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An assessment of teacher needs for
the utilization of park programs and
resources within the British Columbia
school curriculum

by

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to the required standard


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ABSTRACT

An assessment of the use and effectiveness of national and provincial park programs and resources by teachers on Vancouver Island, B.C. was conducted by the author and funded by Environment Canada Parks Service during the autumn of 1991. One-hundred-sixty-six teachers from eleven public school districts and four independent schools were surveyed. Teachers from all grade levels (K-12) and across all major subject disciplines were included in the survey. The research data collected in this survey provided valuable insight into the types of programs, services, and resources offered by parks which are most useful to teachers. General kinds of resource materials and concept areas (topics and themes) of most value to teachers and which could be offered through park programs were also identified. Factors affecting the implementation and integration of park programs and resources into the school curriculum were identified. Recommendations were provided for the future development of park programs which will enhance park useability by school groups. Future research needs in the field of park education were discussed.


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CHAPTER 1
BACKGROUND, RESEARCH OBJECTIVES, METHODOLOGY
AND DATA ANALYSIS

Background to the Study

Why do we need parks? This is a question often asked by politicians, industrialists, environmentalists, educators, and public citizens. Are parks merely places for people to engage in various forms of recreation, or do they hold some other instrumental and intrinsic values? Additional values of parks include preservation of significant natural areas and historical and cultural sites (Rowe, 1982; Rowe, 1989). As well, parks provide a myriad of opportunities for aesthetic, spiritual, and educational pursuits (Livingston, 1989). It is this last value, education, which formed the impetus for this study. What then should meaningful education entail, not only within the classroom, but especially in informal/outdoor education settings? The following quotation by Steve Van Matre (as found in Gough, 1990) eloquently provides an insight into the kinds of processes necessary to provide effective,

meaningful, and relevant education in the lives of students today.

The minutiae of life's workings are not of foremost importance for us; our goal is not pulling apart the insides of a frog, but understanding the frog inside the pond and the pond inside the water cycle ... This does not mean that we think the small picture of life is unimportant, but only that such study should be self-motivated and should follow the individual's grasp of the big picture.

It is this understanding of the "big picture", in other words being able to understand the relevance of environmental education within a societal and global context, which is so important. Environment Canada Parks Service shared my enthusiasm and desire to learn more about informal education in park settings, and actively encouraged and funded this study.

Trends in Park Usage

A 1991 survey of British Columbia public school districts indicated that 28% of the districts in the province have an outdoor school or use non-district facilities for environmental and outdoor education (EPPSA, 1991). Records kept for Vancouver Island provincial parks indicate that approximately 20,000 students attended spring and fall park school programs in the 1989-90 school year (S. Kirkvold,

pers. comm., 1991). A recent mini-survey conducted by Environment Canada Parks Service of 33 school principals from central Vancouver Island revealed two significant findings. The survey indicated that 92% of respondents wanted more park programs for schools, and 40% have at some time been unable to book a program due to high user demand (S. Kirkvold, pers. comm.,1991). Capital Regional District Parks (Victoria, B.C.) noted that their demand for educational programs is approximately 400% of what they fill, and the Royal British Columbia Museum (Victoria, B.C.) also cannot fill all of its requests for school programs. These data indicate a high demand for park and informal education programs which is not always being met.

In addition to a lack of program availability, researchers have uncovered other reasons why some teachers are not using parks. Snively (1988) found that out of 200 marine educators sampled, "... the majority prefer field based studies, but rely heavily on a narrow selection of print material and films in their teaching." She also found that although these educators incorporated field trips into their curriculum, they rarely reported using resource persons or

related facilities (e.g., park facilities, services, and personnel). Caduto (1984-85) found that one of the most significant constraining factors affecting the implementation of environmental programs in schools was inadequate training of the classroom teacher in environmental education. McLaren (1989) cited teacher involvement and effective support for teacher inservice education as critical components of effective environmental program implementation.

Thus, while our parks and their inherent resources are certainly available as educational theatres, and the demand for environmental education programs is in some cases very high, many educators in British Columbia are for various reasons, not taking advantage of these opportunities (Lien, 1989). It would seem apparent that given favourable circumstances, teachers should want to utilize park resources and programs. However, their continued reluctance to do so has spawned the need for further research.

A Need for Further Research

A number of pressing questions stem from the above observations. For example, educators at informal educational institutions (parks, museums, zoos, aquaria, and nature centers) have "... a myriad of questions related to how they might better serve school groups, as well as visitors in general" (Balling and Falk, 1980). School administrators also want to be assured that visits to these institutions accomplish some worthwhile pedagogical goals. Questions such as "do children learn on field trips, what are the factors affecting what and how much they learn, and how can schools use field trips more effectively", abound. For the most part, answers to these questions have been provided by anecdotal descriptions and testimonials (Falk, 1983). Only a few studies have addressed any of these issues, most often in the context of science-related field trips (Koran and Baker, 1979). In general, the results show that significant cognitive learning does occur on field trips and, at the very least, field trips are perceived as worthwhile by students and educators (Boggs, 1977; Collins, 1992; Falk, 1983; Gottfried, 1979).

Other related questions concerning informal education environments ask whether national and provincial parks programs and resources represent a viable educational pathway within the school curriculum. As well, do teachers value the opportunity to use these sorts of resources and services in their teaching? If so, what specific materials, services, and related factors might enhance the educational product, facilitate its implementation, and further its usage? Can national and provincial park organizations bridge some of the potential logistic and implementative shortcomings faced by teachers? Once again, these are questions which must be addressed, and to date, there is a paucity of research data from British Columbia upon which to draw conclusions.

Research Objectives

In response to questions such as those posed above, a research project on Vancouver Island, B.C. was initiated by the author and funded by Environment Canada Parks Service, during the autumn of 1991. The broad objectives of this study were as follows:

1. Determine what teachers perceive about park services,

- programs, and resources.
2. Identify a general range of concept areas, topics, themes, or learning processes teachers feel could be enhanced through student exposure to park programs and resources.
 3. Identify factors affecting the implementation and integration of park programs and resources into the school curriculum.
 4. Identify specific components of park programs and resources which most readily satisfy the educational requirements of the school curriculum.
 5. Identify the usefulness of specific types of teacher resource materials.
 6. Provide recommendations for the future development of park programs which would enhance park useability by school groups.

Survey Methodology

Questionnaire Format

Vancouver Island, with its diverse natural landscapes and park settings, and wide range of community demographics and interests,

was chosen as a study site for assessing the needs of teachers regarding their use of park programs and resources. The 13 public school districts and five major independent schools (both sectarian and nonsectarian) on the Island were surveyed using a mail-out questionnaire. This questionnaire contained 35 multiple choice style and five written response questions. The multiple choice questions either involved selection of a single response, or a range of choices requiring ranking (e.g., most preferred/valued to least preferred/valued; very significant to not significant). Multiple choice question/responses of this type are believed to be valid and reliable in measuring attitudes toward environmental topics (Millward, 1975). The written response questions generally required only a few sentences of elaboration. A sample questionnaire is included in Appendix I.

Pilot Survey

A pilot mini-survey was conducted in May of 1991 in order to assess the style, format, and "user friendliness" of the questionnaire. This pilot questionnaire was completed by six Victoria teachers (three

elementary, three secondary), and three persons involved with education in park or museum settings. Minor changes to the questionnaire were made subsequent to these evaluations. Respondents indicated that questionnaire completion time was 15-20 minutes.

Questionnaire Distribution

The 13 public school districts and five major independent schools on Vancouver Island were contacted by letter in November of 1991 to inform administrators of the intent of the study, and to request permission to survey teachers within their district or school. A follow-up telephone call was then made to an appropriate representative within each district or school who could function as a contact person and assist with questionnaire distribution (usually the assistant superintendent, school principal, or headmaster's assistant). Further explanation of the distribution and return procedures was made at this point. Two school districts denied permission to conduct the survey, stating that their teachers were too busy to complete the questionnaire. For reasons unknown, one

independent school did not respond to requests by the author to conduct the study. Letters explaining the intent of the study and relevant instructions for questionnaire distribution and completion are included in Appendix II.

Twenty-five questionnaires were mailed to each public school district office while 10 were sent to each independent school. As described above, questionnaires were mailed to a specific contact person within each district or school for subsequent distribution. Questionnaires were then sent by the contact person to any five teachers at any five schools within the district. For independent schools, questionnaires were distributed to any 10 teachers within that school. In all cases, the contact person was instructed to distribute questionnaires to teachers ranging from K-12 and across all subject strands.

Because of their slowness in granting permission to survey teachers and the need to have completed questionnaires returned by the end of December, 1991, one school district was mailed 15 questionnaires instead of the usual twenty-five. Two additional questionnaires

were sent to a small, rural school in one of the districts, bringing the number of teachers surveyed in that district to twenty-seven. In total, 297 questionnaires were mailed out to teachers.

Completion of the Questionnaire

Completion of the questionnaire by teachers was entirely voluntary, and participant confidentiality was ensured by the nature and intent of the questions themselves. A stamped, self-addressed envelope was provided with each questionnaire to expedite return.

Participants were instructed to return their questionnaire by December 13, 1991.

Park Interpretive Program Managers Questionnaire

As a supplement to the teacher survey, a brief questionnaire (four short answer questions, one ranking question) was sent to a limited sample (n=10) of park interpretive program managers in February of 1992. Results of this sample provided only qualitative data, however, its intent was to facilitate some analysis of how park

education personnel perceive the use of their programs and resources by school groups. A sample questionnaire is included in Appendix III.

Data Analysis

Analysis of questionnaire data primarily involved the use of simple descriptive statistics. This included calculation of relative frequency of responses for the multiple choices given in questions of this type, as well as sample mean and standard deviation for those questions which used an interval or ratio level of measurement. Data from the written response questions and interpretive program managers questionnaire were also analyzed descriptively and summarized to illustrate any trends.

In addition to the above statistical treatments, Chi-square (X^2) and analysis of variance (Anova) tests were applied to teacher survey questions #19, 28, 29, and 30 (see Appendix I). These four questions sought to determine which major limiting factors influence teacher use of parks, as well as which park experiences, resources, and services are most valued by teachers. Anova is

useful for comparing the means of two or more samples both within and between groups (Ostle and Malone, 1988), and X^2 can be used for analysis of categorical data (frequency counts) such as those obtained in this survey (Snedecor and Cochran, 1980). These analyses were necessary to determine any significant differences in teacher responses between choices (e.g., ability to distinguish if response to choice "a" is statistically different from choice "b"), as well as differences based on teacher gender, geographic location (urban versus rural), or administrative structure (public versus independent school system).

All tests were conducted at the 0.05 level of significance. Data summary and analyses were performed using SPSS (Statistical Package for the Social Sciences, version 3.1, University of Victoria, 1992).

Limitations of the Study

Most studies have limitations and problems associated with the distribution of survey questionnaires or other sampling devices. As

previously described, schools chosen for questionnaire distribution in this study were selected by grade level such that a range of teachers from K-12 would be sampled. Thus, primary, intermediate, and senior secondary schools were surveyed. However, there is no way of determining whether all questionnaires were randomly distributed to teachers within these schools. Because the contact person was relied upon to select teachers, there may have been some bias associated with the selection process. Nevertheless, it was felt that direct teacher selection by a contact person would increase the completion and return rates for the survey.

The size of the survey distribution (n=297) may have offset potential selection biases by sufficiently sampling a representative cross section of teachers. There is some evidence to suggest this from the demography of the survey respondents (fully summarized in Chapter 3) when compared to the demographic proportions of Vancouver Island teachers as a whole. A subset of these data is as follows.

Fifty-two percent of respondents were male (48% female) and 55%

taught at the elementary level (45% secondary). Within the elementary grades 59% of teachers were female (41% male), while in the secondary grades only 33% were female (67% male). This compares to an overall public school teacher ratio on Vancouver Island of 36% male to 64% female (B.C. Teachers' Federation Records Div., pers. comm., March 1993). A gender summary of elementary versus secondary teachers on Vancouver Island is unavailable, however, this information was obtained for the Vancouver School District. In this district, 83% of elementary teachers are female (17% male), while 51% of secondary teachers are male (49% female). The overall teacher gender proportions in Vancouver District (30% male:70% female) approximate that of Vancouver Island (including male:female percentage ratios of 34:66 for Victoria, 35:65 for Nanaimo, and 37:63 for Campbell River). It is therefore within reason to make the assumption that the gender proportions by grade level are also similar on Vancouver Island (there will undoubtedly be some skewness in this interpretation since a large urban school district cannot be directly compared to an average of urban and rural districts as found on Vancouver Island). The respondent return rates in this study indicate higher proportions of male teachers both

overall and at the elementary grade level, than on Vancouver Island in general or in the Vancouver School District. This may be due to a possible male bias associated with involvement in park and field trip related activities. Consequently, male teachers may have been more willing to complete and return the survey questionnaire (131/297 or 44% of the questionnaires mailed out to teachers were not returned).

Reliability is a measure of the repeatability or accuracy of the sampling instrument. When reliability is high, repeated surveys will provide similar results to those obtained in the original survey. In general, reliability is a function of adequacy of sample size. Small, non-random samples will not usually produce reliable survey results. In this study, overall reliability was satisfactory given the moderate sample size (N=166) and representative teacher demographic ratios described above. Nonetheless, a larger sample size based on a stratified random sampling design (e.g., divide Vancouver Island into "survey regions or strata" such as north-, central-, and south-Island) would improve instrument reliability and reduce geographic bias by illustrating variation between strata.

Sample randomness (and therefore reliability) could also be increased by obtaining a list of teachers in each strata (from the B.C. Teachers' Federation Records Div.) and selecting teachers randomly using a random number generator. Survey questionnaires would then be mailed directly to these individuals along with a follow-up letter in an effort to increase respondent return rates.

Validity is a measure of the representativeness of the sampling instrument. In other words, did the survey ask the "appropriate" types of questions necessary to meet the research objectives. In general, the validity of the survey questionnaire in this study was satisfactory. However, three areas of interest were inadequately addressed and consequently any conclusions concerning these areas must be made carefully. These were evaluation of student learning in park settings; which specific park programs and resource materials were most effective educationally; and are the survey results valid and applicable in other regions of British Columbia. These limitations are discussed in Chapter 4 as areas of future research.

In summary, responses received from teachers in this study were analyzed in order to provide insight into the use of park programs and resources in the school curriculum. The general types of programs, services, resources, and concept areas (topics and themes) offered by parks or which teachers felt should be offered, were identified. Factors affecting the implementation of park programs in the school curriculum were also identified and recommendations for future development of park programs were proposed.

CHAPTER 2

LITERATURE REVIEW

This chapter is divided into sections covering five broad areas. The first section deals with the historical development of parks as we know them today. The second section discusses the role of parks in education from a wilderness perspective. The third section further discusses the role of parks in education by describing the characteristics of users of informal education programs, as well as the educational mandates and associated programs and curricula of various agencies and organizations. The related principles and models of learning in informal education environments, as well as limitations to learning and the development of responsible learner attitudes are discussed in the fourth section. The final section describes recommendations for more effective environmental education obtained from four recent studies in British Columbia.

The Historical Development of Parks

Webster's Dictionary (1970) defines a park as "a large area known

for its natural scenery and preserved for public recreation by a state or national government." According to this definition, a park should be a large, natural, uninhabited area set aside by government for public recreation. Given this traditional context, how have parks as we now know them developed?

The first natural areas to be set aside for human recreational use were the game preserves and royal forests of France and England during the Middle Ages (ca. 1000 A.D.). Hyde Park in England (a formal garden) was one of the earliest tracts of land to be called a "park" in 1536. In North America, Yosemite was the first sizeable natural park to be established (California, 1864). The establishment of Yellowstone National Park (Wyoming) in 1872 created a global interest in parks. In 1879, Royal National Park was established in Australia. In Canada, Banff was established as our first national park in 1885 (Hummel, 1989).

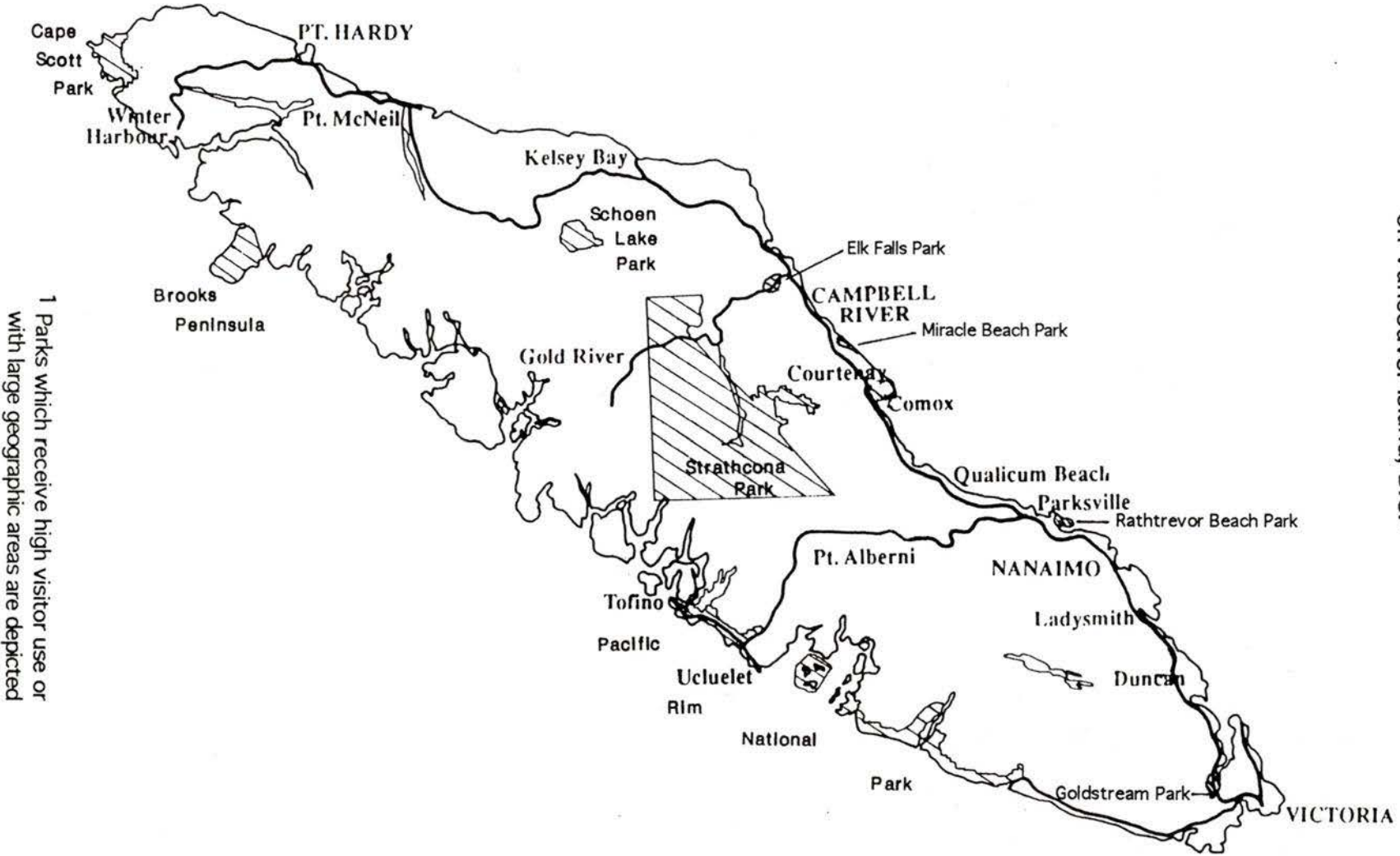
Worldwide, there has been a profusion in park establishment during the twentieth century. Today the International Union for the Conservation of Nature and Natural Resources (IUCN) lists over 3500

protected areas in 125 countries, encompassing approximately 4.5 million square kilometres. Of these protected areas, more than 1000 are national parks. In Canada, there are presently 34 national parks, 151 national wildlife areas (including migratory bird sanctuaries), and over 3985 provincial parks, wildlife/wilderness areas, and ecological reserves. This represents a total of approximately 620,000 square kilometres, or 6.3% of our nation (Hummel, 1989).

Parks in British Columbia

British Columbia is a province rich in natural resources, biologic and geographic diversity, and associated recreational, aesthetic, spiritual, educational, and economic opportunities. In B.C. there are 6 national parks, 15 national wildlife areas, 390 provincial parks, 12 wildlife and wilderness areas, and 129 ecological reserves (including one national park and 73 provincial parks and ecological reserves on Vancouver Island, see Figure 2.1). Together these represent about 63,000 square kilometres, or 6.6% of the provincial land base. This is proportionately very close to the total area of

VANCOUVER ISLAND BRITISH COLUMBIA



1 Parks which receive high visitor use or with large geographic areas are depicted

Figure 2.1 National and Provincial Parks on Vancouver Island, B.C.¹

protected park land in Canada. By the end of this decade, the provincial Ministry of Environment, Lands and Parks, and Ministry of Forests, through a project called the *Protected Areas Strategy*, intend to expand park and wilderness areas in British Columbia to approximately 12% of the province. There are four major goals behind this initiative (British Columbia Ministry of Environment, Lands and Parks, and Ministry of Forests, 1992):

1. protect representative examples of each of the province's 59 identified landscapes and ecological types within large parks or wilderness areas
2. protect the province's outstanding natural and cultural features
3. contribute to maintaining biodiversity and important wildlife habitats
4. provide a full range of outdoor recreation opportunities with B.C.

Surrounding jurisdictions including Alberta, Washington State, and Alaska incorporate 8.2%, 11.3%, and 37.9% of their land base, respectively, in protected park land (Foster, 1989). Clearly, parks in British Columbia and nearby are being set aside to preserve our natural heritage for the benefit and enjoyment of future generations.

The Role of Parks in Education

A Wilderness Perspective

Parks and wilderness areas can be wonderful educational classrooms, not only for the scientific community, but for the public in general. Provided human impact is minimal, the observation of natural, historic, or cultural phenomena in a park or wilderness setting can be an exhilarating educational experience. This is evident in the following accounts.

The preeminent conservationist John Muir held a boundless passion for wilderness and the conservation of nature. He was one of the first advocates during the late 1800's for a park system in the United States which would protect natural areas. To Muir, wilderness places and ultimately parks, presented an opportunity to explore creation and draw precious insights into the workings of our world, society, and oneself. In his journal Muir once noted concerning his lifelong devotion to nature: "I only went out for a walk and finally concluded to stay out till sundown, for going out, I

found, was really going in" (Teale, 1954). Writing about a 1944 wilderness canoe voyage and referring to himself, Pierre Elliott Trudeau remarked: "I know a man whose school could never teach him patriotism, but who acquired that virtue when he felt in his bones the vastness of his land and the greatness of those who founded it" (Trudeau, 1970). In an essay on the role of parks, Eidsvik (1989) stated that "if we lived in a perfect world and managed our resources in a sustainable fashion, with future generations in mind, we probably wouldn't need protected areas. Unfortunately we don't live in a perfect world. ...Parks [and wilderness areas] are established in most cases for the benefit, education, and enjoyment of current and future generations - for the long term."

Tanner (1979) stressed the dominant beneficial influence youthful experience in the outdoors and relatively pristine wilderness environments had in the lives of persons who went on to become "active and informed citizens". Pless (1987) found that, from most important to least, visitors to natural areas came for aesthetics, education, nature, escape, solitude, exercise, and novelty. Thus, parks and wilderness areas are special places which have the

potential for varied and numerous opportunities for reflecting, communicating, learning, and even shaping character.

The Education Mandate of Parks, the Ministry of Education, and Other Organizations

Most informal learning environments such as parks, museums, aquaria, nature centres and forestry centres have implicit goals of enhancing visitor awareness and appreciation of natural ecosystems (Collins, 1992; EEPsA, 1991; Falk, 1983). For example, in a recent survey of 99 school teachers from around British Columbia, Enviroscope (1993b) found that teachers described forest education as interdisciplinary and integrative by nature, providing a virtually ideal context to enlist recent revisions in educational philosophies and goals. Students have opportunities to gain knowledge of natural and social systems by employing skills of critical and creative thinking, decision-making, problem-solving, active exploration, and cooperation. In addition, teachers reported emphasizing the students' personal relationship to the forest by examining such areas as careers, recreation, spiritual connections, aesthetic

appreciation, community involvement and forest use decisions, as well other issues relevant to their lives. What then are some of the specific educational roles, mandates, and programs held by parks and other organizations, as well as the more formal school system? The following section illuminates this question by first discussing the characteristics of users of informal education programs, and continues with a summary of the educational goals and/or programs of four major agencies and groups.

Characteristics of Users of Informal Education Programs

It is important to understand the characteristics and needs of visitors to parks, museums, zoos and other informal education settings in order to appreciate which types of educational programs and resources will be most suitable. A study of park visitor demography at the Kensington Nature Center in Pennsylvania (Snowberger, 1985) found that the average visitor was between 11 and 35 years of age, and was either a housewife, student, or professional. Most visitors to parks and other informal education settings typically have no particular instructional objectives or

goals on which to base their explorations other than to randomly explore (Screven, 1976). They seek concrete experiences where they can put into practice what they have learned (Boyle, 1981). The typical visitor is usually constrained by time and is often part of a group (Field and Wagner, 1973). Unless they are a part of an organized tour or program, such groups can wander freely about, often not viewing exhibits in their intended order (Screven, 1976). Visitors to parks are usually looking for relaxed, enjoyable atmospheres (Field and Wagner, 1973; Stirling, 1981). The most common type of participation in parks is in nonpersonal type services such as self-guided walks or drives, stopping at roadside exhibits, stopping at visitor centres, and reading park brochures or maps (Mullins, 1979). The majority of Canadians today are urban dwellers. They often come to parks to simply get away from the hectic pace of the city. As such parks can offer a sense of solace and provide lasting experiences and impressions (Edwards, 1989). What sorts of learning approaches and mechanisms are therefore most suitable to this audience?

Education programs designed for student visitors must recognize the

changing developmental characteristics of young people as they grow and mature. Without going into a detailed discussion of cognitive, intellectual, and social development, suffice it to say that in general, young learners visiting parks and other informal education environments will benefit from programs which allow the opportunity for exploration and self-discovery, and are rich with activities and hands-on experiences. Collins (1992) researched and strongly recommended the use of multi-sensory, multi-media interactive education kits as a technique for enhancing cognitive learning. Denning (1991) found that interactive media allow the user to have some control over the media presentation and thereby make choices about the pace, sequence, and level of information presented. This in turn can facilitate enhanced educational value and ease of use of the program for a broad range of audiences having differing learning styles and needs.

Canadian Parks Service Education Mandate

Canada's Green Plan clearly encourages responsible environmental citizenship and a furthered understanding of our environment. "...

The Government of Canada will also use its own resources such as the National Parks and National Historic Sites to develop and deliver programs consistent with the environmental citizenship objectives" (Government of Canada, 1990). These include a variety of campaigns designed to enhance environmental awareness and promote public participation; development of learning materials and programs designed to promote understanding and motivate informed decision-making at all levels of society; development and implementation of environmental action and training plans appropriate for specific target audiences (Government of Canada, 1990). Furthermore, as stated in Parks Service policy, Canada's national parks have been "... set aside for the benefit, education, and enjoyment of the people of Canada" (Parks Canada, 1985).

A shared objective of the Council of the Haida Nation and the Canadian Parks Service is the need to "provide heritage interpretation and broader environmental education messages which focus on the protected area's contribution in maintaining ecological integrity and promote a philosophy of environmental stewardship" (Canadian Parks Service, 1992). In the still remote wilderness of

Gwaii Haanas (South Morseby, Queen Charlotte Islands, B.C.), visitors to the park have an opportunity to interact with native Haida Gwaii people. Collins (1992) developed an interactive educational resource kit on nesting seabirds which will be used to assist the Canadian Parks Service in training native Haida Gwaii Watchmen. This kit provides the educational resources to facilitate interactions between the Haida Gwaii Watchmen and park visitors. As the Watchmen are a first point of contact for visitors to the park, they can play a significant role in providing interpretation of natural history and cultural heritage (Collins, 1992). Kimmel (1993) developed a similar educational resource kit on marine mammals for the same region of Gwaii Haanas.

B.C. Parks Education Mandate

The provincial B.C. Parks system has provided valuable informal learning opportunities for students, teachers, and the general public for over three decades. The first public education programs began with the opening of nature houses in Manning Park in 1961, and at Miracle Beach in 1962. Park interpretive programs expanded to

reach a high level in 1974. At this time there were 50 seasonal park interpreters plus trainees working in 30 parks. Community school programs were very popular in Victoria, Vancouver, Prince George, and Nelson during the winter months. Since 1978, the responsibility for provincial park interpretation has become decentralized through the creation of three regional Visitor Programs Officer positions and 14 district Visitor Services Coordinators (Stirling, 1981). Private contractors now provide interpretive services and programs for the public in B.C. parks.

Through its Visitor Services program, B.C. Parks has promoted understanding, support, and a sense of stewardship among students, thus encouraging the importance of protecting the natural and cultural heritage of British Columbia and areas abroad (Enviroscope, 1993a). The main goals of the B.C. Parks education program (1993) are to:

1. develop conservation ethics which value and support the need for protected areas, both in British Columbia and throughout the world
2. acquire knowledge of representative and unique elements of

British Columbia's natural and cultural heritage

3. act responsibly and constructively towards the environment, based on well-reasoned, defensible positions on environmental and social issues
4. develop physical skills through safe and sustainable recreation compatible with the protection of natural and cultural heritage
5. appreciate and support the intrinsic, inspirational and aesthetic values of the natural environment

B.C. Parks recently completed a project which identified the curricular linkages between its program objectives and those of British Columbia's formal education system (B.C. Ministry of Education). The impetus for this Parks' study was that an increased understanding of Ministry of Education objectives and curricular pathways will enhance the educational value of park experiences and over the long term, will contribute to the development of responsible citizens. In this context, the B.C. Parks' Education program addresses student development with broad learning intentions which encompass conservation ethics, knowledge, personal and social development, recreation and physical skills, and

aesthetic values (Enviroscope, 1993a).

B.C. Ministry of Education Mandate

The mission statement of the British Columbia school system is "... to enable learners to develop their individual potential and to acquire the knowledge, skills, and attitudes needed to contribute to a healthy society and a prosperous and sustainable economy" (B.C. Ministry of Education, 1990). Such a society and economy are achievable when "educated citizens" are developed. Characteristics of the educated citizen are (B.C. Ministry of Education, 1990):

1. thoughtful, able to learn and to think critically, and to communicate information from a broad knowledge base
2. creative, flexible, self-motivated and possessing a positive self image
3. capable of making independent decisions
4. skilled and able to contribute to society generally, including the world of work
5. productive, able to gain satisfaction through achievement and to strive for physical well being

6. co-operative, principled and respectful of others regardless of differences

Nested within this larger educational mandate are specific learning dimensions, some of which either refer directly to the natural world, or foster the skills and attitudes which can enable learners to make informed decisions about the environment. Three such examples from the Ministry's *Year 2000* document (B.C. Ministry of Education, 1990) are the need for learners to:

1. acquire a basic understanding of the natural world and its operation, and the principles with which we organize our knowledge about it
2. develop the ability to select and use information to develop solutions to problems
3. develop attitudes related to being motivated to ask questions, to seek answers, and to learn

It is clear that the policy or at least the intent of the Ministry is supportive of environmental education. This position was mirrored in a statement by McLaren (1989) who was speaking about the

relationship between environmental education and the public schools in B.C. He stated, "... there are parents, educators, and administrators in British Columbia who believe that students should be introduced to the natural resources and heritage of the province during their school years."

The Education Mandate of Other Environmental Organizations

A number of government and private organizations promote education about the environment and natural resources, and encourage responsible attitudes and user ethics. Their programs are sometimes associated directly with national and provincial parks, or can be readily facilitated within a park setting. They are regularly used by school groups in British Columbia. Eight examples of such organizations and programs are:

1. B.C. Environment (Wildlife Branch), which sponsors *Wildlife Viewing in British Columbia*. This program advocates a non-consumptive use of wildlife by providing opportunities for viewing and photography. Through interpretive displays and

information pamphlets, the program provides information about animal ecology, the need for habitat protection, and gives suggestions for responsible viewing behaviour.

2. B.C. Environment, which sponsors *Project Wild*. This interdisciplinary environmental and conservation education program is used widely by school teachers throughout the province from grades K-12. It stresses the life necessities of food, shelter, and space (habitat) required by all living things, and the sometimes fragile inter-relatedness between living things and their environment (ecology). Concepts such as the effects of pollution, resource management, and environmental values and ethics are also illustrated. *Project Wild* lessons stress how to think about wildlife and the environment, not what to think. To date, approximately 125 *Project Wild* leaders have been trained in B.C. who have in turn trained over 2000 teachers to use this program in their classrooms (EPPSA, 1991).
3. World Wildlife Fund, which sponsors *Operation Lifeline*. This is an educational guidebook which provides activities designed to increase awareness and concern for Canada's endangered and threatened animals, plants, and habitats. These include species

native to B.C. such as the Sea Otter, Vancouver Island Marmot, Marbled Murrelet, and Burrowing Owl.

4. Government of Canada, Department of Fisheries and Oceans, which sponsors *Salmonids in the Classroom* (SICP). The focus of this program is on the enhancement of the salmonid resource and the maintenance of a healthy natural habitat for fish. This program has been designed for both elementary and secondary schools and has been used by teachers in an estimated 626 schools provincially, to supplement the science, language arts, and social studies curricula (EPPSA, 1991).
5. Council of Forest Industries (COFI) and the B.C. Forestry Association (BCFA), which sponsor *FOREM* and *Project Learning Tree*, respectively. *FOREM* is a set of forestry education modules which advocate multiple resource use, primarily from an industry perspective. It is used in the Science and Technology 11 program. *Project Learning Tree* is also an industry sponsored forestry education program which attempts to provide a balanced presentation that doesn't exclusively represent industry or environmental groups. It is recommended support for the B.C. science curriculum.

6. Environmental and Outdoor Education Centres. There are a number of environmental and outdoor education/interpretive centres throughout B.C. which actively play an important role in providing environmental education in this province. A few examples are as follows:
 - a) McQueen Lake Environmental Education Centre, operated by Kamloops School District #24. The most important element of its philosophy is that "man is only one part of the interconnected life-systems of this planet" (School District #24, 1990, as found in EEPsA, 1991).
 - b) Privately owned Strathcona Park Outdoor Education Centre, located on Vancouver Island. Its philosophy is based on "holistic environmental education [which] does not separate work from play or education from life and which is a composite experience involving all that is available in both the physical and human environment" (Strathcona Park Outdoor Education Centre, 1990, as found in EEPsA, 1991).
 - c) Coast Mountain Outdoor School, operated by Howe Sound School District #48. Its philosophy states that "outdoor education is a method for effective teaching of all areas of

the curriculum ... through utilization of the outdoor setting, the total curriculum can be enriched and enhanced" (School District #48, 1991, as found in EEP SA, 1991).

7. The Environmental Educators' Provincial Specialist Association (EEPSA) of the British Columbia Teachers' Federation, represents many of the environmental educators in B.C. This group emphasizes the importance of the teacher in helping students develop the connectiveness with nature so vital to developing an environmental ethic (EEPSA, 1991). EEP SA has several broad goals of environmental education which reflect the goals of education and learning dimensions outlined by the provincial Ministry of Education (see B.C. Ministry of Education, 1990). These goals provide experiences which enhance physical development, social development, intellectual development, emotional development, artistic/aesthetic development, and social responsibility. EEP SA is a strong supporter of learning in informal settings such as parks, nature and interpretive centres, and museums.
8. Northwest Aquatic and Marine Educators (NAME) has a diverse membership of environmental and marine educators from the

Pacific Northwest (B.C., Washington State, Oregon, Alaska).

Membership backgrounds include education, science, government, museums and aquaria, research, and environmental education consultants. NAME was formed to enhance the sharing of information and provide opportunities to share educational experiences and expertise about the marine and aquatic issues in the Pacific Northwest.

Relevant Environmental Education Curricula in the B.C. School System

It is apparent that outdoor and environmental education curricula are becoming increasingly well established, both in informal settings and in schools at several levels. Enviroscope (1993a) documented numerous linkages between B.C. Parks goals and objectives, and the educational learning objectives established by the B.C. Ministry of Education for school students (grades K-12). Linkages are especially strong surrounding the "social responsibility" goal of the primary school curriculum (grades K-3). The *Primary Program Foundation Document* states that "education

should provide each learner with knowledge and understanding of the social, physical, and biological worlds; the balance between man and his environment; and should develop attitudes and behaviours leading to intelligent use of the environment" (B.C. Ministry of Education, 1990). The primary science program encourages teachers to provide children with "real" experiences such as field trips. The intermediate science program (grades 5-7), as well as junior secondary (grade 8 & 9) and senior science (grade 11), teach units on changes in the environment, ecology, salmonids, and resource management. Grade 10 science deals with population growth, a topic in natural resources, and pollution. Earth Science 11 deals with natural resources, weathering, and volcanoes, while Science and Technology 11 has a module on forestry. Geology 12 covers minerals, volcanoes, glaciers, and some general concepts of landscape physiography. Thus, the connection between school curricula and the objectives, resources, services, and programs offered by parks is great, especially at the late primary (year 2 and 3), middle intermediate (year 7, 8 and 9), and grade 11 years. The potential to increase this connection is even greater.

Integrated park/school programs can provide excellent platforms for communicating information about geographic regions and natural, historic, or cultural resources. Because of the multi-faceted scope of most environmental topics, often requiring consideration of a number of interests and points of view, these same park programs provide an outstanding opportunity for nurturing the skills and attitudes of learners.

Principles of Informal Education

Schools are turning increasingly to parks, museums, zoos, aquaria, and science centres for assistance in educating students (Price and Hein, 1991). The 1986 assessment of science education in British Columbia revealed a marked decrease in teacher satisfaction with standard science materials and equipment between 1978 and 1986 (B.C. Ministry of Education, 1986). The high demand for educational park programs cited previously (this paper), suggests that numbers of teachers are looking toward non-traditional, supplementary curriculum sources, approaches, and environments in their teaching.

Informal education institutions are now questioning how to make their educational exhibits and programs more effective. Because visitors to informal education settings such as park interpretive centres come from a wide variety of backgrounds, nationalities, and knowledge bases, educational experiences in these environments must be flexible and diverse enough to capture the interests of those visitors. Borun (1988) stated that people interpret what they see based upon prior experiences and therefore demonstrate their knowledge in different ways that are comfortable to them. Thus, informal education programs must recognize or at least be sensitive to the prior beliefs and knowledge which visitors (learners) hold. Snively and Sheppy (1990) contended that although marine topics and resource issues provide relevance to science, the marine curriculum that has been developed for schools in Canada and the United States fails to address students' prior beliefs, values, opinions, and knowledge. Snively and Sheppy (1991) went on to state that it is through the cluster of concepts, beliefs, opinions, and values held by students towards the ocean, that they go on to learn new knowledge and eventually construct new ways of thought.

The remainder of this section discusses the constructivist approach to learning (a teaching and learning model which is significant in its recognition of learners' prior beliefs, attitudes, and knowledge), and then continues with further discussion of the general principles of informal education (including how learning occurs, effective learning, limitations to learning, and the development of responsible learner attitudes).

The Constructivist Model of Teaching and Learning

The enhancement of environmental awareness and associated positive skills and attitudes in student learners and the general public, is readily recognized as a paramount educational objective. Yet, is the process oriented, issues and action based style of learning often associated with environmental education (Gough, 1990), the most effective learning mechanism? To answer this question, one must have an understanding of the learning models and approaches which can be most effectively applied to the development and implementation of informal education programs. More (1989) referred to learning styles as characteristic or usual

strategies that an individual uses in acquiring knowledge, skills, and mastery of a subject. The following paragraphs discuss the constructivist model of learning and its relevance to informal education in more detail.

The constructivist approach to learning has been described by numerous researchers (Baimba et al., 1993; Driver, 1987; Driver and Oldham, 1986; Posner et al., 1982; Tuckey, 1992). This approach brings prior knowledge and experiences to bear in order to construct meanings in new situations. It closely resembles the process oriented philosophy of curriculum development as described by Reid (1981), Schwabb (1969), and Stenhouse (1975). This philosophy de-emphasizes linear, goal directed learning which is heavily directed by pre-set goals and objectives. Instead, the process approach emphasizes procedural principles, selection of the most appropriate and valuable learning experiences, and student inquiry and discovery. The constructivist model builds upon the process approach by being cognizant of the learners' prior knowledge, past experiences, and personal learning situation and environment. In this way, new knowledge is not simply discovered through various activities. It is

actually constructed through a set of learning circumstances which recognize "where the student has been" and meshes this past knowledge with the appropriate questions, concepts, experiences, and explanations which work together to form new knowledge and understanding.

How Does Learning Take Place?

How do school children learn new things, the often fascinating "things" of science, nature and the environment? In an effort to explain how children learn science, Driver (1983) pointed out that "...from the earliest days of life, a child develops beliefs about the things that happen in its [his/her] surroundings." As the child grows older, these beliefs become integrated into a coherent explanatory model of the world (Tuckey, 1992). Osborne and Wittrock (1983) stated that for real learning to take place, learners must build links between their prior/existing knowledge base, and new ideas and concepts. Tuckey (1992) showed that prior knowledge was important in enabling pupils to construct plausible hypotheses about science centre exhibits. Posner et al. (1982), however, suggested

that dissatisfaction with one's existing conceptions is an important condition which must be filled before the more radical form of conceptual change known as accommodation can occur. Thus, students will be faced with the choice of either assimilating new ideas and concepts into their prior set of beliefs and explanations, or if they are faced with some anomaly, are dissatisfied, and cannot successfully synthesize these new ideas into a set of prior beliefs, they should consequently adopt or accommodate them (Posner et al., 1982). Snively (1990) made a similar observation when she stated, "... when the accepted scientific view is presented in a classroom setting, [the student's] cluster of prior ideas, beliefs, values, and emotions serves as the initial set of interpretive categories, and it is the potential match between these existing cognitive commitments and the new information which determines how the student will respond to the instructional inputs." Driver (1987) would describe such a transition in knowledge as being socially constructed, a product of a set of experiences from which learners build a view of the world closer to that of the scientists.

It would seem well within reason indeed, that a process oriented

learning regime which also adheres to the constructivist approach and attempts to recognize the prior conceptions and misconceptions of students, and endeavours to shape knowledge as well as values, should comprise an optimum learning milieu. How do our parks and park programs, and their potential integration into the school curriculum fare in this light?

Effective Learning in Informal Education Environments

Carr (1985) found that libraries, museums, zoos, parks, historical sites, and other cultural institutions can be vehicles for much self-directed learning. By their very nature these sorts of informal education environments are conducive to process oriented learning activities which are activity based, exploratory, and experiential. A substantial amount of research exists concerning effective learning strategies and informal education environments, especially in museum settings (Cameron, 1986; Falk, 1983; Falk, 1989). Although the study of nature and visitor centres (generally in park settings) is a relatively new field, in many ways it parallels the development of museum evaluations, which have been documented extensively

(Pless, 1987). Some findings concerning learning in informal settings are summarized in the following section.

In a survey of museum users, Falk (1989) found that "... people were best able to remember things that they already knew something about." Bruner (1961) found that long term memory processing and intellectual potency improved when learners exercised problem solving and self-discovery. Henson (1986) emphasized the importance of inquiry learning and student involvement in the learning process. Feher (1990) found that the best interactive science centre exhibits stimulated interaction by learners at four distinct levels (namely experiencing, exploring, explaining, and expanding). However, for actual learning to take place she found there must either be a match between the conceptual contents of the exhibit and the prior knowledge of the learner, or the learner must be sufficiently stimulated to actually form a change in his or her prior misconceptions. Kelsey (1991) found evidence of prior misconceptions in a "successful" killer whale program at the Vancouver Aquarium (Vancouver, B.C.). A change in belief by the trainers to recognize the interesting activities that whales

themselves generated, only occurred when the training staff began to question their own human-centred perspectives.

Maddock (1991) attributed the success of both formal school and informal youth and adult education programs at an Australian wetlands centre to a strong community involvement component. In an evaluation of science teachers who were developing a junior secondary general science curriculum patterned on constructivist science, Baimba et al. (1993) observed the realization which teachers came to regarding the isolation of school science from the learners' everyday experiences. As a result, these teachers began to support new aims, objectives, and methods of teaching general science, recognizing the importance of building the teaching-learning process around students' real-life experiences. In this same regard, Driver (1986) contended that individuals construct their own knowledge, and curriculum is therefore more helpfully seen as a set of experiences which enables students to develop the skills or ideas intended.

Snowberger (1985) described how visitors to a wilderness park in

Washington State were most impressed with activities that permitted physical and verbal participation, were interesting, humorous and enthusiastically presented. Peart (1984) found that objects on display in museums and other informal settings gain greater meaning when there is an opportunity for multi-sensory interaction. Denning (1991) found that an interactive display which supplemented the diorama exhibit at the Royal B.C. Museum significantly increased visitor interaction with diorama objects and enhanced enjoyment and learning from the experience. Manning and Potter (1984) used computer simulation as a tool in teaching park and wilderness management. This model reduced the complexity of the outdoor system under study, allowed students to act as managers, and increased student exposure to characteristics of actual park and wilderness areas.

Denning (1990) suggested that museum visitors who had access to natural history interpretation while at an exhibit (e.g., trained interpreters or docent guides) seemed to learn more than those who did not, and generally enjoyed their experience. A recent survey of Canadian school children found that "... knowledge and commitment

to oceans developed most successfully if the student had guided, direct contact with the marine environment" (Lien, 1989). The Vancouver Aquarium promotes a teaching approach where students are empowered through role playing to be experts and decision makers. This encourages "reflection and self-directed learning" (Baron, 1991). Plummer (1984) found the educational potential of parks included developing process skills, understanding conflicts arising in parks between economic development and environmental protection, and promoting concern for environmental conservation and quality of life. Wake (1987) described a need for the public to be better acquainted with the kinds of research conducted in many aquaria, zoos, and parks. This would enhance the value of these centres to the public as research and education resources. Price and Hein (1991) defined an educationally effective program as one in which "...products are not emphasized, inquiry is sparked, open-ended questions are generated, and students actively participate and appear involved. Students in these programmes look forward to attending, tell their parents about what they are doing, recommend the programme to their friends, think the programme is fun and return to the museum on their own after programme completion."

The above findings indicate a number of things about learning in informal education settings. In general, the concepts and principles associated with process oriented learning and the constructivist approach are essential to the success of informal education programs. This involves recognition of learners' prior knowledge, experiences, and misconceptions, and utilization of process oriented learning strategies such as problem solving, self-discovery and inquiry learning, and verbal and physical participation. In summary, this approach emphasizes experiential, interactive learning in a non-isolated context. The learner is able to compare old experiences and conceptions with new information, questions and circumstances. Eventually the learner constructs a new knowledge and understanding and is able to connect the educational experience to real life situations (e.g., local community issues, jobs and careers). Settings such as parks and museums provide the opportunity for this type of learning experience.

Limitations to Learning in Informal Settings

What factors limit learning in informal education settings? Balling

and Falk (1980) concluded that environmental novelty (newness of the field trip setting) was the most significant factor affecting student behaviour and learning. For example, to a primary student in a highly novel environment (e.g., an unfamiliar rural park setting well away from home), task learning often decreases. Behavioural data suggest that unfamiliar natural environments produce higher levels of excitement and even anxiety, placing preemptive demands on the learner thereby lowering student attention toward the learning task (Balling and Falk, 1980).

These findings illustrate the importance of the time, place, and structure of the learning environment and the potential effect these have on associated learning outcomes, especially in potentially novel settings such as parks and other informal education environments. A poor understanding of these variables can alter the success of informal education programs. For young students, a first visit to a park might best emphasize activities which familiarize them with the setting, while later visits can focus on more conceptual material. Thus, field trip experiences should be well planned, including the use of advance organizers (e.g., pre-trip

activities and materials, slide shows, etc.) by the teacher or trip leader in order to minimize student anxiety and capitalize upon the effects of the setting novelty relative to student and pedagogical needs.

Informal Education: Developing Responsible Learner Attitudes

The development of responsible attitudes and behaviour is a crucial underpinning to any truly successful environmental education program. According to Collins (1992) and Ng (1986), a fundamental concern for park interpreters is designing programs which help visitors develop a keener awareness, appreciation, and understanding of the environment; encourage thoughtful use of the recreation resource; and promote public understanding of the agency's goals and objectives. This section of the chapter discusses environmental education and the associated development of responsible learner attitudes.

Jaus (1984) found enhanced retention of environmental attitudes and

learning in school children who had previously received environmental education instruction. Horsley (1979), in a comparison of American and non-American students' attitudes toward environmental issues, concluded that overall, American students were more concerned about environmental issues and rated the environment more positively. He attributed this to increased exposure to environmental information and issues by the Americans. Fortner and Teates (1980) discovered that both coastal and inland students in Virginia perceived in much the same way, the importance of various marine-related experiences relative to their knowledge and attitudes about the marine environment. Snively and Sheppy (1991) found similar attitudinal response patterns concerning marine related issues between students in coastal and interior British Columbia.

Beckmann (1988) examined the effect school visits to nature reserves had on students. She found that while most students had previous experience with national parks and environmental media, there was a need for basic conservation and management values and ideas to be continually emphasized. In a study of ecological

attitudes and actions, Weigel (1985) found that once behaviour -relevant information was supplied to the test persons, their "... attitudes exerted a more pronounced influence in shaping subsequent actions." Thus, when considering environmental education, information should be made available "... regarding both the type of action implied by that knowledge and specific guidance as to how to carry out that type of action" (Weigel,1985). Ames (1971) concluded that "... in the final analysis the success of environmental education will be measured in terms of its ability to change the behaviour of society." Andrews (1989) stated that the "main aim of an environmental education program should be to develop in students a personal environmental ethic which results in an 'environmentally positive' behaviour related to environmental, social, and economic issues. ... The educator's role is to provide students with a balanced set of experiences that will assist the students with the formation of positive values."

Bateson and Wolthers (1989) investigated possible attitude changes toward the Pacific salmonid resource by primary students in British Columbia who had studied the *Salmonids in the Classroom Program*

(SICP, Govt. of Canada, Dept. of Fisheries and Ocean, 1979). They referred to a prior study by Staniforth (1987) which claimed that teachers chose to teach SICP because it is so "interesting". Teachers and students enjoyed the activities, and the program itself may lead to opportunities to leave the classroom to observe and make changes to the local environment. Bateson and Wolthers stated that SICP is unique because it integrates not only across the science curriculum, but into other classroom subjects such as language arts. However, they cite a lack of formal evaluative mechanisms of SICP, and caution that more comprehensive teacher training designed to increase teachers' environmental literacy is required. Another significant unknown is whether or not teachers value environmental education more than the core science or arts-related activities from SICP. If the teachers themselves have little concern for the environmental education aspects, then "students from those teachers may not learn to value salmon in the environment" (Bateson and Wolthers, 1989). Conversely, as was the conclusion in this study, an incongruity occurred between the students' learned outcomes and the goals of the Department of Fisheries and Oceans. It would appear that after rearing salmon fry

from eggs in their classrooms, students displayed strong preservationist attitudes toward the salmon they released and did not want to jeopardize the lives of the fish.

The results of the SICP study indicate the importance of the educator's learning (teaching) objectives and presentation of the curriculum material. How these are accomplished can affect student attitudes and learning outcomes. Once again, the prior knowledge, experiences, and misconceptions of the learner, and perhaps the teacher, must be understood if truly effective learning is to occur.

Environment Canada recently noted that better environmental education is "a requirement for good decision-making ... helping to translate environmental awareness into action" (Government of Canada, 1990). One of the major environmental education objectives of the United Nations Belgrade Charter (UNESCO, 1975, as found in EEPISA, 1991) was to "help individuals and social groups acquire social values, strong feelings of concern for their environment and the motivation for actively participating in its protection and improvement."

The above studies and positions suggest that the development of positive, responsible attitudes toward the environment is a critical step in "creating" the globally responsible citizen. A positive attitude can enhance the learner's acquisition of new knowledge and skills necessary to solve current and future problems facing society and the environment. Informal education settings such as parks and museums are ideal environments for propagating such attitudes.

Recommendations for Environmental Education from Other Studies

Recommendations for improving environmental education were made in two park related, one forestry related, and one general environmental education study undertaken over the past three years in British Columbia. The two park studies looked at ways in which provincial parks could become more involved with schools. The third study was a survey specifically of forest education in British Columbia (Enviroscope, 1993b), while the final study provided an overall assessment of environmental education in B.C. (EPPSA,

1991). Their similarities are indicative of the consistent requirements and parameters associated with the effective implementation of park and environmental education programs into the school curriculum.

B.C. Parks School Survey

A recent study conducted by the B.C. Ministry of Parks (1991) revealed some interesting trends. One-hundred-thirty-five provincial teachers who had used an existing B.C. Parks' school program were surveyed. A list of potential ways B.C. Parks could become more involved with schools was presented on the survey as a set of options. According to respondents, the most preferred option was increased "visits to the classroom by park staff or contractors". The most useful option was the provision of "resource materials on the specific park you will be visiting, such as park features, maps, plant and animal lists, and suggested activities". A highly recommended option was the development of a "curriculum-related program including activities, lesson plans, and resource materials" (B.C. Ministry of Parks, 1991).

B.C. Parks Education Programs Curriculum Links

Assessment

B.C. Parks recently commissioned a project to determine the linkages between the goals and objectives of the Ministry of Education and those of its own. The six major recommendations of this study as documented by Enviroscope (1993a) were:

1. Develop a consistent environmental education philosophy: employ the term "environmental education" rather than "science" or "social studies" as a descriptor for educational programs; respect our environment, our society, and ourselves; guide learners to big concepts; encourage participant curiosity; emphasize quality rather than quantity; match environmental education processes with children's developmental characteristics.
2. Formalize a program development plan: prioritize areas of program development; coordinate curriculum integration and linkage processes with the Ministry of Education; establish an Advisory Council to the B.C. Parks' Education program; liaise with ministries and organizations presently working on environmental education curriculum materials; select a cross-section of

- teachers, interpreters and specialists to form a review committee to penultimate documents; submit educational materials to Learning Resources Branch, Ministry of Education.
3. Commit funds to develop and maintain B.C. Parks' education links: establish funding and opportunities for teachers to assist in planning and review of B.C. Parks Education materials; establish a budget to hire teachers and assistants during the summer to develop education materials; investigate corporate sponsorship.
 4. Develop programs and people: involve teachers in all stages of the development of B.C. Parks Education program resource materials; host teacher workshops to motivate and orient teachers to the B.C. Parks Education program and associated resource materials; keep B.C. Parks interpretive staff and contractors updated about the *Year 2000* and environmental education initiatives; continue to deliver quality live interpretive programs because students enjoy them.
 5. Develop resource materials: develop a B.C. Parks Learning Resources Manual; produce regularly updated newsletters, both printed and electronic, supporting and augmenting the Learning Resources Manual and B.C. Parks Education programs; develop

field trip planning packages using a standard format for all parks; develop materials by "landscape themes", such as rivers, marine environments, and mountains; develop concise, "user friendly" resource materials that includes activities, backgrounds and descriptions, graphics, worksheets, etc.; set priorities for park resource material development.

6. Develop a competitive marketing strategy: market B.C. Parks Education materials for use in schools; advertise the B.C. Parks Education program including target groups such as the B.C. Teachers' Federation, B.C. Science Teachers Assoc., EEPISA, and NAME.

Enviroscope - Focus on Forest Education in British Columbia

Enviroscope (1993b), with input from the Forest Education Advisory Committee, surveyed approximately 100 teachers from across B.C. in an effort to assess the needs of teachers for effective forest education.

Teachers collectively endorsed a theme of "caring for our forests", based on awareness of forest environments, information about how forests work, and concern for different perspectives on forest use. Teachers described forest education as interdisciplinary and integrative by nature, providing a virtually ideal context to enlist recent revisions in educational philosophies and goals. Teachers considered field studies a priority for effective forest education.

Teachers wanted curriculum guidelines for each level to ensure smooth transitions for their students and to avoid repetition or omission. They suggested both universal and level-specific learning outcomes which should underlie curricular themes for forest studies. Teachers expressed a need for better access to information about what forest resource materials are available and appropriate for their level of teaching (Enviroscope, 1993b). They cautioned that existing materials and forest education programs were often biased or narrow in perspective, leaning more toward the commercial, multiple use side of forestry rather than the holistic, ecological approach taken by "forest education".

Many teachers recommended expansion of the "Adopt-a-Forester" program, as well as training for non-teacher specialists who visit schools to help them with strategies on how to give presentations to students. Finally, teachers wanted an accurate big picture [an overview] of forests and forestry in B.C.

EEPSA - Provincial Environmental Education Review

In a broad survey of environmental education in British Columbia, EEPSA (1991) found that the most valuable environmental education activities are those which ultimately build long-term commitment. Many activities, though valuable for building awareness, lack integration into the day to day activities of the students.

EEPSA also concluded that few of the available learning resources actually meet the goals of environmental education. Most resources are well-meaning attempts by organizations to promote a particular message. This forces a dependency on a single source type of information which is in conflict with the environmental education goal of students learning to critically examine the issues and reach

their own conclusions (EEPSA, 1991). This illustrates the need for new, broader based environmental education learner resource materials.

EEPSA (1991) recommended that a province-wide curriculum assessment guide be developed which "would provide the framework to allow teachers to develop exciting programs that integrate goals of several subject areas, and also validate the efforts of those teachers who already are producing similar programs."

CHAPTER 3

SURVEY RESULTS

This chapter presents the results of the teacher survey in four sections. The first section discusses survey demographics, and summarizes questionnaire distribution and return rates as well as demographic information about the respondents (gender, age, university training, teaching experience, and grade level and subject area taught). The second section summarizes teacher responses to the 35 multiple choice questions in the survey, while the third section illustrates more detailed observations and conclusions made by teachers in their responses to the five written style survey questions. The final section presents the views of park interpretive program managers on the use of parks by school groups.

Some results are presented in point format and as graphs to enhance clarity of interpretation. A discussion of the survey results relative to the research objectives described earlier is found in Chapter 4.

Survey Demographics

Responses were received from 11 out of 13 public school districts and four out of five independent schools on Vancouver Island. Two school districts denied permission to conduct the survey, stating that their teachers were too busy to complete the questionnaire. For reasons unknown, one independent school did not respond to requests by the author to conduct the study. In total, 297 survey questionnaires were mailed out to teachers. Of this, 166 completed questionnaires were returned including 148 responses from public school teachers and 18 responses from independent teachers. Thus, for the purpose of statistical data analyses the sample size was $N=166$, equating to a questionnaire return rate of 56% (166 responses/297 questionnaires mailed out). This compares favourably with other teacher surveys about environmental education in B.C. (2577/4800 or 54% return, B.C. Ministry of Education, 1989, as found in EEPsA, 1991; 300/1500 or 20% return, EEPsA, 1991). Of the 166 questionnaires returned, 152 were completely usable for application of the selected statistical tests. Fourteen questionnaires had missing data on at least one question.

This reduced the sample size for those questions, but statistically significant trends were still apparent.

Fifty-two percent of respondents were male and 48% were female. Forty-six percent of teachers were between 35 and 44 years of age. Forty-three percent of teachers surveyed had more than 15 years teaching experience. Fifty-five percent of teachers were from an urban school environment and 45% were rural. Forty percent of teachers held a university major in education, while 18% and 9% held majors in social sciences (geography, economics, history, political science, sociology, psychology) and ecology/biology, respectively. Fifty-five percent of teachers taught within the grade K-7 range, while 45% taught between grades eight and twelve. Thirty-six percent of teachers taught at the general subject level, while 19% taught sciences, 16% taught social sciences, and 11% taught humanities as the majority of their teaching load. Other subject areas included practical arts (5%), special education (5%), mathematics or computer science (2%), and fine arts (1%). Based upon gender, 28% of male teachers taught at the general subject level, while 26% taught science and 21% taught social sciences. A

smaller proportion of women taught subject specific areas (13% science, 10% social sciences, 15% humanities), with more women teaching at the general level (44%).

Teacher Responses to Multiple Choice Style Survey Questions

The most salient responses and trends from the 35 multiple choice style questions have been summarized and grouped by sub-heading. In this manner, summary data are presented concerning teachers' views of environmental education; use of field trips, park programs and associated limiting factors; most valued park experiences and resources; and student evaluation in park settings.

Data are presented as frequencies (converted to percentages). More detailed analysis of responses to survey questions #19, 28, 29, and 30 involved X^2 and Anova testing. F statistic values are cited for responses showing statistically significant differences at the $p=0.05$ level of significance.

Environmental Education

Sixty-two percent of teachers agreed strongly that information about our natural and cultural environment and related issues such as conservation and resource management, should be taught as a compulsory part of the school curriculum. Eighty-nine percent of teachers felt that environmental education as described above, should be integrated across the school curriculum. Of this total, 52% (77/148) were elementary and 48% (71/148) were secondary teachers. Thus, 85% (77/91) of elementary and 95% (71/75) of secondary teachers surveyed were in favour of integration. Ninety percent of teachers responded "definitely yes" that field trips and/or exposure to informal education environments and programs such as those offered by parks will enhance process oriented learning (e.g., self-discovery, inquiry, group interaction, see Figure 3.1). Sixty-nine percent of teachers responded "definitely yes" that park-related information and environmental education curricula have significant overlaps (see Figure 3.2).

Figure 3.1 Will Field Trips Enhance Process Oriented Learning?

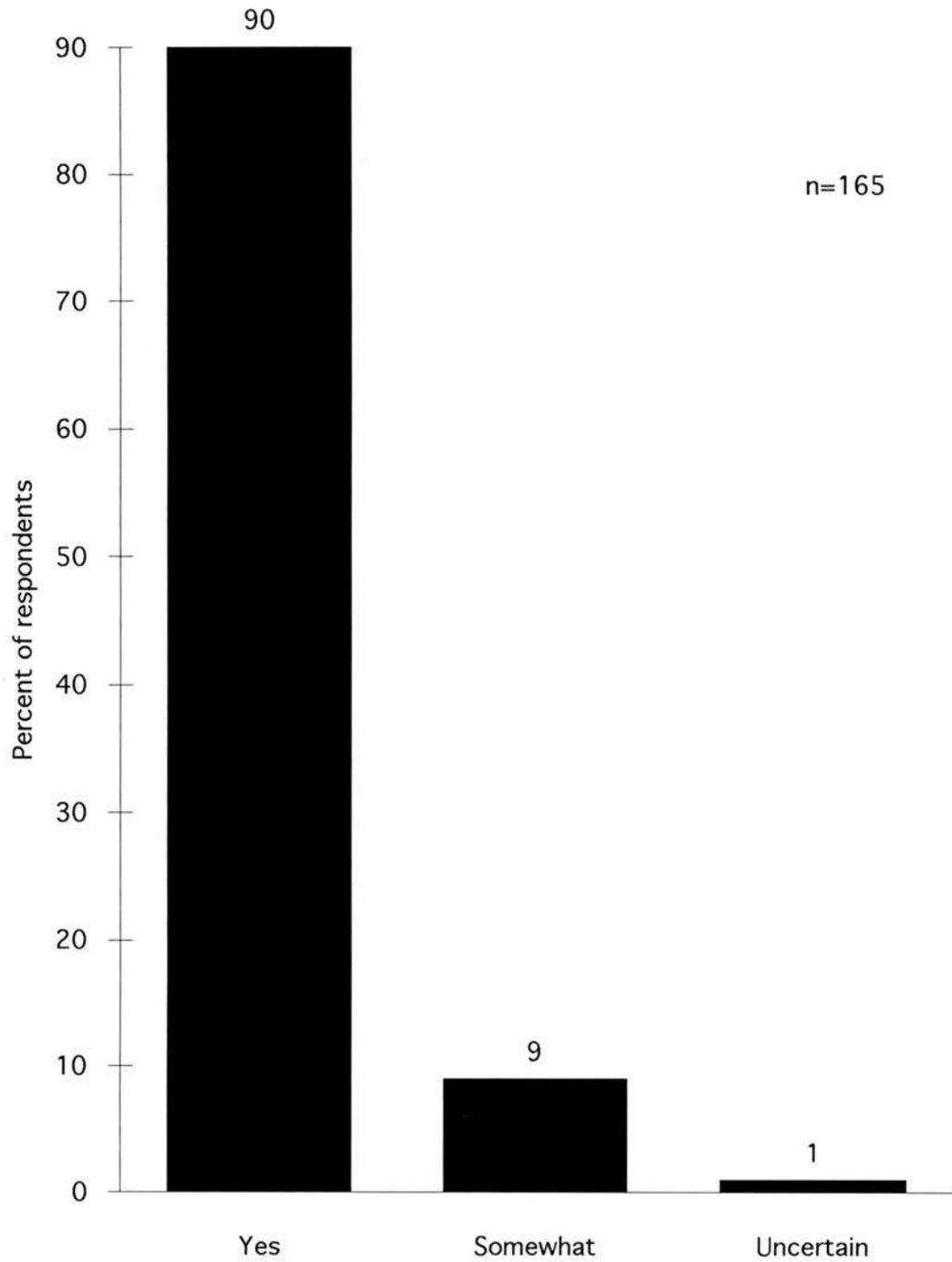
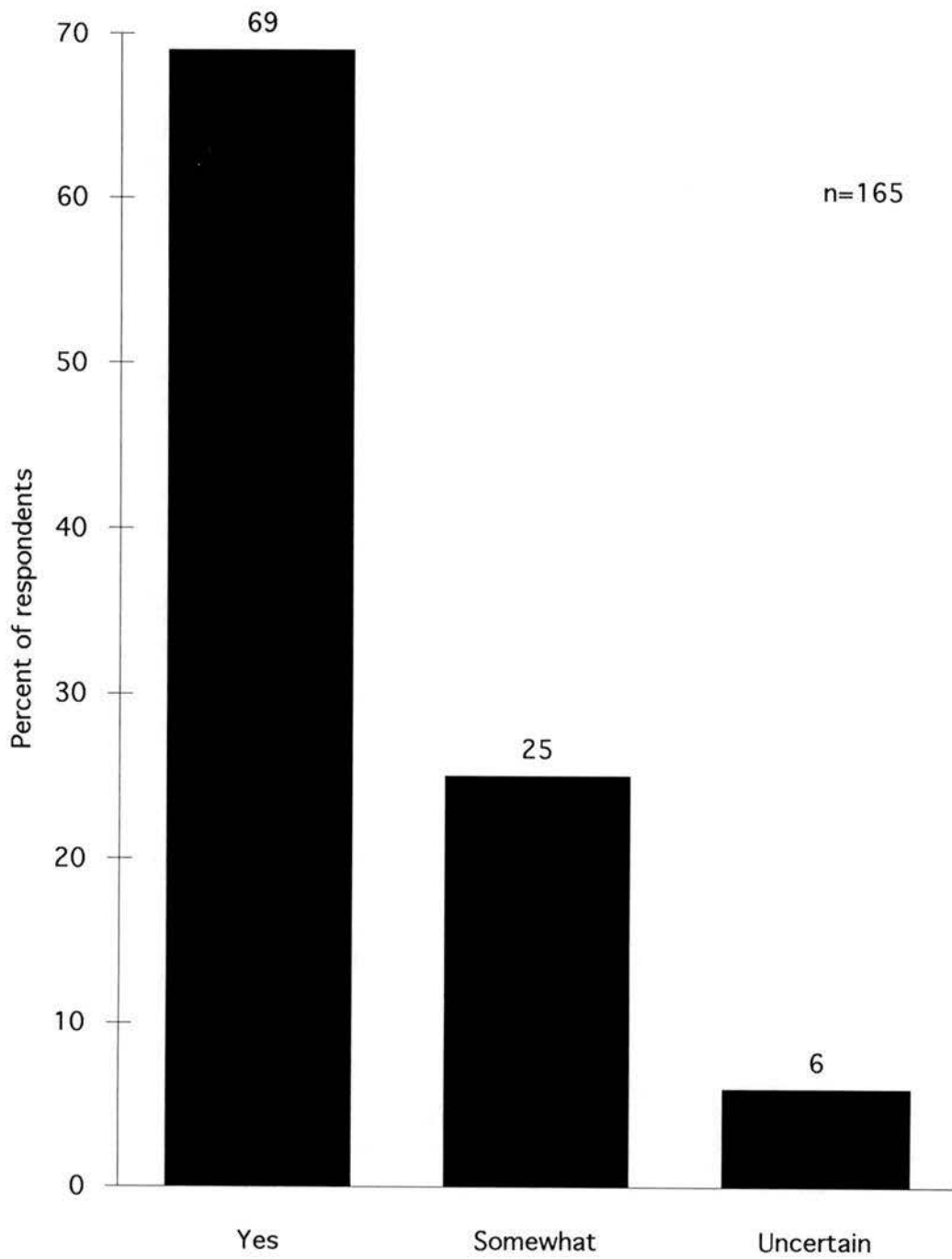


Figure 3.2 Do Park and Environmental Education Content Overlap?



Use of Field Trips and Park Programs

Thirty-eight percent of teachers had taken a school group or educational field trip to a national or provincial park in B.C. between one and three times during the past five years (see Figure 3.3). However, 27% of teachers had never taken an educational field trip to a national or provincial park in B.C. For these teachers, 40% cited insufficient funding while 27% cited lack of time as their major limiting factors (Figure 3.4).

Figure 3.3 Number of Field Trips Taken by Teachers in the Past Five Years

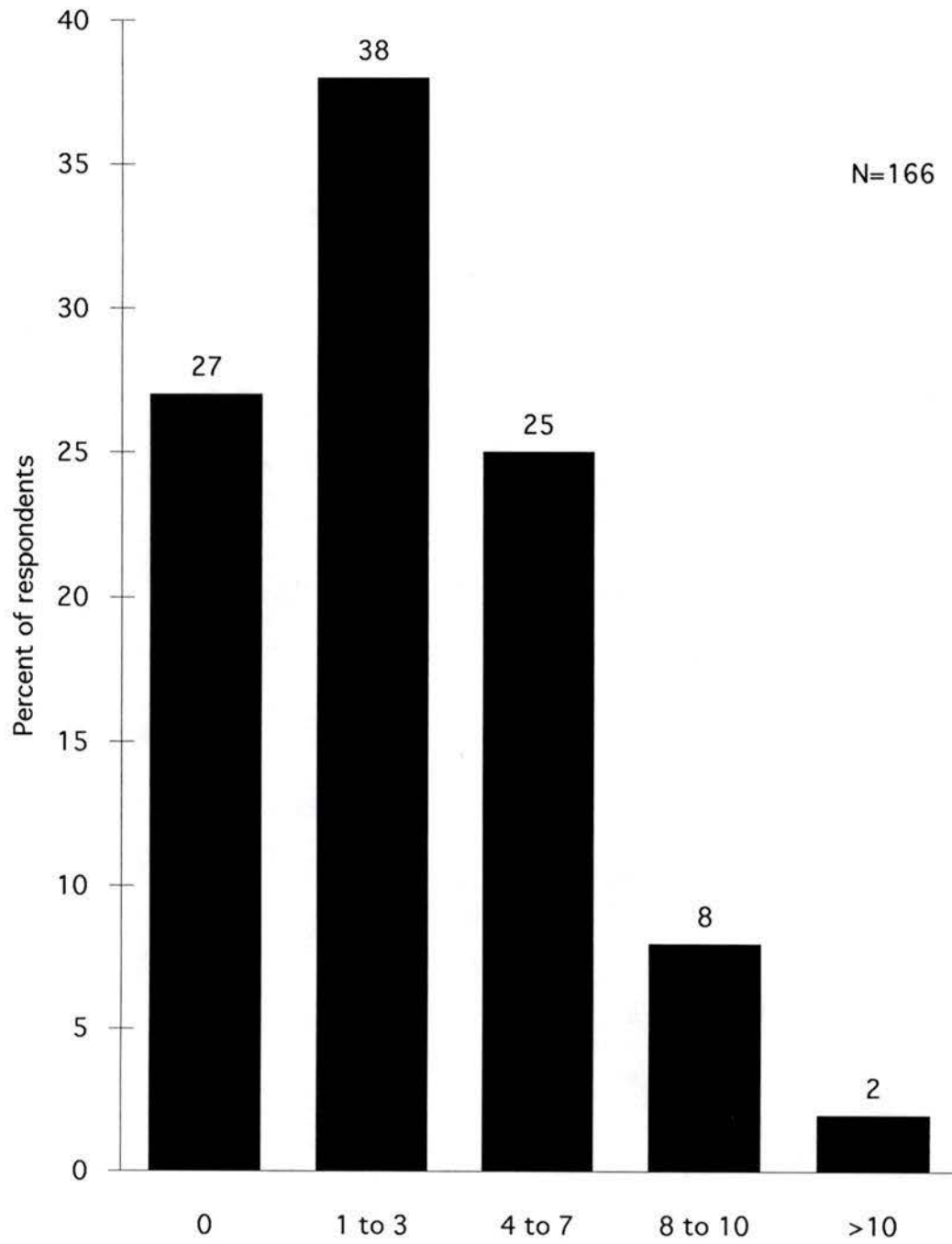
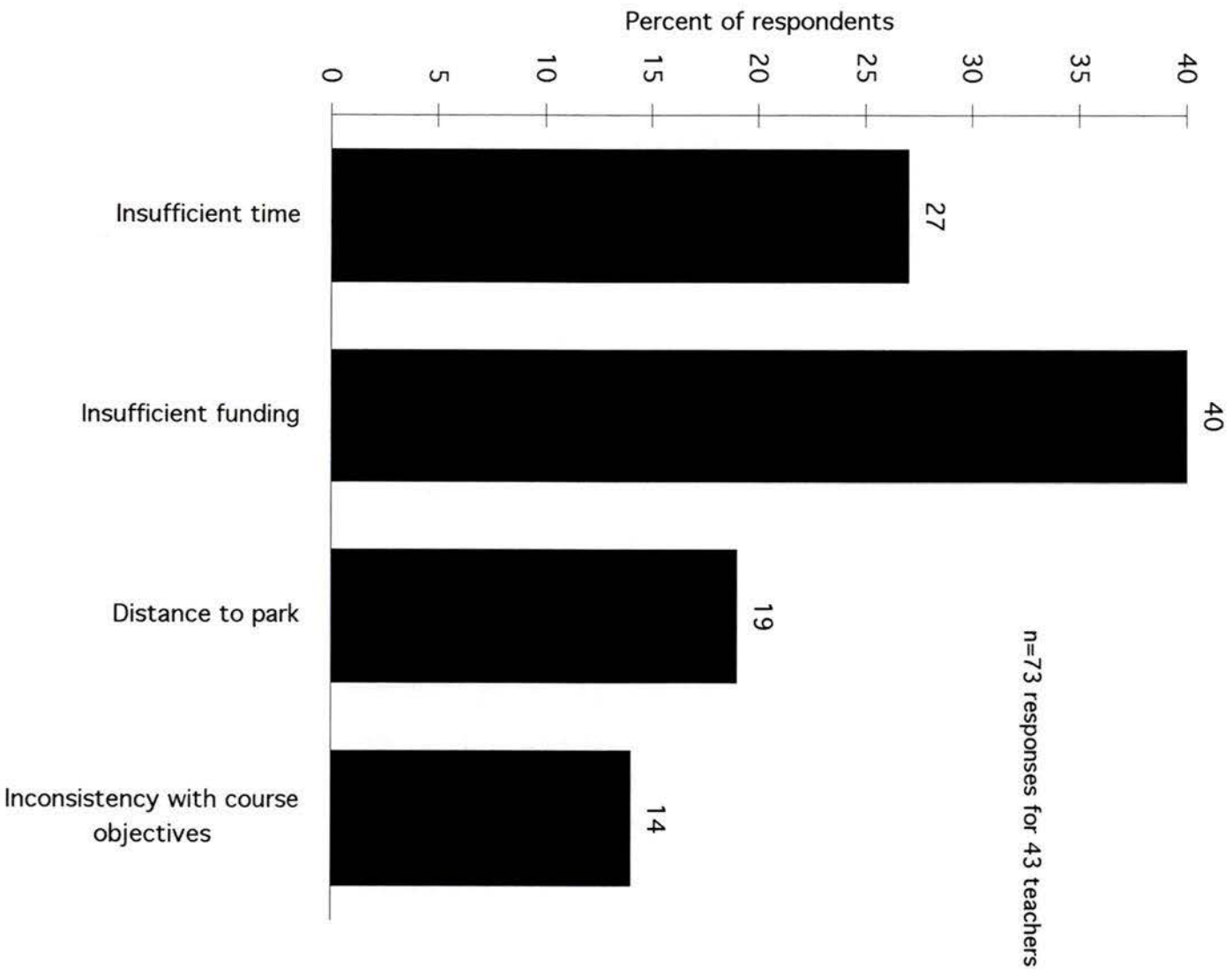


Figure 3.4 Teachers Who Have Never Taken a Park Field Trip

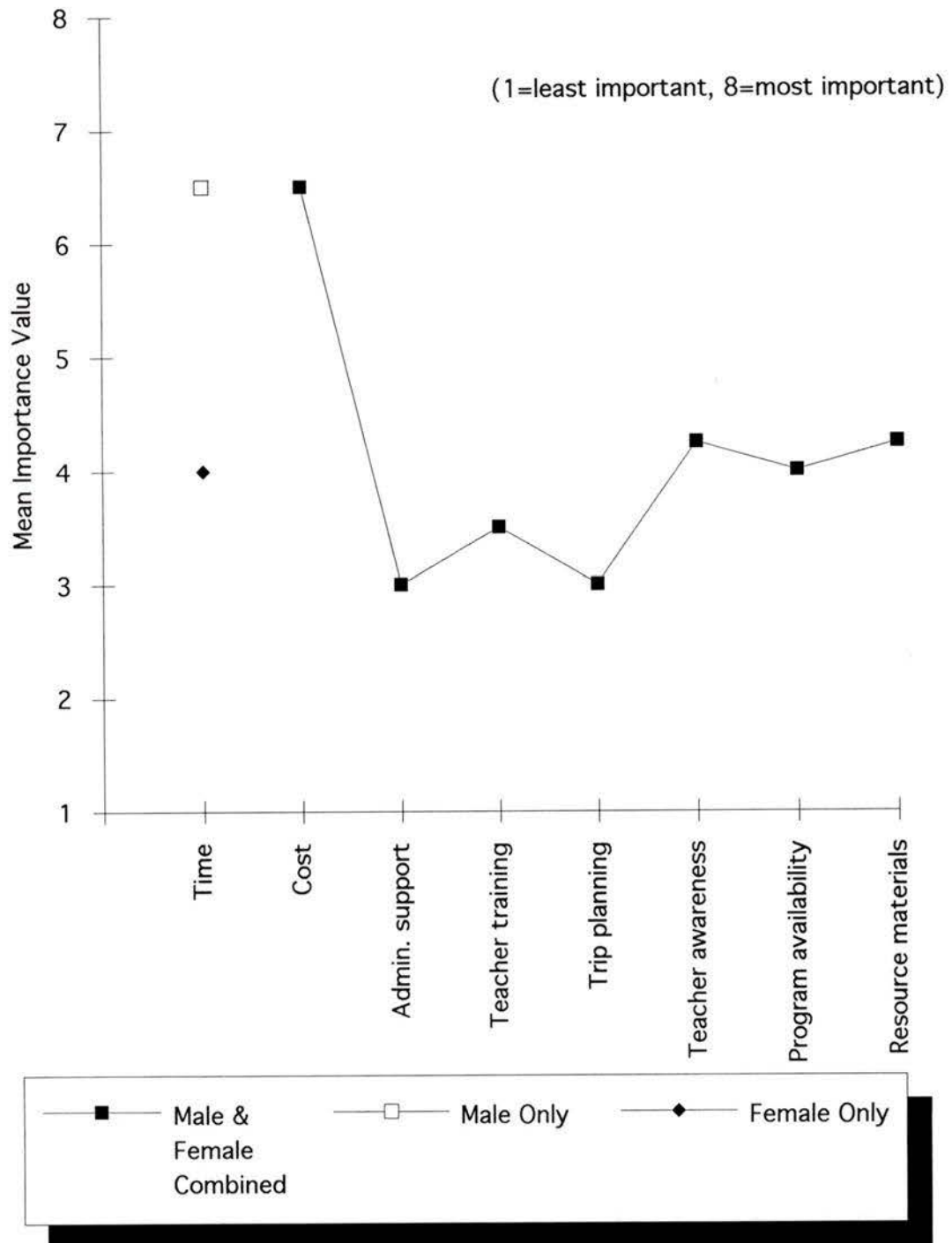


Factors Limiting Teacher Use of Park Programs

For teachers who were able to use park facilities and programs, time and cost once again emerged as the dominant limiting factors influencing their ability to use the programs. However, female teachers saw cost as the most important limiting factor while time was of moderate importance. Male teachers rated time and cost equally important. This gender difference was significant at $p < 0.05$ (Anova F statistic = 11.84, 1/141 d.f., see Figure 3.5).

The remaining factors influencing teacher use of park programs showed no difference in their relative importance based on teacher gender, geographic location (urban versus rural), or public versus independent school system (Anova, $p > 0.05$). Availability of park programs and resource personnel, availability of resource materials for schools, and teacher awareness of park resources, programs, and services were of moderate importance. Teacher training/background knowledge, teacher uncertainty in trip planning/preparation, and administrative support for field trips were all secondary limiting factors (also see Figure 3.5).

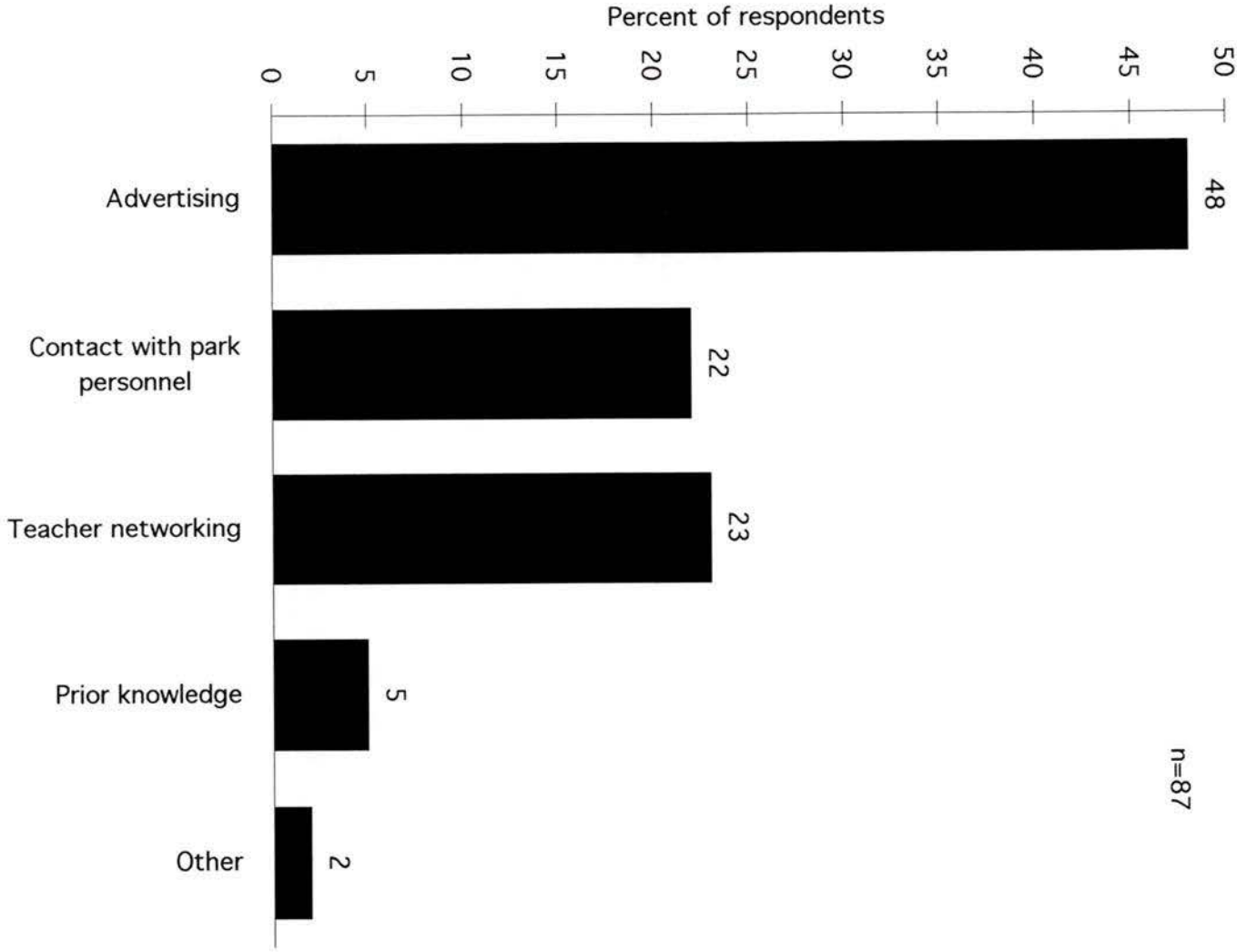
Figure 3.5 Limiting Factors Influencing Teacher Use of Park Programs



Forty-eight percent of teachers stated they were aware of the park resources, programs, and services available to them as educators, locally and regionally. Of this total, 48% received information through direct park advertising or promotion (e.g., mail-outs or media communication). Twenty-three percent learned about park programs through sources such as teacher networking, while 22% relied on direct contact with park personnel (e.g., word of mouth or telephone conversation). Teachers' prior knowledge and other sources were cited least often as mechanisms for promoting teacher awareness of park programs and resources (see Figure 3.6).

Respondents did not qualify the extent of their awareness (e.g., knowledge of which particular programs or services were available; knowledge of booking procedures; knowledge of necessary materials or other resources), but only that they had become aware of the programs as described above. Twenty-two percent of teachers indicated they were unaware of local or regional park resources, while 30% said they were uncertain.

Figure 3.6 Method of Awareness of Park Resources and Programs



Most Valued Park Experiences, Programs, and Resources

Teachers felt the most significant aspect of their park educational experience was the experience itself, including park beauty, aesthetics and locale, and specific natural, historic, or cultural phenomena. Park facilities (e.g., visitor centres, interpretive trails, exhibits) and park interpretive programs were valued but were less significant (see Figure 3.7).

Teachers felt the guided, park staff-led walk, tour, or activity in the park was the most valued educational park experience. Student self-discovery learning (via an exploratory, teacher-led walk) and interpretive programs involving visual or "hands-on" exhibits held moderate value. Audiovisual and theatrical presentation style programs were least valued (see Figure 3.8). These are "passive" programs where students observe a presentation and may ask questions, but do not actively participate in activities such as role playing or skits.

Figure 3.7 What Was Significant About the Park Experience?

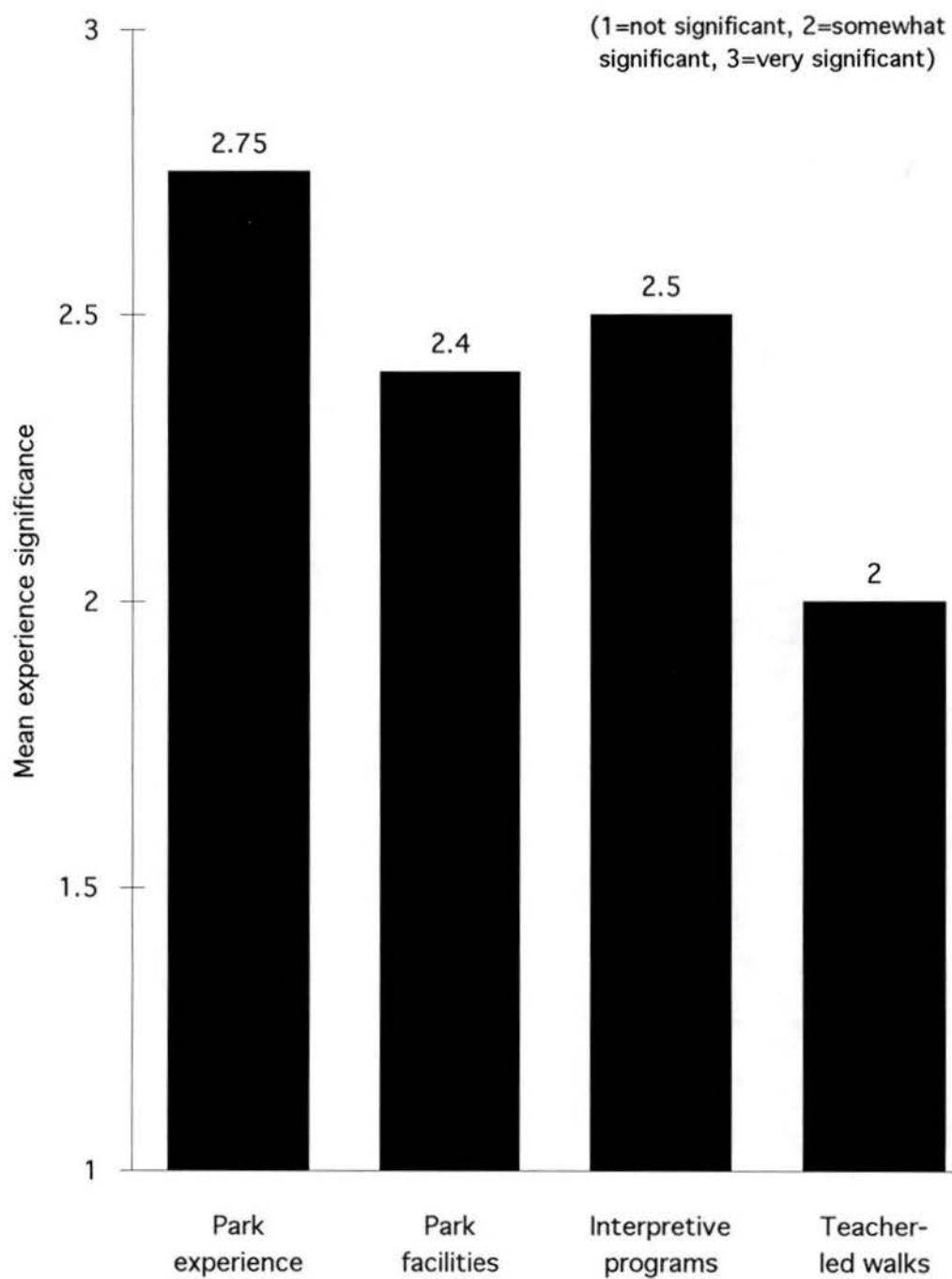
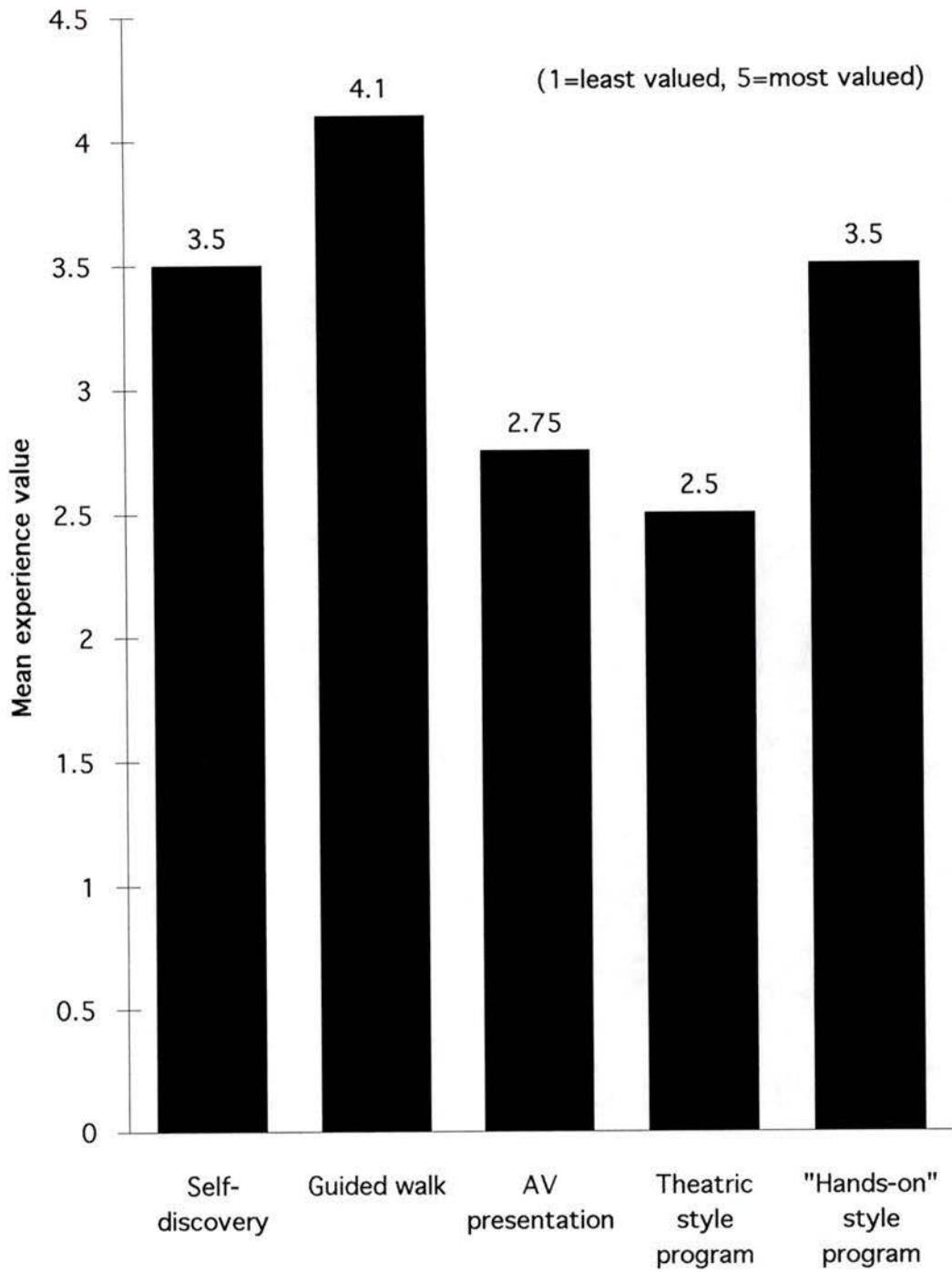


Figure 3.8 Park Experiences Most Valued by Teachers



Resource materials or services most useful to teachers were program information packages of available educational services for local or regional parks. This includes information about program content/theme, program style (e.g., slide show, naturalist walk), and scheduling and booking procedures. School visits by park personnel were found to be least useful from the range of choices of park resources and services. However, it must be noted that all choices listed, including more background information on parks (e.g., maps, plant and animal lists, cultural or historical features, etc.), and suggested student activities and lesson/unit plans, were considered useful by teachers. There was no significant difference in the degree of utility between these resource materials or services (Anova, $p > 0.05$, see Figure 3.9).

When the park resource materials and services as described above were rank listed by preference, irrespective of utility, the same trend emerged. Program information packages of available educational services were most preferred, while school visits by park personnel either prior to or in lieu of a park visit, were least preferred (see Figure 3.10).

Figure 3.9 Park Resources or Services Most Useful to Teachers

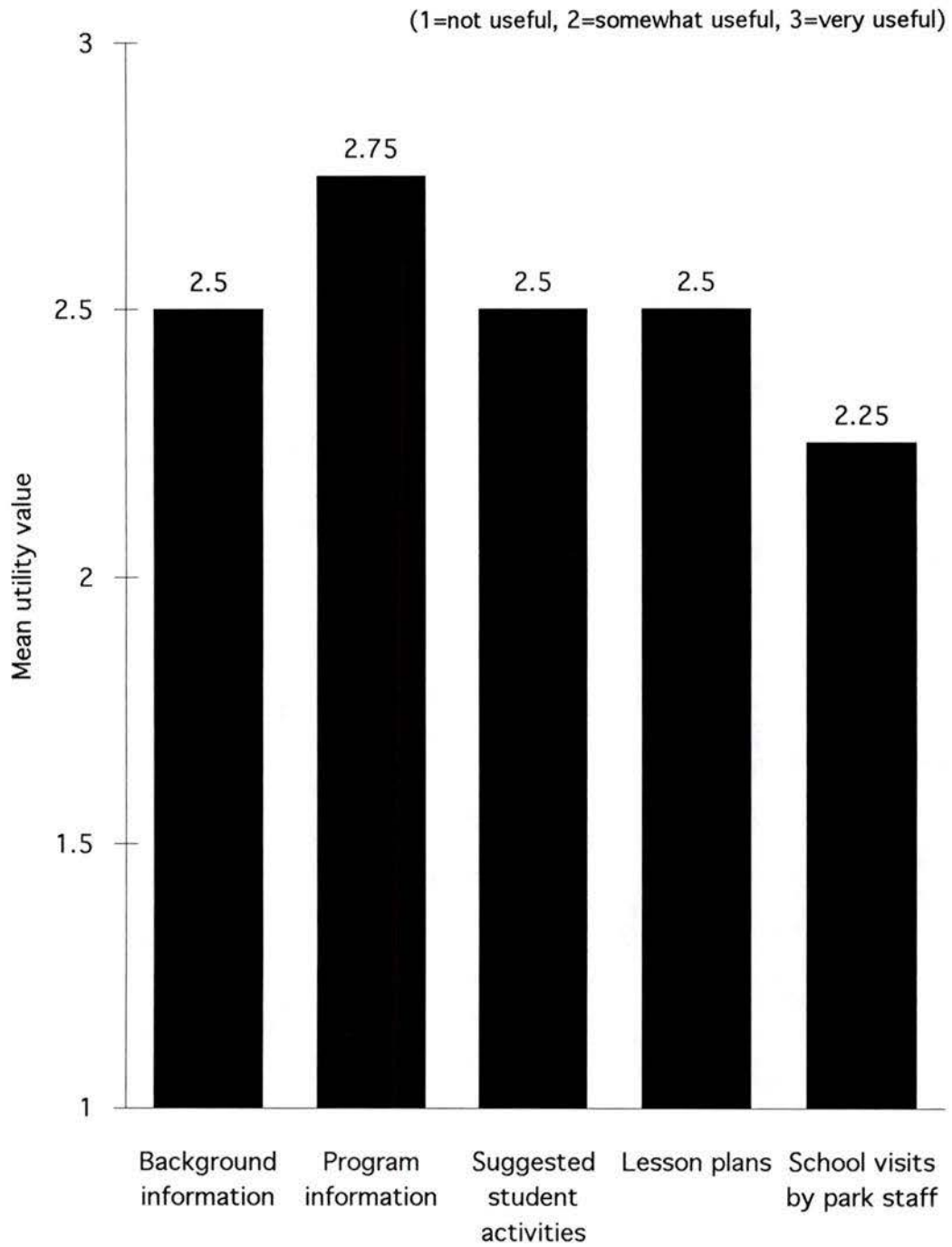
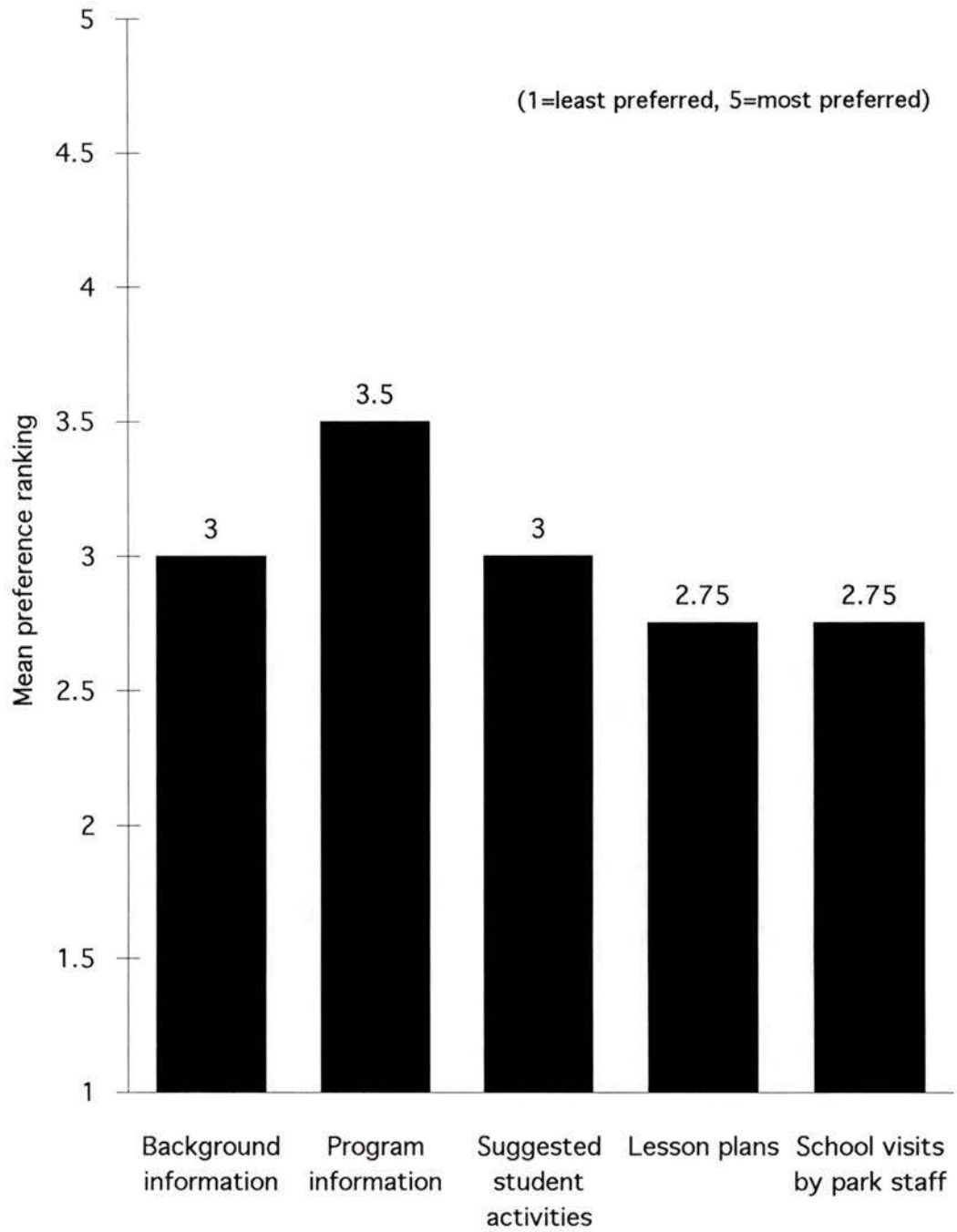


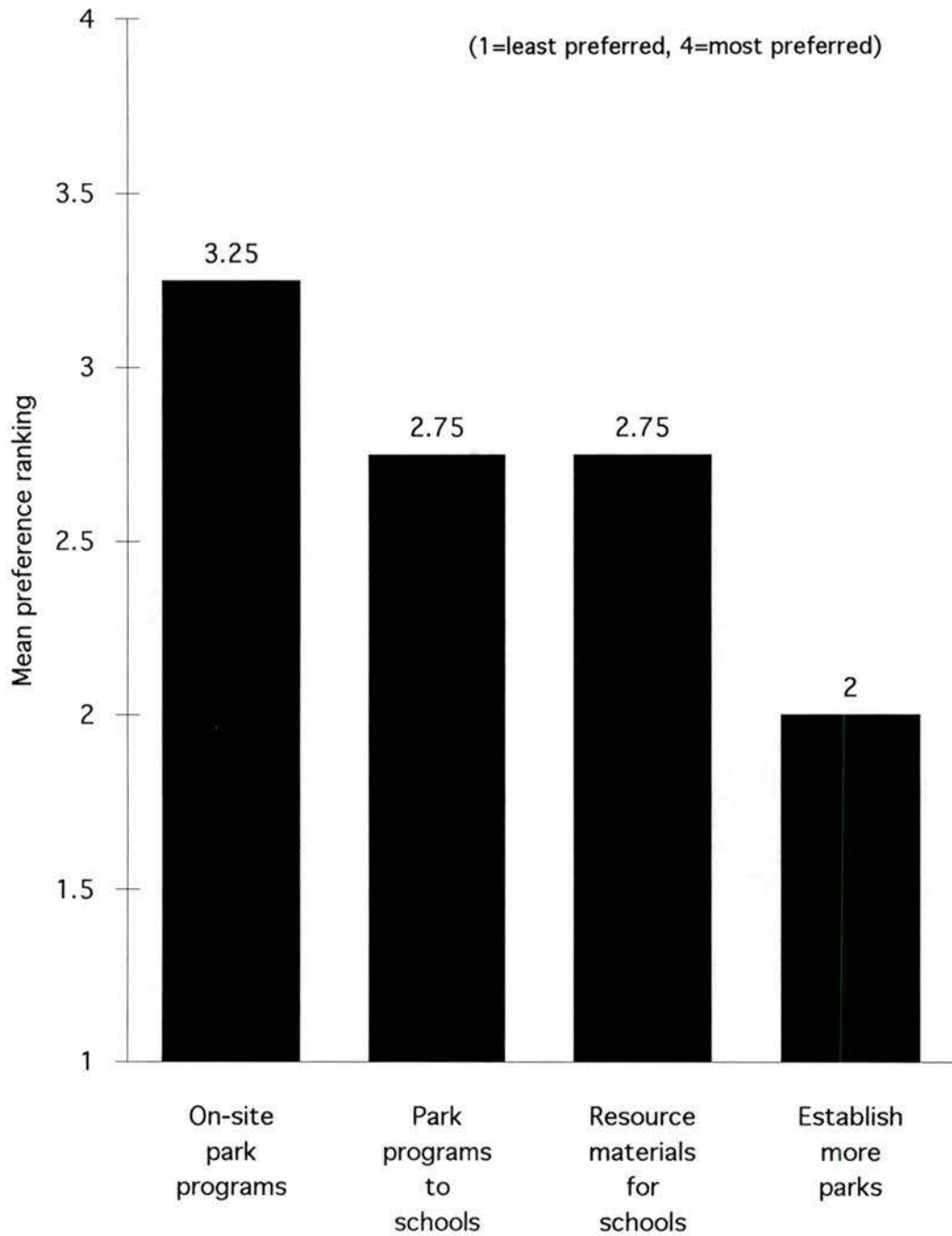
Figure 3.10 Teacher Preferences of Most Useful Park Resources and Services



No significant differences were found between the resource material and service preferences illustrated in Figure 3.9 and Figure 3.10 based upon teacher gender, urban-rural school setting, or public versus independent school system (Anova, $p>0.05$). However, due to the small sample size of independent school teachers surveyed, caution must be used when making any interpretations concerning public versus independent school teachers.

More on site (within park) educational programs provided by park staff was the most preferred choice of teachers who felt there is a need for more park programs and services. More park programs brought out to schools and more resource materials available to schools (e.g., background information on specific parks, suggested pre- and post-field trip activities) were less preferred but were still of moderate preference to teachers. Interestingly, the creation of more parks was least preferred (see Figure 3.11).

Figure 3.11 Which Park Programs Should be Implemented?



Ninety-one percent of teachers were in favour of having/attending park sponsored inservice workshops designed to familiarize participants with park features, resources, services and programs. Most teachers indicated these workshops could be held on existing professional development days.

Evaluation of Students

Evidence of student attendance and participation in the park field trip or program, and a summative anecdotal description of student learning involving joint assessment by park staff and teachers, were considered the most important methods of evaluating the educational effectiveness of park programs. Traditional "paper and pencil" style testing was rated less important, as was the need for more research into evaluation of informal education programs (see Figure 3.12).

Figure 3.12 Evaluation of Park Program Effectiveness



Teacher Responses to Written Style Survey Questions

Observations and conclusions made by teachers in response to the five open-ended written survey questions are summarized below. Questions of this style have the advantage of being able to extract a lot of information on a particular topic, but also have the disadvantage of being more difficult to quantify and analyze. Thus, responses are shown in point form and grouped under sub-headings (namely, important educational themes identified for park programs; teacher inservice needs; and additional comments) to enhance clarity of presentation and interpretation. Response frequencies are given as percentages.

In total, 401 written responses were received from teachers. Because of the conditional nature of some of the questions (e.g., if you answered "yes" to question #37, please elaborate), not all teachers responded to each written style question. Discussion relevant to these results is found in Chapter 4.

Important Themes Identified by Teachers for Park Programs

- 42% of teachers indicated that environmental awareness, including some understanding of ecology, biodiversity (plants and animals), wildlife habitat, ecosystems and natural cycling (e.g., food webs, nutrients, water), and knowledge of natural resource issues such as forestry and wilderness conservation, were important themes encountered in past park visits which related especially well to the school curriculum.
- 34% of teachers mentioned that programs on beach studies, sea creatures, and salmon related well to the school curricula.
- 6% of teachers felt park programs on native people/culture related well to the school curriculum.
- only 3% of teachers indicated that park programs involving creative writing, poetry, reading, art, or drama related well to the school curriculum.
- 41% of teachers wanted additional emphasis on man's impact on the environment implemented into park programs. This included topics such as sustainable development (economy), wilderness preservation, endangered species, pollution, natural resource

management, and environmental appreciation and associated values.

- 16% of teachers wanted more park programs dealing with ecosystems and habitat.
- 9% of teachers wanted more park programs dealing specifically with native plants (identification and ethnobotany)
- 6% of teachers wanted more park programs which provided information on local geology.
- 5% of teachers wanted more park programs having an outdoor recreation/appreciation component (e.g., similar to the *Outward Bound* philosophy).

Teacher Inservice Needs

- of the 91% of teachers in favour of park sponsored workshops, 53% felt workshops should be held on teacher professional development days. Teachers stressed that these workshops must be advertised well in advance to facilitate scheduling on a district wide basis.
- teachers indicated that workshops would allow them to expand

their knowledge of specific areas (e.g., spawning salmon, native flora, geology, cultural history), as well as providing them with more information on the description and availability of park programs and services offered in the upcoming school year.

- 17% of teachers felt workshops should be activity based, where teachers would actually travel out to a park (on a professional day) and thereby gain a "hands on" familiarity with the park and the potential programs available to school groups.
- 8% of teachers wanted park personnel to come out to the schools to put on workshops (on professional development days), or make presentations at staff meetings.
- 7% of teachers were willing to accommodate park workshops during after-school hours, or as a summer or weekend field seminar.

Additional Teacher Comments

Additional written comments from 12 of the teachers surveyed represent rather well some of the needs and feelings teachers harbour concerning park programs. These are grouped below by six

general themes and are expressed as direct quotations:

1. Teachers need to experience the outdoor learning environment.

Teachers need to be taken out of the classroom and shown what is out there. They need to be released during school time, not given an extra burden on top of their day's work. Many teachers do not have an appreciation of the natural environment. They must be educated before we can hope to get to the students.

Many teachers, while wanting to create hands-on experiences, don't have the skills or the background knowledge. They need to get outdoors and see how much fun learning can be.

2. Educational benefits of a multi-faceted, experiential program.

The Wendell house program at Barkerville was wonderful but the season was so short and demand so high, the costs so much (2 days travel each way) that I was only able to do it once. The booking was very difficult to get. The program was multi-faceted, including cooking, craft making, theatre (participatory), all in the actual setting. Best thing I ever did in 20 years of teaching and my graduates still come back and talk about it.

3. Development of a conservation ethic and responsible attitudes and values.

The conservation ethic must be pushed. Students are the citizens of the future. If they do not appreciate wilderness more than our generation has, we're in deep, deep trouble.

National and provincial parks are underused by the education institutions in B.C. With the environmental problems facing the generations of students currently in schools, parks education could help generate a better awareness of

environmental problems and could promote and encourage more students to work toward building a better/healthier environment.

4. Development of more park resource materials.

I would like to see a cooperative effort between teachers and park personnel in developing relevant, thematic materials that can be used in the park and the classroom. We need more teacher friendly materials.

Make more educated park personnel available to assist teachers or lead students and teachers on specific subject park tours and activities. Have more activities relevant for grades 8-10; all too often park activities are catered to elementary levels.

5. Teacher inservice training and methods of increasing awareness of park programs and resources.

While teachers may be familiar with some of the services or programs offered, they may not be aware of the full extent of them; inservice programs would ensure complete awareness.

For the one program that I did, I heard about it by accident. There was also only a short booking time (3 days). I phoned early on day 2 and got the last available time. Obviously more time is needed to accommodate all groups. I really hope that information will become more available as a result of this survey.

Finding appropriate times for inservice workshops would be difficult. Teachers often have very little energy left at the end of the day for workshops. An interested, school 'contact' person might help with spreading information about the parks and their programs.

I think teachers should always pre-visit and pre-plan field trips but this can be costly and nearly impossible for off-

island (or distant) locations. Participation in locally produced professional development days might be a good access point for park personnel and teachers to meet.

6. Time and regular school commitments are a limiting factor.

Extra-curricular activities (choir, sports) take up a lot of time. In a rotary system field trips are often postponed or deleted for the sake of regular sports or music programs.

The above comments were reflective of the general concerns teachers held regarding their use of park programs and resources.

Responses to Park Interpretive Program

Managers Questionnaire

Responses from a small sample of park interpretive program managers (n=10) provided a qualitative assessment of some of the perceptions managers hold concerning the use of their parks by school groups. Once again, these are summarized below and grouped by sub-heading (program awareness and user demand; most valued park programs; and limiting factors influencing the use of park programs).

Park Program Awareness and User Demand

In spite of efforts by some parks to reach teachers by direct advertising (mail-outs and public radio announcements), teacher networking ("word of mouth" between teachers) was cited as the most prevalent manner by which teachers became aware of park programs and services.

Dependent on their location (e.g., proximity to a major urban centre), most parks were unable to meet the demand for programs, services and facilities by school groups.

Most Valued Park Programs

Park interpretive personnel felt the most successful park programs or experiences for school groups as measured by audience receptivity, adaptability, educational effectiveness, and longevity (consistent demand for program for more than one season), and therefore those most valued by teachers, were those involving a guided, park staff-led walk, tour, or activity in the park. Example

programs mentioned were beach (intertidal) walks (Miracle Beach Provincial Park, Rath Trevor Provincial Park, Pacific Rim National Park), forest walks (Pacific Rim National Park, Goldstream Provincial Park), spawning salmon (Goldstream Provincial Park), and historical period costume activities (Fort Rodd Hill National Historic Park).

Park interpretive personnel felt programs involving a visual or "hands on" exhibit were also valued by teachers, followed to a lesser extent by programs with an audiovisual presentation (e.g., slide show, video, movie).

Limiting Factors Influencing the Use of Park Programs

Park staff indicated the major limiting factors influencing utilization of park programs and resources by school groups were cost and time. These were primarily associated with travel and transportation expenses.

In general, the views of the park program managers regarding school use of park resources coincided with those of teachers. Guided, activity oriented programs were most popular and successful, while time and cost were the major limiting factors. However, unlike teachers who stated that direct park advertising and promotion was their primary method of obtaining information about park programs and resources (48%), program managers cited teacher networking as the most prevalent manner by which teachers became aware of park services. While networking was also seen by teachers as an important means of awareness (23%), the larger proportion attributed by teachers to direct advertising may be the result of the frequent "barrage" of product and service advertising which teachers receive, coupled with the fact that teachers are generally interested in finding out about park programs available to them locally and may therefore be more selective in responding to "awareness mail" for parks in their area.

CHAPTER 4

DISCUSSION, SUMMARY RECOMMENDATIONS, AND FUTURE RESEARCH

This final chapter discusses the most salient observations and trends which were apparent from the survey. Summary recommendations for implementing park programs in the B.C. school curriculum are made. Relevant conclusions are drawn and the need for further research is elaborated.

Discussion of Observations and Trends

Park User Demand

The demand for park resources and programs by school groups in B.C. is high and often cannot be met by existing park resources. This demand is especially high near large urban centres in the lower mainland and on Vancouver Island (B.C. Ministry of Parks, 1990). Increasing the number of parks alone will probably not meet the growing user demands. Better equipping teachers with resource

materials which provide information and activities about the park, and inservice training to allow teachers to use the parks and natural areas on their own (e.g., as their "own park interpreter"), may be a real solution.

Limiting Factors to Park Use

Time and cost were repeatedly cited by teachers as the most important factors influencing their use of park programs. This finding is consistent with a study of science programs and related field trips where Price and Hein (1991) concluded that "the most common feature of every program we observed was difficulty with transportation" (bus scheduling; bus arriving too early or late; cost of bus transportation is prohibitive).

With only two exceptions, there was no difference in teacher response to survey questions based on teacher gender, location (urban-rural), or school system (public versus independent). These two exceptions both involved perception of limiting factors influencing teacher use of park programs. Male teachers felt time

was most important while females felt it was of secondary importance. Male teachers tend to teach at the subject specific level (e.g., sciences, social studies, mathematics) while females are often generalist teachers. There may be more of a "time demand" perception difficulty held by males who teach these content oriented subjects, with the associated fear that a field trip will take away from class time. The second significant difference in teachers' perceptions of limiting factors occurred between public and independent school systems. The independent school teachers took more field trips per capita and were therefore less concerned about potential limiting factors. The reasons for this are speculative, however, the small sample size of independent teachers (n=18) precludes any direct comparison to the sample of public school teachers (n=148).

Regional Biases

The high value placed on marine related programs by the survey participants is likely due to the bias resulting from Vancouver Island teachers being in such close proximity to an ocean

environment. Because of their limited access to the ocean, interior (mainland) teachers may prefer to have other park related curriculum units.

Teachers on Vancouver Island have parks in closer proximity than many other areas of British Columbia. Hence, teachers in northern B.C. for example, may not want more "on-site park programs". Unlike Vancouver Island teachers, these teachers may in fact want more park programs brought out to the schools and more teacher resource packages for use in the school. Even though teachers placed a relatively low priority on the creation of new parks, this again may be the result of potential biases of Vancouver Island teachers who generally do not have to travel long distances to reach natural park areas. More emphasis on creation and/or proximity to parks may be paid by teachers in the interior of B.C. where inter-park distances can be great.

Teacher Awareness of Park Programs

The way in which teachers become aware (or perceive that they are

aware) of park programs and resources is crucial. Many teachers surveyed (79/166 or 48%) were not aware of the park resources in their area. For those that were aware, direct park advertising or promotion, and teacher networking ("word of mouth", electronic mail, association newsletter) are the most effective means of communication. It is obvious the lines of communication between teachers and park personnel are still relatively inefficient for such a large percentage of the respondents to have been unaware of the programs and resources in their area.

Most Valued Park Experiences, Resources and Services

The most valued and educationally meaningful park experiences involved active participation, including self-discovery (exploratory learning) and guided park walks or tours. These activities are consistent with the process oriented, experiential, constructivist approach to learning. The educational merit of this learning model cannot be overstated. It is by taking into consideration the experiences of the learner, both past and present, building in new knowledge and activity, and making the whole experience realistic

and applicable in that person's life, that lasting learning can occur. The newness and excitement of an outdoor park setting provide an excellent atmosphere for learning in this context.

The survey results indicated that program information packages of available educational services for local or regional parks (including type of program and scheduling information), and more background information on particular parks (e.g. maps, faunal lists, information about park features and themes) were the most preferred resources useful to teachers. Resources of this kind are generally preferred because of the high demand for park services and the fact that many teachers are unaware of the park resources and related themes, activities and materials available to them. These findings are consistent with other recent studies of parks and environmental education in B.C., as described earlier (EPPSA, 1991; Enviroscope, 1993a; Enviroscope 1993b). One minor difference from these findings was documented by B.C. Parks in their 1990 school survey (British Columbia Ministry of Parks, 1991). According to their results, the most preferred park resource for teachers was increased "visits to the classroom by park staff or contractors".

This difference in the findings of the two studies might once again be attributed to regional biases. Unlike this study, the B.C. Parks project surveyed teachers from across the province which would have imparted a different measure of regional and geographic biases to the results.

Teachers felt that more on site (within the park) educational programs provided by park staff was the most preferred type of service which should be augmented. This choice is consistent with the high value teachers place on guided, park staff-led walks, tours, or activities in the park as their most valued educational park experience.

Only a small percentage (3%) of teachers indicated that park programs involving creative writing, poetry, reading, art or drama related well to the school curriculum. At first this finding was somewhat puzzling given that these types of creative, process oriented activities tend to blend well with the facilities, experiences, and learning approaches found within and associated with parks. However, this may be the consequence of the small

percentage of fine arts teachers (1%) who responded to the survey questionnaire. It is difficult to assess whether this small proportion was the result of inadequacies in the questionnaire distribution or whether teachers from this subject discipline were not very interested in park programs and chose not to respond to the survey.

A large majority of teachers (91%) were in favour of having/attending park sponsored inservice workshops designed to familiarize participants with park features, resources, services, and programs. Inservice has been shown to enhance teachers' abilities to more effectively utilize informal education environments (Caduto, 1984-85; McLaren, 1989). The importance of this professional development activity should not be overlooked.

Summary Recommendations

A number of recommendations have been made based on the findings of this study. It is hoped these recommendations will assist educators and park personnel in better understanding and improving

the utilization of park programs and resources within the school curriculum.

1. The placement or linkage of park programs within the school curricula should be maximized. This can be accomplished by directing appropriate park programs to meet the needs of particular school curricula (e.g., intermediate science offers units on ecology and resource management; field trips to parks and park related concepts tie in well with these themes). As well, park programs should not be used as convenient "filler activities" at the end of the school year, but should attempt to fit more closely into the school curriculum throughout the year and across a breadth of subject disciplines. Ideally, themes and messages contained in park programs have the capacity to span the entire school curriculum. This potential is supported by the views of teachers themselves (89% of teachers surveyed felt environmental education, including natural, cultural, and historical environments and related issues should be integrated across the school curriculum). Integrated curricula can reduce school time and funding restrictions by essentially sharing

- (distributing) the cost of field trips to parks across an integrated "multi-subject" curriculum as opposed to a single subject curriculum. In other words, a park program which can offer information or a message on a particular theme while concurrently promoting the acquisition of another skill or form of knowledge or appreciation, is more desirable and cost/time effective for the school than a park program which is uni-dimensional in topic, scope, and approach. An example might be a program on traditional native basket weaving. Students would learn elements of native history and culture, identification and use of plants, and have an opportunity to try an art/craft form.
2. Fifty-two percent of teachers were uncertain or unaware of local or regional park programs and resources available to them as educators. More effort should be spent informing teachers of park programs, resources, and services. This should include resource information on program content/theme (e.g., where does this fit into the school curriculum), program style (e.g., guided walk), and scheduling and booking procedures (e.g., 60 day advance registration required).

3. Due to high user demand for park programs, and the need for teachers to schedule field trips into their school year (thereby reducing potential conflicts with other competing school activities), park information should be distributed to schools and/or school districts at least six months in advance of the program date.
4. As one-quarter of teachers surveyed received information on park programs and resources from "other sources" (e.g., teacher networking), more effort should be spent advertising in publications, newsletters, or electronic media which teachers are likely to see. An excellent candidate would be the B.C. Teachers' Federation newsletter (issued quarterly), the *Recommended Resources List* produced by the Ministry of Education (Learning Resources Branch), or some of the provincial specialist association newsletters accessible through the B.C. Teachers' Federation (e.g., EEPSA (*Clearing*), B.C. Science Teachers Assoc., B.C. Social Studies Teachers Assoc., Northwest Aquatic and Marine Educators Assoc., Independent Schools Assoc. Bulletin). Park information could also be communicated electronically via Simon Fraser

University User Exchange Network (Burnaby, B.C.), and the Community Learning Network (Education Technology Centre, Dunsmuir Lodge, Sidney, B.C.).

5. While park funds and personnel may be limiting factors, more effort should be directed at maintaining or increasing programs which involve in-park activities such as guided, park staff-led walks/tours, and "hands-on" educational activities involving acquisition of some skill, knowledge, or appreciation (e.g., orienteering, art work, demonstration of historical or cultural skills, and arts/crafts such as traditional weaving, ethnobotanical edibles, etc.). These sorts of in the park experiences were valued most by teachers surveyed.
6. Possible corporate funding and the use of university cooperative work program students (e.g., in geography, natural resource management, or education) as seasonal interpretive naturalists are potential ways of offsetting the demands on park funds and staff during periods when user demand is high.
7. More resource materials, including background information on specific parks and suggested activities and lesson/unit plans were valued by teachers and should be developed. Useful

materials would include curriculum units for teachers for either park specific or general environmental topics/themes, along with pre- and post-field instructional materials and activities.

8. Resource materials must be chosen, developed, distributed, and incorporated carefully to maximize integration into the school curricula. This process will be most successful if teachers jointly collaborate with park staff in resource development, field testing, evaluation, and implementation. The use of joint development workshops, for example, where teachers and park staff work together at developing a specific unit, could be held during School District professional development days around the province. Another mechanism involves the use of an established training program such as *Project Wild* to convey specific information about parks or an environmental education topic. Once again, teachers could be involved at the development stage, assisting with content writing, selection of materials and learning activities, and design of evaluation techniques. It is important for teachers to initiate ideas for the development of learning resources and activities, and not just have the

initiative come from an interested agency (e.g., B.C. Parks).

This can be facilitated through teacher specialist associations (e.g., EEPISA) and the B.C. Teachers' Federation.

9. Park sponsored inservice workshops for teachers should be implemented on a regional or district basis, perhaps once per school year. These should be held on teacher professional days, and should be advertised well in advance to maximize attendance and avoid conflict with other activities. Where feasible, workshops should be held in the park setting, thereby providing teachers with a "hands on" familiarity for the park and the potential programs available to school groups.
10. Workshops should familiarize teachers with the types of programs and resources available to them regionally and locally, and could also provide suggestions regarding the best potential times to integrate specific park programs/resources with various school curricula (e.g., park program P may be best suited for primary science and is offered at Park X, Y, and Z during April and May). This process could function reciprocally where schools could recommend which programs they would like to see offered at a park(s) during a particular time of the

- school year. In addition, park personnel could work in collaboration with an interested "teacher buddy" who would assist with workshops and pass along information between teachers and park staff.
11. Dependent on the type and location of parks found locally or regionally, inservice workshops should include themes which provide information on environmental awareness and human impact on the environment within a large context, as well as specific local or regional knowledge areas. Sub-themes could include sustainable development, global pollution, wilderness conservation, natural resource management, ecology, biodiversity, endangered species, native and cultural history, local flora and fauna, and local geology.
 12. Inservice workshops should not just be an "advertising" tool (use of newsletters/bulletins as described earlier will accomplish this). They should also be a forum where teachers can reciprocate ideas and suggestions, and especially for those 27% of teachers who had never taken an educational field trip to a national or provincial park, the workshops could provide the opportunity to learn about the potential benefits as well as the

logistics of conducting field trips (thereby reducing "teacher fear or reluctance"). Appropriate information about conducting a field trip in Park X could be provided. This could include suggestions for the most appropriate themes, activities, lessons, or units to build around the park experience (pre- and post).

13. Inservice training of teachers so they can better conduct teacher-led student walks in the park. This could help alleviate park staffing problems, especially during periods of high user demand by school groups when park facilities and services are often in short supply. By being better acquainted with park resources and related educational messages, teachers could become their own "park interpreters" for a short time. As indicated by teachers, a guided park experience led by park personnel is most valued. However, if adequately informed, some teachers who are unable to attend a park at a specific time due to overbooked programs could still attend on their own, thereby securing the benefit of the park experience for their students. In addition, for those areas of the province far removed from parks, trained teachers could provide "in the park-

like experiences" using their knowledge of local areas and environmental awareness issues.

14. In outlying areas of the province where access to parks by school groups might be very limited and costly, even "park-trained" teachers as noted above should still have the benefit of a visit from a park interpretive staff person. Contractors could be hired to bring messages and information about particular parks and related natural, cultural, or historical themes out to these schools (or school districts) on a rotating basis, perhaps once per school year.
15. Park interpretive staff should become more involved with teachers in co-evaluating the educational effectiveness of park programs attended by school groups. This would entail a joint anecdotal description of student learning based on observation of student behaviour and participation in specific activities. Obviously it would be almost impossible for park staff to be involved with evaluation on a per student basis, however, park personnel should provide written feedback to the school describing their perception of a particular park activity as an educational experience. The teacher(s) should provide similar

feedback to the park. ...What worked? What didn't work?

Should any activities be modified? Did the students exhibit any behaviour which indicated a positive learning experience? This sort of evaluation assists both teachers and park staff by providing a quick, albeit qualitative, measure of accountability.

16. Make the park, its programs, and its staff seem real and relevant in the daily lives of learners. Park programs should show that the park plays a significant role in the ecology, history, or culture of an area, and that if possible the activities or features of the park relate somehow to the lives of the people who live nearby. This could be accomplished by demonstrating that parks can be used for scientific research which is of benefit to society (e.g., salmon enhancement), or that significant cultural findings are located in the park (e.g., native totems or middens signify a cultural presence and way of life). Specific topics such as these can lead into "broader scope" issues such as fisheries management, water pollution, and native land claims and self-government. McLaren (1989) stated that teachers who organize and operate environmental or outdoor experiences need "...to see them in the context of a

larger set of district goals for environmental education." Thus, if park experiences or post-trip activities can actively get students relating to these types of issues, then the value and lifespan of the educational experience will have multiplied.

Future Research

The benefits of environmental education for students in combined school and park settings are substantial and as yet unfulfilled. Research indicates a lack of data relevant to student and teacher needs in informal education environments such as parks and museums. Not enough is known about assessment and evaluation of environmental education programs and potential changes in student attitude and behaviour. Teacher training programs in environmental education are inadequate. The reciprocal goals, needs, and desires of educators and parks or related organizations are also unclear (e.g., curriculum objectives, institutional objectives, materials, activities, programs, planning, implementation strategies). However, in spite of these limitations and concerns, the demand for park and other informal education programs is high and is likely to

increase. Educators have a wonderful natural, historic, and cultural resource awaiting them in our provincial and national parks. The *Year 2000* document (B.C. Ministry of Education, 1990) indirectly supports park education by referring to the education system's responsibility to help students become "life-long learners" and acknowledges that a systems approach to learning and living can help individuals explore the connections which we need to understand in order to determine solutions to current problems. Informal education environments such as parks are ideal places for experiencing such life-long learning. One way this can be accomplished is through environmental education programs.

Results from this study illustrate the need for further research in the field of park education in British Columbia. A number of specific areas are inadequately studied and require investigation. These are summarized below:

1. what specific park programs, resources, and services are most valued by teachers on a regional or local basis (e.g., what programs are most valued or were most effective at individual parks such as Pacific Rim National Park or Swan Lake Nature

Sanctuary; how do these findings compare with other parks in different settings or geographic areas; are there any trends associated with regional biases)? Improved awareness of differences and common trends for park programs in different regions of British Columbia will assist park managers and educators in providing more effective programs for school groups.

2. what types of resource materials/media for receiving information on park phenomena, programs, services, and educational activities are most useful to teachers (e.g., audiovisual [VHS or film], print [lesson and unit plans, student activities and worksheets], interactive computer software)? Are these most effective at specific parks or in certain regions of the province?
3. an in depth comparison of the use of park programs and resources by public and independent school teachers is needed. Due to the small sample size of independent teachers in this survey, direct comparison to public teachers was not possible. However, some noteworthy trends emerged concerning limiting factors affecting teacher use of park programs and resources. Independent school teachers took more field trips per capita and were therefore less

concerned about potential limiting factors. The reasons for this are speculative, but are likely a function of a more flexible school curriculum, smaller class sizes, and a less restrictive budget for activities such as field trips. On southern Vancouver Island five major independent schools are found in the Victoria area alone, and park use by these schools is relatively high and consistent. Comparisons of park use by public and independent teachers in this region would be valuable.

4. analysis of potential differences in the use of park programs and resources by rural and urban teachers. This area of research would help park managers and educators deal with some of the regional biases affecting school use of park programs and resources. In interior areas where distances to parks and therefore the time and cost to get there can be great, issues such as the creation of more parks, development of more resource materials on individual parks for use by teachers in the school, and provision of inservice workshops and park programs brought out to the schools, should be better understood. As well, an improved understanding of the needs of urban school users who consistently use parks within or close to large urban centres

(e.g., Swan Lake Nature Sanctuary, Goldstream Provincial Park)

may help alleviate some of the problems associated with scheduling and overbooked school programs often associated with these parks.

5. comparison of the use of park programs and resources by elementary and secondary teachers. Most generalist teachers are found at the elementary level while subject specialists tend to be found at the secondary levels. Thus, associated teacher attitudes, priorities, and limiting factors (e.g., time and cost) influencing their use of parks should be investigated.
6. effective methods for evaluating student learning in park and informal education settings are poorly developed and tested. For example, how does involvement in park programs affect student values, beliefs, and opinions regarding specific environmental issues? Substantial debate continues over the most effective methods of evaluating student learning in this area. A descriptive (and sometimes subjective) evaluation of student learning based on student participation and demonstration of specific learning outcomes (e.g., change in student attitude or belief regarding a natural resource issue) is a method of

evaluation preferred by many contemporary educators. In this context, improved methods for evaluating nature study skills (e.g., observing, recording, classifying, handling of organisms and natural habitats) acquired by students during outdoor/park experiences must be developed. Conversely, other educators prefer more traditional methods of evaluation involving comprehension testing for specific areas of knowledge, understanding, and application (e.g., knowledge of the life cycle of the Pacific salmon and understanding of related issues surrounding fisheries management). Active participation by learners in the design and evaluation of park education programs is another related concept which should be tested as part of an overall effort to improve our understanding of learning in informal education environments.

7. the validity of making comparisons and generalizations about learning in different informal settings (e.g., parks, museums, zoos, aquaria, science centres) needs to be determined. More research has been conducted on learning in museums and science centres as opposed to parks, and consequently new comparative studies are required.

8. by following a constructivist approach to learning and teaching, educators will hopefully capitalize on the resources and related experiential opportunities found in our parks. As Dewey (1938) stated, "teaching and learning are a continuous process of reconstruction of experiences." The application of constructivist learning and teaching in informal settings such as parks will require considerably more pre- and post-field trip preparation. As well, teachers must become familiar with the principles and practices associated with this model. These include knowledge and understanding of the appropriate teaching strategies (e.g., questioning, listening, discussing) necessary to get at students' prior beliefs and to challenge their conceptions/misconceptions during instruction. More research is certainly required in this area of education.

In conclusion, teachers, school administrators, and parks' staff in British Columbia have the chance to work together to achieve meaningful and hopefully enduring educational experiences in the lives of students. Further research in the field of park education can only serve to enhance this prospect.

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TEACHER NEEDS ASSESSMENT QUESTIONNAIRE**Part I - Teacher Background**

1. Are you male or female?

a) male _____

b) female _____

2. How old are you now?

a) 24 years or under _____

b) 25-34 years _____

c) 35-44 years _____

d) 45-54 years _____

e) 55 years or over _____

3. How many years have you been teaching as of September, 1991?

a) 0-2 _____

b) 3-5 _____

c) 6-10 _____

d) 11-15 _____

e) more than 15 _____

4. Do you have a major field associated with your university degree?

a) yes _____

b) no _____

5. If you answered "yes" to question #4, what is your major or area of concentration?

- a) education _____
- b) general science _____
- c) biology or ecology _____
- d) chemistry or physics _____
- e) geology _____
- f) social sciences (geography, economics, political science, history, sociology, psychology) _____
- g) mathematics or computer science _____
- h) humanities (including English, English literature, French, or other foreign language) _____
- i) fine arts (including art, drama, or music) _____
- j) practical arts (physical education, technology or business education, home economics) _____
- k) other _____

6. What grade level do you currently teach? You may select more than 1 response if applicable.

- a) K-3 _____
- b) 4-7 _____
- c) 8-10 _____
- d) 11-12 _____

7. What subject area, discipline, or strand comprises the majority of your teaching load?

- a) sciences _____
- b) social sciences _____
- c) humanities _____
- d) fine arts _____
- e) practical arts _____
- f) mathematics or computer science _____
- g) special education (i.e. learning disabled, ESL, gifted, etc.) _____
- h) general _____
- i) other _____

8. Do you teach in an urban or rural school/school district?

- a) urban _____
- b) rural _____

9. Do you teach in the public or independent school system?

- a) public _____
- b) independent _____

Part II - Environmental Education

10. Do you feel information about our natural and cultural environment, and related issues such as energy conservation and resource management, should be taught as a compulsory part of the school curriculum?

- a) yes, strongly agree _____
- b) yes, agree _____
- c) undecided _____
- d) no, disagree _____
- e) no, strongly disagree _____

11. Do you feel environmental education as described in question #10 should be taught as a separate course, or should it be integrated across the school curriculum?

- a) taught as a separate course _____
- b) integrated cross-curricularly _____
- c) should not be taught at all _____
- d) undecided _____

12. Do you feel field trips and/or exposure to informal educational environments and programs such as those offered by parks, interpretive centers, and museums, will enhance process oriented learning (i.e. self-discovery, inquiry, group interaction)?

- a) definitely yes _____
- b) somewhat _____
- c) uncertain _____
- d) definitely no _____

Part III - Parks and Education

13. Do you think park-related information and environmental education content (curriculum) have significant overlaps?
- a) definitely yes _____
 - b) somewhat _____
 - c) uncertain _____
 - d) definitely no _____
14. Have you ever taken a school group or an educational field trip to a national or provincial park in B.C.?
- a) yes _____
 - b) no _____
15. If you answered "yes" to question #14, how many times in the past 5 years have you done so?
- a) 1-3 _____
 - b) 4-7 _____
 - c) 8-10 _____
 - d) more than 10 _____
16. If you answered "no" to question #14, what was your reason? You may select more than 1 response if applicable.
- a) insufficient time in school year (i.e. too many other conflicting events) _____
 - b) insufficient funding available to cover cost of trip _____
 - c) distance to park is prohibitive (i.e. park or nature center is too far away) _____
 - d) field trips are inconsistent with the objectives of your particular course or curriculum _____
 - e) field trips are inconsistent with the objectives or policies of school or district administration _____
 - f) do not personally believe in field trips as a valid pedagogical tool _____
 - g) other _____

17. Have you ever taken school field trips or utilized park educational programs in the past, but have since stopped using park resources in this manner?
- a) yes _____
- b) no _____
18. If you answered "yes" to question #17, what was your reason? You may select more than 1 response if applicable.
- a) insufficient time in school year (i.e. too many other conflicting events) _____
- b) insufficient funding available to cover cost of trips _____
- c) distance or travel time to park(s) is now prohibitive _____
- d) field trips inconsistent with objectives of course or curriculum (i.e. now teaching within a different subject or strand) _____
- e) field trips inconsistent with objectives or policies of school or district administration _____
- f) no longer believe in field trips as a valid pedagogical tool _____
- g) dissatisfied with the resources or services provided by the park(s) during previous visit(s) _____
- h) other _____
19. What do you feel are the major limiting factors which influence whether or not you are able to visit a park or utilize park programs? Please rank the following factors in order of importance (1-most important, to 8-least important).
- _____ time (including travel time and loss of regular classroom time)
- _____ cost (including associated travel costs and substitute teaching time)
- _____ administrative support (i.e. from principal or school district)
- _____ teacher training and background knowledge (i.e. teacher may be unfamiliar with park resources or a particular theme, and therefore feels reluctant to initiate or lead a field trip)
- _____ teacher uncertainty in planning and preparing for field trips
- _____ teacher awareness of park resources, programs, and services available to schools (locally & regionally)
- _____ availability of park programs or resource personnel (i.e. lack of available bookings due to high user demand)
- _____ availability of resource materials for schools (i.e. background literature on park resources or themes, supplementary activities, lesson plans and unit plans)

20. Are you aware of the park resources, programs, and services, locally and regionally, which are available to you as an educator?

- a) yes _____
- b) no _____
- c) uncertain _____

21. If you answered "yes" to question #20, how did you become informed?

- a) direct park advertising or promotion (display, mail-out newsletter, or media communication) _____
- b) direct contact with park personnel (word of mouth or telephone conversation) _____
- c) information passed from other sources (i.e. teacher networking) _____
- d) prior knowledge (i.e. attended past programs) _____
- e) other _____

22. Do you do any classroom preparation prior to your visits to parks?

- a) yes _____
- b) no _____

23. Do you do any post-field trip activities following your visits to parks?

- a) yes _____
- b) no _____

24. If you answered "yes" to question #22 or 23, please elaborate below.

25. If you have attended a park or park program as an educator, what did you find significant about your experience? Please classify the following as: 1-very significant, 2-somewhat significant, 3-not significant.
- _____ the experience itself, including park beauty, aesthetics and locale, or specific natural, historic, or cultural phenomena such as spawning salmon, coastal tidepools, or native totems
- _____ park facilities such as visitor centers, interpretive (signed) trails, or "hand-on" exhibits
- _____ park interpretive programs including slide talks, guided walks, theatrical presentations
- _____ teacher-lead walks
26. Do you think there is a need for more park programs and services?
- a) yes _____
- b) no _____
27. If you answered "yes" to question #26, which of the following would you like to see implemented? Please rank the following in order of preference (1-most preferred, to 4-least preferred).
- _____ more educational programs provided by park staff **on site within the park**
- _____ more park programs/services **brought out to the schools** (i.e. visits by park staff)
- _____ more **resource materials available to schools** (i.e. background information on park features and resources; suggested pre- and post-field trip activities; supplementary unit plans on various themes)
- _____ more parks
28. What sorts of park experiences do you value most as an educator at the grade level you teach? Please rank the following in order of importance (1-most valued, to 5-least valued).
- _____ opportunity for self-discovery learning (i.e. exploratory, teacher-lead walks along interpretive trails or throughout the park)
- _____ guided, park staff-lead walk, tour, or activity in the park (i.e. plant walk, beach seine)
- _____ park staff-conducted audiovisual presentations (slides, movies, discussions) about the park or park phenomena (i.e. geologic formations, historic harbour/outpost)
- _____ interpretive program involving a theatrical presentation (dramatic skit) relevant to the park or park phenomena
- _____ interpretive program involving either a visual or "hands-on" exhibit (i.e. display of park artifacts)

29. What sorts of park resource materials or services would you find useful as an educator?

Please classify the following as: 1-very useful, 2-somewhat useful, 3-not useful.

- background information on particular parks or areas (i.e. natural, historic, or cultural phenomena and features; maps; plant and animal lists). Primarily for teacher use.
- program information packages of available educational services for parks in your area or region, including program content/theme, program style (i.e. slide show, naturalist walk, school visit by park staff), scheduling and booking procedures
- suggested student activities for pre- and post-visits to the park(s)
- lesson plans and unit plans relevant to specific parks, natural phenomena, or specific content themes (i.e. natural landscapes/history of Vancouver Island)
- school visits by park personnel, either prior to a park field trip, or in lieu of a park visit when this option is not feasible

30. Rank the choices listed in question #29 (abbreviated below), from 1-most preferred, to 5-least preferred.

- background information on parks ...
- program information packages ...
- suggested student activities ...
- lesson plans and unit plans ...
- school visits by park personnel ...

31. Which would you find useful as a medium for receiving information on park phenomena, resources, programs, services, and educational activities and supplements? Please classify the following as: 1-very useful, 2-somewhat useful, 3-not useful.

- print materials (i.e. lesson plans, unit plans, student activities and worksheets)
- audiovisual materials (VHS or film)
- interactive computer software (including Compact Disk and Laser Disk)

32. Rank the choices listed in Q. #31 (abbreviated below), from 1-most preferred, to 3-least preferred.

_____ print ...
 _____ audiovisual ...
 _____ computer ...

33. Do the themes, general content, and activities provided in park programs relate to areas in your course or curriculum?
 a) yes _____
 b) no _____
 c) uncertain _____
34. If applicable, which themes or content areas encountered in past park visits related especially well to your school curriculum?
35. Can you suggest any particular themes (i.e. endangered species) or content areas you would like to see implemented into park programs?
36. How should the educational effectiveness of park programs and services be evaluated?
 Please rank the following in order of importance, from 1-most important, to 4-least important.

_____ standard teacher administered "paper & pencil" evaluation subsequent to the park visit or program (i.e. theme or concept testing)
 _____ student attendance and participation in the park field trip or program, and completion of related pre- and post-program activities, worksheets, etc.
 _____ summative anecdotal description of student learning involving observational feedback and input from park staff and teachers. This may entail some assessment of student involvement in a park related experience or project (i.e. stream channel enhancement), or a subjective evaluation of student attitudinal change subsequent to the park experience (i.e. new interest and appreciation displayed for native culture).
 _____ more research is needed in order to accurately assess student learning in informal educational settings such as park and museum field trips

37. Would you be in favour of park sponsored inservice workshops designed to familiarize teachers with park features, resources, services, and programs?

a) yes _____

b) no _____

38. If you answered "yes" to question #37, please elaborate below.

39. Would you be willing to pay for park programs, school visits, resource materials, or workshops?

a) yes _____

b) no _____

40. If you answered "yes" to question #39, please elaborate below.

Additional Comments

Thank you for your time and valued input!

E. Todd Manning
Dept. of Social & Natural Sciences
Faculty of Education
University of Victoria
Victoria, B.C.
Tel: c/o 721-0201
Fax: 721-7767

Nov. 12, 1991

Dear School Administrator:

I am conducting a study designed to assess the needs of teachers relative to the effective use of national and provincial park resources and programs within the school curriculum. The data obtained will be analyzed using standard regression/correlation statistics (SPSS), and will ultimately be used to enhance utilization of park programs by school groups in British Columbia.

I would like to survey **25 teachers** within your school district using the attached questionnaire. A random sample of teachers from K-12, across all subject strands, would be most desirable. Thus, contingent upon your approval, the questionnaires and accompanying introductory letters (to follow) are to be randomly distributed amongst your teaching staff. Your assistance in distributing the questionnaires in this fashion would be greatly appreciated (i.e. 5 questionnaires to each of 5 schools via District or inter-campus mail).

Completion of the questionnaire is entirely voluntary, and participant confidentiality is ensured by the nature and intent of the questions themselves. Stamped, self-addressed envelopes will be provided to facilitate return of questionnaires.

If you have any concerns or questions regarding the intent/methodology of my research, please do not hesitate to contact me.

Could you also please supply me with written/Faxed approval of my questionnaire and subsequent consent to conduct this study within your school district as soon as possible.

Thank you for your time and valued assistance!

Yours sincerely,


E. Todd Manning

cc Dr. G. Snively

E. Todd Manning
Dept. of Social & Natural Sciences
Faculty of Education
University of Victoria
Victoria, B.C.
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Fax: 721-7767

Nov. 12, 1991


Dear Teacher:

I am conducting a study designed to assess the needs of teachers relative to the effective use of national and provincial park resources and programs within the school curriculum. The data obtained will be analyzed using standard regression/correlation statistics (SPSS), and will ultimately be used to **enhance utilization of park programs by school groups in British Columbia.**

Preliminary feedback from a small sample of teachers indicated a questionnaire completion time of about **15-20 minutes**. Your assistance in completing the attached questionnaire is greatly appreciated, though entirely voluntary. Participant confidentiality is ensured by the nature and intent of the questions themselves.

Please return the questionnaire **by December 13** in the stamped, self-addressed envelope provided.

With thanks,



E. Todd Manning

Park Interpretive Program Managers Questionnaire
February 1992

1. How are schools in your district/region informed of park programs and services?

2. Are you able to meet the demand for programs, services, and facilities by school groups in your district parks?

3. In general, which **2 park programs or activities** within your park(s) have been most successful for school groups in terms of audience receptivity, adaptability, educational effectivity, and longevity (able to employ program for more than 1 season)?

4. Based upon your experience, what are the major limiting factors which influence whether or not school groups are able to visit your park(s) or utilize park programs and resources?

5. Based upon your experience, what park experiences do you feel teachers/educators value most? Please rank the following in order of importance (1-most valued, to 6-least valued).
 - _____ opportunity for self-discovery learning (i.e. exploratory, teacher-lead walks along interpretive trails or throughout the park)
 - _____ guided, park staff-lead walk, tour, or activity in the park (i.e. plant walk, beach seine)
 - _____ park staff-conducted audiovisual presentations (slides, movies, discussions) about the park or park phenomena (i.e. geologic formations, historic harbour/outpost)
 - _____ interpretive program involving a theatrical presentation (dramatic skit) relevant to the park or park phenomena
 - _____ interpretive program involving either a visual or "hands-on" exhibit (i.e. display of park artifacts)
 - _____ other (describe below)

VITA

Surname: Manning
Given names: Eric Todd
Place of birth: Edmonton, Alberta
Date of birth: 13 December 1956

Educational Institutions Attended:

| | |
|------------------------|-------------|
| University of Calgary | 1974 - 1979 |
| University of Calgary | 1983 - 1986 |
| University of Victoria | 1989 - 1993 |

Degrees Awarded:

| | |
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| BSc. (Environmental Biology) | University of Calgary, 1979 |
| BEd. (Secondary Education) | University of Calgary, 1986 |

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Title of Thesis: An assessment of teacher needs for the utilization of park programs and resources within the British Columbia school curriculum.

Author


(Signature)

ERIC TODD MANNING
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September 21, 1993
(Date)