that the participants received the email.

To compensate for this limitation the IMNP state coordinator posted on IMNP's website an announcement of the study and the link to the survey. Another method used to compensate for the lack of communication, was the local chapter leaders at meetings notified the participants of the study and provided the link to the survey.

2) Another limitation was the participation of the study was voluntary, so even if a person received the email there was no guarantee the person would complete the survey.

To address this issue, the emails to the participants included an explanation of how the study could benefit their experience and IMNP.

3) Answers to the survey questions relied on the participants' memories, and over a period of time memories may become murky and distorted.

To address this limitation the researcher, in collaboration with the IMNP state coordinator, designed questions to trigger the participants' recollections. Some of the questions were open-ended, which allowed participants to personalize their response and depict in detail their experiences (Simon & Goes, 2013). The coordinator had directed the program since its conception in 2008, which added in-depth understanding when drafting the questions. The IMNP state coordinator's background was in organizing and executing environmental education classes for the public, which also aided in drafting the questions.

4) An accurate assessment of the findings was impossible, because each participant's attitudes and interpretations of the questions created variables that could not be controlled.

The questions were crafted to decrease the possibility of multiple interpretations. Analysis of the data were an attempt to objectively categorize a range of subjective answers.

ASSUMPTIONS

During the study certain assumptions were supposed.

1) An Internet-based survey was a reliable method of understanding the participations' perceptions of IMNP.

Research showed that online surveys tended to yield a large amount of qualitative data (Hisako, McIntyre, Tomazic, & Katz, 2005).

2) The participants of the study would understand the survey questions.

The survey underwent a pilot test to assure that the questions were clear.

3) The participants would give accurate answers of their experiences.

The participants were informed their identity and responses would be unknown, because they would not provide any elements of their identity and access to the survey was via an internet link and was administered by SurveyMonkey. Assuring participants that their responses were confidential made it more likely that they would respond honestly (Simon & Goes, 2013).

SUMMARY

The role the public plays as environmental stewards is critical to the preservation of nature**.** Society faces several challenges in its quest to be stewards of the environment. A principal challenge is the public's lack of understanding of the environment. To be effective stewards the public must to be environmentally literate.

Numerous studies revealed that the public has minimal knowledge of the environment. Educating the public about nature is a primary method to address the public’s lack of environmental literacy. One vehicle used to teach the public about nature is the Idaho Master Naturalist Program. The mission of IMNP is to develop a corps of environmentally educated volunteers to serve as environmental stewards. It is important to verify if IMNP is achieving its mission, because it plays such a crucial role in environmental stewardship.

CHAPTER 2

REVIEW OF LITERATURE

The review of literature consists of:

1) Master Naturalist Program;
2) Environmental Education; and
3) Adult Education.

MASTER NATURALIST PROGRAM

Master Naturalist Program (MNP) is a vital portal for educating the public in biophysical subjects, as well as exposing them to nature. MNP is a mechanism for adults to learn about nature and volunteer in environmental efforts (Guiney et al., 2006; Main, 2004). Mason (1995) elucidated that involving the public in activities connected to nature increased their understanding of the environment.

A typical MNP education program consists of a 40-hour course that incorporates lectures and hands-on learning. Participants join in field trips and real-life environmental projects, so they experience nature and practice what they learned (ANROSP, 2013). Advanced educational classes on a variety of environmental topics are available after a participant has completed the initial course. Several programs require a final project that allows the participants to synthesize and apply what they learned (ANROSP, 2013).

In 2005, researchers conducted a needs assessment of MNP, which included examining the potential benefits of the program. The researchers concluded that a master naturalist program format provided a successful mode of teaching the public about environmental topics (Savanick & Blair, 2005). Moreover, natural resource professionals in 43 states reported that volunteers who participated in such programs had a positive impact in environmental education, public outreach, and conservation projects (Savanick & Blair, 2005).

Analysis of master naturalist programs in various states revealed that they were achieving their mission to educate adults to become stewards of the environment (Larese-Casanova, 2011). Broun, Nilon, and Pierce II (2009) conducted a study evaluating the proficiency of the Missouri Master Naturalist Program in educating its members. They found that after completing the program the members' knowledge of key ecological and conservation

concepts had increased.

A 2004 assessment of the Texas Master Naturalist Program (TMNP) demonstrated after attending the program the participants' knowledge increased [15 %] (Bonneau, 2004; Haggerty, 1999). In 2012, the TMNP program was evaluated to assess the impact of the program on its members. "The sophistication of volunteer environmental projects in Texas increased because of the education received through TMNP" (Haggerty, personal correspondence, 2012). Eighty-two percent of TMNP participants have continued to use their knowledge in nature-based volunteer work (Haggerty, personal correspondence, 2012).

Since 1997, TMPN volunteers have dedicated over 1.76 million hours of service of environmental projects, research, education, and outreach activities, valued at more than $21 million. This service has resulted in enhancing 90,000 acres of wildlife and native flora habitats and educating more than 2 million youth and adults about the natural world (Texas Master Naturalist Program, 2013).

Another example of an effective program is the Florida Master Naturalist Program (FMNP). As of 2012, FMNP has granted 1,002 master naturalist certificates to its participants (Florida Master Naturalist Program, 2012). Despite the lack of mandatory volunteer service, FMNP certified master naturalists have logged 164,913 nature-based volunteer hours. Volunteer activities by percent of total active time include environmental education (48.8%), citizen science (32.2%), and restoration and management (11.6%) (Florida Master Naturalist Program, 2012).

The following statements by MNP participants illustrate how it has enhanced their lives.

"I enjoy the program because it restores my faith in humankind as well as reconnecting me to my natural world."

"I enjoy the program because it proves to me over and over that each of us –even me- can make a difference and change our world for the better-especially if we all work together."

"I feel fortunate to have been exposed to your wonderful program."

"I wish the training wasn't over."

"Excellent program! It has far exceeded my expectations."

"I learn something new every time I volunteer and work with people on the same project." (Colorado Master Naturalist Program Evaluations, 2011 and 2012; Haggerty, personal correspondence, 2012; Kenney, personal correspondence, 2012; Larese-Casanova, 2011; Texas Master Naturalist Program, 2013).

Interest in joining MNP organizations has increased since its inception in 1994. TMNP started with four chapters and 150 volunteers in 1998 and by 2012 there were 44 chapters, which had certified 7,389 master naturalists (Texas Master Naturalist Program, 2013). FMNP has educated 3000 people since its first participants graduated in 2001 (Florida Master Naturalist Program, 2012). Idaho Master Naturalist Program started with one chapter in 2008 and by 2013 had nine chapters with 415 participants (Focht, personal correspondence, 2013).

ENVIRONMENTAL EDUCATION

Environmental education is a complex field combining topics from diverse arenas, including ecology, earth science, biology, physics, and social sciences. The concepts of environmental education were so broad that specialists in the field referred to it as interdisciplinary (Lin, 2002). It initially focused on instilling an aesthetic appreciation of the natural world (Pinar, 2004). Over time the focus of environmental education expanded to include conservation and critical thinking (Sterling, 2001).

In the 1960s, because of concerns for the integrity of the earth, the goals of environmental education expanded to encompass that the learners not only understand environmental issues, but they act upon this knowledge (Sterling, 2001). Stapp et al. (1969) researched the objectives of environmental education and proposed the mission of environmental education was to produce "a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve those problems, and motivated to work toward their solution" (p. 31). Carter and Simmons (2010), who were part of a study of the history, philosophy, and goals of environmental education, expounded on Stapp's study and proposed that environmentally literate citizens "understand what they do as individuals and in groups makes a difference in their world" (p. 13).

In 1970, a definition of environmental education was crafted at a conference held by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) and the World Conservation Union. The attendees defined environmental education as the process of recognizing principles and clarifying ideas to develop skills and attitudes necessary to understand the inter-relatedness between man and his biophysical surroundings (NAAEE, 2013).

Roth, a professor of environmental education at the Ohio State University, conducted a study to determine what topics should be included in environmental education (Roth, 1973). Forty professionals in various fields from 12 ecological regions produced a list of 112 concepts. A panel of experts from the Ohio State University reviewed the 112 concepts and organized them into four interrelated topics: biophysical, socio-cultural, environmental management, and change. Biophysical focused on the interdependence of all life forms, socio-cultural addressed the relationship between humans and the environment, and environmental management involved how humans oversee natural resources. Change encompassed the other three categories (Roth, 1973; Roth, 2008).

In 1977, UNESCO hosted the Intergovernmental Conference on Environmental Education where the attendees drafted the Tbilisi Declaration, which set forth guidelines for environmental education programs. There were five principles:

1) Awareness -- acquiring a mindfulness of the environment;
2) Knowledge -- gaining a variety of experiences in and an understanding of the environment;
3) Attitude -- developing the initiative to participate in environmental conservation;
4) Skills -- attaining the techniques for solving environmental problems; and
5) Participation -- taking part in environmental activities (NAAEE, 2013).

These five principles are the root skills that environmentally literate citizens require (NAAEE, 2013).

Pooley and O'Connor (2000) studied the cognitive bases of environmental attitudes and found that it was what people felt and believed about nature that formed their attitudes, which impacted their behavior. They proposed that to change environmental attitudes educators needed to focus on emotions and beliefs rather than just on environmental knowledge (Pooley & O'Connor, 2000).

The North American Association for Environmental Education clarified (2013):

> The purpose of environmental education is to foster the education of skilled individuals able to understand environmental problems and possessing the expertise to advise effective solutions to them. In the broader context, environmental education's purpose is to assist in the development of a citizenry

conscious of the scope and complexity of current and emerging environmental problems and supportive of solutions and policies that are ecologically sound.

"It starts out with framed information that evolves into understanding the subject's underlying principles, the skills needed to investigate the subject, and the understanding of how to apply that information" (Coyle, 2005, p. xiii).

Environmental education was not only about acquiring knowledge of the natural world it was about cultivating a connection between people and the earth that generated a feeling of personal responsibility and inspiring action (NAAEE, 2013). Jonathan Wert (1976), a specialist in environmental education, proposed that an effective environmental program was one that led the learner to become:

1) Conscious of the environment;
2) Concerned about it;
3) Engaged in finding solutions; and
4) Involved in environmental activities.

Environmental education should motivate the student to engage in a life-long process of learning about the natural world (Moody & Hartel, 2007; NAAEE, 2013; Roth, 2008; Tilden, 1967).

ADULT EDUCATION

Researchers have conducted a variety of studies to understand how adults learn and why they attend education programs. Bergevin (1967), a renowned adult educator, postulated several reasons why adults participated in educational programs:

To achieve happiness and meaning in life;

To understand themselves and their relationship with other people;

To advance spiritually, culturally, physically, politically, and vocationally; and

The desire for lifelong learning;

Even though these reasons were developed over 40 years ago they remain relevant in the 21st Century.

To create an effective adult education program, it is important to recognize how adults learn. Andragogy and self-directed learning are two methods advanced to explain how adults learn. Andragogy was a teaching method that promoted the learner-centered approach

(Conlan, Grabowski, & Smith, 2003; Knowles, 1984). Knox, a professor of adult education, studied the methods of adult learning and found that andragogy was first developed in Europe in the 1830s (Knox, 1996). "Its fullest flowering occurred in Yugoslavia where it was established as an academic discipline…." (Knox, 1996, p. 26). In 1968, Malcom Knowles, who specialized in adult education, introduced the discipline to the United States in a journal article, and in 1970 expanded on the theme in his book *The Modern Practice of Adult Education* (Knox, 1996).

The four principles of andragogy were:

1) Adults needed to be involved in the construction and evaluation of their learning;
2) Adults were interested in learning about subjects that were relevant to their job or personal life;
3) The basis for learning was through experience; and
4) The learning was problem-centered rather than content-oriented (Knowles, 1975).

Self-directed learning, which incorporated the andragogy style, was a leading theory of how adults learned (Conlan, Grabowski, & Smith, 2003). Brockett and Donaghy (2005) researched the evolution of self-directed learning using Cyril Houle, a pioneer in adult education, as a starting point. They determined Houle had substantially influenced self-directed learning through his writings, especially *The Inquiring Mind* (Houle, 1961). As explained by Brockett and Donaghy, Houle clarified in a 1988 reprint of *The Inquiring Mind*, "the idea that men and women should assume responsibility for their own learning was tacitly accepted by most people" (Brockett & Donaghy, 2005, p. 2).

A major contributor to the self-directed learning orientation was Allen Tough, a student of Houle and the renowned educator from Canada. In a 1967 study, Tough described self-directed learning as self-teaching: the learner assumed responsibility for planning and directing the course of the study (Tough, 1967; Tough, 1979). Underlying Tough's theory was the supposition that adult learners had the aptitude to plan and guide their learning (Hiemstra, 2002). Self-directed learners were the primary initiators, managers, and evaluators of their learning experiences (Merriam, Caffarella, & Baumgartner, 2007). Self-directed learning was predicated on the postulation that adults were capable of self-direction (Hiemstra, 2002).

The process of self-directed learning occurred when "...individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals,

identifying resources for learning, choosing, and implementing appropriate learning strategies, and evaluating learning outcomes" (Knowles, 1975, p. 18). Knowles (1975) based his approach on teaching adults on five premises:

1) Adults perceived themselves capable of self-direction and self-motivation.
2) Adults' past experiences were resources for learning.
3) Learning should be related to the needs of the adult learners.
4) A problem-centered orientation to learning was necessary for adult learners.
5) Adult learners had the desire to immediately apply what they learned.

Knowles (1975) proposed that self-directed learning was a proper method for adult learners, because "an essential aspect of maturing is developing the ability to take increasing responsibility for our own lives to become increasingly self-directed" (p. 15). Knowles also discovered there was enough evidence that self-directed adult students learned more and better than adult reactive learners. Reactive learners respond to the teacher, which limits the learning to the boundaries shaped by the teacher: the students do not know how to learn but only how to be taught (Knowles, 1972). "They [self-directed learners] enter into learning more purposefully and with greater motivation. They also tend to retain and make use of what they learn better and longer than do the reactive learners" (Knowles, 1975, p. 14). The self-directed approach focused on the learning activities rather than on the teaching (Seevers, Graham, Gamon, & Conklin, 1997). Knowles (1975) proposed that adult education was not about teaching adults but aiding them in learning.

Self-directed learning occurred when circumstances arose to form the stimulus and the opportunity for contemplation leading to learning (Hiemstra, 2002). Brookfield (1986) proposed, there were two conditions required for self-directed learning to occur: when the learners had authentic control over decisions of their learning and when the learners chose from a range of available resources. Merriam, Cafferella, and Baumgartner (2007) explained, that self-directed learning occured both by design and by chance, and it depended upon the actions of the adults as well as the circumstances in which they found themselves. Self-directed learners tended to select a course from choices that were available to them rather than pre-planning their coursework (Spear, 1988). An important aspect of self-directed learning was that it could be used in a variety of educational forms, including environmental education (Conlan, Grabowski, & Smith, 2003).

In 2006, Trotter, a professor of education, researched teacher development programs through the lens of adult learning. Trotter found that a key part of adult learning was that adults used experience as a resource to learn and it must be incorporated in the teaching process. Two other essential elements of adult teaching were that adults needed to plan their own educational path and the purpose of adult education was to promote learner development through reflection and inquiry (Trotter, 2006).

For teaching to be fruitful the student must comprehend and apply the information they are taught: they had to transform. Transformative learning was defined as learning that induced change in the learner and produced a shift that affected the learner's subsequent experiences (Clark, 1993). The transformational perspective proposed learning could facilitate adults to undergo conversion through self-reflection (Kroth & Boverie, 2000; Merizow & Associates, 2000; Taylor, 2008).

Mezirow (1978) crafted the term "perspective transformational" to explain the sequences of changes that adults went through as they adjusted to the meanings they developed during their lifetime. Transformation was set in motion by a situation that stimulated adults to reflect upon their beliefs. This reflection would cause discourse with others that would expand the adult's beliefs, which led to new knowledge that resulted in future learning and growth (Mezirow, 1978; Merizow & Associates, 2000). The changes involved reflection and discourse about long held assumptions that led to action and social change (Cranton, 2006).

Mezirow and Associates (2000) postulated that transformative learning occurred through three stages: self-reflection, reflective dialogue, and reflective action. Self-reflection began the process of transformation and was the point where adults confronted the situation that caused them to question their assumptions. The second stage was reflective dialogue. In that stage the process of testing the validity of assumptions involved cooperation with others to establish new frames of reference. The final stage of transformation was reflective action that involved integrating the new assumptions into their life (Kroth & Boverie, 2000; Merizow & Associates, 2000; Taylor, 2008).

THEORETICAL FRAMEWORK

Since the early 1900s, researchers have conducted studies to discern why adults undertake educational endeavors. Cyril Houle developed a principal theory of why adults undertook

learning. In 1961, Houle conducted a qualitative case research that involved 22 adult learners. Houle proposed there were three classifications of adult learners: goal-oriented learners, learning-oriented learners, and activity-oriented learners (Houle, 1961)

Goal-orientated adult learners attended education to accomplish a specific purpose (Houle, 1961). The purposes were varied, including such aims as obtaining a GED, computer proficiency, or a certificate as a master naturalist. In many occasions the reasons for undertaking the education was related to the learner's career. Houle found that an event occurred that instigated the adult to seek education. The event could vary from an adult's perceived need to better the community to learning the complexities of a new health care system (Houle, 1961).

Learning-oriented adults pursued education for its own sake. Learning-oriented adults enjoyed the activity of learning. Many such adults took advantage of the community library, the museum, botanical gardens, and other similar institutions. Houle discovered that learning-oriented learners tended to believe that education would enhance their lives. Many adults in this taxonomy found learning led to personal enjoyment. In certain situations, fun may have been the distinct purpose for an adult's participation in education (Houle, 1961; Houle, 1992).

Activity-oriented learners took part for the activity itself. The focus was not necessarily on learning but being active. The learners took part in education because of the social contact. The reasons behind the attendance could be boredom, loneliness, or the desire to interact with others. "Their selection of any activity was essentially based on the amount and kind of human relationships it would yield" (Houle, 1961, p.54). According to Houle, activity-oriented learners were motivated to participate in education for reasons dissimilar to the subject matter of the program (Houle, 1992).

Since Houle's initial study, many other researchers have sought to confirm the validity of his findings. Boshier and Collins (1985) tested the veracity of Houle's theory with a large database representing many adults and various programs. Based on their research, they found the goal and learning classifications still applied, but the activity classification was more complex. They expanded the reason active-oriented learners' sought education to include external expectations and community service.

SUMMARY

The literature review furnished perspective into assessing IMNP's effectiveness in educating its participants and motivating them to be environmental stewards. Review of the Master Naturalist Program demonstrated how such programs are effectively teaching adults about the environment and exposing them to nature-based activities through classroom and hands-on activities.

The examination of environmental education revealed that the primary goal of environmental education is to develop environmentally literate students who are self-directed to continue learning and who are motivated to be environmental stewards. The motivation to continue to learn should be a life-long process (NAAEE, 2013). Research showed that environmental education has brought about the transformation required for the public to become environmental stewards (Coyle, 2005; Fraj-Andres & Martinez-Salinas, 2007).

The review of adult education provided an understanding of why and how adults learn. The literature clarified that adult learners were motivated for self-growth and to increase social and technical skills. A major explanation emerged for how adults learn: the subject had to be relevant to the adult's interests and it needed to feel useful to the learner. Adults wanted to spend time learning what would make an immediate difference (Vella, 1997). The essential elements of adult teaching were that adults needed to plan their own educational path, be able to apply the knowledge, and the purpose of adult education was to promote learner development through reflection and inquiry (Trotter, 2006). These elements, which flow from self-directed learning, are effective techniques for adults to learn. Transformative learning facilitated adults to undergo change through self-reflection, which subsequently influenced their actions (Cranton, 2006; Merizow, 1978).

The theoretical framework used in the study was based on Houle's theory that there are three taxonomies of adult learners: the goal-oriented, the learning-oriented, and, the activity-oriented. Goal-oriented learners pursued education to accomplish a specific objective. The learning-oriented adult attended educational programs for the love of learning. Those learners who were activity-oriented pursued learning with no necessary connection to the education (Houle, 1961).

CHAPTER 3

METHODOLOGY

A mixed method research design, which included qualitative and quantitative, was used to conduct the study. The study examined the perceptions of the participants of Idaho Master Naturalist Program (IMNP) to ascertain if it was accomplishing its mission, "to develop a corps of well-informed volunteers to actively work toward the stewardship of Idaho's natural environment" (Idaho Master Naturalist Program, 2011, p. 3).

According to Van Maanen (1988), when a study sought to understand and to describe the meanings individuals gave to events a qualitative study was appropriate. A qualitative research study provided a method to discover and interpret the meaning persons place on their experiences (Cohen, Manion, & Morrison, 2007). As Merriam (2009) elucidated, "the primary goal of a basic qualitative study is to uncover and interpret" how individuals construe their experiences (p. 24).

As Patton (1990) explained, "the task of the qualitative researcher is to provide a framework within which people can respond in a way that represents accurately and thoroughly their points of view..." (p. 21). Moreover, qualitative research constructs how and why program outcomes are achieved (Bamberger, 2000; Creswell, 2007). A qualitative research method was suitable for the study, because the objective was to explore the perceptions of the participants to determine if IMNP was achieving its mission.

PARTICIPANTS

The target population of the study was all the participants 18 years or older who attended IMNP between 2008 and 2013. The selection process was used to ensure a large group of participants in the study. The study was a census of all participants from 2008-to-2013. The years 2008-to-2013 were the years IMNP was active when the study was conducted. A total of 415 individuals attended IMNP between 2008 and 2013. Of the 415, 15 participated in the pilot survey and were not included in the final survey.

When the participants joined IMNP they supplied their emails to IMNP. The IMNP state coordinator emailed 400 IMNP participants the link to the survey. Thirty-six of the emails

were undeliverable; thus, 364 participants potentially received the email. The response rate was 52.5%.

Participation in the study was voluntary. The participants did not receive any payment or gift for taking part in the study. This was a blind study, because the participants did not provide any personal information or other identifying material when responding to the survey. The researcher did not have the names of the participants nor did she have any direct contact with the participants. There was no process of linking the individual responses with the participants' identities. The data were collected by an Internet-based survey that was administered by SurveyMonkey, an online survey platform.

DATA COLLECTION

When conducting a qualitative research there are many approaches for data collection (Creswell, 2008; Marshall & Rossman, 2006). The method of data collection used in the study was an Internet-based survey. Survey research was an excellent method in collecting original data from a large population that would be too difficult to observe directly (Babbie, 2001). Surveys were a valid method to gather information on knowledge and attitudes of the participants of a study (Radhakrishna, 2007).

The use of the Internet had become widespread and many researchers had used online designs to conduct research (Fraley, 2004). According to Gosling et al. (2004), online surveys had the potential to reach a greater population and were as effective as mail surveys (Gosling, Vazire, Srivastava, & John, 2004). Research showed that online surveys tended to yield a large amount of qualitative data (Hisako, McIntyre, Tomazic, & Katz, 2005).

The survey used in the study was designed specifically for the study and was developed by the researcher with the assistance of Focht, the developer of IMNP and the IMNP state coordinator. It included an introduction notifying the participants the reasons for, and benefits of, the study, that the survey was voluntary, they could opt-out-at-any-time, and that their responses were anonymous.

Using the format developed by Radhakrishna (2007), the survey underwent the following steps to assure its validity and reliability, and that it achieved the study's purpose. Radhkrishna's method consisted of five sequential steps that built upon each other. The steps were:

1) Background: examination of the purpose of the study.;
2) Conceptualization: concepts for the questions were governed by what the survey was measuring (the participants' perceptions, recalling experiences, and knowledge).;
3) Format: this stage involved constructing the questions, the sequence of the questions, and the format of the survey.;
4) Establishing Validity: validity was confirmed by using a panel of experts to measure the readability of the survey. Five questions guide the process for showing validity, which are set forth below.; and
5) Establishing Reliability: a pilot test was conducted to establish reliability.

As Norland-Tilburg (1990), assistant professor of agricultural education at the Ohio State University, explained, reliability is the accuracy of the survey. After each step the study survey questions were refined. These steps were necessary to lessen measurement error (Groves, 1987).

Before drafting the survey, the purpose and research questions were reviewed to provide a foundation for crafting the questions, so they were clear, concise, and would elicit responses to answer the research questions. Once the questions were drafted, each one was scrutinized to identify spelling, grammar, awkward words, and confusing structure. The questions were examined to guarantee they were easily understood and did not have multiple interpretations. The order of the questions was considered, because one question may influence how the participant interprets the next question (Boyer & Stron, 2012).

After the questions underwent an internal review, a panel of experts assessed the survey. The panel consisted of Sara Focht, developer of IMNP and IMNP state coordinator, Dr. Lynn Kinter, lead botanist at the Idaho Natural Heritage Program and instructor of IMNP topics, Julie McWhorter, architect of an IMNP local chapter and outdoor science instructor, and Dr. Lorri Morgan, former professor of adult education at the University of Idaho.

When assessing the survey, the panel considered questions set forth by Radhakrishna (2007) and Simon and Goes (2013). The questions were:

1) Are the questions clear and easily understandable?;
2) Are the questions appropriate for the participants?;
3) Will the questions elicit similar responses from the participants?;
4) Is the survey determining what it is intended to measure?; and

5) Is the survey sufficiently comprehensive to collect the required data to answer the purpose of the study?

Based on the observations and comments from the panel, the survey was modified.

After the questions were revised, the survey underwent a pilot test to authenticate its reliability. The participants of the pilot included 15 members of IMNP and five local chapter leaders, for a total of 20 pilot participants. The survey and introduction were revised to address the pilot participants' answers and comments.

Once the survey was finalized, the IMNP state coordinator emailed the 400 participants a link to the survey (Appendix B). The state coordinator emailed the participants three times. The state coordinator also posted on IMNP's website the introduction of the study and the survey link. Another form of communication was the leaders of the IMNP local chapters notified the participants of the study and gave them the link to the survey. They made the announcement at two monthly meetings.

Table 3.1: Timeline IMNP Contacted Participants

Emails Sent	Website Postings	Local Chapter Announcements
6 February 2013	8 February 2013	February chapter meetings
13 February 2013	15 February 2013	March chapter meetings
6 March 2013	8 March 2013	

The survey consisted of questions that were both open-ended and multiple choice. Open-ended questions were suited for obtaining the perceptions of participants (Barriball & While, 1994). As Simon and Goes (2013) explained, the use of open-ended questions inspired participants to share their experience in detail. The survey covered five areas of inquiry:

1) Reason for joining IMNP;
2) Assessment of the educational portion of IMNP;
3) Assessment of the volunteer portion of IMNP;
4) Influence IMNP had on the participants; and
5) Participants' overall view of the program.

The initial portion of the survey began with a series of questions that collected information about the reasons for joining IMNP, if they became certified master naturalist, and the amount of time of the participants attended the educational and volunteer portion of

IMNP. The level of participation was sought to provide an overview of the degree of involvement in and commitment to IMNP.

The next set of questions dealt with the participants' perceptions of the educational and the volunteer components of IMNP to determine if they were satisfactory. The participants were asked to assess the curriculum and teaching methods of IMNP. The questions also examined the types of volunteer activities the participants conducted and their thoughts on the volunteer program. The subsequent portion of the survey involved a series of questions that sought to learn the influence IMNP had on the participants, benefits the participants acquired from attending the program, and their suggestions on how IMNP could be modified.

The questions allowed the participants to place their involvement with IMNP in a long-term context and to elaborate on the influences the program had on their lives. The questions dealt with the participants' self-reflections on how the program affected their knowledge of environmental concepts and volunteering in nature-based activities. The data provided a portrayal of the thoughts and experiences of the participants of the program.

DATA ANALYSIS

Data analysis is the process of making meaning from the data (Simon & Goes, 2013). The data was analyzed using a constant comparative method. Glaser (1965) developed the constant comparative method as the core qualitative analysis used in the grounded theory. The constant comparative method became the primary analysis process in other traditions of qualitative research (Boeije, 2002). Under a qualitative analysis the data were open-ended, emergent, and analyzed to identify patterns and themes (Glaser, 1965; Creswell, 2008; Merriam, 2009). The method of analysis used in the study was inductive, the researcher examined and drew meaning from the data, rather than deductive that defined at the outset what would be found (Fram, 2013; Glaser, 1992).

Table 3.2: Steps of Data Analysis

Steps	Process
1	Read responses
2	Read, read, and read again
3	Pause and contemplate the data
4	Open Coding: Condense and synthesize the data and begin coding similar data
5	Axial Coding: Re-exam data and codes. Reconfigure the codes to those that showed patterns
6	Preliminary Categories: Develop initial categories from the codes
7	Reflect & Re-exam: Data, codes, and categories for different alternatives
8	Final Categories: Reduce and combine categories into final ones
9	Themes: Develop themes from analysis process

As the data were collected it was read and collated into similar responses. From this process the data were analyzed and coded. Coding was a method of tracking the responses and interpreting the data (Charmaz, 2006). The first process of analysis was open coding, which involved condensing and identifying data that could answer the research questions and resolve the purpose of the study (Glaser, 1992). From the open codes preliminary categories were identified. The preliminary categories formed the framework for further analysis.

Open coding required the researcher to take one piece of data and compare it to all other pieces of data that were either similar or different. During this process the researcher began to look at what made this piece of data different or similar to other pieces of data (Boeije, 2002; Fram, 2013; Glaser, 1992). The first step used by the researcher was to analyze the data using a line-by-line format. Responses to each question were read, scrutinized, and compared to each other. Similar responses were then input into codes. Each question underwent this process. The initial phase of analysis resulted in codes that were more descriptive and less analytic in nature. The data were reduced through constant recoding (Glaser, 1992).

Focused codes emerged from the data and were used to compare the participants' experiences and perceptions (Merriam, 2009). Through coding potentially relevant information was identified. The codes were reviewed to see if they provided insight and

answered the research questions. Each code was compared to another code from which patterns emerged that were placed in preliminary categories (Creswell, 2008). The codes and preliminary categories were viewed at different angles to gain greater clarity.

Once the initial phases of coding were completed, the second stage of coding began: axial coding. Axial coding involved further synthesis of the data. The categories were re-examined to determine how they were linked. The codes were reviewed, compared, combined, and reduced. The review process started over: refining and revising the codes and placement of the codes within the categories. Next, the categories were analyzed to determine if they were relevant and supported by the data. The categories were delineated, and connections were built to reveal the participants' reflections (Boeije, 2002). Refinement of analysis resulted in focusing the key categories of the research (Charmaz, 2006). During this process the categories were reviewed to verify that they reflected the data.

The final categories advanced were the ones that held across the data (Merriam, 2009). Once the final categories were completed, the data were revisited to look for alternative interpretations. Patterns and categories were derived directly from the data not from previously established theories (Charmaz, 2006). After further review of the responses, it was determined that no new data emerged that added to the understanding of the categories and that saturation had been achieved (Merriam, 2009). Tenets that grew from analyzing the categories evolved into themes.

RELIABILITY

An important component of analysis was to assure the findings arose from the data and not the researcher's presumptions (Kroth, 2012). Reliability could be deemed the fit between what a researcher recorded as data and what occurred in the natural setting that was being researched (Cohen et al., 2007). To ensure reliability, Creswell (2008) recommended using at least two of eight verification processes. These processes included peer review, triangulation, member checks, adequate engagement in data collection, researcher's reflexivity, external audits, and rich descriptions (Creswell, 2008; Merriam, 2009). Four methods were used in the study to ensure reliability: peer review, reflexivity, rich descriptions, and external audit.

According to Guba (1981), peer review “provides inquirers with the opportunity to test their growing insights and to expose themselves to search questions” (p. 85). Advice from

other professionals, such as members of academic staff and thesis committee members, improved the quality of the findings (Creswell, 2008). The peer reviewers for this study were Dr. Allison Touchstone, former professor of Agricultural Education at the University of Idaho, Dr. Lorri Morgan, former professor of adult education at the University of Idaho, and Dr. James Connors, a professor of Agricultural Education at the University of Idaho.

The peer reviewers examined how the data were collected, managed, and the methodology used in the study. Dr. Touchstone and Dr. Morgan were involved in the construction of the study, including the conception of the purpose of the study, drafting the survey questions, and the choice of the methodology used. Dr. Connors reviewed the drafting of the study, data management, methodology and analysis processes, and the findings of the study. The study underwent modifications to reflect the peer reviewers' assessment of all the components of the study.

To avoid clouding the findings with the researcher's bias the researcher conducted reflexivity throughout the research process. Reflexivity was attending systematically to the context of knowledge construction during every step of the research process (Merriam, 2009). Before, during, and after collecting the data, the researcher reviewed personal views on the subject to minimize any assumptions held about the study. The researcher challenged her personal thoughts during the coding to assure the conclusions were based on the data. During the data analysis, the researcher studied her thoughts on the subject to minimize any assumptions she may have on the subject. She challenged her conclusions while writing the findings to assure they were based in the data and not her preconceived notions.

Rich description was another method used to establish reliability. Lincoln and Guba (1985) explained, rich description is a way of achieving a type of external validity. Creswell (2008) described the practice of thick description as a rendition of how people feel and the meaning they place on their experiences. Rich descriptions gave enough context, so that a person outside the phenomena could make meaning of the behavior (Creswell & Miller, 2000).

The language should be detailed enough to transport the reader into the events being described in the study. Rich description enabled readers to make decisions about the applicability of the findings to other settings or similar contexts (Creswell, 2008). In the study, rich description was achieved by relating the phenomena the participants were describing,

portrayal of participants' reasons for their involvement in the program and of their experiences, as well as their assessment of the program.

External auditors reviewed the data to assure the categories and findings were grounded in the data and prevented any misinterpretation of the data. The auditors were persons who were involved in administering IMNP, who taught topics at IMNP, developed local IMNP chapters, and taught at post-secondary level schools. The external auditors reviewed the analysis process and provided the researcher with alternative viewpoints. The external auditors' observations helped to refine code, categories, and themes to more accurately reflect what was emerging from the data.

VALIDITY

There are two types of validity: internal and external. Internal validity arose when the findings were based on the data collected (Merriam, 2009). Continuous examination of the data, comparing the codes to the responses, and reflecting on the categories assured the findings of the study derived from the data (Golafshani, 2003).

External validity asked if the findings of the study could be applied to another setting: Are the findings transferable? (Merriam, 2009). As Lincoln and Guba (1985) clarified, qualitative researches study a unique arena and that the data from the research is tied to that specific arena. As to the transferability of the study, the focus of this research was IMNP's implementation of the program and its outcome. Program execution and result are themes that are important to other organizations similar to IMNP. However, as a qualitative study the data were open to multiple interpretations. As Creswell (2008) explained, transferability is the responsibility of the person doing the generalizing.

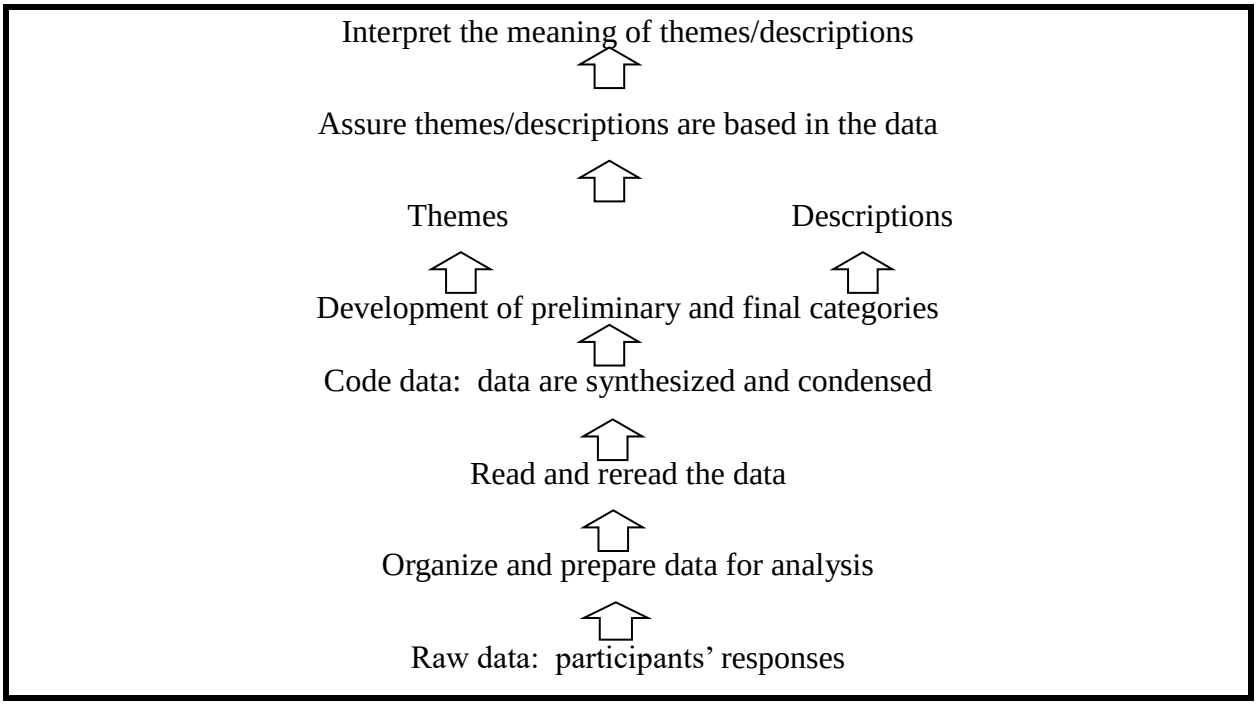

Figure 3.1: Process of Validating the Accuracy of Findings

SUMMARY

The research employed in the study was a mixed method. The study was a census of participants 18 years or older who had attended IMNP between 2008 and 2013. A total of 415 persons joined IMNP between 2008 and 2013; however, 15 participated in the pilot study, so they did not participate in the final survey. The IMNP state coordinator emailed 400 participants the survey; but 36 of the emails were undeliverable; thus, 364 participants potentially received the email. The response rate was 52.5%.

The instrument used to collect data was an Internet-based survey crafted specifically for the study, which was administered by SurveyMonkey. The survey consisted of open-ended and multiple-choice questions. The use of open-ended questions stimulated participants to share their experiences in detail. The survey was voluntary and anonymous. A constant comparison data analysis method developed by Glaser (1965) was used to analyze the data. Analysis of the data resulted in categories being developed from which themes emerged and conclusions were drawn. To assure the reliability and validity of the study four checks were employed: peer review, external audit, reflexivity, and rich description.

CHAPTER 4

FINDINGS

The purpose of the study was to ascertain if the Idaho Master Naturalist Program (IMNP) was fulfilling its mission to develop a corps of environmentally literate volunteers. The study was a census of the participants 18 years or older who had attended IMNP between 2008 and 2013. The data were collected using an Internet-based survey, netting a 52.5% response rate.

DATA COLLECTED

The survey sought to answer the research questions:

1) Did involvement in IMNP increase the participants' attendance in nature education?
2) What was the participants' assessment of the curriculum and teaching methods of IMNP?
3) Did involvement in IMNP increase the participants' volunteering in nature-based activities?
4) What was the participants' assessment of the volunteer program?
5) What influence did IMNP have on the participants and their views of nature?
6) What was the participants' overall assessment of IMNP?

Research Question 1: Did involvement in IMNP increase the participants' attendance in nature education?

To answer research question one, it was necessary to determine the amount of time the participants spent attending nature education before and after joining IMNP. A total of 172 participants responded to the question.

Twelve percent said they had attended less education after joining IMNP. Eighteen percent said they had attended about the same amount of education before and after joining IMNP. Seventy percent of the participants said, after joining IMNP their participations' of nature education had increased.

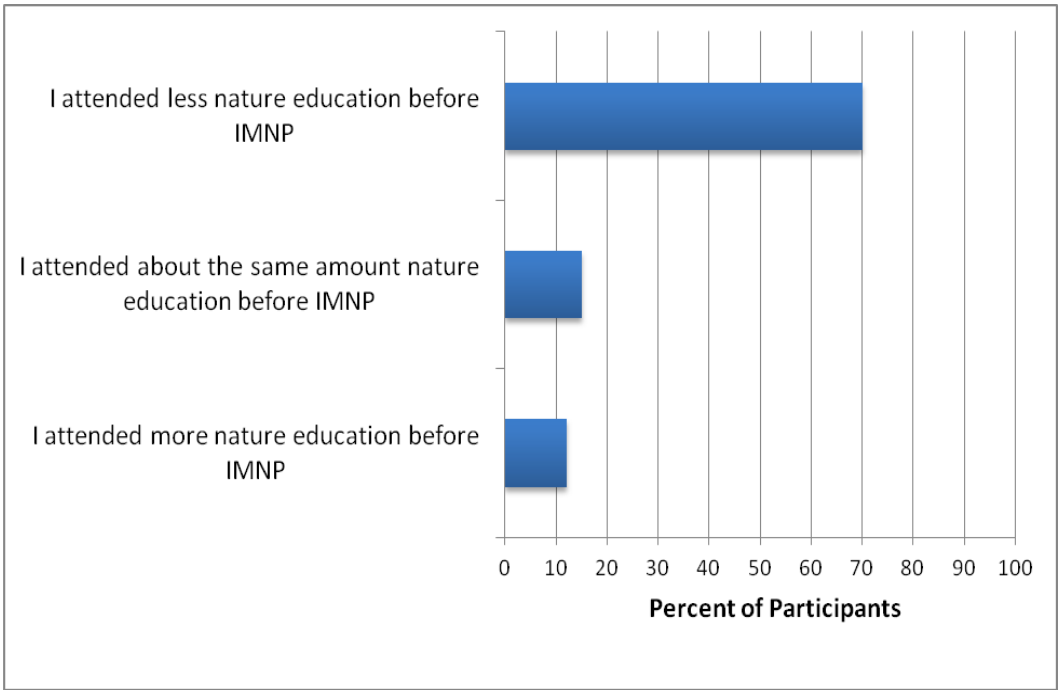

Figure 4.1: Time Spent Attending Nature Education

Research Question 2: What was the participants' assessment of the curriculum and teaching methods of IMNP?

Participants' Assessment of IMNP Curriculum

To assess the educational portion of IMNP it was essential to learn what the participants' thought of IMNP's curriculum. The curriculum developed by the IMNP state office consisted of a variety of topics. The IMNP local chapters could teach other topics not developed by the IMNP state office and they did not have to teach all the topics, except for Introduction to the Idaho Master Naturalist Program.

The participants were asked what topics they were taught. A total of 190 participants responded to the question. The topics most attended were (from most to least): Introduction to the Idaho Master Naturalist Program, Geology of Idaho, Plants, Ornithology, Ecological Concepts, Ichthyology and Fisheries, Mammalogy, Ecosystem Management, Nature Journaling, and Aquatic Ecology. The All other responses reflect the topics taught by IMNP local chapters.

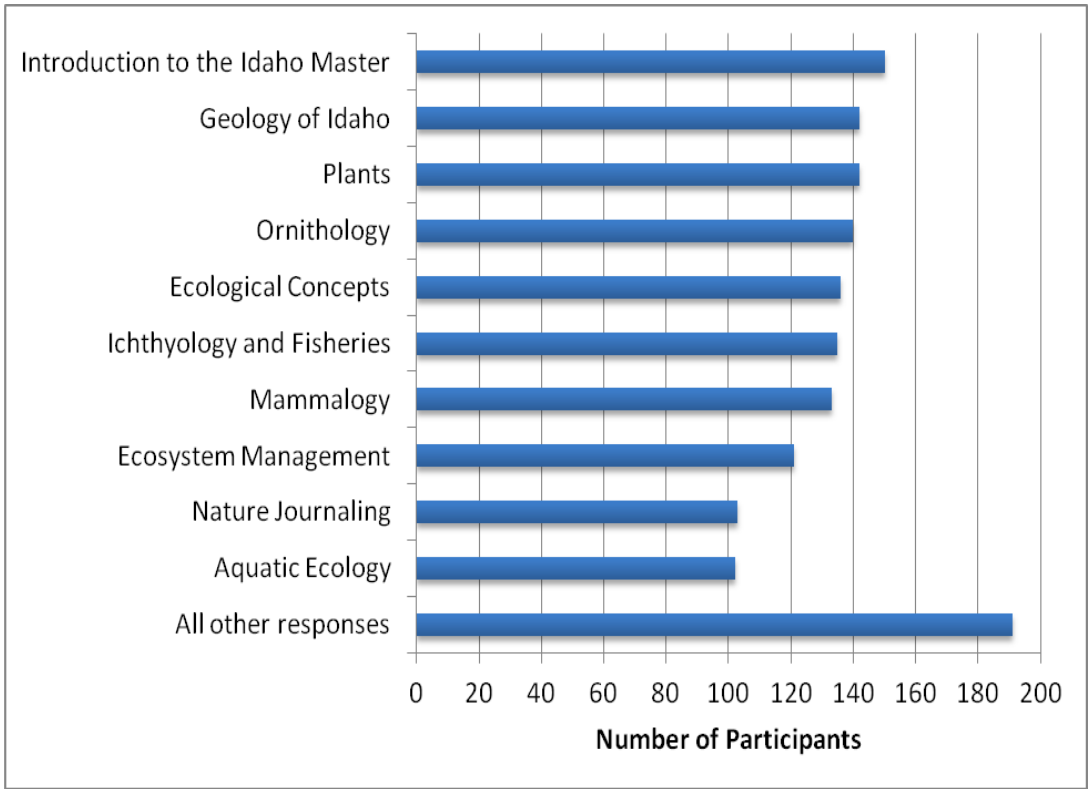

Figure 4.2: Topics Attended by Participants

To gain insight into the participants' view of the curriculum, the participants were asked, ***What are your thoughts about the written curriculum of IMNP?*** A total of 157 participants responded to the question. The participants' responses to the question were categorized as diagramed in Table 4.1.

Table 4.1: Participants' Thoughts About the Curriculum

Thoughts on Curriculum	Frequency	Percentage
Satisfactory	116	73.8
Needs Improvement	31	19.7
No Thoughts on Curriculum	10	17.5

The following quotes are a sample of why the participants thought the curriculum was satisfactory.

> "The lectures I attended were very well presented the speakers were very knowledgeable and kept my interest even though I knew most of the material."

"The lectures provided during the 40 hours of education requirement were of high quality and had data and information from folks who were field professionals."

"Yes. I was able to ask questions and to become aware of problems."

"I tell people to use it as a reference."

"Overall well done."

"Really good information. I still refer to several of the handouts."

"The written material, which is nicely done, gives a broad-based foundation upon which to build our own bank of knowledge."

"Excellent, great reference material."

"Even as an advisor and having natural resources as a career, I have learned from presenters we have had in their specialized fields."

The quotes below explain why the participants thought the curriculum needed to be improved.

"The topics didn't seem to be as well-integrated as they could have been; they seemed to be based on who was available to teach. The classes provided some good foundation, but not much opportunity to apply knowledge."

"Not as much as I had hoped. The written material was mediocre."

"Not very useful. To general and not specific to our area."

"[I] wish some were more in-depth. Many needed additional editing."

"There were so many topics addressed so superficially, the depth of addressing these issues wasn't there."

"Some speakers did help because they facilitated a discussion during class. Other speakers merely rattled off the list of birds and bird calls for me to memorize (which I didn't do). This was not effective to get our class critically thinking about resource management in the area."

"Could be improved and streamlined. The lecturers presenting the material were the most important in my classroom efforts."

The quotes below demonstrate why the participants said they did not have any thoughts on the curriculum.

"No particular thoughts."

"Didn't have time to read the material."

"Honestly, I don't remember the curriculum."

To understand how the participants felt about the effectiveness of the educational program they were asked, ***In what areas do you believe you need more education to be a well-informed steward of nature?*** A total of 106 participants responded to the question. The participants said they felt they needed more education in all topics.

"More in depth in all areas."

"I need education in every area to feel well-informed in this vast field."

"I would like continued science speakers and classes, especially about water resources and our changing climate and its effects on our natural world."

"I personally need more depth in entomology, ornithology and botany – but that is just because that is what I am really interested in and want to be able to share with others on nature walks."

"Refresher courses in all phases would be greatly appreciated."

"I would have preferred a more structured evolution to the class. Start with basic biology, mammals vs birds kind of stuff, then move on to specific topics. I don't feel like we had [any] basic core to build from just special topics. Would be nice to understand more of how things all fit together."

"I would like to improve my general knowledge of plants and birds for purposes of identification, as well as their relationships to other areas of the environment."

"Geology, forest ecology, land use and management."

"Some of the basics – geology, soils, ecoregions, ecological concepts, Idaho-specific issues (minerals, aquifers, forest fires, invasive, etc.). We seemed to spend lots of time on animals and not much on plants. We also spent much less time outside than I was expecting and hoping for."

"Deeper understanding of balancing a natural state and intrusion of people. Both sides of issues such as salmon and dams, clear cutting, hatchery versus natural spawning."

"Understanding more: animals/behavior, life cycles of native plants in our vicinity, need to be tested on identifying plants and trees, how weather in our area affects natural species-plant and animals. I would have been willing to take 6 months of classes and be tested."

"All, but this is why I participate in continuing educational efforts and self-directed educational experiences."

"I believe that it is up to me to continue to learn which I am doing through advanced training and study on my own."

"Different management styles and techniques of animals and ecosystems."

"More advance training in fisheries, biology, wildlife biology, ecosystem management."

"All areas that have been covered."

To attain understanding of the participants' assessment of the curriculum the participants were asked, ***Did participating in IMNP improve your understanding of nature and natural resource management concepts?*** A total of 149 participants responded to the question.

Table 4.2: Did Participants' Understanding of Nature and NRM Improve

Did Understanding Improve	Frequency	Percentage
Understanding Improved	137	91.9
Understanding Did Not Improve	12	08.0

The following quotes are a sample of why the participants' said their understanding of nature and natural resource management had improved.

> "Definitely, the IMNP program of classes with lecture (theory), field training presented by a mixture of specialists--professors, as well as experts in [field] work from USFS, USNP, ID Dept. of Parks/Rec, Fish & Wildlife, & HFF--presented the multiple approaches to conservation and management of our resources."

> "Yes absolutely! Prior to this I did not have any more than a very basic understanding of these concepts. The speakers have been fascinating."

> "I am pretty well-grounded in basic concepts because of my job--scientist in environmental review program. The general classes were a good refresher though and I learned a lot about some specific topics that I had very little previous experience with – sheep, mushrooms, trees, cranes, frogs, etc."

> "I have always had an understanding of ecology and the natural world but the IMNP expanded my knowledge a great deal."

> "My participation in IMNP exposed me to many details of the ecological and natural resource management concepts about which I knew little."

> "Yes, I learned many things that I did not understand about resource management. Some techniques I do not agree with, but it is mostly sound."

> "Yes and it has allowed me the opportunity to help others understand natural processes."

> "Yes. I had no background in resource management, so I was starting from scratch. The initial MN course was very helpful, especially since most of our instructors were professionals in the resource management field. The subsequent field trips and volunteer work also helped my understanding."

The responses below demonstrate why participants said their understanding had not improved.

> "No, I have over 20 years working in natural resources."

> "No, I have three degrees in natural resources and natural resource management."

"Not much, because I have an advanced degree in Environmental Science."

"No. I had education regarding ecological and natural management concepts before joining."

To asses if IMNP's education program was increasing the participants' knowledge of nature, they were asked, ***Do you feel you received an adequate education to be a well-informed steward of nature?*** A total of 159 participants responded to the question.

Table 4.3: Did Participants Receive Adequate Education

Receive Adequate Education	Frequency	Percentage
Yes	126	79.2
No	33	20.7

The quotes below show why the participants' said they had received an adequate education.

"Broadened my knowledge and perspective, helping me to impart that knowledge to others more effectively."

"Yes, but I could always use more training. The beauty of the program is that it requires continual learning."

"It helped to strengthen my knowledge and keep up to date on changes within the natural resource management concepts of today."

"Yes, definitely, if compared to the average citizen with little or no connection to nature."

"Yes. The program has provided me with a better and broader perspective on the topics learned."

"Yes but staying informed is crucial & ongoing."

"Yes the well rounded education, the field trips, and the volunteer work has allowed us to gain information."

"The IMNP experience certainly enriched my knowledge of eastern Idaho's environment and management issues on its public lands. I do see things differently now and feel I am a "better-informed" steward of the land, at least. Certainly there are many who are much better-informed than I, whether self-educated or professionally involved in nature stewardship, so it depends who you're comparing me to."

"Yes, I feel I am relatively well-informed; however, I know there is still much to learn!"

The following quotes are a sample of why the participants' said they did not receive an adequate education to be a well-informed environmental steward.

"Not by this program. Topics were not covered in adequate depth, and additional depth that should have been provided by continuing education was often lacking."

"No, only marginally educated."

"Since I have a degree in Environmental Science, I can't be sure if the IMNP classes alone would have been enough. The material is good, but there's a lot to cover in a short time."

"The scope is too big to feel I am well informed about nature. However, we never stop learning, and this program makes that very enjoyable. Obviously I know more now than before, but that only makes it easier to see how much more there is to learn."

"It's a beginning, there is always so much more to learn. My volunteer work has been very educational!"

"No not without more study and more hands on, I just couldn't commit."

"This is a process and not a goal. The real stewards are always learning, always questioning."

Participants' Assessment of IMNP Teaching Methods

Another component of the educational program was the teaching methods utilized by IMNP. There were four teaching methods: Lectures, Field Trips, Hands-on Activities, and Assignments. The participants rated the effectiveness of each type of teaching method.

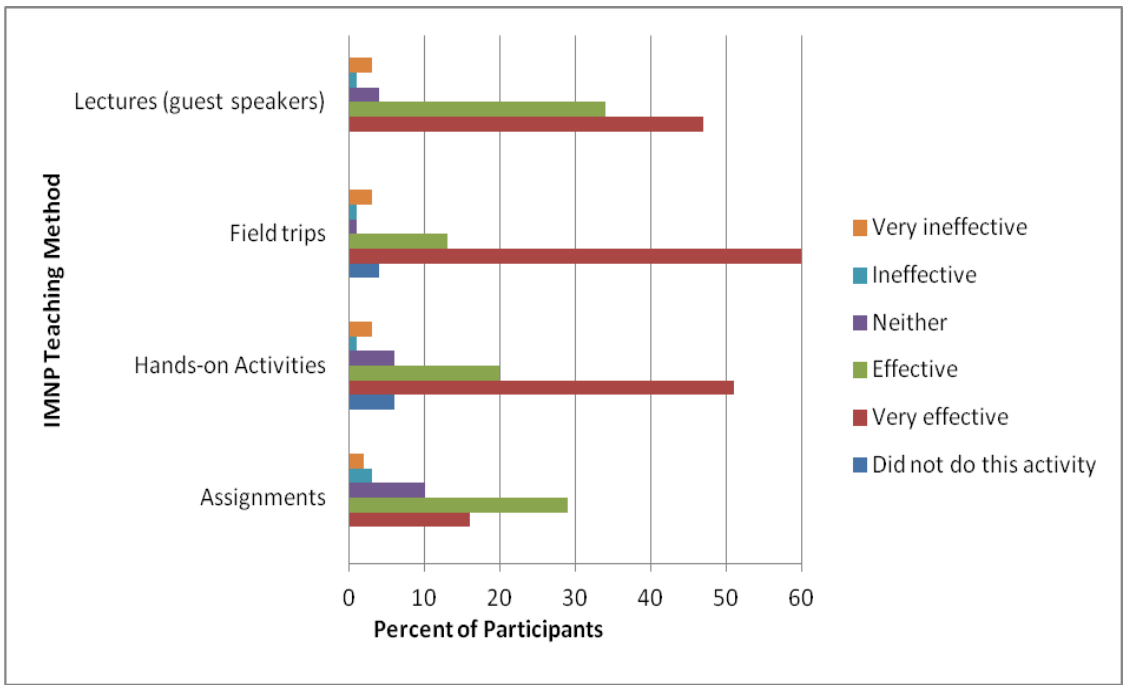

Figure 4.3: Participants' Rate of Effectiveness of IMNP's Teaching Methods

The participants said the experiential form (field trips and hands-on activities) of learning was the most effective teaching style. Sixty percent of the participants found the field trips very effective and 51% said the hands-on activities were very effective. Forty-seven percent of the participants said that the lectures were very effective and 16% said the assignments were a very effective.

Eight percent of the participants said the field trips were very ineffective and six percent said hands-on activities were very ineffective. Eight percent of the participants said the lectures were very ineffective, while three percent said assignments were very ineffective.

Research Question 3: Did involvement in IMNP increase the participants' volunteering in nature-based activities?

To answer research question three, the participants were asked how much time they spent volunteering in nature-based activities before and after joining IMNP. One hundred and sixty-eight participants answered the question. Seventy percent of the participants said they had increased volunteering after joining IMNP, while 22% said their volunteering was the same before and after joining IMNP. Twelve percent of the participants said their volunteering had decreased after joining IMNP.

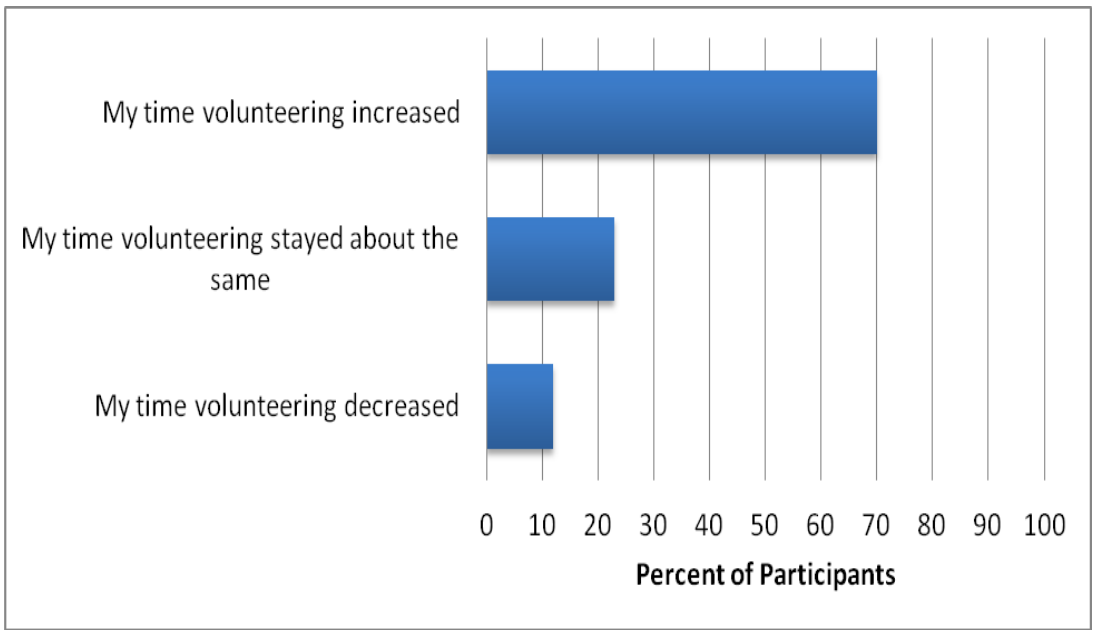

Figure 4.4: Time Spent Volunteering Before and After Joining IMNP

Research Question 4: What was the participants' assessment of the volunteer program?

The participants were asked what types of volunteer activities they joined. There were five types of volunteer activities available to the participants: Administrative Work, Citizen Science, Chapter Formation and Maintenance, Educational Programming, and Stewardship.

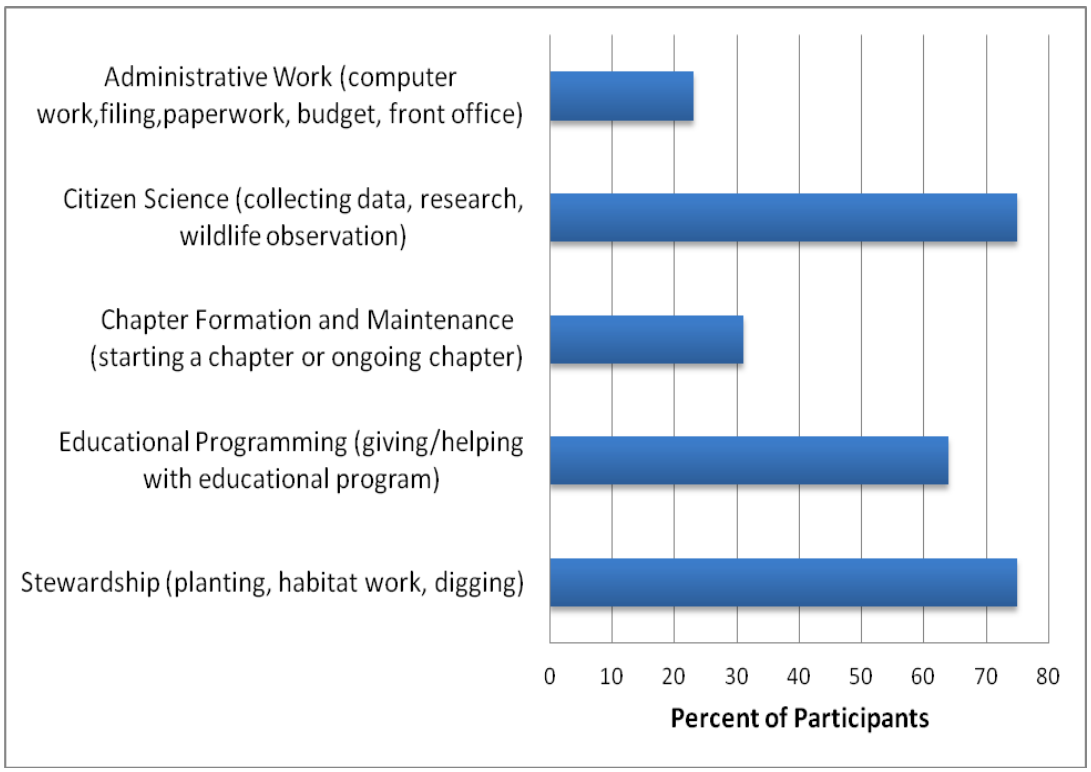

Figure 4.5: Volunteer Activities Participants Joined

Seventy-five percent of the participants took part in Citizen Science and Stewardship activities. The next most attended activity was Educational Programming with 64% of the participants joining it, while 31% participated in Chapter Formation and Maintenance. Twenty-three percent participated in Administrative Work.

To provide more insight into the volunteer portion of the program, the participants were asked to ***Describe a favorite volunteer experience***. A total of 151 participants answered the question.

Eighty-four of the participants said a favorite volunteering experience was Citizen Science.

"Ferruginous Hawk and Raptor Study sponsored by the BLM. I like observational studies and this was that kind of program. I became familiar with some key desert habitat and just getting out in nature was fun and rewarding. Although we found no Ferruginous Hawk nests in our area, we did monitor other raptor nests."

"Buffalo Run Fish Ladder: learned to identify and record fish species and activities – interesting and filled a need."

"Water bird counting on Boise River. I like the continuity and learning more over time by repeating the same activity over and over."

Thirty-two participants said Stewardship was a favorite experience.

"We built wood-duck boxes. Fun and team-work were the best aspects."

"All of them, but mostly working with the Idaho Trail Association building and maintaining trails throughout the state."

"I like doing wood duck box restoration. It is great to see that the boxes are being used and always a great day out in nature with nice people."

"It is hard to pick one! But, one of my favorites has to be building, installing, and monitoring nest boxes for American kestrels - loved this because it merged a personal interest with wildlife need and it allowed me to get to know some of the great people that are part of my chapter."

Thirty participants said Educational Programming was a favorite experience. The following responses explain why the participants enjoyed this type of volunteering.

"Snowdon's education center visiting with people and educating them about the mission of the rehabilitation center."

"I have taken the lead over the Bear Safety Education IDF&G trailer education program and I am very proud to be sharing info with the general public and promoting safety that will not just protect people but more importantly protect bears from having to be put down."

"Educational Programs, especially those that provide day-long or longer opportunities for young people (pre-teen is my favorite learning age)."

Five participants said they had not participated in a volunteer program.

Research Question 5: What influence did IMNP have on the participants and their views of nature?

To understand the influence IMNP had on the participants it was necessary to know why the participants joined IMNP. They were asked ***What motivated you to become involved in IMNP?*** A total of 173 participants answered the question.

"Heard about it from friends with like interests and decided to join."

"I had friends in the program."

"The love of outdoors, nature, biology and retirement."

"I have always been interested in nature, outdoors, fishing, animals and reptiles. When I heard about the program, I jumped at it."

"I love nature and all things wild. I wanted to become more involved in what I loved."

"A strong interest in the out of doors and our environment."

"A great opportunity to learn about a variety of nature and ecology subjects and meet interesting people."

"I wanted to learn about the area."

"Learning more about the natural world and environmental issues."

"I wanted to increase my knowledge on nature based subjects."

"I teach Earth Science, and I wanted the education to help me be a better teacher."

"Interested in gaining knowledge and assisting various projects – making a positive difference."

"A calling to serve and learn."

"Fascination with wildlife in general and desire to help with wildlife conservation."

"Desire to learn and share about the natural world and thus help raise awareness for preservation of it."

"My love of the ecosystem and the people involved."

"I like to volunteer and I love nature. I also like educating others about nature."

"Sounded like fun and was something useful."

"Personal growth and the ability to give back to the community. To protect nature."

"To give back for what I have enjoyed and to go to another level of service."

"I was looking for volunteer opportunities and IMNP fit my area of focus."

"I would like to eventually have a career doing wildlife education."

"Explore more nature/wilderness opportunities because it is my passion – looking for different opportunities in changing my career."

"I would like to become an environmental educator."

To gain better perception into how IMNP influenced the participants they were asked ***Did you certify as an IMNP Master Naturalist the year you began the program, and if not, why?*** A total of 179 participants answered the question. One hundred and twenty-two said they had certified and 57 said they did not certify the first year they joined IMNP.

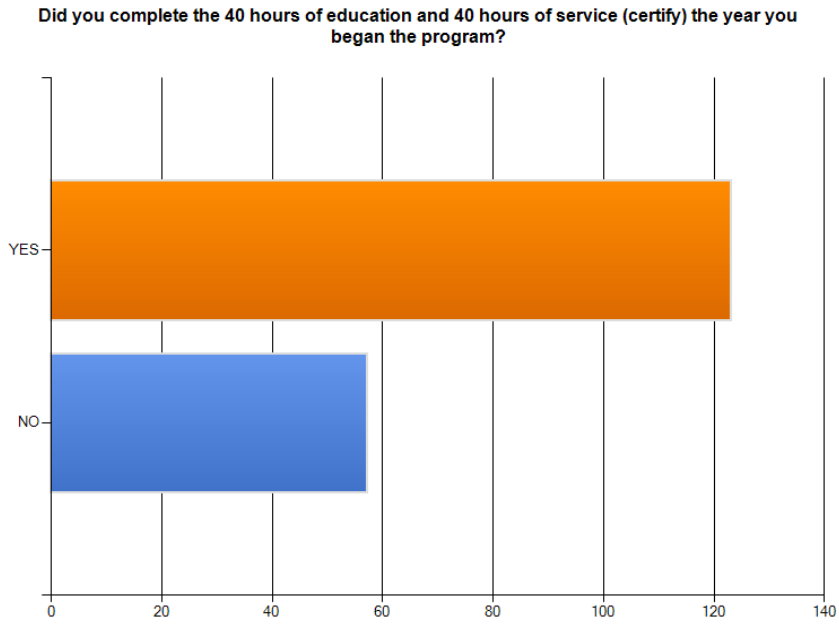

Figure 4.6: Did Participants Certify as Master Naturalist

The reasons for not certifying in the first year of joining IMNP are set forth below.

"I work full-time and had too many schedule conflicts to be able to participate."

"I did the following year.... Thyroid cancer."

"[H]ealth problems, caring for elderly parents."

"Family issues, could not do volunteer work."

"Part time resident; still need 5 hours."

"[M]issed some classes."

"Classroom still in session - plan to complete in 2013."

"Not enough volunteer opportunities on weekends."

"I work two jobs and have a family."

"I did not complete the required number of service hours."

"I am still in my training time and year of service."

"Trying to make a living!"

It was essential to understand what benefits the participants believed they had received from attending IMNP. They were asked ***What benefits did you gain from attending IMNP?*** A total of 149 participants answered the question. The following quotes set forth the different benefits the participants said they received from being a part of IMNP.

"More knowledge about the area we live and an appreciation of how things work in nature."

"I learned about things I was interested in. It helped me be more sure of myself in teaching my classes. I also met and re-met like-minded friend."

"It convinced me to leave my current career and go back to college so that I may enter the field of public nature education."

"Awareness, education, needs and successes."

"Knowledge, hands on field experience that cannot be replaced! An understanding of how the IDF&G operates, and how we dovetail with them"

"Makes for a richer life in all areas."

"I enjoy the opportunities to volunteer in citizen science."

"Certification adds to my credentials"

"Community involvement, social contacts, knowledge."

"Lifelong learning. I enjoyed working with staff and volunteer"

"Knowledge, friends, resources."

"Primarily meeting other folks with similar interest and focus."

"My knowledge base about the topics covered has been greatly increased. I felt comfortable with incorporating what I have learned into work I do and will do."

"Benefit of knowing and understanding nature and being able to communication this to students."

"Personal growth and the ability to give back."

"Valuable volunteering that is greatly appreciated by agencies and individuals."

"Learning how little I know. Connection to how to learn more in a variety of ways. Connection with people working in the field. Connection to all the many volunteer possibilities."

"I have learned so much about nature, and I have had experiences I would never have had in any other organization. I am a great believer in life long learning, and I have learned so much through this organization. It has been a wonderful experience for me in retirement."

"I am a lifelong learner, having been a public school teacher, so I enjoy new learning and skills to share."

"I was able to get a job with F&G in part due to my attending."

"I feel like I am part of the community and have something to offer it."

"Participating in IMNP was like an additional training class every week for my job. I was able to directly use what I learned in IMNP to help me be a better environmental educator."

To ascertain the effect IMNP had on the participants, they were asked, ***Do you think your views of nature changed because of your experience with IMNP?*** A total of 150 participants answered the question.

Table 4.4: Did Participants' Views of Nature Change

Did Views of Nature Change	Frequency	Percent
Views Changed	74	49.3
Views Did Not Change	76	50.6

The quotes below explain why the participants thought their attitudes about nature had changed.

"I saw more because I knew more."

"It has increased my own awareness of man's impact on nature."

"Exposure to all the different topics on nature have enlightened my views. Encourages me to keep learning on my own as well."

"I have a better sense of the interconnectedness of nature and people."

"My fascination has increased even more."

"I have always enjoyed nature. Now I have learned some more ways of appreciation. It is a forever ongoing activity!"

The following quotes are a sample of why the participants said their views about nature had not changed.

"I do not think my fundamental views on nature have changed as a result of my involvement in the IMNP. However, I do believe that my views have been re-enforced."

"I've always loved nature. I just know more about it now and have an avenue to learn more."

"No, still love and appreciate every natural living thing."

"No, but I had a very good ecological education before entering the program. I was looking for more depth for this specific geographic area."

"Not really. My views on nature were what caused me to participate in the program."

"No, I've always been interested in nature but IMNP has helped find the opportunities to volunteer."

"No, just strengthened."

"Not exactly changed, but reinforced. Specifically, although I always realized how complex and interdependent that I thought, and that there's much more to learn."

"No, only more grateful for the opportunity to work in the natural world."

It was important to understand if IMNP had influenced the participants' view of natural resource management, because many environmental stewards work with governmental agencies that manage the environment. They were asked, ***Do you think your views of natural resource management have changed because of your experience with IMNP?*** A total of 137 participants answered the question.

Table 4.5: Did Participants' Views of Natural Resource Management Change

Did Views of Natural Resource Management Change	Frequency	Percent
Views Changed	85	55.9
Views Did Not Change	52	34.2

The quotes below demonstrate why the participants believed their participation with IMNP had changed their views of natural resource management.

"I have a new appreciation of the role that IF&G has in fostering the management and care of all of the natural habitat and critters in the different habitats."

"I have a much stronger appreciation for conserving our natural resources."

"Yes, I have a better understanding of wolf management and the importance of riparian management as a result of my volunteer work."

"I have a better understanding of the importance of professional, science-based management as a critical tool in the preservation of our natural resources, both animate and inanimate."

The following quotes explain why the participants said their involvement with IMNP had not changed their views of natural resource management.

"I knew a lot about NRM going into it, as I majored in it years ago."

"No, not to any significant degree. I have always been strongly in favor of protection and management for a sustainable world."

"I have more knowledge, but my views are the same."

"My views have not changed, but they have expanded to include areas I was not informed about previously."

"Well, not really I have always felt that there needs to be a balance between use and protection."

"Don't know that they have changed, but I understand them better."

Research Question 6: What was the participants' overall assessment of IMNP.

To thoroughly assess the program the participants were asked, ***How could IMNP be improved?*** A total of 138 participants answered the question.

"More evening and weekend volunteer opportunities would be nice."

"Make classes more accessible to working people."

"The program is well thought out though I cannot claim to be a master naturalist. As far as the core instruction, many subjects are not covered adequately because of time constrains"

"I think the program could be more rigorous in terms of expectations for learning."

"Possibly having more complete listings of volunteer opportunities for the area."

"Participants should be encouraged to do more with the text provided. Some lectures [are] not even related to text so sometimes it didn't get read."

"More opportunities to teach rather than do event grunt work. Better integration of subjects; a standard curriculum across chapters. More opportunities for field conservation work/citizen science."

"Intensity of classroom training could be increased with testing in order to help retain/recall information."

"More field trips! Although the speakers were very good and we learned a lot from them, it would be nice to have more hands on experiences."

"I think little self-quizzes might be helpful to make sure members really understand concepts. They don't need to be turned in, but can be taken by IMNP members to check understand."

"My compliant is that most courses are held on weekdays when I am working. I have to take time off to go to classes. While I am only required to take 8 hours to keep up my certification, I would go to more for the review if they were evening or weekends, like when I first took the class."

"Love the idea of an annual statewide meeting which could include workshops and lectures."

"More opportunities for field training in small groups."

> "Not too much, really, because at least it opens the issues up to dialogue, and offers us ways to participate in precipitating changes."
>
> "I think that more field trips would be helpful to bridge the gap between the "classroom" knowledge and the "real natural world." This is really helpful to develop a better understanding of the local and regional natural ecosystems, habitats and the animals present in those environments."

DATA ANALYSIS

The participants' responses for each survey question were initially read to understand the essence of the answers. The data was reread, synthesized, and descriptive codes were developed. Excel and note cards were used to organize the data. The initial 124 codes were constructed from responses of similar thought. The data was reanalyzed to determine if there were any additional codes. The initial codes were collated into related responses, 42 focused codes. The focused codes were placed in a codebook (a spreadsheet) with corresponding quotes.

The focused codes were scrutinized and clustered into tentative categories that described groups of common codes. The categories were tested against the data to determine if they were valid. From the tentative categories preliminary categories were constructed that assembled related codes and were relevant to the research questions. There were a total of 22 preliminary categories.

Table 4.6: Preliminary Categories

Category	Concepts
1	After joining IMNP, the participants attended more education than they did prior to joining IMNP.
2	The curriculum is helpful and used as a reference.
3	They learned more when the lectures included hands-on activities and field trips.
4	Continuing education is necessary.
5	After joining IMNP, the participants volunteered more than they did prior to joining IMNP.
6	They appreciate the volunteer opportunities.
7	The knowledge acquired from attending the education program deepened the participants' views of nature.
8	Their beliefs of nature were reinforced.
9	Admiration for conservation increased.
10	They gained awareness of their part in preserving the environment.
11	Their views of natural resource management changed, because of their increased knowledge of nature.
12	The participants learned the importance of natural resource management.
13	They had a new appreciation for the agencies that manage nature.
14	Science is important to successful management of the environment.
15	Their knowledge of nature increased.
16	They received an adequate education to be well-informed stewards of nature.
17	The benefits from joining IMNP are diverse and personal, from social interaction to being environmental stewards.
18	Schedule more times when the topics are taught, so those who work can attend them.
19	The structure of the education program needs improvement.
20	Increase hands-on activities and field trips.
21	There needs to be more volunteer activities.
22	Communication of the volunteer activities needs to be improved.

The preliminary categories were reviewed, compared to the data, and combined into key categories. Categories 1 and 5 were combined, because they measured if the program was adequately crafted to stimulate the participants to be involved in the program. Categories 2-4

were combined, because they provided understanding of the educational component of IMNP. Categories 7-10 were unified into one category, because they examined the participants' views of the nature. Categories 11-14 were combined, because they described the participants' understanding of natural resource management. Categories 15-16 were consolidated, because they examined the participants' knowledge of the environment. Categories 18-22 were combined into the participants' suggested modifications to IMNP.

From the refined preliminary categories ten final categories were constructed. The final categories captured reoccurring patterns that cut across the data and answered the research questions.

Table 4.7: Final Categories

Category	Concepts
1	Since joining IMNP the participants attended more environmental education and volunteered in more nature-based activities.
2	The participants found the curriculum and teaching methods satisfactory.
3	Continued environmental education was essential.
4	The participants' views of nature were deepened and reinforced.
5	The participants' views of natural resource management were transformed.
6	The participants' knowledge of the environment increased.
7	The participants' were adequately knowledgeable to be environmental stewards.
8	The participants found joining IMNP beneficial.
9	The curriculum and teaching methods need refinement.
10	The volunteer program needs to be modified.

The themes evolved from analysis of the data, code development, construction of preliminary categories, and classification of the final categories as described above. The five themes represented the data and how it was related.

Table 4.8: Themes

Themes	Concepts
1	IMNP engaged the participants to attend environmental education and volunteer in nature-based activities.
2	Environmental education is important and a life-long learning endeavor.
3	The participants' awareness of nature and natural resource management was enhanced.
4	IMNP developed a corps of environmental literate volunteers.
5	IMNP was a beneficial program and inspired the participants to be environmental stewards.

SUMMARY

The participants said since joining IMNP they have attended more education, that the curriculum was satisfactory, and they enjoyed experiential learning. The participants' understanding of nature and natural resources management had increased. They felt that their views of nature had not changed, but their views of natural resources management had changed. The participants said they had received an adequate education to be well-informed stewards; however, that they required ongoing education.

Since joining IMNP, the participants had increased volunteering in nature-based activities. The main volunteer activities they participated in were Citizen Science, Stewardship, and Educational Programming. Their favorite volunteer experience was a Citizen Science activity.

The participants suggested making the teaching schedule more flexible, increase the depth of the topics, increase in-field teaching, and give more volunteer opportunities.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

The role the public plays as environmental stewards is vital. To be effective stewards the public must be environmentally literate. Environmental literacy is understanding nature to the level that a person can act as an environmental steward and be motivated to pursue environmental learning (North American Association of Environmental Education, 2013). Baba Dioum, a renowned natural resource manager, elucidated what motivated people to be effective environmental stewards: "In the end, we will conserve only what we love; we will love only what we understand; and we will understand only what we have been taught" (Dioum, 1968).

The Idaho Master Naturalist Program (IMNP) was created to educate the public about nature and to advance a corps of environmental stewards. The purpose of the study was to ascertain if IMNP was fulfilling its mission to develop a corps of environmentally literate volunteers. An Internet-based survey sought to answer the research questions:

1) Did involvement in IMNP increase the participants' attendance in nature education?
2) What was the participants' assessment of the curriculum and teaching methods of IMNP?
3) Did involvement in IMNP increase the participants' volunteering in nature-based activities?
4) What was the participants' assessment of the volunteer program?
5) What influence did IMNP have on the participants and their views of nature?
6) What was the participants' overall assessment of IMNP?

CONCLUSIONS

Participants' Attendance of Nature-based Education

The data revealed that, since joining IMNP, the participants have attended more nature-based education. Intriguingly, some of the participants said they attended less education after joining IMNP. It appears those participants had studied environmental science in a formal

school setting, as demonstrated by the following quote: "I have degrees in Zoology and Ecology."

Participants' Assessment of IMNP Curriculum

The data demonstrated that the curriculum was satisfactory. The following quote explains why the participants considered the curriculum satisfactory.

> "There was a well-rounded group of topics and I was able to gain a better understanding of several different concepts."

The education program included a process for IMNP local chapters to teach topics that related specifically to their location, which broadened the learning experience of the participants.

The data revealed that several of the participants were novice environmental students and required supplementary introduction to the topics. The following quote reflects this finding.

> "I would have preferred a more structured evolution to the class. Start with basic biology, mammals vs birds kind of stuff, then move on to specific topics. I don't feel like we had basic core to build from just special topics. Would be nice to understand more of how things all fit together."

The participants' view of whether they were sufficiently knowledgeable about nature was at the core of determining if they were environmentally literate. The data displayed that the participants had received an adequate education to be well-informed stewards. The quote below explains why the participants said they were sufficiently educated.

> "Broadened my knowledge and perspective, helping me to impart that knowledge to others more effectively."

The participants held that IMNP was a valuable organization and that they would continue to attend it.

The data showed that the participants felt they required ongoing environmental education, as the quotes below demonstrate.

> "I consider the material and presentations to be more of an introduction to topics that help me be a more-informed steward of nature. In other words, the education launches me on a more life-long learning track for which I have some responsibility. On-going educational opportunities are essential for this."

> "The beauty of the program is that it requires continual learning."

The participants' responses illustrated how essential the educational portion of IMNP was in their learning process and evolution as environmentally literate stewards.

Participants' Assessment of IMNP Teaching Methods

There was some criticism that the lectures varied from unproductive, mediocre, and to extremely helpful. The following quote provides clarity as to why some participants thought the lectures required improvement.

> "Some speakers did help because they facilitated a discussion during class. Other speakers merely rattled off the list of birds and bird calls for me to memorize (which I didn't do). This was not effective to get our class critically thinking about resource management in the area."

The teaching needed to be dynamic: engaging the participants and initiating dialog to facilitate learning. Moreover, the education format needed to be problem-centered rather than content-oriented (Knowles, 1975).

Nevertheless, the data showed that the teaching methods (field trips, hands-on activities, assignments, and lectures) were satisfactory. Experiential learning was the most effective teaching style, as illuminated by the following quote.

"[I] [g]ained knowledge and increased [my] understanding by hands on experience."

This demonstrated how important it was that the lectures were conducted in tandem with real-life actions.

As the literature clarified, adults prefer to apply new things as they learn, so it was advantageous that IMNP provided hands-on activities as part of its education. The data revealed that there needed to be more in-field activity, as explained by the quote.

> "The classes provided some good foundation, but not much opportunity to apply knowledge."

For the participants to be environmental stewards they had to transform. Transformative learning induced change in the learner and produced a shift that affected the learner's conduct (Clark, 1993). Transformation occurred through self-reflection, reflective dialogue, and reflective action (Mezirow & Associates, 2000). IMNP initiated the participants to undertake self-reflection as they attended education and to have in-depth conversations with other participants and environmental experts. Reflective action occurred as the participants applied their knowledge to their life and volunteering as environmental stewards.

Participants' Assessment of IMNP Volunteer Program

The data showed that, after joining IMNP, the participants had increased volunteering in

nature-based activities. The chief volunteer activities they participated in were Citizen Science, Stewardship, and Educational Programming. Their favorite volunteer experiences were Citizen Science activities. The participants' responses revealed that IMNP provided enough variations in its volunteer opportunities to allow its participants to join in one that satisfied their interest and kept them volunteering.

IMNP's Influence on Participants

It was necessary to determine if IMNP had improved the participants' understanding of nature and natural resource management. The responses indicated that a few of the participants level of understanding had not improved. The participants explained the reason for the lack of improvement was that they were already well educated in environmental topics or had extensive experience in the environmental field. Nevertheless, the data demonstrated that overall the participants' understanding of nature and natural resource management had improved.

It was important to assess if IMNP had altered the participants' views of nature and natural resource management. The data showed that half the participants' views of nature had not changed because they already believed it was important to protect the environment. The responses showed that even though the participants' views had not changed their knowledge had expanded and their views were reinforced. "I've always loved nature. I just know more about it now and have an avenue to learn more."

The other half of the participants' views of nature had changed. The reasons for the changes varied, but all had an underlying connection: that the changes had occurred because of their increase in environmental knowledge. The changes included an awaking of their interaction with nature and an intensification of the importance of conservation.

The participants' views of natural resource management had changed. The principal changes were increased knowledge of the governmental agencies that managed natural resources and the importance of learning about the environment.

The data displayed that the benefits the participants attained from joining IMNP were diverse: IMNP had increased their knowledge about the environment, provided them a venue to make new friends and interact with experts in the environmental field, a realization of their importance as environmental stewards, and an avenue to act as environmental stewards.

Participants' Suggested Modifications to IMNP

The data revealed that the participants' suggestions for modifying IMNP were diverse and perceptive. The scheduling of the time topics was taught needed to be flexible. The depth of the courses needed to be augmented, as well as the structure of the lectures. They also said increasing hands-on and in-field teaching would increase their knowledge, as illuminated by the following quote.

> "I think that more field trips would be helpful to bridge the gap between the classroom knowledge and the real natural world."

The participants suggested that there needed to more volunteer opportunities, the times the activities were offered needed to be varied, and the volunteer portion needed to be better organized.

RECOMMENDATIONS

Recommended Modifications to IMNP

Several principles emerged from the data that IMNP could apply to accentuate the participants learning experience and increase their knowledge about nature. When joining IMNP the participants' knowledge of the environment varied from a minimal familiarity to an advanced degree in natural sciences. The responses showed the difficulty of teaching a topic to a participant who lacked a basic science education. A lack of understanding of the fundamentals of the topic made it difficult for the participants to develop critical thinking skills and to continue learning on their own.

Initially teaching basic science courses, such as biology, botany, ecology, geology, and hydrology, would provide a foundation for novice participants to use when attending specialized topics. The struggle with focusing on the basics is that it could bore the more informed participants, particularly those with degrees in environmental sciences. However, the informed participants could use their knowledge to assist the novice participants and be part of the teaching process, which would strengthen their knowledge.

Supplementing the topics by adding new topics every year would keep the participants engaged in education. The participants' responses reflected that on-going educational

opportunities were necessary for the participants to be environmentally literate. The following quote explains what motivates the participants to attend life-long learning.

> "Need education in all [topics], but this is why I participate in continuing educational efforts and self-directed educational experiences."

IMNP needs to expand the times lectures are presented to include evenings and weekends, so the working participants can attend the lectures. Podcasts of the lectures would provide an avenue for the participants who missed a lecture to view it and an opportunity to review the topics. Increasing the amount of time the topics are taught, connecting the written curriculum to the topics taught, and adding more depth to the topics would intensify the participants knowledge.

The literature showed that learning would be reinforced if the students had a means of measuring their progress, so that they could feel a sense of accomplishment. It would enlarge the participants' education experiences if IMNP instituted an informal method, such as quizzes, for the participants to measure their knowledge as they proceeded through the topics. The quote below exhibits the participants' desire for a method to measure their knowledge.

> "I think little self-quizzes might be helpful to make sure members really understand concepts. They don't need to be turned in but can be taken by IMNP members to check [their] understand[ing]."

It would be advantageous if IMNP followed a self-directed learning process. Brookfield (1986) postulated that it was important that adults took part in the education process, including the planning of content and method of teaching. The curriculum taught by IMNP consisted of a wide spectrum of environmental topics; however, the participants had minimal input into the choice of the topics they were taught. The data indicated that the participants did not determine when or how the topics were taught or if the lectures needed to be supplemented with hands-on activities. It would expand IMNP's effectiveness to include the participants in selecting the topics and the planning of the teaching methods, including the time frame, the length the topics are taught, and the application of the knowledge to real-life activities.

Continuing Assessment of IMNP

This is an area in which continuing exploration would be fruitful in identifying areas where there are gaps in the education process and volunteering opportunities. It would assist

IMNP to ask each participant when they join IMNP what their level of knowledge is of the environment. This will assist IMNP in determining how to implement the education program. To fully assess whether the curriculum and teaching methods were developing environmentally literate stewards, the participants' knowledge before and after joining IMNP should be appraised. The knowledge assessment would determine if the participants' knowledge had improved and the degree it improved. A yearly evaluation of the participants' knowledge would determine if ongoing involvement in IMNP was enhancing the participants' understanding of the environment. It would be favorable to have novice, moderately knowledgeable, and knowledgeable participants evaluate each topic to determine which ones need to be supplemented with basic information and need to be augmented.

It would benefit IMNP to conduct surveys on the teaching methods the participants desired, as well as the topics taught and the mode of the curriculum. Conducting an appraisal of the program biennially, especially conducting surveys of the participants to solicit their experiences and suggested modifications to the program, would assist IMNP in educating the participants.

Another avenue to evaluate the efficiency of the program is to survey past and present IMNP teachers to learn their thoughts on the most valuable methods of teaching, how long the topics should be taught, which topics were the most useful or needed to be amplified, and what hands-on activities resulted in supplementing the participants' comprehension of the topic.

Surveying present and past IMNP local chapter leaders' assessment of the program would provide insight into how each local chapter functions. These assessments would bring a more localized view of IMNP. Conducting reviews by the IMNP local chapter leaders would enhance the program.

IMNP should conduct biennially surveys of the participants' observations of the volunteer program. This would assist in determining the types of volunteer activities the participants' favor, when the activities should be offered, and the structure of the volunteer program. Postings on the website, emails, and announcements at meetings about what types of activities are available and who to contact to participate in them would increase volunteering.

SUMMARY

IMNP plays a crucial role in educating the participants about nature and developing an association of environmentally literate volunteers. Since joining IMNP the participants attended more education and volunteered more in nature-based activities. The results of the study indicated that the participants had increased their understanding of nature and that they had received an adequate education to be well-informed environmental stewards. The participants said the curriculum was valuable and would continue to use it as a reference.

The participants believed that IMNP had taught them how important it was for them to be environmental stewards, provided them with a path for life-long learning, furnished them professional benefits, increased their volunteering in nature-based activities, and provided them a venue to meet people who were like minded. The participant suggested that IMNP needed to offer lectures at night and on the weekends, augment the topics, increase in-field teaching, and add more volunteer opportunities.

The data demonstrated that IMPN was an ideal setting for providing adults with a broad base of environmental knowledge to become environmentally literate. The data displayed that IMNP cultivated a corps of adults who continued to learn about the environment and maintained an involvement in nature-based activities. IMPN's educational and volunteer formats were proficient in delivering a group of environmental literate stewards.

> "I think that having passionate scientists and public stewards of wildlife come to class to share their work and open the door for our participation is the way that you turn well-informed students into enthusiastic stewards."

IMNP provided a participatory and experiential learning process. The participants' responses revealed that despite problems with the education format they did learn to the extent they became environmental literate stewards. Notwithstanding the broad array of the participants' level of environmental knowledge, the participants had acquired sufficient understanding of nature and the skills to be environmental stewards. The data showed IMNP was fulfilling its mission by developing a corps of environmental literate stewards.

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APPENDIX A

University of Idaho IRB Letter of Exemption

University *of* Idaho
Office of Research Assurances
Institutional Review Board
875 Perimeter Drive, MS 3010
Moscow ID 83844-3010
Phone: 208-885-6162
Fax: 208-885-5752
irb@uidaho.edu

To: Allison Touchstone

From: Jennifer Walker
Chair, University of Idaho Institutional Review Board
University Research Office
Moscow, ID 83844-3010

Date: 1/21/2013 11:46:40 AM

Title: Thaine MS Survey

Project: 15-573

Certified: Certified as exempt under category 2 at 45 CFR 46.101(b)(2).

On behalf of the Institutional Review Board at the University of Idaho, I am pleased to inform you that the protocol for the above-named research project has been certified as exempt under category 2 at 45 CFR 46.101(b)(2).

This study may be conducted according to the protocol described in the Application without further review by the IRB. As specific instruments are developed, modify the protocol and upload the instruments in the portal. Every effort should be made to ensure that the project is conducted in a manner consistent with the three fundamental principles identified in the Belmont Report: respect for persons; beneficence; and justice.

It is important to note that certification of exemption is NOT approval by the IRB. Do not include the statement that the UI IRB has reviewed and approved the study for human subject participation. Remove all statements of IRB Approval and IRB contact information from study materials that will be disseminated to participants. Instead please indicate, 'The University of Idaho Institutional Review Board has Certified this project as Exempt.'

Certification of exemption is not to be construed as authorization to recruit participants or conduct research in schools or other institutions, including on Native Reserved lands or within Native Institutions, which have their own policies that require approvals before Human Subjects Research Projects can begin. This authorization must be obtained from the appropriate Tribal Government (or equivalent) and/or Institutional Administration. This may include independent review by a tribal or institutional IRB or equivalent. It is the investigator's responsibility to obtain all such necessary approvals and provide copies of these approvals to ORA, in order to allow the IRB to maintain current records.

As Principal Investigator, you are responsible for ensuring compliance with all applicable FERPA regulations, University of Idaho policies, state and federal regulations.

This certification is valid only for the study protocol as it was submitted to the ORA. Studies certified as Exempt are not subject to continuing review (this Certification does not expire). If any changes are made to the study protocol, you must submit the changes to the ORA for determination that the study remains Exempt before implementing the changes. Should there be significant changes in the protocol for this project, it will be necessary for you to submit an amendment to this protocol for review by the Committee using the Portal. If you have any additional questions about this process, please contact me through the portal's messaging system by clicking the ‘Reply’ button at either the top or bottom of this message.

Jennifer Walker

APPENDIX B

Survey Instrument

The Public's Role as Environmental Stewards: A Study of Idaho Master Naturalist Program

The purpose of this study is to determine if the Idaho Master Naturalist Program (IMNP) is fulfilling its stated mission "to develop a corps of well-informed volunteers to actively work toward stewardship of Idaho's natural environment." IMNP is aware of and supportive of this study. The University of Idaho Institutional Review Board has certified this study as Exempt.

You were selected to take part in the study, because you are 18 years and older and attended IMNP between the years 2008 and 2013. As a participant in this study you will be able to affect future development of IMNP by identifying program and participant needs. The results of this study will provide IMNP data of the effectiveness of the program and information on modifications that would increase the participants' experience.

Participating in the survey is voluntary and you can opt out any time. You do not have to complete the survey. There are no immediate or expected risks for taking part in the survey. You will not receive a gift or monetary benefit from completing the survey.

If you have questions or concerns about the survey, please contact

C. A. Thaine, Principle Investigator
Graduate Student
Department of Agricultural Education
College of Agricultural and Life Sciences
University of Idaho
thai7916@vandals.uidaho.edu.

Participation and responses to the questions are anonymous. You do not provide any identification when participating in the study. SurveyMonkey, an Internet-based survey platform, is administering the survey questionnaire. To begin the survey, please click on the link http://www.surveymonkey.com. Remember you do not have to complete the survey.

Please select one of the following before beginning the survey:

Yes, I agree to participate in the survey.

No, I do not agree to participate in the survey.

Thank you for taking the time to complete this survey. You may choose to withdraw from this study at any time without any penalty.

MEMBERSHIP AND YEAR JOINED IMNP

1. What local chapter are you a member or were a member?

   BYU Idaho - Rexburg

   Henry's Fork Chapter - Island Park

   McCall Chapter

   Pend Oreille Chapter - Sandpoint

   Portneuf Chapter – Pocatello

   Sagebrush Steppe Chapter – Boise

   Treasure Valley CC Chapter – Ontario

   Upper Snake Chapter – Idaho Falls

   Wood River Valley Chapter - Ketchum

2. Please mark the year you joined IMNP.

   2008

   2009

   2010

   2011

   2012

   2013

3. What motivated you to join IMNP?

CERTIFICATION AS A MASTER NATURALIST

4. Did you complete the required 40 hours of education and 40 hours of volunteer service to certify as a Master Naturalist the year you began the program?

   Yes

   No

5. If you said no, please tell us why you did not certify?

AMOUNT OF TIME PARTICIPATING IN IMNP ACTIVITIES

6. Please choose the sentence that best describes the amount of time you volunteered since joining IMNP compared to the amount of time you volunteered before joining IMNP.

   My time volunteering increased.

My time volunteering stayed about the same.

My time volunteering decreased.

7. Please choose the sentence that best describes how much nature education you attended before joining IMNP compared to the amount of time you attended nature education after joining IMNP.

   I attended less nature education before IMNP.

   I attended about the same amount nature education before IMNP.

   I attended more nature education before IMNP.

ASSESSMENT OF EDUCATIONAL PORTION OF IMNP

8. Did participating in IMNP improve your understanding of nature and natural resource management concepts?

   Yes.

   No.

9. Please explain your answer to question 8.

10. What are your thoughts about the written curriculum for IMNP? (These are the written chapters you received in your binder or CD.)

11. Please mark the subjects you were taught while attending IMNP.

    Introduction to the Idaho Master Naturalist Program

    Nature Journaling

    Ecological Concepts

    Ecosystem Management

    Aquatic Ecology

    Ichthyology and Fisheries

    Plants

    Ornithology

    Mammalogy

    Geology of Idaho

    Other topics by local chapters

12. Rate the effectiveness of each type of teaching method:

    Lectures
    Field trips
    Hands-on activities
    Assignments

Very ineffective Ineffective Neither Effective Very Effective Did not participate

13. Do you feel you received an adequate education to be a well-informed steward of nature? Please elaborate?
14. In what areas do you believe you need more education to be a well-informed steward of nature.

ASSESSMENT OF VOLUNTEER PORTION OF IMNP

15. What types of volunteer activities did you participate in while attending IMNP? Please check all that apply.

    Administrative Work (computer work, filing, paper work, budget, front desk work)

    Citizen Science (collecting data, research, wildlife observation, data entry)

    Chapter Formation and Maintenance (starting a chapter or ongoing chapter work)

    Educational Programming (giving/helping with educational program or event, staffing an informational booth)

    Stewardship (planting, habitat work, digging, yard work, manual labor)

16. Please describe a favorite volunteer experience.

PARTICIPANT'S OBSERVATIONS OF IMNP

17. Do you think your views of nature have changed because of your experience with IMNP? Please elaborate.
18. Do think your views of natural resource management have changed because of your experience with IMNP? Please elaborate.
19. What benefits did you gain from attending IMNP?
20. How could IMNP be improved?