Ontario's Rice Lake Plains Tallgrass Prairie Restoration Site: Curriculum Field Trip Kit for Grade Seven and Nine

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Abstract

The Tallgrass Prairie Restoration Site is run by the Kenny Family in Bailieboro Ontario, located approximately twenty minutes outside of Peterborough. The site began in 1995, with the goal of restoring Tallgrass prairie to the area, and now is a twenty-acre portion of the Kenny Family farm. They contacted the Trent Centre for Community Based Education (TCCBE) in hopes of organizing educational opportunities on the prairie site with local elementary and secondary schools within the Kawartha Pine Ridge District School Board.

A feasibility study was conducted by interviewing eight teachers from the Kawartha Pine Ridge District School Board. Four interviews were conducted at the elementary level and four at the secondary level. These interviews had the purpose of uncovering the teachers attitudes towards field trips and the feasibility of a field trip to the Tallgrass Prairie Restoration Site. They also aided in uncovering ideas to include in the creation of a curriculum kit which could be used in conjunction with a field trip to this site. The curriculum kit would link the Ministry of Education curriculum to the activities at the site.

The results from these interviews stated that a field trip to this site would be feasible. However, strong connections to the curriculum would have to be present within the curriculum kit. Budget, trust and liability were additional issues which were touched upon throughout the interviews. As long as these stipulations were met, the feasibility of a field trip, using a suitable curriculum kit, would be possible.

Overall Introduction

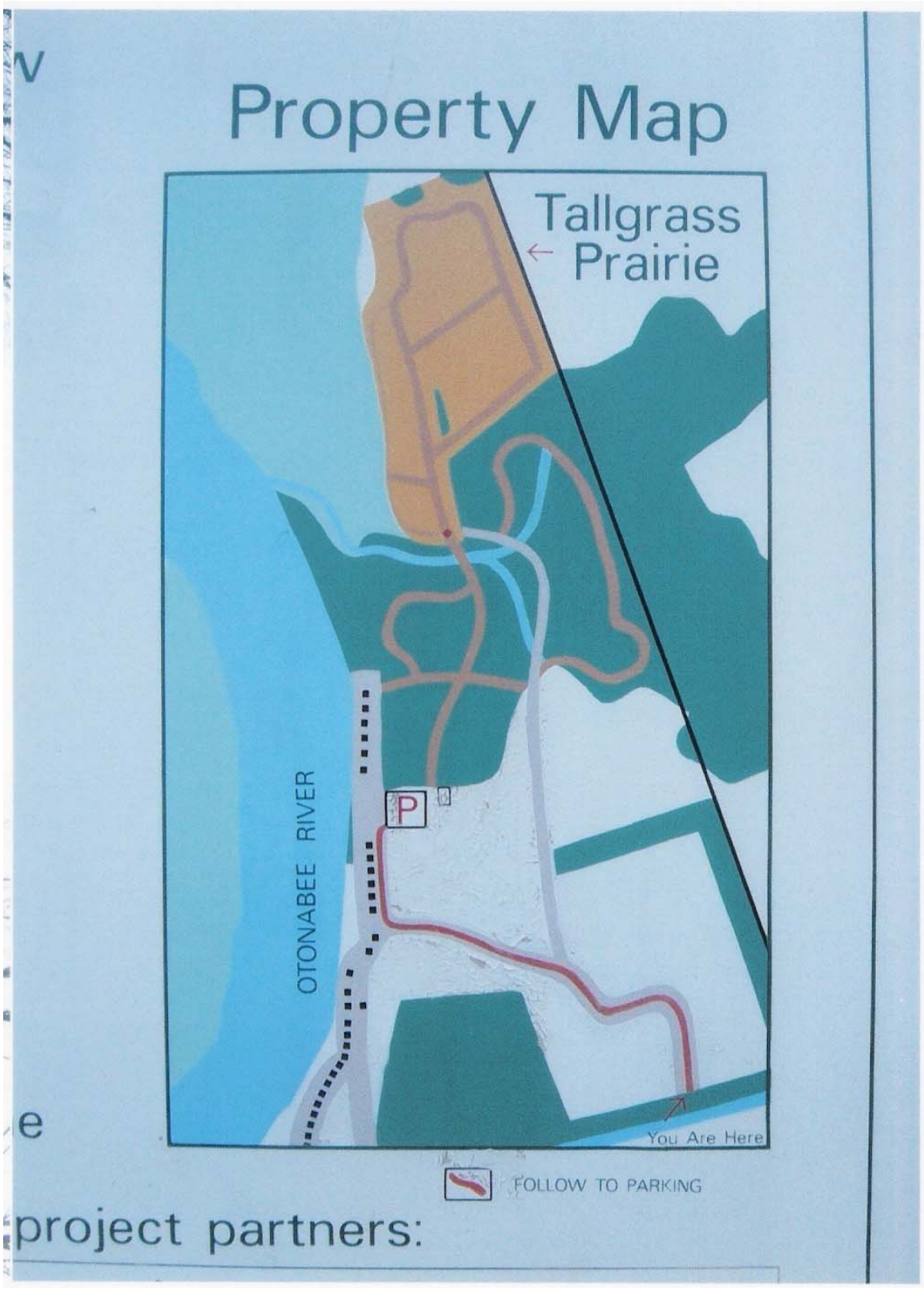
The Central Ontario Rice Lake Plains Restoration Site began in 1995, with the goal of restoring tallgrass prairie to the Peterborough area. The Tallgrass Prairie Restoration Site is now established on a 20-acre portion of the Kenny Family farm on the Otonabee River delta at Rice Lake. The restoration site offers public access to a significantly endangered habitat, as less than one one-thousandth of a percent of the original prairie expanse, exists in Ontario. Considering the rarity of this site, the hosts wished to promote public access and contacted the Trent Centre for Community Based Education in hopes of achieving this goal through the school board. Figure 1 shows the area and expanse of the Kenny Family farm including the Tallgrass Prairie Restoration Site.

The purpose of this study was to uncover the educational opportunities on the Tallgrass Prairie Restoration Site and to develop curriculum kits for educational audiences. These curriculum kits have been created in order to facilitate educational lessons both in a classroom and at the Tallgrass Prairie Restoration Site. More specifically, the study was interested in exploring the answers to three main research questions. The first question addressed the feasibility of teachers showing interest in a field trip to the Tallgrass Prairie Restoration Site. The second question explored how the Tallgrass Prairie Restoration Site can be integrated into the curriculum. The final question investigated what teachers would expect to be included in a curriculum kit for a field trip to this site. This research project focused on the elementary and secondary levels of the Kawartha Pine Ridge District School Board. As a result of differences in curriculum expectations, these levels were investigated and analyzed separately.

Therefore, an elementary and a secondary section can be found within this report. Figure 2, shows the boundaries of the Kawartha Pine Ridge District School Board.

In the elementary stream, the feasibility study focused on the seventh grade. This rationale was based on the strong links between the grade seven curriculum and the Tallgrass Prairie Restoration Site. In the secondary stream, the grade nine geography curriculum was chosen as the base of the feasibility study as well as the curriculum kit. Both grade nine academic and applied geography, had numerous curriculum links to the Tallgrass Prairie Restoration Site which could be examined further.

An open-ended interview protocol was decided to be used as the primary method of research for the feasibility study for the elementary and secondary levels. The interview questions were designed to explore the three research questions identified above. These interviews were conducted with elementary and high school teachers from the Kawartha Pine Ridge District School Board. Each section of this report will include a brief introduction, methodology, overview of interview results and findings as well as a discussion, concluding comments and reflections.



(Map provided by Heather and Tony Kenny)

Figure 1: Map of the Tallgrass Prairie Restoration Site Property.

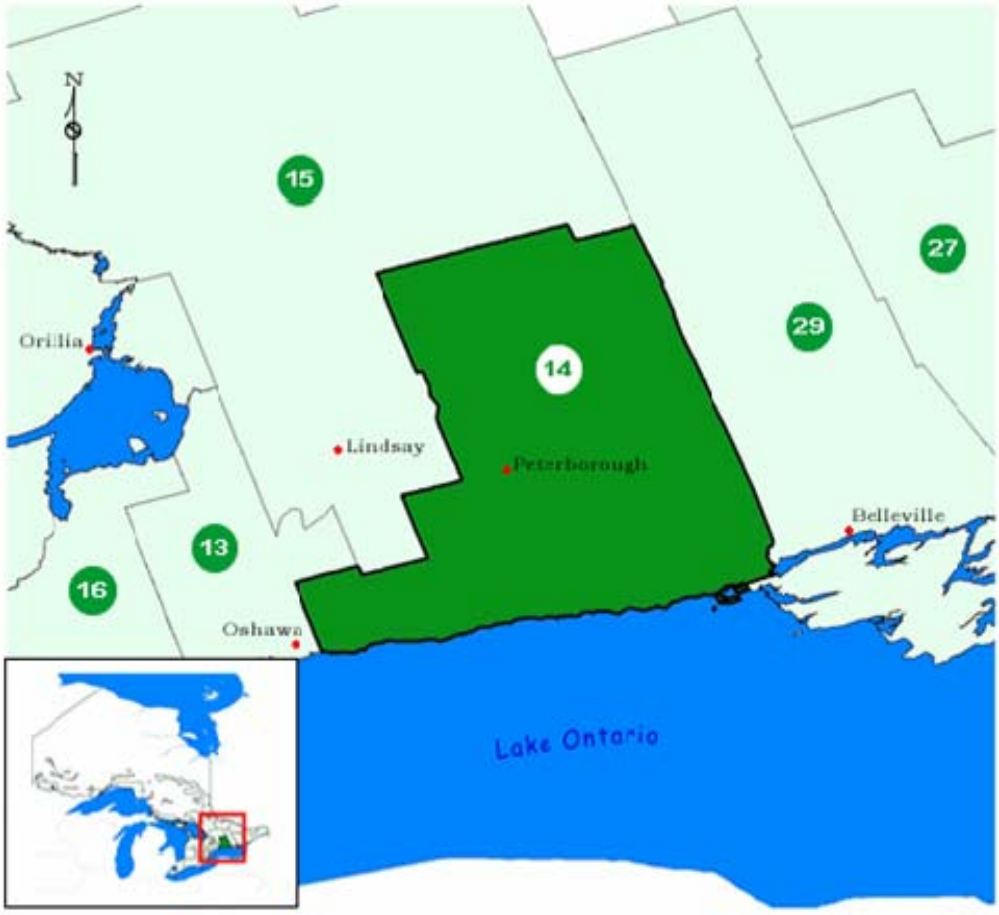


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Figure 2: Map of the Kawartha Pine Ridge District School Board Boundaries.

Introduction

What is a tallgrass prairie ecosystem? Where does it exist in Canada? How can a tallgrass prairie restoration site be used to educate school children? This literature review will address these questions in four main sections. The first section will explain the history of the tallgrass prairie, and the various conditions essential for the growth of this ecosystem. The second section will explain the general importance of outdoor education and discuss how it can be useful for educational purposes. The next section identifies the importance of field trips and the controversies that surround them. The last section focuses on curriculum kits: what they are; how they are useful to teachers; and how a tallgrass prairie restoration site can be incorporated into classroom learning by directly addressing Ontario Ministry of Education curriculum documents. The conclusion will address links among all of the previous sections.

The History of Tallgrass Prairie

There are three main types of prairie that exist in North America: tallgrass, mixed and short-grass prairies (Alderville First Nation, 2003). All three prairies are considered grasslands and are dependent on specific amounts of rainfall and soil composition (Alderville First Nation, 2003). The tallgrass prairies of North America are among the most biologically diverse grasslands in the world (Price et al., 2002). They are also some of the most endangered ecological communities in Canada (Rodger, 1998). In Ontario, these are communities that the Natural Heritage Information Centre (NHIC) classifies as areas with less than ten percent tree cover (Rodger, 1998).

Historically, tallgrass prairies comprised one million square kilometers of land in central Canada and the United States (Alderville First Nation, 2003). Today less than one

tenth of one percent of this once abundant tallgrass prairie exists (Alderville First Nation, 2003). Over the past 200 years the majority of prairie habitat has been converted to agricultural land or urban development (Rural Lambton Stewardship Network, 2006). Given the specific growing conditions of tallgrass prairies, it is essential to protect those areas which do exist. In Canada, the main area of tallgrass prairie is located in the Red River Valley of Manitoba and is 6,000 square kilometers (Environment Canada, 2004). In addition to this area, there are 1,200 square kilometers located in an area of sandy soils in Southern Ontario (Environment Canada, 2004).

Tallgrass prairies are among the most productive vegetation types in the world. The growth range of certain species is limited to specific areas and depends on local topography, soil quality and drainage as well as wind exposure and amount of moisture received (Mutel & Packard, 1997). Due to these various conditions for growth, there is an incredibly diverse variety of plants found in tallgrass communities of Southern Ontario (Rodger, 1998). Tallgrass prairie in Ontario is made up of native grasses called warm season grasses, which actively grow during the warm and dry months (Rural Lambton Stewardship Network, unknown). Species that thrive in these conditions are native plants such as Switchgrass (*Panicum virgatum*), Big Bluestem (*Andropogon gerardii*) and Indian Grass (*Sorghastrum nutans*), which have the ability to grow taller than two meters in height (Rodger, 1998). Wildflowers (forbs) also thrive alongside these grasses. They range in size from tiny yellow star grass (*Hypoxis hirsute*) to the giant sunflower (*Helianthus giganteus*), which reaches three meters high (Rodger, 1998).

The soils of a tallgrass prairie community are very important to their growth. Tallgrass prairies generally grow on deep soils with a topsoil depth greater than twenty-

five centimeters (Rodger, 1998). Certain sites are composed of deep silt loam soils which are dominated by the native species of Big Bluestem and Indian Grass (Mutel & Packard, 1997). These grasses produce a strong, stiff, multiple stemmed structure with a deep root system of up to two and a half meters deep (Rural Lambton Stewardship Network, unknown). The deep roots of this structure provide the grasses with a buffer strip that traps sediment and contaminant runoff while providing excellent erosion control with lengthy roots (Rural Lambton Stewardship Network, unknown). Unfortunately, these rich soils appealed to farmers in the past, which resulted in the almost complete conversion of tallgrass prairie into agricultural lands, leaving only a small number of natural tallgrass prairie areas in Canada (Mutel & Packard, 1997).

Climate plays an essential role in the growth of different varieties of grasses. As the climate becomes cool and more humid, the invasion of tree growth into tallgrass communities becomes a more prevalent issue. This is due to increased shade, as tallgrass communities require a warm climate (Rodger, 1998). Remnants of some tallgrass prairie communities can be found in specific areas in Southern Ontario which experience warmer than average microclimates, for example, areas with a south-facing slope or sandy sites near lakes and rivers (Rodger, 1998). Tallgrass prairies flourish in drought and fire-prone areas that have been maintained historically by Indigenous Peoples' use of fire (Rodger, 1998).

Fire is essential to the growth of tallgrass prairie communities. Historically, lightning was known to ignite prairie fires, but these essential fires were predominantly set by Indigenous People's for several reasons, including trapping animals (Rodger, 1998). Fire eliminates dead grasses and accumulated leaf litter that slowly decays on the

ground (Roger, 1998). Without fires, this ground matter would eventually prevent the growth and renewal of prairie species after a few years (Alderville First Nation, 2003). Fire also changes the composition of nitrogen in the soil and the black ash left on the surface attracts warmth from the sun, heating the soil, promoting the growth of new tallgrass species. This is commonly termed a fire cycle (Alderville First Nation, 2003).

These various conditions for growth have created an ecologically diverse ecosystem of plant life, tallgrasses as well as many wildflowers, which provide food and shelter for a wide variety of wildlife (Rodger, 1998). Invertebrates such as butterflies, grasshoppers, dragonflies, ants, beetles and spiders are found in great abundance in tallgrass prairies (Rural Lambton Stewardship Network, 2006). Small mammals such as meadow jumping mice, meadow voles and short-tailed shrews are accompanied by larger mammals including coyote, deer and American badger (Rodger, 1998). There are also a number of birds such as bobolink, Eastern meadowlark, Northern bobwhite and the savannah sparrow that thrive in the tall cover created by tallgrass prairies (Rural Lambton Stewardship Network, 2006). Amphibians such as frogs, snakes and turtles can also be found in tallgrass communities depending on their proximity to lakes or rivers (Rodger, 1998). All of these species interact and are dependent upon one another as well as their environment to create a successful ecosystem.

Today a 4410 hectare preservation site is located in Kansas, U.S., called the Tallgrass Prairie National Preserve (Christopherson, 2003). This site was created to protect what is left of the endangered tallgrass ecosystem in the United States. Restoration sites are areas that have been restored to their natural historic condition, in order to preserve the heritage of the area as well as the diversity located in rare

ecosystems. These preservation areas and restoration sites have been developed in Canada and the United States to protect what is left of this endangered ecosystem. These restoration sites are difficult to develop due to the specific conditions of growth that tallgrass species are accustomed to. Throughout history, fire was essential to ensure the renewal of the tallgrass prairie and is still crucial in restoration sites. Today fire is now managed through a controlled prairie burn conducted by professionals, mimicking a natural fire cycle.

The tallgrass prairie is among the most biologically diverse ecosystems in the world as well as one of the most endangered ecological communities in Canada. This ecosystem has great potential to enhance and improve the educational opportunities of elementary and secondary students. It can provide students with a glimpse into the tallgrass bioregion and the geographical history of the tallgrass prairie, which directly relates to Ontario Ministry of Education curriculum requirements. The tallgrass prairie community is an excellent outdoor education opportunity for school groups to explore, with an emphasis on hands-on learning.

Outdoor Education: An Alternative Teaching Device

Teaching inside the classroom is the most common method of educational instruction. Teachers do not often venture into outdoor environments with their students in today's education system (Fjortoft, 2001) However, stepping outside the classroom can allow an experience beyond what many students consider "traditional school" (Foran, 2005). Bringing concepts and ideas of the world into the classroom can be a difficult task; a more beneficial approach would be to take the children out into the world (Hammerman

et al., 1968). This section will focus on defining outdoor education and emphasizing its importance within schools, as an alternative way of learning new theories and ideas (Foran, 2005).

Outdoor education can be defined as the use of the outdoors to facilitate and enrich learning, in relation to school curriculums and involves extending classroom learning to the outdoor environment (Hammerman et al., 1968). The outdoor classroom offers opportunities in visualizing and identifying current problems involving humans and their environment. These opportunities enable students to connect with the outside environment (Carlson et al., 1963).

According to L.B Sharp's thesis relating to outdoor education, "what can be best learned inside the classroom should be learned there; and that which can be best learned through direct experience outside the classroom should be learned there" (Donaldson et al., 1972, p. 121). While in the outdoor environment, teachers learn with their students in a less formal atmosphere. Learning in the outdoors provides a naturally less stressful and unrestricted learning environment (Donaldson et al., 1972). This type of learning usually involves students working in teams, while also furthering their individual knowledge through hands-on education (Donaldson et al., 1972).

Outdoor education is increasingly important in facilitating learning because students are growing up in a different world than their parents (Rivkin, 1998). Children are living in a society that is highly industrialized and increasingly urbanized (Donaldson et al., 1972). Outdoor education is one way urban children can be provided with a conception of rural environments and how they should be protected and sustained. These

excursions should take place during school hours and relate to specific areas of the curriculum (Donaldson et al., 1972).

According to Fjortoft (2001), the opportunities to venture outdoors have disappeared. Children are no longer spending hours outside playing, exploring, or discovering new and exciting events, most of their time is spent indoors (Fjortoft, 2001). Outdoor activity is being replaced with sitting in front of a computer, watching television or playing video games (Fjortoft, 2001). However, outdoor education offers direct experiences which lead to a greater appreciation and a wiser use of the natural environment for the purposes of education (Carlson et al., 1963). Additionally, outdoor education can help reduce the problems the future will face in regards to the environment (Davis, 1998). Through outdoor education programs the schools can prepare students to use their recreational resources intelligently (Davis, 1998). Students can learn to value wildlife, plants, soil and water in order to develop a sense of conservation at an earlier age (Donaldson et al., 1972). Furthermore, outdoor education is needed to provide children with the necessary attitudes, values and knowledge to change current patterns and to secure healthy and sustainable future (Davis, 1998).

Outdoor education is important to the educational system because the outside environment provides the ability for students to see educational lessons in actual context (Donaldson et al., 1972). Also, outdoor education increases students' curiosity and many crave to learn more (Foran, 2005). The students become less afraid of questioning the unknown (Foran, 2005). The learners can observe, search, study, and compare, try and test theories of others and their own (Fjortoft, 2001). While at the same time they can acquire skills and an appreciation for the environment that contribute to their personal

happiness and satisfaction. This is the foundation of outdoor education (Carlson et al., 1963).

Incorporating outdoor education into the curriculum can be quite difficult to put into practice (Simmons, 1998). When the school assumes the responsibility for an outdoor education program, it also assumes the responsibility of relating it to the objectives of educational curriculum (Donaldson et al., 1972). The implementation of an outdoor program involves the intelligent planning by teachers using nature and real life experiences to interpret subject matter found in the school curriculum (Hammerman et al., 1968). In outdoor education, program planning needs to be flexible. A unique aspect of outdoor education is the learning is guided by the event as it happens or through the actual experiences of the students (Kuru et al., 2000). Additionally, the information is not conveniently categorized to any one subject matter as it is in the classroom; the extent of the exploration is limited only by the circumstances (Hammerman et al., 1968). The possibilities for the students and the teachers are limitless and learning becomes fun and interesting, but more importantly voluntary instead of mandatory (Kuru et al., 2000).

Though indoor classrooms are the leading practice of teaching, learning can be better understood through the less ‘traditional styles’ of teaching outdoors through educational programs (Foran, 2005). Traditional styles include, teacher centered discussions and lessons with no active involvement from the students (Anderson et al., 2000). However, some ideas are learned better through hands-on experience, and many of the objectives of education can be obtained through the skillful use of the natural environment (Carlson et al., 1963). Outdoor education allows students to think about the subject matter through experiences as they interact with the teacher and other students

(Anderson et al., 2000). When presented with the idea of outdoor education most people are interested, it is believed to be fun, simple, and the experiences and knowledge that are gained from the education are unforgettable (Hammerman et al., 1968). However, the progress of outdoor education has been slow due to some of the cost and liability issues (Toronto Star, 2006). The next section will introduce some of the potential problems outdoor education faces regarding field trips.

Field trips: Facts and Controversies

A common method to integrate outdoor excursions into the school curriculum is through the use of field trips. Field trips are defined as "a trip taken by students to a museum, factory, geological area, or environment of certain plants and animals, with the purpose of gaining firsthand knowledge outside of the classroom" (dictionary.com, 2006). Often, field trips are very rewarding and beneficial to student's learning experiences and aid in providing teachers with effective instructional material. In fact Kisiel (2006) asserts that for a field trip to be an effective teaching strategy, it must be relevant to what is being taught in the classroom and well structured.

Several studies have shown the benefits of field trip participation. In a study of one hundred and twenty-eight individuals, forty-six of which were adults, conducted by Falk and Dierking (1997), ninety-six percent could recall a field trip taken between the first and third grade. One hundred percent of the subjects remembered one or more things learned on the trip and could relate it to the associated subject matter. Furthermore, seventy-nine percent of all participants remembered who went on the trip with them. This

study revealed that field trips create both social and educational memories amongst those who participate.

Pace and Tesi (2004) replicated these results when they conducted a study to investigate the long term impacts of field trip experiences. Four men and four women were interviewed about their experiences of field trips between kindergarten and the twelfth grade. Researchers found that field trips that included hands-on activities had a positive impact on the students' ability to recall information that was learned on the educational excursion. Social benefits were also common among participant's field trip experiences. Ultimately, researchers concluded that field trips are both educationally and socially beneficial for the participants.

Other studies have shown that relevant and well organized field trips increase participant's information retention. In a study conducted by Hurd (1997), those who participated in a well organized field trip performed better on a test of knowledge related to the field trip, than those who attended a poorly organized field trip. Although the benefits of field trips have been well documented, there are people who disagree with their use.

There is controversy as to whether or not it is appropriate to have field trips within the school curriculum. Critics of field trips believe they are unnecessary because the liability increases when students are taken off school property. This argument is based on extensive documention of legal cases that have arisen due to liability issues with field trips. According to the Journal of Law and Education (2004), in the case of Marcello versus the New York Board of Education, a student drowned on a school field trip. The parents of the child sued the school board for negligence and damages, won their case

and were awarded three million dollars. Additionally, in October of 2006, a civil rights lawsuit was filed by a group of parents against the Camden School District for field trip fees that were charged to parents even though they were already financed by the board. Although, no verdict has been reached, the school board is under severe scrutinty and field trips have ceased (Philidelphia Inquirer, 2006).

As a result of these implications, several school boards have discouraged the use field trips as part of the curriculum. In fact, there have been several measures taken to ensure that the frequency of field trips decreases; one such measure is budget cuts. In 2003, the Toronto District School Board closed three of its eight outdoor education centres and cut the amount of time grade six and seven students spend in the remaining facilities from five days to two and a half (Toronto Star, 2006). Presently, the Toronto Distrcit School Board is looking at cutting remaining field trip funding to save 2.3 million dollars and use it instead towards an eighty-four million dollar deficit reduction plan (Toronto Star, 2006). Ultimately, without the necessary monetary resources, field trips will cease to exist.

In addition to controversy concerning field trips within administrations, there is also reluctance amongst teachers to plan and implement field trips or excursions outside of the classroom.This contoversy stems from several documented cases that have occurred in various school boards across North America. On April 10th, 2006 Education Week, a well published education magazine, featured a twenty-eight year veteran teacher who was placed on administrative leave as a result of a field trip liability issues (Education Week, 2006). In this case, the teacher eventually lost their job due to a

parental complaint related to a nude sculpture during a field trip to the Dallas Museum of Art (Education Week, 2006).

A similar case was documented in Great Britian in March of 2006. A primary school teacher organized a trip to a Jacobean mansion in Birmingham, United Kingdom but failed to count the number of children during the trip (Times Educational Supplement, 2006). Upon returning to the school, she discovered that she had left two children behind (Times Educational Supplement, 2006). As a result, the General Teaching Council found her guilty of unacceptable professional behavior and her job was terminated (Times Educational Supplement, 2006). In each of these cases, the teachers involved blamed their errors on the unrealistic level of responsibility placed upon them when outside of the classroom. Unfortunately, several teachers believe the possible tribulations and consequences of field trips are not worth the risk (Education Week, 2006).

Budget cuts and the reluctance of school boards and teachers to actively engage in school field trips have initiated the use of visual lessons. In his article, Barak (2005) provides information on the virtual field trips that are offered by the non-profit organization, Center for Interactive Learning and Collaboration. According to Barak (2005), they offer virtual excursions to a variety of places including NASA and the Baseball Hall of Fame. Additionally, all virtual field trips are interactive. Barak (2005) asserts that this is a viable option to field trips. Yet, this option is not more cost efficient because an average virtual field trip costs approximately 100 dollars (Barak, 2005).

Others have further critiques of the virtual field trip. Gillespie and Kalinowski (2006) discuss how education based only on in class lessons continuously disconnects

students from the actual world. A group of York Region students in Ontario were asked to talk about what they expected to see during a trip to an outdoor education centre on Lake Simcoe (Gillespie & Kalinowski, 2006). Journalists were shocked to hear that the majority of the group expected to see large whales in Lake Simcoe (Gillespie & Kalinowski, 2006). According to the authors, no amount of visual learning within the classroom will be enough to counteract an education system that has abandoned outdoor education and field trip excursions (Gillespie & Kalinowski, 2006).

Although teachers may report that a primary reason for including field trip experiences is to support what they are teaching in class, the link to the curriculum may actually be quite weak (Kiseal, 2005). Additionally, control and liability issues may discourage their use. However, there may be a solution to this problem. According to Kiseal (2006), blending a field trip directly into the classroom curriculum is the best way to create a more meaningful experience for students. Kiseal (2006) also asserts that field trips run smoothly if there is a well structured plan in place. Ultimately, the reduction of field trip related dilemmas can be accomplished by the use of a curriculum kit.

The Curriculum Kit and the Link to the Ontario Curriculum

A curriculum kit is a composition of documents that specify what is involved in a teaching activity and how to implement it. These kits include information on the regulations of field trips, and field trip forms, including parental permission slips for students and possible chaperone request forms. In particular, curriculum kits specify how a field trip can be incorporated into the classroom by directly relating to curriculum documents. Curriculum kits that include information on how the field trip will aid in

meeting the overall expectations of a certain grade's subject requirements are valuable. Lessons plans, pre-site activities, on-site activities and post-site activities are very important elements of a curriculum kit and are attractive to teachers because they make the option of a field trip very accessible and useful.

Before teachers plan a field trip it is important that they think about how the field trip will relate to a subject area or unit they are covering in the classroom (Kisiel, 2006a). Teachers must decide what the purpose of the field trip is going to be (Frederick & Childers, 2004). It is important that a curriculum kit clearly and critically outlines how the field trip can be incorporated into classroom learning (Kisiel, 2006a). Approval of the field trip by administration can sometimes even depend on this factor (Kisiel, 2006a).

By taking the time to integrate field trips into course curriculum they become essential parts of the learning process instead an auxiliary alternative (Kisiel, 2006a). Teachers need to consider what will be encountered on the field trip because it is important that a field trip illustrates significant concepts and allows students to see real life examples, which they can later discuss and build upon in the classroom (Kisiel, 2006b).

Once a connection between classroom learning and a curriculum kit has been made the teacher should research the field trip site ahead of time. This can include visiting the site or checking a website, if available so that they are aware of what is offered and how to use it effectively. This can increase the level of comfort that the teacher has with the field trip, which will in turn increase the comfort level of their students (Kisiel, 2006a). Teachers should do a "dry run", which will alert them of any possible problems that may put a damper on the trip (Frederick & Childers, 2004). This

can also provide teachers with details and observations that can be shared with the students prior to the trip (Frederick & Childers, 2004).

Teachers do not generally prepare students for a field trip to an informal environment. However, research shows that the amount of preparation students receive for a field trip can significantly impact their learning (Cox-Petersen & Melber, 2001; Kisiel, 2006a). A major factor in improving student's learning on field trips is reducing the novelty of the physical setting. Teachers need to provide their students with information about what they will see at the site before they arrive. This needs to be done to avoid "cognitive overload", which can interfere with other observations or activities that students are learning about (Kisiel, 2006a). Teachers should let students know the reasons for the trip, what they can expect to discover at the site and how the planned trip relates to the information they will or have been discussing in class (Frederick & Childers, 2004).

One month before the trip is to occur it is suggested that teachers gather parent volunteers and send home permission slips and equipment lists to parents (Frederick & Childers, 2004). Chaperones can help with control and liability issues, which often discourage teachers from incorporating field trips into the learning process. The preparation of chaperones for a field trip is just as important as preparing the students. Chaperones need to be well informed of the activity and their role before arriving to the field trip location in order to avoid loss of precious field trip time (Kisiel, 2006a). The final day before the trip, the teacher should discuss safety procedures and review equipment needed (Frederick & Childers, 2004).

In regards to liability issues, what happens on a field trip is the responsibility of the teacher (Kisiel, 2006a). Teachers need to make sure that the experience is structured in a way that makes the greatest connection to class curriculum. Teacher should make sure that the activities included in the field trip are best suited to the setting and are almost impossible to recreate in the classroom (Kisiel, 2006a). Activities that students can observe and interact with first hand as well as record observations and develop inferences about should be a priority in a field trip (Kisiel, 2006a). Worksheets are great aids in helping to facilitate thinking or record observations; they should follow themes and not cover the whole site (Kisiel, 2006a). Before leaving the site at the end of a field trip it is beneficial to have a ten minute summary session to go over important points of interest and what students have learned (Frederick & Childers, 2004). Students need a "debriefing" session in which important points are discussed, misconceptions are cleared up, new questions are explored, and relationships are drawn between specific features and background knowledge learned from class lessons (Frederick & Childers, 2004).

Follow up and post-site activities are an area of field trips that many teacher find difficult (Kisiel 2006a). Research on field trip learning suggests that the follow-up is a critical part of the experience because it helps to solidify some of the inferences and ideas students have developed during the trip (Kisiel, 2006a). Studies of how people learn in museum settings suggests that reinforcing the experience afterwards, through classroom activities, books or television can help students remember the new concepts and ideas that emerged on the field trip (Kisiel, 2006b). Using information technology to extend learning once students get back to the classroom is a beneficial learning tool that should be taken advantage of by teachers (Cox-Petersen & Melber, 2001). When teachers make

connections to field trips through follow up activities, they increase student's learning opportunities and further their understanding on the subject.

Teachers should provide students with an opportunity to share their perceptions of the excursion, review the purpose of the trip and discuss if it was met (Frederick and Childers, 2004). If a field trip has been effectively incorporated into the curriculum, the follow-up will simply be the next lesson that builds on the experience (Kisiel, 2006a). It is important that strong connections between the curriculum and the field trip are made so that students not only remember what they did, but why they did it (Kisiel, 2006a). Field trips should be considered more than a single event because it can be used as part of an instructional unit, as a launch activity before a unit begins, a way to reinforce concepts in the middle of a unit, or a culminating activity after the unit is completed (Cox-Petersen & Melber, 2001).

Conclusion

Overall, a tallgrass prairie curriculum kit would cover selected areas of Ontario Ministry of Education Curriculum. Such a field trip could be incorporated into grades seven science and grade nine academic geography of Canada (Ministry of Education and Training, 1998; Ministry of Ontario, 2005). This could also be adapted to include grade nine applied geography of Canada as well (Ministry of Education and Training, 1998; Ministry of Ontario, 2005).

In grade seven science, students study 'Interactions Within Ecosystems', which is an introduction to the study of ecology (Ministry of Education and Training, 1998). It also involves the investigation of complex interactions between all types of organisms

and their environments (Ministry of Education and Training, 1998). A field trip to a tallgrass prairie site would be beneficial to this unit because students would learn about a specific type of ecosystem in Ontario and how it consists of communities of plants and animals that are dependent on each other, as well as on the non-living parts of the environment (Ministry of Education and Training, 1998). Students will also be able to investigate interactions that occur within an ecosystem, such as the tallgrass prairies and identify factors that affect the balance among the components of the ecosystem, for example, forest fires (Ministry of Education and Training, 1998). The last expectation that a field trip to a tallgrass prairie site would meet for the grade seven science curriculum, is that students will gain an understanding of the effects that human activities and technological innovations have on an ecosystem (Ministry of Education and Training, 1998). They will also learn about the effects of the changes that take place naturally in regards to the sustainability of an ecosystems (Ministry of Education and Training, 1998).

A tallgrass prairie field trip would relate to the curriculum of grade nine academic geography of Canada through two units. A tallgrass prairie restoration site would relate directly to the curriculum expectations of the unit 'Geographic Foundations: Space and Systems' because it would help students to understand the regional diversity of Canada's natural and human systems, emphasizing Canada's ecosystems (Ministry of Education, 2005). This type of field trip would also meet a another expectation of the grade nine 'Space and Systems' unit by allowing students to analyze local and regional factors, such as agriculture and climate change, that affect Canada's natural systems (Ministry of Education, 2005).

The second unit of grade nine academic geography that a field trip to a tallgrass prairie restoration site would be useful is 'Human-Environment Interactions' (Ministry of Education, 2005). A tallgrass prairie restoration site would directly relate to the curriculum expectations of this unit by allowing students to analyze the ways in which natural and human systems interact (Ministry of Education, 2005). Another expectation of this unit is that students be able to make predictions about the outcomes of these interactions (Ministry of Education, 2005). A tallgrass prairie restoration site is an excellent example of human interactions with the environment, that have caused devastating effects on an ecosystem. A tallgrass prairie restoration site is an attempt at ecologically restoring precious tallgrass prairie land, which also directly links to the grade nine curriculum expectation that geography students evaluate various ways of ensuring resource sustainability in Canada (Ministry of Education, 2005).

This review has aimed to set the stage and to give a sense of how the Ontario Curriculum can be related to a specific ecosystem in Ontario, the tallgrass prairies. It has been clearly identified in the literature that outdoor education and field trips are beneficial education tools that teachers should use to engage their students in learning. However, it has also been identified that there are controversies, risks and limitations associated with field trips. This research project aims to reduce those risks by the creation of an effective and structured curriculum kit. Ideally, this curriculum kit would be available at various locations such as local libraries, school boards as well as online.

1. Introduction

It was the purpose of the elementary section to obtain elementary school teachers' thoughts and feelings on the feasibility of field trips as well as the usefulness of field trip based curriculum kits. Further, a goal was to obtain opinions concerning the appropriate composition of a curriculum kit to ensure its efficacy. Based on the responses of four elementary school teachers, a curriculum kit suitable for a grade seven school field trip was developed.

2. Methodology

The principal method for this project was the use of a semi-structured interview protocol, which was delivered to four intermediate teachers in the Kawartha Pine Ridge District School board. The interview protocol began with simple demographic questions followed by seven research questions. Three questions discussed the feasibility of field trips to the Central Ontario Tallgrass Prairie Lands site. They included specific questions on the frequency and timing of fieldtrips as well as potential problems associated with fieldtrips. One question investigated the link between the Tallgrass Prairie Lands site and the Ontario curriculum. The remaining three questions discussed curriculum kits and included specific questions on their effectiveness and composition. The interview protocol ended with a question regarding the teacher's opinions on participation in a future trial run. After the interview was composed, it was submitted for review by the geography ethics board at Trent University. A copy of the interview protocol can be found in the appendix. Once the protocol had successfully passed the review board, the project was granted permission to obtain interview subjects.

A letter providing a detailed description of the project was delivered to ten elementary schools in the Kawartha Pine Ridge District School Board. The letter requested intermediate Geography teachers to contact the researchers if they were interested in participating in the study. Unfortunately, this method was unsuccessful as no responses were received. Thus, modifications to our data collection were required. After one week of no response from the schools, telephone calls were made to set up appointments with school principals to obtain permission to interview the intermediate teachers. During this process, we encountered several setbacks. We found it difficult to persuade secretarial staff to set up meetings with the principal or vice principals. After several conversations and approximately two weeks of waiting, meetings with principals at three separate schools were scheduled.

Out of the three meetings, all principals granted their permission to continue with the study and interview teachers at their respective schools. They also gave a sincere commitment to speak with teachers at the appropriate grade level and ask them to participate. One week later, two of the three principals contacted us with two interview subjects each. During these conversations, the date and time of the interviews were scheduled.

The interviews took place in the teacher's host school during their prep periods or after school. The interview was conducted in a comfortable, quiet setting and took approximately 30 minutes to complete. Prior to the interview, teachers were asked to sign a research consent form and were guaranteed their full anonymity in the project. Both researchers were present during the interviews. While one researcher conducted the interview, the other took detailed notes of body language, important points and

suggestions. Once the interviews were completed, teachers were thanked for their time and participation.

Ultimately, the method of obtaining qualitative data through the use of an open ended, semi-structured interview was used to investigate three main research questions. The first was the feasibility of teachers being interested in a fieldtrip the grassland prairies restoration site? The second was how the Tallgrass Prairie site could be linked to the Ontario curriculum. Based on the agreed project deliverable, the development of a Central Ontario Tallgrass Prairie Land curriculum kit, the third research question investigated what teachers expected in a curriculum kit.

Therefore, the interview answers associated with each research question were transcribed and analyzed using a coding process designed for open ended interview questions. All interview questions and answers relating to the first research question were read over and coloured highlighters were used to distinguish common answers among each of the four interviews. From the commonalities found between the four interviews, overall themes were developed relating to the first research question. This process was repeated for the interview questions and answers associated with the second research question as well as the third research question.

3. Results

3.1 Demographics

It was the goal of the researchers to ask simple demographic questions to investigate possible differences in interview answers based one or more of the following: age, gender, length of teaching and subjects taught. Unfortunately, the participants who

volunteered for this study had similar demographics. All were female and all were older than 37. All participants had also been teaching for more than 12 years and finally, all participants had taught a variety of subjects and were currently teaching intermediate Geography at the time of the interview.

3.2 The Feasibility of a School Fieldtrip

When asked how many field trips the intermediate teachers took their students on each year, the answer varied according to which of the two schools the teachers were from. The two teachers from the first school both stated that it depended on what was being offered. However, both agreed that they generally take their students on five art based trips and two or three science or outdoor based trips. The teachers from the third and fourth interview stated that they do not take their students on any Geography based field trips throughout the year because the intermediate grades operate on a rotary system. In the third interview, the teacher stated that she has five grade seven Geography classes due to the large number of students who attend the school and if she were to take them on a class field trip they would miss their other subject periods. The common answer among the two teachers from the third and fourth interview was that they tended to take their grade seven students on two field trips per year.

There was a universal response among all interviewed teachers when asked whether they would like to take their students on more fieldtrips. All of the teachers interviewed agreed that they would love to take their students more fieldtrips throughout the year. There was also a common theme discovered when teachers were asked to provide a rational for their answer. Each teacher mentioned the benefits of hands on experience in their answer. One teacher stated, “If I could take kids places all the time I

would because any hands on application you can give to the actual curriculum is so beneficial." Ultimately, all of the teachers agreed that field trips are very important for student learning and they would absolutely take their students on more field trips if it were plausible.

Each teacher was asked when they usually schedule field trips during the school year. The teachers from the first and second interview stated that it depended on the type of field trip that would determine what time it was scheduled. However, there was an agreement that both teachers were open to the idea of scheduling field trips anytime throughout the year. One teacher stated that they "try to spread the field trips out over the year, so parents aren't hit with a large sum of money at one particular time." Both interview three and four agreed that the best time for a field trip for a rotary school would be at the beginning and close to the end of the year. Three out of the four teachers interviewed believed that a trip at the beginning of the year is beneficial because fieldtrips tend to bring a class together and develop cohesiveness.

When asked about whether there were any issues hindering the teachers from taking their students on more fieldtrips, the answers were split into two themes based on which school the participants were teaching at. The theme from interview one and two was related to cost. In interviews one and two both teachers agreed that it was the cost factor for families due to the extremely high bus costs. Both teachers stated that the school did not have the resources to cover the bus costs for field trips, which limits the number of out of town trips they can attend.

However, in interview three and four the theme was related to their rotary system. Both teachers agreed that cost was not an issue at their school but rather it was the large

number of students. According to one teacher, Geography is only taught twice a week for 45 minutes, which does not allow enough time to go on a field trip. Only one teacher mentioned that safety may be an issue that would hinder her from taking students on field trips.

3.3 Links to the Ontario Curriculum

During the interview, teachers read over a brochure for the Central Ontario Tallgrass Prairie Lands and then were asked if the site would fit into their teaching curriculum. All of the teachers agreed that the site could be linked to the grade seven Geography curriculum. Two teachers stated that the students learn about the physical environment in seventh grade Geography and the Tallgrass Prairie Lands would be beneficial for hands on learning about soil, agriculture, preserving the environment and planting. Although unrelated to Geography, another teacher stated that entire grade seven science unit is about ecosystems and that the Tallgrass Prairie site would be wonderful for the students to see after learning the in class material. It was also mentioned that the site could tie into the history curriculum at the intermediate level as well as the First Nations unit in the grade six curriculum.

When asked if teachers would take their students to this site as a field trip there was unanimous agreement that this would be a very beneficial fieldtrip for students and for teachers because it fits very well with the Ontario curriculum. Further, three out of the four teachers agreed that they would be more likely to take their students to the site as a field trip if it could be linked to the curriculum for more than one subject.

3.4 Curriculum Kit Development

Teachers were asked if they were familiar with the idea of a curriculum kit. All four teachers declared that they were familiar with curriculum kits and had used them several times throughout their careers. Based on this answer, teachers were asked if there would be more incentive to plan a fieldtrip to the Tallgrass Prairie Land Site if they had a corresponding curriculum kit available to them. All teachers enthusiastically agreed that they would be much more likely to plan a field trip to the site if they provided a curriculum kit. When asked for their rationale, there was a definite theme relating to preparation. Three of the four teachers said the curriculum kit would prepare the teacher for what to expect at the fieldtrip site. These teachers also stated that this preparation and the background information provided by curriculum kits help prepare the teacher to make the best out of the day. One teacher was very adamant about the usefulness of a curriculum kit. She stated,

> "For myself, a curriculum kit would promote the site, looking at the kit would tell me exactly what was there, what I could do with my students and for planning. If I knew there wasn't a kit to go with this site, there would be far less chance of me planning and far less chance of me being interested because I don't have the time to research everything" (interview #2).

There was also a theme relating to pre-teaching about the field trip. All four teachers said that greatest teaching outcomes occur when you can prepare the students for things they will learn on the fieldtrip by pre-teaching lessons relating to the fieldtrip site.

In order to develop an efficient curriculum kit for the Central Ontario Tallgrass Prairie Lands, teachers were asked what they would look for in a curriculum kit to the

site. All teachers were very specific in their answers and were in consensus in what they desired for a perfect curriculum kit. The first thing mentioned in all interviews was the presence of facts, background information and visuals about the site. Three teachers stressed that these were the most important aspects because it provided all the research necessary to teach a unit effectively. A glossary of vocabulary, the historical significance of the area and pictures of the different types of grasses and a list of additional resources were also mentioned. One teacher believed that a fun attention grabber to start off the unit involving neat facts to gain the students interest would be beneficial.

Ultimately, all of the teachers expected that the curriculum kit should explain how the unit fits with the Ontario curriculum and stressed the importance of curriculum appropriate lesson plans. The most common response was that they would like to have pre-teaching lesson plans prior to visiting the site, lesson plans while at the field trip site and follow up lessons to assess what the students had learned. During one interview, the teacher brought up the possibility of having a guest speaker come in and talk to the students about the site and what they will expect to see and be doing while at the site.

Finally, a uniting theme among all of the interviews was that the curriculum kit had to be cross-curricular. For the teachers whom are on rotary, this is a necessity because they do not have their own class. In order for students not to miss time from their other subject areas, the lesson unit would have to incorporate several curriculum subjects. For the teachers not on rotary, a cross-curricular unit would also be beneficial because teachers could teach curriculum requirements for a variety of subjects with the use of one single curriculum kit. Additionally, all teachers stated that they would be willing to

participate in a future trial run if a curriculum kit were developed for the Central Ontario Tallgrass Prairie Land Site.

4. Discussion

4.1 Curriculum Links

In the present study it was found that all teachers took their students on school fieldtrips at least twice a year due to the learning benefits of hands on experience. This finding supports the results of past research. According to Kiesal (2006a) field trips are very rewarding and beneficial to student's learning experience. Additionally, Falk and Dierking (1997) found that one hundred percent of the subjects in their study remembered one or more things learned on the trip and could relate it to the associated subject matter. Further, Hurd (1997) concluded that relevant and well organized field trips increase participant's information retention.

A second finding of the present study was that teachers believed there was a beneficial social aspect associated with school fieldtrips. This finding is also supported by the current research literature. The study conducted by Falk and Dierking (1997) as well as the study by Pace and Tesi (2004) revealed that field trips created positive social memories amongst those who participate. Ultimately, researchers concluded that school field trips are socially beneficial for participants.

According to past research, teachers reported liability issues as a primary issue hindering school fieldtrips. However, this was not consistent with the findings of the current research study. Instead, fifty percent of the teacher's reported that the use of an intermediate rotary system was a primary issue that hindered the use of school fieldtrips.

It was further explained that the rotary system would cause students to miss all other subject areas if they participated in a day long Geography field trip.

The results from the present study also found that teachers reported cost as an issue that hinders fieldtrip excursions. This finding is supported by current literature. According to the Toronto Star (2006), in 2003 the Toronto District School Borard closed three of its eight outdoor education centres and cut the amount of time grade six and seven students spend in the remaining facilities from five days to two and a half to reduce fieldtrip related costs. The results of the present study indicate that there must be strong curriculum links to the potential field trip in order for teachers to participate. Teachers reported that both the administration as well as the students must understand why the field trip is important and how it is linked with classroom learning. This finding reflects the results of past literature. Kiseal (2006a) asserted that strong connection between the curriculum and the field trip made students not only remember what they did, but why they did it.

There was a unanimous finding among all teachers that the tallgrass prairie site would be strongly linked to the ecosystems unit in grade seven Geography and science. In grade seven Science, students study 'Interactions Within Ecosystems', which is an introduction to the study of ecology (Ministry of Education and Training, 1998). It also involves the investigation of complex interactions between all types of organisms and their environments (Ministry of Education and Training, 1998).

Although there was no concurrent support for the inclusion of background readings and visuals, the inclusion of pre-lessons, lessons for the site and post lessons is supported by past literature. Cox-Petersen & Melber (2001) found that that the amount of

preparation students receive for a field trip and the amount of hands on learning during the field trip can significantly impact their learning. Additionally, the researchers found that when connections to fieldtrips are made through follow up activities, they increase student's understanding on the subject.

4.2. Reflection

To bring our research project full circle, it is important to provide a short reflection based on our experiences. An important finding while conducting research was it was extemely difficulut to gain access into elementary schools. In additon to being questioned about our intentions, providing proof of identification and visitor sign-in lists, secretaries were very hesitatnt to allow direct contact with prinicpals or vice principles. This hesitancy was regardless of whether the school was contacted by letter, telephone call or an in person visit. Once direct contact was made with principals, the process moved very quickly. A related observation involves the Catholic School Board system. Although it was stated at the beginning of the project that both the public board and the catholic board would be researched, the Catholic Board would not approve of conducting interviews with their teachers. This ultimately limited our studies to participants of the Kawartha Pine Ridge District Schoolboard.

The variability among our participants was also limited due to the timing of the study. At the time we were trying to obtain interviews, teachers were in the middle of writing report cards. This greatly affected the number of participants who were willing to participate. As a result, our participants were all female and were close in age. Thus, it is

the suggestion of the current researchers that further interviews be conducted with teachers with different demographics to study similarities and differences in the results.

An interesting finding that often arose was that teachers would report feelings of anxiety and distress before participating in the interview. They attributed the anxiety to not knowing what would be asked of them in the interview and more importantly, that they may not know the answer. Therefore, it is also suggested that a document outlining the scope of the interview questions be sent prior to the interview to alleviate potential stress that teachers may feel and to possibly recurit a larger number of participants.

Appendix

Interview Protocol

1. Introduction

Introduce ourselves
Give an overview of the project
Ensure confidentiality
Ask for permission to record the interview
Teacher: Definitely

Demographic Questions

1. What is your gender?

Teacher: Female

2. What is your age?

Teacher: over 50

Interview Questions

1. How long have you been an elementary school teacher?
2. What subject(s) do you teach?
3. How many field trips do you take your students on each year?
    a. Would you like to take them on more?
    b. If so, why? If not, why?
    c. Are there issues hindering you from doing so?

Have the teacher look at the brochure for the restoration site and have them answer the following:

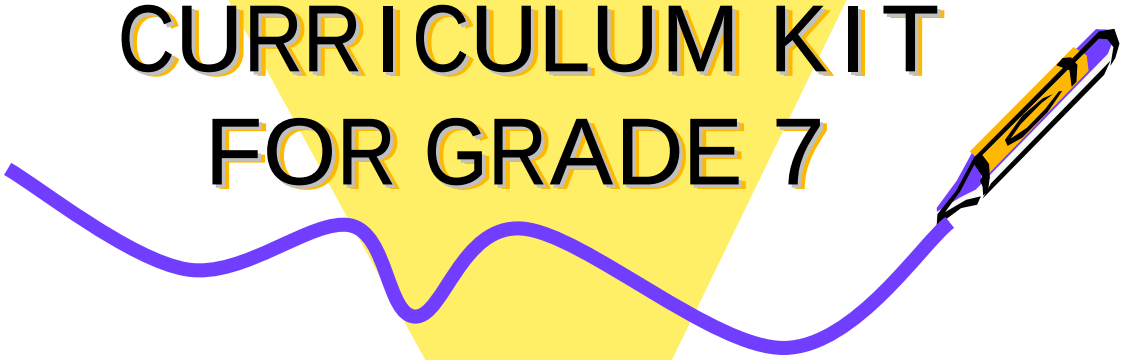
4. Would this fit into the curriculum you teach
    a. If yes, where. If not, why not
5. Would you take students to this site as a field trip
    a. Why? or why not?
    b. What is beneficial, what are the drawbacks of the site
6. When do you usually schedule fieldtrips?
    a. What is your reasoning?
    b. The site is ecologically active in September and October. Would you be able to fit a fieldtrip in at this time?
7. Are you aware of curriculum kits?
8. Would there be more incentive to plan a field trip to this site if there were a curriculum kit available to you?
    a. Why or Why not?
    b. What would you look for in a curriculum kit for a trip to this restoration site?
9. Any additional comments, thoughts, concerns or questions

Conclusion

1. Thank-you for participating, we appreciate you taking the time to meet with us.
2. If a curriculum kit is developed for this restoration site, would you be willing to participate in a trial run in the future?

CENTRAL ONTARIO'S RICE LAKE PLAINS TALLGRASS PRAIRIE

CURRICULUM KIT FOR GRADE 7



CENTRAL ONTARIO'S RICE LAKE PLAINS TALLGRASS PRAIRIE

FIELD TRIP PLANNING

Dear Parents,

On _____, our class will be going on a field trip to the Central Ontario Rice Lake Tallgrass Prairie Site. We will be traveling by school bus, leaving at 9:00am and returning by 3:00pm. Students are asked to bring a bag lunch on the day of the trip. It also advised that students dress accordingly (old clothes, boots, etc.). Also please have your child bring in _____ to cover the cost of the entrance fee and bus. It would be appreciated if this money could be brought in by _____.

This field trip reinforces our unit on ecosystems, natural resources, and physical geography and addresses learning expectations in the Ontario curriculum at the grade seven level. We plan to visit the Tallgrass Site to gain a better concrete understanding of the interaction of ecosystems. Students will complete activities in the upcoming weeks to extend their learning in this area.

If you are able to accompany our class on this field trip, we would appreciate your assistance. Please indicate on the form below if you would like to join us.

Please sign the attached from and return it to me by _____. Students will not be permitted to go on this trip without the permission form signed and returned.

Thank-you for your support and interest.

Sincerely,

PARENT PERMISSION FORM

- O Yes, I give permission for my child _____ to go on the trip to the Central Ontario Rice Lake Tallgrass Plains Restoration Site on _____.
- O No, I do not give permission for my child _____ to go on the trip to the Central Ontario Rice Lake Tallgrass Plains Restoration Site on _____.
- O Yes, count me in as a helper on this field trip. Please contact me at _____.

Parent/Guardian Signature: _____ Date: _____

Dear Volunteer,

Thank-you for taking the time to volunteer to accompany us on our upcoming field trip. I welcome your offer of assistance. I'm sure that the students will enjoy a richer, more productive day because of it.

Please meet me at 8:30am on _____ in room _____. I am calling all the volunteers together to answer questions, clarify expectations, and explain how you can help on this day. In the meantime, here is some information about our school expectations and your role as a volunteer.

RESPONSIBILITIES

- Teachers are responsible for the conduct and manners of the class at all times. Refer any situation requiring discipline to me immediately
- You will be asked to supervise a small number of students. Please keep a record of their names and use the materials I will provide, such as a clipboard, paper and a pencil
- Wile you are on your won with your group of students, please review the rules for taking washroom breaks and water fountain drinks, being respectful and cooperating with others

BUS SAFETY

- The bus driver is responsible for the safety of the bus and its passengers
- Students must not leave their seats while the bus is in motion
- Students must sit properly at all times
- Students behaviour shall be the same as in a classroom setting
- Activities that might distract the driver or other users of the road are not permitted
- Windows may be adjusted with consent from an adult
- Students must not put their hands, heads or objects out the window
- Students' lunch bags, books, etc. must be placed on the floor or held on laps

SEATING ARRANGEMENTS FOR ADULTS ON THE BUS

- If there is only one adult, please sit at the back of the bus
- If there are two adults present, one should sit at the back and one at the front
- If there are three or more adults, please spread out accordingly.

Thank-you again for offering your assistance.

Sincerely,

Field Trip Itinerary

8:30am	Meeting with volunteers
8:50-9:00am attendance	Gather students, load bus and take
9:00-9:30am Site	Travel to Rice Lake Plains Tallgrass Prairie
9:30-10:00am	Arrive at site and receive introduction/tour of the site
10:00-11:00am	Split class into 4 groups and have each group complete the activity/station associated with their number
11-12:00pm	Groups move on to their second workstation
12-12:30	Lunch
12:30-1:30pm	Groups move to their third workstation
1:30-2:30pm	Groups move to fourth workstation
2:30pm	Thank the hosts of the Tallgrass Site, load bus and take attendance
3:00pm	Return to the school for buses/pick up

CENTRAL ONTARIO'S RICE LAKE PLAINS TALLGRASS PRAIRIE

BACKGROUND INFORMATION

Rationale: Why Field Trips?

- According to L.B Sharp's thesis relating to outdoor education, "what can be best learned inside the classroom should be learned there; and that which can be best learned through direct experience outside the classroom should be learned there".

- Taking students out of the regular classroom and school environment into the larger community generates interest and enthusiasm, helps to motivate students, creates positive attitudes towards learning and provides students with meaningful and relevant experiences.

- Out of classroom excursions provide first hand experiences from which learning occurs in all areas of the curriculum and involves the students working in teams, while also furthering their individual knowledge through hands-on education.

- Students are able to connect with the outside environment while the schools and the field trip location can prepare students to use their recreational resources intelligently.

- Students learn to appreciate and respect nature and the outdoors which often stimulates an awareness of and an interest in environmental issues. Furthermore, outdoor education is necessary in providing children with the necessary attitudes, values and knowledge to change current patterns and to secure healthy and sustainable future.

- Students and teachers experiences real life situations, view artifacts from the past, and discover the realm of scientific exploration and experimentation.

What is a Tallgrass Prairie?

Tallgrass Prairie takes its name from the dominant tall grasses which grow well over one metre high. This grassland, once stretching across the vast Corn Belt of the USA and into Canada, was described by early explorers as exceeding the height of their horse's bellies. A walk through the luxuriant, wildly-hued growth is an experience that individuals cherish forever.

The main range of Tallgrass Prairie in Canada is the 6,000 square kilometre plain centred in the Red River Valley in Manitoba. This is in addition to a 1,200 square kilometre area of sandy soils in southern Ontario between Lakes Huron, St. Claire and Erie, where Tallgrass Prairie can also be found. But this grassland is disappearing; the rarest in Canada, all but a fraction of one percent has been converted to cropland, urban development, industrial sites, or has been invaded by forest cover. Four publicly-protected sites in Manitoba total less than 100 hectares.

Recent efforts to identify all remaining Tallgrass Prairie in Manitoba located only 81 additional hectares of prime prairie, plus 220 hectares of mostly atypical examples, all of it under private ownership. Some of these

lands have recently received protection under the province's Critical Wildlife Habitat Program and the Manitoba Naturalists Society's Prairie Patron Program.

Today Tallgrass Prairie may be quite difficult to identify: under heavy grazing, Kentucky bluegrass generally overtakes the site; in the absence of fire, Aspen poplar, Western snowberry, Smooth bromegrass, and Kentucky bluegrass take over. To help in your identification, look for the key species listed below to determine whether your grassland is Tallgrass Prairie.

Typical Plants of the Tallgrass Prairie		
Grasses	**Forbs**	**Shrubs**
Big Bluestem	Meadow Blazing Star	Leadplant
Little Bluestem	Cluver's Root	Dwarf False Indigo
Indian Grass	Golden Alexanders	Prickly Rose
Switchgrass	Silver-leaved Psoralea	Shrubby Cinquefoil
Prairie Dropseed	Western Silvery Aster	
Sideoats Grama		

What is the Central Ontario Rice Lake Plains Tallgrass Prairie?

There are a number of types of prairie -- the shortgrass (or fescue) which is common in the mid-west, the mixed grass and the tallgrass. Each of these broad types is further subdivided into classes which reflect the unique composition of grasses and wildflowers which thrive in each geographical area. As the climate changes, so do the species of plants that grow within it. Once covering an area of 20,000 - 30,000 acres, now less than 2,000 acres of Tallgrass Prairie exists in Ontario today.

The Rice Lake Plains Tallgrass Prairie is a subset of Tallgrass Prairie -- this means that many of the species are similar, but plants which enjoy a more temperate clime are not present and hardier plants are present. A full complement of the Rice Lake Plains Tallgrass Prairie would be 35 wildflowers and 15 grasses. At this time, it is thought that 1/1000 of one percent (that's a tiny number!) of the original Rice Lake Plains Tallgrass Prairie exists currently in a natural state. The Rainbow Restoration project seeks to re-establish 20 acres of Rice Lake Plains Tallgrass Prairie. This makes the site the largest site of its kind in the world

Where is the Central Ontario Rice Lake Plains Tallgrass Prairie?

The Rainbow Restoration site is located adjacent to Rainbow Cottages Resort, on the Kenny Family Farm, in South Monaghan Township, on the north side of Rice Lake, the west shore of the Otonabee River. The site is owned and operated by Tony and Heather Kenny, who dreamed of re-establishing the Tallgrass Prairie their 20-acre field. The site enjoys a close proximity to Rice Lake and the wetland areas that surround the site on two sides. Wildlife species which enjoy the wetland also use the prairie upland for nesting purposes. To the north, there is an adjacent woodlot and to the west, farmland in pasture.

What are the Main Objectives of the Site?

- To create an agricultural buffer strip by retiring 20 acres of farmland to reduce erosion and the possible infiltration of herbicides, pesticides and fertilizers into a provincially significant wetland complex which is part of the Otonabee River / Trent Severn Waterway watershed.
- To re-establish a highly endangered Rice Lake Plains Tallgrass Prairie ecosystem to provide habitat critical to endangered species of birds, insects, small and large mammals and amphibians which rely on prairie habitats for rearing, shelter and forage.
- To create a demonstration site featuring the importance of wetland and shoreline buffer strips for water quality and wildlife habitat, to demonstrate the value of tallgrass prairie ecosystems as an option for retiring marginal lands and to demonstrate innovative approaches to tallgrass prairie restoration and management.
- To provide public access for education, research and nature appreciation opportunities currently unavailable in this part of the province.
- To raise local awareness of the plight of rare, threatened and endangered ecosystems and in particular, the Rice Lake Plains Tallgrass Prairie.
- Highlight the economic and ecological advantages of prairies, namely; for agricultural production, erosion control, habitat enhancement, nature appreciation and other natural heritage values.
- Promote the role of the new Ontario Prairie and Savannah Association and the Tallgrass Communities of Southern Ontario Recovery Plan which are spearheaded by the Ministry of Natural Resources, the Natural Heritage Information Centre and the World Wildlife Fund.

What does the Site have to Offer?

- Experienced tour guides lead tours throughout the seasons. Topics covered include marshlands, maple syrup, woodlands, wildlife, birding, forgotten friends (insects, amphibians, and reptiles), varied ecosystems, canoeing, tree and plant identification, agricultural, dogsledding. Wonderful photography opportunities - amateur and professional photographers welcome. Each tour is personally tailored to individual group interest, ability and size. School fieldtrips are welcome.

Spring Tours:

- Maple Syrup Production Demonstrations, Tours and Tastings: Visit a maple syrup bush in production; enjoy some of nature's sweets.
- Waterfowl Return: Explore the Otonabee River delta by boat, view the first returning waterfowl.
- Fish Spawning: Peek through the waters for a look at bass and bluegill nests.
- Snapping Turtles: Wait for a thunderstorm and come out to see the turtles nesting.

Summer Tours:

- Tallgrass Prairie: Explore the Rainbow Restoration Site of Rice Lake Plains Tallgrass Prairie. See the wide variety of flowers and grasses that covered this area in the early 1800's.
- Marshlands: Enjoy a canoeing tour of the Otonabee River delta and the provincially significant wetland complex.
- Upland Tours: Tour through the woodland, identifying insects, trees, plants and reptiles and exploring the ecosystems which each needs for survival.
- Butterflies and Birds: Tour the Tallgrass Prairie site to discover the varied selection of butterflies and birds which inhabit this rare ecosystem.

- Osprey Nesting Sites: This area is known for its significant osprey population. Visit area nesting sites, watch as the osprey young fledge and feed.
- Marshland Birding: Spend some time in a wildlife viewing blind to discover the wide range of birds in the marshlands.
- Summer Maple Tours: Trace the path of maple sap to maple syrup, learn to identify sugar maple trees.

Fall Tours:

- Autumn Woodlands: Discover the characters of plants and trees in the fall - see their seeds and their colours.
- Birding on Rice Lake: Take a boat tour to Rice Lake to watch as waterfowl gather for their annual migration.
- Tallgrass Prairie: Explore the Rainbow Restoration Site in the Fall, there is always something blooming right until frost!

Winter Tours:

- Winter Botany Tours: Learn to identify plants and trees in winter by touring the woodlands and uplands.
- Dogsledding: Join the Silver Lady Dog Sled team for an afternoon.
- Winter Birding: Watch various species of birds arrive at various birdfeeders throughout the property.

CENTRAL ONTARIO'S RICE LAKE PLAINS TALLGRASS PRAIRIE

SPECIES PHOTOGRAPHS

Prairie Brome

Pasture
Rose

Slender Wheatgrass

Evergreen Bearberry

Fragrant Sumac

Upland Willow

Lowbrush Blueberry

Gray Dogwood

New Jersey Tea

Sky Blue Aster

Daisy Fleabane

Arrow Leafed Violet

Spreading Dogbane

Sneezeweed

Stiff Gentian

Trillium

Virginia Mountain Mint

Fireweed

Sunflower

Fringed Gentian

Canada Golden Rod

Blue-Eyed Grass

Wood Lily

Early Prairie Cup

Long Headed Thimbleweed

Tall Cinquefoil

Flattopped Golden Rod

Horay Vervain

Indian Paint Brush

Frost Aster








Controlled Burning


After the Burn


Big Bluestem - Andropogon Geradii

Other Names: Turkey Foot or Bearded Brass

Habitat: Tallgrass prairies, savannahs, along roadsides or other disturbed areas

Form: Grows upright from tufted clumps
Stems are blue with reddish tinge
45 cm to 2.5 meters tall

Flower: Slender red to purple spike like clusters radiating from top of stem,
Divided into three or more parts (resembles a turkey foot)

Foliage: Leaves have a blue-gray tone early in the season
Leaves are covered in silky hairs

Blooms: August – October

Fruit: Grain; small, fuzzy purple-green seed with silky hairs

Wildlife Value: Excellent forage species for deer

Human Value: Aboriginal people set fire to the prairie to stimulate the growth of the Big Bluestem and other species of wild grasses which in turn attracted deer, a main food source. Today, several tallgrass species are being commercially grown as forage crops for cattle.

Did You Know…

Big Bluestem is the signature grass of tallgrass Prairie. The plant is capable of sending roots Down in excess of 3m. Big Bluestem turns a distinct Bronze in the fall

Little Bluestem - Schizachyrium Scoparium

Other names: Little Blue

Habitat: Tallgrass prairies, dunes disturbed sites

Form: Grows upright in tufted clumps
Stems are blue-green in the spring, yellow in the summer and copper in the late fall through winter

Flower: Single, white, hairy, elongate flower cluster at the tip of each flower stock
Flower cluster has long hairs that give the plant a feathery appearance

Foliage: Up to 30 cm long and less than 5 mm wide

Blooms: July-October

Fruit: Small, blue-red, fuzzy seed that matures to a soft cream in early autumn

Wildlife Value: This is an excellent forage grass

Human Value: Nutritional value recognized by livestock producers across the Canadian and U.S Midwest.

Did You Know…

The Little Bluestem, along with many other native prairie plants are becoming increasingly popular as specimen grasses with landscapers and home gardeners due to their unique form, colour, texture, drought resistance and habitat values.

Information Provided by Tony and Heather Kenny

Switchgrass – Panicum Vergatum

Other Names: Tall panic grass, wild red top
Habitat: Tallgrass prairies and savannahs
Form: Grows in big, leafy clumps to 1.5 meters tall
Flower: Single at the ends of the branches
Foliage Head is initially purple, turning tan later in season
Fruit: Grain like; hard and bony
Blooms: All season
Wildlife Value: Excellent Forage Species
Human Value: Recently shown promise in Ontario for use in ethanol fuel, animal bedding and pulp/paper production

Did You Know…
Switchgrass has a vigorous root system that extends 9-11 feet into the soil, and does well on drought-prone sites. Its leafy clumps persist throughout the winter and provides a touch of colour on dark days. Switchgrass is being grown commercially in the Eastern Ontario and Quebec. The seed is being used to produce ethanol through a while the rest of the plant is being sold as bedding material. The crop Only has to be planted once every ten years and requires no fertilizers Or chemical weed control.

Indian Grass – Sorghastrum Nutans

Did You Know…
Indian Grass is of of the more nutritious grasses and is preferred by livestock and deer.
While very common in the western prairies it is less common in the east.

Other Names: India grass or deer grass
Habitat: Tallgrass prairies, alvars, rock barrens
Form: Grows up to 2.4 meters tall in dense tufts
Flower: Narrow long flower head, initially chestnut brown, later turning grayish brown
Bright yellow stamens
Foliage: Long, narrow and gray-green leaf blades
Two projections which look like rabbit ears can be found where the leaf blade attaches to the stem
Blooms: August-September
Fruit: Long, slender, brown seed
Wildlife Value: Host plant for the larval sage of the great spangled fritillary butterfly and little wood satyr
Human Value: Has nutritional value for livestock

Canada Wild Rye – Elymus Canadensis

Did You Know…
Canada wild rye is one of only a handful of "cool season" prairie grasses. The grass tends to grow fastest during spring and fall conditions while "warm season" grasses grow fastest during the heat of the summer. Canada wild rye is also considered an early succession species – one of the first to arrive on a new site and one of the first to be choked out by other competing species.

Other Names: Nodding wild rye
Habitat: Dry prairies, sane dunes and beaches
Form: Bunchgrass, grows up to 1.3 meters tall
Flower: Single, bushy flower that grows above leaves
Usually straight, sometimes nodding
Foliage: Leaves clasp stem at base and are flat or curled inward near the tip
Blooms: May-October
Fruit: N/A
Wildlife Value: Several species of grubs tend to congregate in the root system. Skunks focus much of their excavation activities in search of grubs around these grasses
Human Value: Natives used seeds as a food source

Side-Oats Grama – Bouteloua Curtipendula

Did You Know…
Side oats grama is an important range grass in Southern U.S.A as it cures well and maintains a fairly high forage value throughout the year. In Ontario it is a rare plant species. This means that side oats grama can only be found in approximately 5-20 places in the whole province.

Other Names: Tall grama, banderilla
Habitat: Well drained prairies and dry hillsides
Form: Bunchgrass, grows up to 75 cm tall
Flower: Occur in clusters in two rows mostly along one side of the upper stem
Flowers are inconspicuous, but in full bloom bright red stamens protrude and are showy
Foliage: Straight, stiff leaves which occur mainly on the lower part of the plant
Blooms: July-September
Fruit: Small spikes which are borne along the side of each central seed stalk
Wildlife Value: Provides nesting cover for birds and food for small animals
Human Value: Excellent range grass

Blue-Eyed Grass – Sisyrinchium Montanum

Did You Know…
Blue-eyed grass gets its common name from the way the flowers appear like blue eyes on grass-like stems. Its flower only blooms for one day, and only in the morning providing it is sunny. The flower closes upon being picked.

Other Names: Common blue-eyed grass
Habitat: Tallgrass prairie, meadows, old fields and alvars
Form: Up to a dozen stems that grow up to 30 cm tall
Flower: Deep blue flowers surrounding a yellow eye; occurring is cluster of2-4 near the tip of the stem
Foliage: Narrow and grass like
Blooms: June-July
Fruit: Black seeds that are round and resemble flax
Wildlife Value: Hardy, fragrant and has a high nutritional value
Human Value: Natives made a tea from the root to treat diarrhea and stomach aliments.

Smooth Beardtounge – Penstemon Digitalis

Did You Know…
Smooth Beardtongue contains powerful chemical called “cardiac glycoside”. This chemical is a defense compound that aids in protecting the plant from herbivores. Cardiac glycoside is also is the chemical from which the heart stimulant “digitalis” is derived from.

Other Names: Foxglove beardtongue
Habitat: Moist and fry sites in prairies, oak savannah, marsh edges
Form: Grows to 120 cm tall
Smooth, shiny appearance
Flower: White, tubular flowers that are penciled inside with purple
Foliage: Leaves are widest at base and tapefr to a pointed tip
Blooms: Mid May – mid July
Fruit: Seed heads produce a pungent odor, not unlike the fruit of Ginko Biloba
Wildlife Value: Benefits bees, butterflies and hummingbirds
Human Value: The heart stimulant, Digitalis, is a derivative of this plant

Hairy Beardtongue – Penstemon Hirsutus

Other names: Wooly beardtongue

Habitat: Usually on dry, well drained or rocky areas, prairies, savannahs and alvars

Form: Grows to 80 cm, usually less than 50 cm
Soft hairs on stem give the plant a wooly appearance

Flower: Lavender coloured flowers, degree of colour varies from the site to site. Trumpet shaped or tubular flowers with white lips

Foliage: Oblong to lanceolate. Can be toothed or toothless

Blooms: Mid-May – Early June

Fruit: Hard cased seed heads are shaped like a closed tulip

Wildlife Value: Benefits bees, butterflies and hummingbirds

Human Value: Natives used the roots to sooth toothaches

Did You Know…
The Hairy beardtongue gets its name from its hairy stamen that is somewhat unique for the family. The Hairy Beardtongue is part of a large family of beardtongues that vary greatly in height and colour. While the plants share a common form and flower shape, their site preferences and tolerances for drought and water are often different.

Canada Anemone – Anemone Canadensis

Other Names: Meadow Anemone

Habitat: Meadows, moist prairies, open woods

Form: Hairy stemmed plants to 60 cm tall

Flower: Each stalk bears a single, white flower with a yellow centre

Foliage: Leaves are deeply divided into three narrow segments which are themselves toothed and sometimes lobed

Blooms: May-June

Fruit: Seed head is composed of a spiny cluster of flattened seed-like fruits with long tips

Wildlife Value: Animals rarely browse on this plant

Human Value: Natives used roots and leave to make an astringent styptic. The medicine was used to treat wounds and nosebleeds. The root was often chewed to clear the throat before singing

Did You Know…
Anemones are members of the buttercup family. All members contain a toxic compound (caustic irritant) that may irritate the skin of some people.

Black-Eyed Susan – Rudbeckia Hirta

Other Names: Coneflower
Habitat: Found in a variety of habitats
Form: 40-50 cm tall
Purple-green, hairy stem
Flower: Composed of a dark brown, button like central disc surrounded by 8-20 yellow petal like flowers
Foliage: Alternate, wide at middle and tapering to a pointed tip
Leaves are tinged purple
Blooms: June-October
Fruit: Small, dark brown seeds
Wildlife Value: Nectar attracts bees and butterflies
Human Value: Tea made from the leaves/roots used by natives to treat sore/snake bites/worm/colds and ear aches. A yellow die was also made from the petals.

Did You Know…
Black-Eyed Susan was originally a prairie a prairie species, but is not common in many different habitats throughout the province.

New England Aster – Aster Novae-Angliae

Other Names: Aster
Habitat: Thickets and meadows
Form: Grows up to 1.7 metres
Flower: Numerous deep violet flower rays surrounding n orange central disc
Foliage: Many long, narrow leaves with smooth margins, leaves clasp stem
Blooms: July-October
Fruit: Tiny dark seeds
Wildlife Value: Attracts butterflies and bees
Human Value: Historically used as cure for fainting spells and loss of consciousness-this was done by burning the plant and forcing the smoke up the patients nostrils with the aid of a paper cone

Did You Know…
New England Aster is the largest and showiest of wild asters. When in bloom, the deep violet flowers attract swarms of butterflies and bees.

Flat-Topped White Aster – Aster Umbellatus

Did You Know…
This perennial native plant is an important host plant in the life cycles of Pearl Crescent and Silvery Checkerspot butterflies. Native tribes used the smoke from burning aster plants to assist in reviving persons who had fainted. Tea was also brewed from aster plants to relieve headaches.

Other Names: Flat-topped
Habitat: Moist to wet areas, in both exposed and shaded sites
Form: Grows to 2 metres tall
Flower: Flower heads composed of 7-14 white petal like flowers surrounding a yellow disc
Foliage: Lance-shaped leaves with narrow bases and pointed tips
Blooms: July-September
Fruit: Single-seeded, dry hard and flattened
Wildlife Value: Provides food for birds, hares, mice and deer
Human Value: Historically, the leaves were used in food and drinks and the flowers for medical purposes

Butterfly Milkweed – Asclepias Tuberosa

Did You Know…
Butterfly milkweed has clear sap unlike other milkweeds. The medical properties of the roots are caused by a powerful chemical which acts as a natural protection against insect damage. Its name suggests the plant was named after the ancient Greek doctor Aesclepius.

Other Names: Butterflyweed or pleurisy root
Habitat: Well drained sandy sites
Form: Bushy in appearance, stems are hairy, 90 cm tall
Flower: Begins lime green, shifts to bright yellow and finally matures brilliant orange
Has a star like appearance
Foliage: Long, narrow leaves with hairy underside
Blooms: July-September
Fruit: Seed pods are smooth to finely hairy, approx 6-8 cm long by 1-2 cm thick
Wildlife Value: Nectar is very attractive to insects and butterflies
Human Value: Roots and seeds used by Aboriginals for food to produce sugar.

Prairie Smoke – Geum Triflorum

Did You Know…
The flowers of prairie smoke only open up enough to admit insects for pollution

Other Names: Old man's whiskers, three flowered avens
Habitat: Dry prairies, alvars
Form: Hairy stemmed plants, grows to 30cm
Foliage: Up to 15cm long and divided into as many as 19 toothed segments. Leaves occur on lower part of plant
Blooms: April-July
Fruit: Showiest part of plant with long, feathery plumes which gave the fruiting heads a wispy, smoky appearance
Wildlife Value: Not an important food source for livestock. May provide forage for sheep.
Human Value: Roots were used to make a medicinal tea

Wild Lupine – Lupinus Perrennis

Did You Know…
Lupines are legumes. This means they fix nitrogen into a less complex form. this allows other plants to absorb the nutrient that is essential to foliage development and plant vigor.
Warning: some lupines are toxic.

Other Names: Lupin
Habitat: Tallgrass pariries, savannahs, sandy open woodlands, meadows
Form: Several hairy stems rise between 30-80cm
Form fan like basal leaves
Flower: Deep blue, pea like flowers surround the stem form its midpoint and taper inwards towards the tip. Each individual flower is approx 2-3cm long
Foliage: Each leaf has 7-10 smooth edged leaflets that radiate outward, leaflets are roughly 2cm wide and up to 8dm long
Blooms: Late May-late June
Fruit: Small hairy seed pods up to 6cm long
Wildlife Value: The only larval host for the endangered Karner Blue Butterfly
Human Value: Natives made cold leaf tea to treat nausea and internal hemorrhaging. Settlers used to feed them to their horses to fatten them up.

Prairie Buttercup – Ranunculus Rhomboideus

Did You Know…
Some buttercups contain an acrid compound that can cause severe mouth, skin, stomach and intestinal irritation.

Other Names: Goldie Labrador buttercup

Habitat: Tallgrass prairie, savannahs, rock barrens

Form: Less than a foot tall, leaves and stem covered with fine silky hairs

Flowers: Usually several individually stalked flowers per plant

Flowers are ¾ of an inch wide with five small hairy sepals and five yellow petals surrounding many yellow stamens

Foliage: Lower leaves of plant are nearly round with shallow rounded teeth

Upper leaves are dissected into 3-5 narrow segments

Blooms: July-September

Wildlife Value: Contains a powerful stomach irritant therefore of little value to wildlife

Human Value: Natives used roots on abscesses. The leaves were also used to ease symptoms of arthritis and rheumatism

Cylindrical Blazingstar – Liatris Cylindracea

Did You Know…
Several species of Dense Blazing Star Are among the most popular perennials Sold in North America. This is attributed To their unique form, long lasting flowers And ability to attract wildlife.

Other Names: Blazing Star

Habitat: Dry prairies, sand dunes, alvars, often associated with limestone or calcium rich soils

Form: Smooth, unbranched plants, up to 60cm

Foliage: Grass like, longest leaves on stem are up to 25cm long with the leaves getting smaller upward along the stem

Blooms: July-September

Fruit: Flower heads are alternate and each flower bract has 10-35 small purple disked flowers

Wildlife Value: Attracts butterflies, hummingbirds and bees

Human Value: A tea was made from the roots and used to treat ailments such as kidney and bladder infections, sore throats and colic

Wild Bergamot – Monarda Fistulosa

Other Names: Bee Balm
Habitat: Prairies, old fields, roadsides
Form: Grows from creeping underground rhizomes 30-100cm tall
Flower: Pink flowers that resemble pom-poms
Foliage: Oval to lance shaped leaves (3-10cm long), opposite arrangement on stem, leaf margins are usually toothed, leaves have minty aroma
Blooms: June-September
Wildlife Value: Very attractive to bees and butterflies
Human Value: The leaves were used to make mint tea and as a seasoning. The leaves are also recognized as having medicinal properties.

Did You Know…
The leaves of Wild Bergamot are what Gives Earl Gray tea its distinct flavour.
The generic name Monarda suggests that this plant was name after Nicoles Monardes, a 16th century writer who specialized in medicinal plants.
The specific name Fistulosa mean tubular and refers to the unique shape of the flower

Canada Tick-Trefoil – Desmodium Canadense

Other Names: Showy Tick-Trefoil, stick-tight
Habitat: Tallgrass prairies, meadows, open woods
Form: Upright, slender, hairy stems giving the plant a bushy look
Grows up to 1.5 metres tall
Flower: Rosy purple flowers arranged in a sense cluster
Foliage: Compound leaves with 3-5 leaflets per leaf
Blooms: July-August
Fruit: Reddish-brown seeds, seeds occurring 3-5 segmented pods that resemble a flattened chain of beads
Wildlife Value: Favourite food source of deer, wild turkeys and ruffed grouse
Human Value: Convert nitrogen into a less complex form tat can be consumed by other plants. Farmer rely on them to improve productivity of fields.

Did You Know…
Tick-trefoils are also known as Stick-tights because the rough Flattened seeds cling tenaciously to Clothing, shoelaces and hair.

Heath Aster – Aster Ericoide

Did You Know…
Heath Aster is the last native plant to flower in Ontario.

Other Names: Frost-weed aster or white aster
Habitat: Upland prairies, pastures and old fields
Form: Slender, erect and open-branched, smooth stem and grows up to 90cm tall
Flower: Miniature white to pink daisy like flowers with yellow centres
Foliage: Alternate leaves that are small, narrow and pointed
Blooms: August-October
Fruit: Tiny seeds with a tuft or white bristles to help them blow away
Wildlife Value: Provides nectar and pollen for bees and other insects
Human Value: Used for ornamental purposes

Round Headed Bushclover – Lespedeza Capitata

Did You Know…
The roots of round headed bushclover extend 1-2.5 metres into the soil and are apparently indestructible. Its sprouts can be grown in flats and eaten like alfalfa or bean sprouts

Other Names: Roundhead
Habitat: Prairies, open woods, disturbed areas
Form: Grows up to 1.8 metres tall
Flower: Greenish-white, pea-like flower heads with a touch of pink near the base
Foliage: Leaves grow in groups of 3 and resemble clover
Blooms: July-September
Fruit: Single seeded fruit capsules
Wildlife Value: Seeds provide food for birds and other wildlife
Human Value: Well suited for erosion control and pasture for cattle

CENTRAL ONTARIO'S RICE LAKE PLAINS TALLGRASS PRAIRIE

LESSON PLANS

Pre-Site Lesson #1
Ecosystem Vocabulary – Spelling Exercise

Grade: 7
Subject: Language Arts, Geography, Science
Skills: Analysis, application, concept development, problem solving, small group work, synthesis
Duration: 1 period
Group Size: Individual or small group work

CURRICULUM LINKS

Language Arts

- Spell familiar words correctly (e.g. words from their oral vocabulary, anchor charts, and shared-guided, and independent reading texts; words used regularly in instruction across the curriculum
- Spell unfamiliar words using a variety of strategies that involve understanding sound-symbol relationships, word structures, word meanings and generalizations
- Confirm spellings and word meanings or word choice using a variety of resources appropriate for the purpose (locate syllables, stress patterns, information about word origins in online and print dictionaries; use thesaurus to explore alternative word choices)

Geography

- Use appropriate vocabulary, including correct geographic terminology

Science

- Use appropriate vocabulary, including correct science terminology

OBJECTIVE

Students will be able to

1) spell ecological concepts
2) Define ecological concepts
3) Apply ecological concepts in classroom setting

METHOD

Students review vocabulary through the use of writing and research skills

BACKGROUND

- The major purpose of this activity is to increase student's familiarity with terms that are important in understanding ecological systems. By becoming familiar with the ecological terms, students will have a better understanding of the terms used when visiting the Tallgrass Prairie Site.

MATERIALS

- List of spelling vocabulary words taken from the glossary in additional resources
- Dictionaries
- Pencils
- Spelling books

PROCEDURE

1. At the beginning of the week write a list of 15 ecological vocabulary words on the board. The words selected should encompass a broad variety of ecological concepts taught in the Ontario curriculum. Some good selections would be:

- Ecology
- Environment
- Carrying Capacity
- Management
- Preservation
- Succession
- Sustainability
- Abiotic
- Species

2. Ask students to write down the vocabulary list in their weekly spelling books.
3. Ask students to use the dictionary/computer to find the definition of each vocabulary word and write it in their spelling books
4. Ask the students to use each vocabulary word in a sentence and write it in their weekly spelling books
5. Ask students to write a one page story in their spelling books incorporating at least seven of the vocabulary words.

6. Give students the week to finish the assignment if they did not get it finished in class and to study the vocabulary words for a spelling test at the end of the week.
7. On Friday, choose ten of the fifteen ecological vocabulary words to include on the spelling test. Ask students to turn to a new page in their spelling books and to prepare for the spelling test. Speak the word out loud to the students and then use the word in a sentence. Repeat the word one last time.

EVALUATION

Collect the spelling books and mark the students spelling tests as well as their weekly work. Record mark in the language strand.

Pre-Site Lesson #2
Environmental Explorer

Grade: 7
Subject: Geography, Current Events, Science, Environmental studies
Skills: Analysis application, classification, comparing similarities and differences, description, discussion, evaluation, interpretation, observation, prediction,
Duration: 45 minutes
Group Size: Relatively small

CURRICULUM LINKS

Geography

- Describe ways in which technology has affected our use of natural resources and the environment
- Explain the concept of sustainable development and its implications for the health of the environment
- Use appropriate vocabulary including correct geographical terminology
- Formulate questions to guide research into problems and points of view regarding the management of natural resources and the environment
- Identify and describe the types of land use (e.g. agricultural, residential, commercial)

Science

- Investigate ways in which natural communities within ecosystems can change and explain how such changes can affect animal and plant populations
- Identify signs of ecological succession in a local ecosystem

OBJECTIVE

To introduce students to the concept of the natural environment. This lesson will allow students to understand the vulnerability of the natural environment and to see how human impacts result in irreversible alterations. It is the hope that this lesson will set the stage for the geography unit on the environment and the science unit on interactions and ecosystems.

METHOD

Students go in an outdoor setting to observe the natural and human environment and how humans have changed the natural environment.

BACKGROUND

People use the environment in many different ways. They use it to meet their basic needs, such as providing fresh drinking water and food. People change the environment by building houses, constructing reservoirs to store fresh water, or perhaps leveling a hill for a shopping center. The look of the environment in any one place is the result of both natural features, such as vegetation, soil, and climate, and human features, such as buildings, roads, and other things people have made. In this lesson, students will use observation skills to analyze changes that people have made to the natural environment. And they will discuss their own opinions and viewpoints—as well as those of others—regarding environmental change

MATERIALS

- Student Worksheet "Environmental Explorer Data Sheet" (Provided)
- Brief statements on environmental issues (prepared by teacher/guide)
- Pencils

PROCEDURE

1. Introduce students to the term "environment." (Environment includes all the things around us—natural features, such as the land, climate, and vegetation; and human features, such as buildings, roads, and other things people have made). Ask students to suggest some basic components of the natural environment (answers may include rocks, water, vegetation, the air, the sun). Next ask students to suggest some basic components of the human environment (answers may include buildings, roads, landfills, and other features that people have added to the landscape). Make sure all students understand these two concepts before proceeding with the lesson.
2. Explain to students that the changes people make to the environment are often viewed in different ways by different people and cultural groups. Ask students if they think the environment should be left alone. Or should it be altered or modified? If so, in what ways and to what extent? If the environment is permanently changed or damaged, how might it affect the future?

3. Distribute the handout Environmental Explorer Data Sheet. Have students read the questions. Tell them that they will be going around the Tallgrass Prairie to observe the environment and to fill out the Environmental Explorer Data Sheet. Give the students a time limit approximately 10-15 minutes then get them back together.
4. Bring the Students Back Together. Once the students have returned to the group, have them list their discoveries of the natural and human environment. Make sure each student has contributed at least one observation.
5. Ask students if they were surprised by anything they observed. Did they discover anything unusual? Was anything they observed confusing to them? Were any observations placed in one column that could go in the other column? If so, ask the students who listed the observations to explain their reasons for categorizing them the way they did. Discuss student responses to the remaining questions on the Environmental Explorer Data Sheet.

   Students may find that not every feature fits neatly into one of the two categories. Suggest they add a third category. Ask students for suggestions as to what to call it. Consider calling it "adapted environment." This category could include features from the natural environment that are placed in a human environment—for example, an ornamental olive tree (natural) used in landscaping around a building (human). Add the third category and list adapted features. Cross out items as they are moved from one list to another.

6. Discuss why there is a need for this third category. Then ask: Is an urban or a rural area more likely to have features that fit in this adapted-environment category? What kind of place might have few or no features that fit into this category?
7. Have students identify ways in which human and adapted features change the natural environment. What natural features do they displace? (Answers may include marsh animals, trees, soil, and birds.) Is such displacement permanent? (If a marsh were removed, the change would be permanent. The marsh wildlife and vegetation would not return, but birds might return if trees were planted.)
8. Select students to explain their positions on the issues. Allow equal time for all points of view to be expressed. After discussion, let

students change their positions. Point out that additional information can be the basis for changing position on an issue. Allow for movement and additional discussion. Students may question each other's positions.

Concluding the Lesson

Review the terms "natural environment," "human environment," and "adapted environment" and discuss some positive aspects of human and adapted environments. (These may include noise barriers, removal of mosquito breeding areas, more homes.) Discuss some negative aspects of human and adapted environments. (These may include loss of animal habitat and a resulting loss of some animals, loss of water-purifying marshes, obstructed views.)

WORKSHEET #1 – Environmental Explorer Data Sheet

Name: _____

Environment to be studied: _____

(Observe the environment and write your observations below.)

1. List five features of the natural environment.

2. List five features of the human environment you observe.

3. List some features of the natural environment that are used by humans. How are they used?

4. List the features of the environment that you particularly liked. Why?

5. List the features of the environment that you particularly disliked. Why?

6. What signs of change did you observe in the environment?

Pre-Site Lesson #3
Tallgrass Prairie Species Research Project

Grade: 7
Subject: Language Arts, Geography, Science
Skills: Analysis, application, concept development, problem solving, research skills, presentation skills, small group work
Duration: 1 week (Duration: 2 hours 20 minutes to 3 ½ hours, plus time outside classroom)
Group Size: Individual or small group

CURRICULUM LINKS

Geography

- Explain the geographic concept of environment and interaction
- Explain the concept of sustainable development and its implication for environment
- Describe positive and negative ways in which human activity can affect resource sustainability

Language Arts

- Locate relevant information using a variety of primary and secondary sources
- Communicate the results of inquiries and analysis for specific purposes and audiences using computer slide shows, videos, websites, presentations, written notes and descriptions.

Science

- Identify biotic and abiotic elements in an ecosystem
- Identify populations of organisms within an ecosystem and the factors that contribute to their survival in that ecosystem
- Identify and explain the roles of producers, consumers, and decomposers in food chains and their effect on the environment (i.e. plants as producers)
- Interpret food webs and show the transfer of energy among several food chains and evaluate the effects of elimination or weakening of any part of the food web

OBJECTIVES

It is expected that students will:

- Analyze the roles of organisms as part of interconnected food webs, populations, communities and ecosystems

- Assess survival needs and interactions between organisms and the environment
- Assess the requirements for sustaining a health local ecosystem
- Evaluate the human impacts on local ecosystems
- Explain how the habitats provide basic needs for the organisms living in them
- Evaluate the effects of habitat loss on the species
- Demonstrate respect for the organism

METHOD

Students are required to complete a research project of a chosen/given topic from one of the species at the Tallgrass Prairie Lands and present it to the class.

BACKGROUND

Students research the different types of flowers and grasses located in the Tallgrass Prairie Lands and then communicate their findings on their chosen topic, food chains, effects of habitat loss and other ecological concepts. This lesson plan complements Tallgrass Prairie Lands themes: ecological integrity and greater park ecosystem. Sub-themes are: species at risk, ecosystem health, biodiversity and local stakeholders. Canada are endangered – including the one that occurs in British Columbia

MATERIALS

- Copy of the different types of flowers and grasses available on the site (provided)
- Word Search (provided)
- Dictionary
- Computer (Internet)
- Lined Paper, construction paper
- Pens, pencils, markers
- Magazines, articles

PROCEDURE

Preparation Activity (Allow 10-15 minutes)

Have students complete the Word Search worksheet. This provides an introduction to the types of grasses and flowers on the site, and an

opportunity for students to review key science vocabulary words and concepts.

1. Discussion (Allow 10-15 minutes)
   As a class, review concepts and terms that may be used in student projects. List words on the board and ask students to explain and give examples of each. Use diagrams when necessary to clarify ideas.

   Suggested vocabulary for review:
   Food chain: an interdependent chain of plants and animals – e.g. plants/producers and animals/consumers, involves flow of food energy
   Food web: individual food chains that are linked
   Habitat: provides food, water, shelter, space for plants and animals
   Ecosystem: a system of living and non-living things
   Communities: an association of plants and animals
   Biotic: living
   Abiotic: non-living
   Producer: produces food – e.g., plants
   Consumer: uses the producer for food, can have primary and secondary consumers
   Decomposer: plant or animal that breaks down dead material for nutrients
   Herbivores: plant eater
   Stamen: the male pollen-producing reproductive organ of a flower, usually consisting of a filament and an anther.
   Pistil: the ovule-bearing or seed-bearing female organ of a flower, consisting when complete of ovary, style, and stigma
   Pollination: the transfer of pollen from the anther to the stigma

2. Research Project (Minimum 2-3 hours, plus time outside the classroom)
   Students are to research one of the different types of plants and grasses from the Tallgrass Prairie Lands. Discuss why you have chosen the plant/grass and its habitat as an example (For example, the Canada Tick-Trefoil is a local species, they are deer's favourite food source, its habitat is grassland and they reside in an area you'll be visiting as a class).

Students are to use books, magazines, publications, recommended Web sites and any other reliable sources in their research. Students will then communicate their research in one of the following formats (or any other forms you can think of that would be suitable):

- a mural
- a display project
- a board game
- an article for the local newspaper
- a creative interview for radio or television, (as though interviewing organisms involved)
- an educational webpage
- a group presentation
- a group theatrical presentation
- a letter to a premier or member of the legislative assembly
- an essay or report

3. Students may choose to work individually or in groups. Whatever format students chose, they must convey the following points:

- The findings of at least one scientific study about the grasses/plants, (specifically, how was the study done? What were the main results? What do the results teach us about habitat loss and plant/grasses and other organisms?)
- A description of a food chain or food web that the plant/grass is part of
- The impact of habitat loss on the chosen grass/plant and other surrounding animals and plants

EVALUATION

The project should:

- Show an understanding of a scientific investigation conducted about the grassland
- Suggest at least one action people can take to curtail habitat loss
- Illustrate how the plant/grass is connected to other organisms
- Evaluate the effects of habitat loss for the plant/grass and give reasons why they and their habitat must be protected

- Show a respect for organisms and their habitats
- The project should be marked according to the achievement chart for Social Studies, History and Geography (provided)

WORKSHEET #1 –Species Word Search

Name _____ Date _____

G D H N S S J F D R G I D Y A C S G Z T C S
V S D U F H D H G C K I B H I Z H B R T Z J
C E T Y S J X V E H G Z D T D G Z F J S D G
F B D H Z H R S H Z F T O A E G Z G G A D C
F E Y R E Y S U B X G I S A T B S T A M E N
O P I S T I N X Z X B H J K I T J Z S J B H
U E D H Y G A A R A V M K S A X C J M A H C
Y Z K Z X B C J A Q Z C K C N H U E O P Z A
T H E B I V O R A G T A H N Z J Z C A M O P
R J F D A E G Z R Z B S J D Z V P O X L K Z
F K C E S Z G H A Q R A J C J M X S A T Z O
B L V C O M M U N I T I E S Z D B Y Z G H S

N O O T P B A G O P C F Z B Z S H T Z H X R
K P I F Y G A A X P G C J J O W X E H X I E
P O L I N A T I O N T E S Y Y Z O M S R P C
D I O D R Z A G D G G I U V O Z V K Z D U U
E U L E T X A S R G J O B Z J S J C A Y J D
C Y I S F N D H S P B Z G E Y A S D D O P O
V T B A G I S S Y F O O D W E B S Y A H N R
B R R I H T H H S Y Z N D L K S C J J L S P
N Q T V O E R H S A J A S P N Z Q B H E E N
Z X Y B O T X B H J H E S A Q T Z N F S P S
A S B N L A I A Z Y A Z U W Q L V S O P C X
Q A C S K B Z C V C B L A E A Z N P O Z R A
P M D R R A A O E V I T B X A A M X D H A X
L J S F A S R N Z C T Z G W U O A Y C Z Z H
R Y X U D E A S A A A T Z E C A T A H T T S
E T A S C R E U E P T G E E P H U X A Z Y A
D R E N V O F M Q A M Z D Z O H S H I H U Y
O E R O N O Z E A A S Q E Q X Z A X N Z Z X
I D T C M F A R Q Q T A Z A C A P Y T Z T P

Find the Following Words:

ABIOTIC
PISTEN
FOOD CHAIN
BIOTIC
FOOD WEB
STAMEN
HERBIVOR
COMMUNTIES
ECOSYSTEM
POLINATION
CONSUMER
HABITAT
PRODUCER
DECOMPOSER

WORKSHEET #2 –Species Word Search

Name _____ Date _____

Life Cycle of Flowering Plants

Find each of the following words.

WATER	WEATHER	PERENNIALS
SEEDLING	BIENNIALS	POLLEN
SEED FORMATION	GERMINATION	ANNUALS
GERMINATE	STORED FOOD	GROWTH
SEED COAT	NECTAR	POLLINATION
SEEDS	CROSS-POLLINATION	ENVIRONMENT
AIR		

S E D L I N G G E R M I N A T I O N E T O E O N W C
O O T G P O L L E N D N O I B I E N N I A L S L E A V
T S P N O I T A N I L L O P S S O R C E O R T N A L X
R I A T A A S E E D F O R M A T I O N O A E R T E S
I O N L S N B I E N N I A L S A I A S R T E C R H C M
R N H C E S S J U R M U H N A T I M I A N T A E N G
L A H T A R E S E R S O N I O I A D P A W L E I R N C
N S T U E T E D S E R L M E P E R R E T A W R N L P O
R U E A C C L A T E D D R A D O O F D E R O T S F A L
N G S D E P W E R C E L E U I S L A I N N E R E P G P
G R O W T N C S T G O S I N N E L H G R O W T H T U
F A P O L L I N A T I O N A E N M N T A I C D E I S F P
T N E M N O R I V N E W T R G H A A N N A U L S A M
N U R S P N I O E I N N W G E N E I E E E I O E T G J

Onsite Lesson – Station #1
Water Investigations

Grade: 7
Subject: Science, Geography
Skills: Analysis, application, classification, comparing similarities and differences, computation, description, discussion, drawing, evaluation, interpretation, measuring, observation, prediction
Duration: 45 minutes
Group Size: Relatively small

CURRICULUM LINKS

Science

- Demonstrate an understanding of the interactions of plants, animals and micro-organisms in an ecosystem
- Investigate the interactions of an ecosystem, and identify factors that affect the balance among the components of an ecosystem
- Identify biotic and abiotic elements in an ecosystem
- Formulate questions about and identify the needs of various living things in an ecosystem and explore possible answers to these questions and ways of meeting those needs
- Use appropriate vocabulary including correct science terminology to communicate ideas, procedures and results
- Compile qualitative and quantitative data gathered through investigation in order to record and present results using diagrams, frequency tables and bar graphs

Geography

- Explain how natural patters result from the interaction of several factors, including climate, landforms, soil types, and competition for available nutrients
- Use appropriate vocabulary, including correct geography terminology to describe observations
- Draw diagrams of river profiles

OBJECTIVES

Students will be able to:

1) Identify several aquatic organisms
2) Assess the relative environmental quality of a stream or pond based on indicators of pH, water temperature and the presence of a diversity of organisms

METHOD

Students investigate a stream or pond using sampling techniques

BACKGROUND

In streams and ponds the presence or absence of certain organisms called indicator species reveals much about the quality of the water. These creatures compose a biotic index. That is, their absence or presence tells us something about water quality.

Water with a rich variety and varied range of aquatic creatures is usually a healthy environment whereas water with just a few different species usually indicates conditions that are less healthy. Pollution generally reduces the quality of the environment and in the turn the diversity of life forms.

The major purpose of this activity is for students to be able to recognize indicators of environmental quality in streams, ponds or other aquatic habitats.

MATERIALS

- Student worksheets #1 and #2 (provided)
- Sampling equipment (nets, sieves, trays, containers)
- Magnifying lenses
- Eye droppers
- Water quality test kit (to test pH and dissolved oxygen)
- Thermometer
- Meter stick

PROCEDURE

1. Find a small, fairly shallow, slow moving stream or pond. Advise students in advance to dress for the setting.
2. Brief the students on habitat courtesies. Emphasize that all wildlife is to be returned to its habitat and encourage care when collected samples.

3. Start by observing the water. Look for organisms on the surface and in the depths. Using the sampling equipment, have the students collect as many different forms of animal life as possible. Place the animals to be observed in the trays, filled with an adequate amount of water and then place them in the shade for further observation
4. Have the students identify and draw the animals on worksheet #1 – those observed in their natural setting and those temporarily removed for observation in the collection containers. Ask them to fill in the number of each kind found and describe the actual location where the animal was found. Once this is accomplished return the animals to their natural habitat
5. Encourage students to discuss their observations
6. Test the water at the field site for other indicators of quality. Using the water quality kit, have the students determine the pH and the temperature of the water as well as the air temperature. Also measure the amount of dissolved oxygen. This data is to be recorded on student worksheet #2.
7. Help the students understand hat the value for pH, water and air temperature affect the diversity of life forms. Ask whether they would expect the same variety in other locations. Summarize the study with a re-emphasis that the diversity of specific animals is an overall indicator of environmental quality.

NOTE: a simple water kit can be obtained by borrowing it fro a high school biology teacher. They are called hydrion kits or Hach kits. The field trip site may also carry them.

WORKSHEET #1 – ORGANISIMS

Prediction/Name of Organism	Sketch of Organism	Location	Number Found

WORKSHEET #2: WATER TESTING

Measurement	Observations	Predictions
Water Temperature		
Air Temperature		
pH Acidity vs. Alkalinity		
Oxygen Dissolved		

Onsite Lesson – Station #2
Naturalist Activity

Grade: 7
Subject: Language Arts
Skills: Application, description, discussion, drawing, media construction, observation, visualization, writing
Duration: 45 minutes
Group Size: relatively small

CURRICULUM LINKS

Language Arts

- Demonstrate an understanding of appropriate listening behaviour by adapting active listening strategies to suit a wide variety of situations, including group activities
- Identify a variety of listening comprehension strategies and use them appropriately before, during and after listening in order to understand and clarify.
- Identify an appropriate form to suit the specific purpose and audience for a media they plan to create
- Identify conventions and techniques appropriate to the form chosen for a media they plan to create and how they will use the conventions and techniques to help communicate their message (poem, drawing, words)
- Explain how skills in listening, speaking, viewing, and writing help them make sense of and produce media.

OBJECTIVES

Students will be able to:

1) Observe and describe their surroundings in a ecosystem
2) Record their observation and descriptions in a written and visual form

METHOD

Students go into an outdoor setting to make and write in journals they design

BACKGROUND

A naturalist is a person who studies nature, especially by direct observation of plants, animals and their environments. Naturalists often spend a lot of time in the outdoors, and they often record their observations in some form – from sketches, drawings, paintings, photos and poetry. Each person's motivation will be unique.

People benefit today form the insights and observations of people who have been fascinated by the wonders of the natural environment. The late Aldo Leopold, known as the father of conservation in North America, and the late Roderick, L. Haig-Brown are among those who have captured their insights in words and offered them to others. Most of the naturalists who put their observations in poetry and prose carry a small journal with them as they wonder natural environments.

The purpose of this activity is for students to make their own journals and to acquire experience in using a journal to record their observations and thoughts.

MATERIALS

- Construction Paper
- Unlined paper
- Stapler
- Pens, markers, crayons, pencils

PROCEDURE

1. Sit in a circle in an area of the Tallgrass Prairie Site that allows a wide range of visuals.
2. Ask students to sit quietly, listening carefully for any sounds. Ask them to look with "soft eyes" – that is, eyes that do not focus specifically on any one thing, but broadly sense what is in the environment. The students may move their heads at first in a scanning motion until they are accustomed to seeing without focusing on one thing at a time. "Hard eyes" are good for looking closely. Encourage students to try looking with both soft and hard eyes, trying to notice the differences in how they feel and what they see.
3. Talk with the students about what they see, feel and notice. A guided imagery can be useful at this point (where the student closes their

eyes and you ask them to visualize what you describe). Possibly read an excerpt from the writings of a naturalist.

4. Get out materials and ask the students to make their own journals. Simply fold the construction paper in half and put a few folded blank pages inside and staple.
5. Give students some time, about 15 minutes to make and personalize their journal. Ask each student to find a quiet place to make a drawing of something they see, write about something they see, write about the way that they feel. The important thing is to stress that the journal is theirs – to fill it with whatever they choose – it is a way to keep memories about the natural environment.
6. Have the group come back together. Discuss the value of journals. In addition to recording impressions, feelings, and observations, a journal can become a log of important data to be referred to later. It can reflect changes in ecosystems, vegetative types, and attitudes about things.

Onsite Lesson – Station #3
Biotic Species Hunt

Grade: 7
Subject: Science, Geography
Skills: Analysis, application, classification, comparing similarities and differences, computation, description, discussion, drawing, evaluation, interpretation, measuring, observation, prediction
Duration: 45 minutes
Group Size: Relatively small

CURRICULUM LINKS

Geography

- Create and use maps for a variety of purposes
- Use maps to identify patters in a given environment
- Draw cross-sectional diagrams to represent landforms/river profiles
- Use contour lines to represent elevation on maps

Science

- Demonstrate an understanding of the interactions of plants, animals and micro-organisms in an ecosystem
- Investigate the interactions of an ecosystem, and identify factors that affect the balance among the components of an ecosystem
- Identify biotic and abiotic elements in an ecosystem
- Use appropriate vocabulary including correct science terminology to communicate ideas, procedures and results

OBJECTIVE

Students will be able to use the knowledge learned in classroom activities (research project pre-lesson) and apply it to real life situations. This 'hands on experience' should strengthen the knowledge of the plants, grasses and shrubs that thrive in a tallgrass prairie environment.

METHOD

Students must go into an outdoor setting and search for particular species given to them on a worksheet.

BACKGROUND

The purpose of this assignment is to get students familiar with the different species of plants, grasses, and shrubs look like in a normal occurrence and if they can identify them with clues given.

MATERIALS

- Student worksheet #1 and #2 (provided)
- Pencils
- Guide to the Tallgrass Prairie
- Measuring tape or Metre Rulers

PROCEDURE

1. Gather students around and reveal to them they will participate in a scavenger hunt around the Tallgrass Prairie Site
2. Ask the students what kind of species they would expect to find on location at the Tallgrass Prairie and ask them what some of their characteristics are
3. Explain what the activity requires the students to do. They must search the Tallgrass (with supervisors) to locate the specific plant given to them on the worksheet. There will be hints given to the students to figure what the plant is.
4. Split the students in pairs so they can work on the hunt together.
5. The picture of the object is given with some helpful hints or its name and the student must use the information given to find the plant or grass and fill in the blanks.
6. After all the blanks are filled in, students are to compose a map of the tallgrass prairie and plot where the hunted species were located. This map should include a fully labeled legend, direction (N,S,E,W), contour lines for rises in elevation, buildings, trails/paths and the biotic species.

WORKSHEET #1 – Abiotc Scavenger Hunt (Teacher Copy)

What does it look like?	Characteristics	What Am I?
	Thrives in disturbed areas Also known as Turkey Foot Can grow up to 2.5 metres	Big Bluestem
	40-50 cm tall Purple-green, hairy stem. Button like central disc surrounded by 8-20 yellow flowers	Black-Eyed Susan
	Other names: Blazing Star Most abundant following fires. Small purple disked flowers	Cylindrical Blazingstar
	Grows upright in tufted clumps. Stems are blue-green in the spring, yellow in the summer and copper in the late fall. Single, white, hairy flower	Little Bluestem
	Nutritious and preferred by deer and livestock. Long, slender and brown Bright yellow stamens	Indian Grass
	Slender, erect and open branched, smooth stem and grows up to 90cm tall. Miniature white to pink flowers with yellow centre	Heath Aster
	Pink flowers that resemble pom-poms	Wild Bergamot
	Bunchgrass, grows up to 1.3 meters tall. Single, bushy flower that grows above leaves.	Canada Wild Rye

WORKSHEET #1 – Abiotc Scavenger Hunt (Student Copy)

What does it look like?	Characteristics	What Am I?
	Thrives in disturbed areas Also known as Turkey Foot Can grow up to 2.5 metres	
		Black-Eyed Susan
	Other names: Blazing Star Most abundant following fires Small purple disked flowers	
		Little Bluestem
	nutritious and preferred by deer and livestock Long, slender and brown Bright yellow stamens	
		Heath Aster
	Pink flowers that resemble pom-poms Leaves have minty aroma Gives Earl Gray its taste	
		

Student Worksheet #2

Central Ontario's Rice Lake Plains Tallgrass Prairie Map

Onsite Lesson – Station #4
Tallgrass Prairie Soil Test

Grade: 7
Subject: Geography, Science
Skills: Analysis, application, description, discussion, observation, problem solving, small group work, synthesis
Duration: 45 minutes
Group Size: Individual or small group work

CURRICULUM LINKS

Science

- Demonstrate an understanding of the interactions of plants, animals, fungi, soil and micro-organisms in an ecosystem
- Investigate the interactions in an ecosystem and identify factors that affect the balance among the components of an ecosystem
- Explain the importance of micro-organisms in recycling organic matter
- Formulate questions about and identify the needs of various living things in an ecosystem
- Explain the importance of plants as sources of energy and as habitats for wildlife
- Use appropriate vocabulary, including correct science terminology to communicate ideas, procedures and results

Geography

- Identify the effects of natural phenomenon on the environment
- Explain how natural vegetation patterns result from the interaction of several factors (type of soil)
- Interpret and compare climate effects
- Use appropriate vocabulary, including correct geographic terminology to describe their inquiries and observations.

OBJECTVIE

Students will be able to evaluate the importance of soil and recognize that soil in many forms contributes to the diversity and balance of ecological systems and environments.

METHOD

Students experiment with and test soil at the tallgrass prairie site.

BACKGROUND

Soil may be defined as the naturally deposited material that covers the Earth's surface and is capable of supporting plant growth and development. All life on Earth, including plants, animals and human beings, depends on soil for existence. Soil is formed as a result of natural decomposition processes that occur over extremely long periods of time. There are five basic factors involved in the formation of soil:

1. material from which the soil is derived
2. living organic matter
3. climate
4. slope and land form, or "relief"
5. time

Natural soils vary greatly in their composition. Because soil formation requires a long period of time and all life depends on soil in some way, conservation and management of soil is critical. Soil testing, or analysis of soil composition, is a very important step in the conservation of soil.

MATERIALS

- pen and paper
- magnifying glass
- pH testing kit/soil testing kit
- Container
- Air thermometer
- Soil thermometer

note: soil testing kits can be obtained from your local high school science teacher or from the board office

PROCEDURE

1. Identify an area on the tallgrass site in which you will collect soil. Make notes regarding the environmental conditions of the area from which you will collect sample.

2. Before taking the soil samples, measure and record the soil temperature and the air temperature right above the soil.
3. Ask the students to take a sample of soil and run it through their hands. Then ask them to record the visual characteristics of the soil. (i.e. color, materials in the soil).
4. Ask the students to test the pH level of the soil and record it on the sheet.
5. To determine which type of soil is at the grasslands prairie site have students follow the directions on the soil texture worksheet (provided) and record their findings on the worksheet.
6. After all students are finished, bring everyone back onto a circle and discuss the importance of soil and the type of soil for nurturing a specific environment. Also discuss the types of species this soil supports in the ecosystem.

Worksheet #1: Soil Testing

Step 1: To first determine what type of soil you have, each person should take a small sample of soil from the area, and follow directions on the attached soil texturing sheet. (You will need to add a few drops of water to your soil sample at the beginning until you achieve the 'sticky point'). What textural class is your soil? Also take note of the colour of the soil. Why is this type of soil characteristic of the grassland ecosystem?

Step 2: Using your pH testing equipment, determine the pH of the soil. What were your results?

Step 3: Take a close look at the soil in your area. Is there any evidence of soil disturbance?

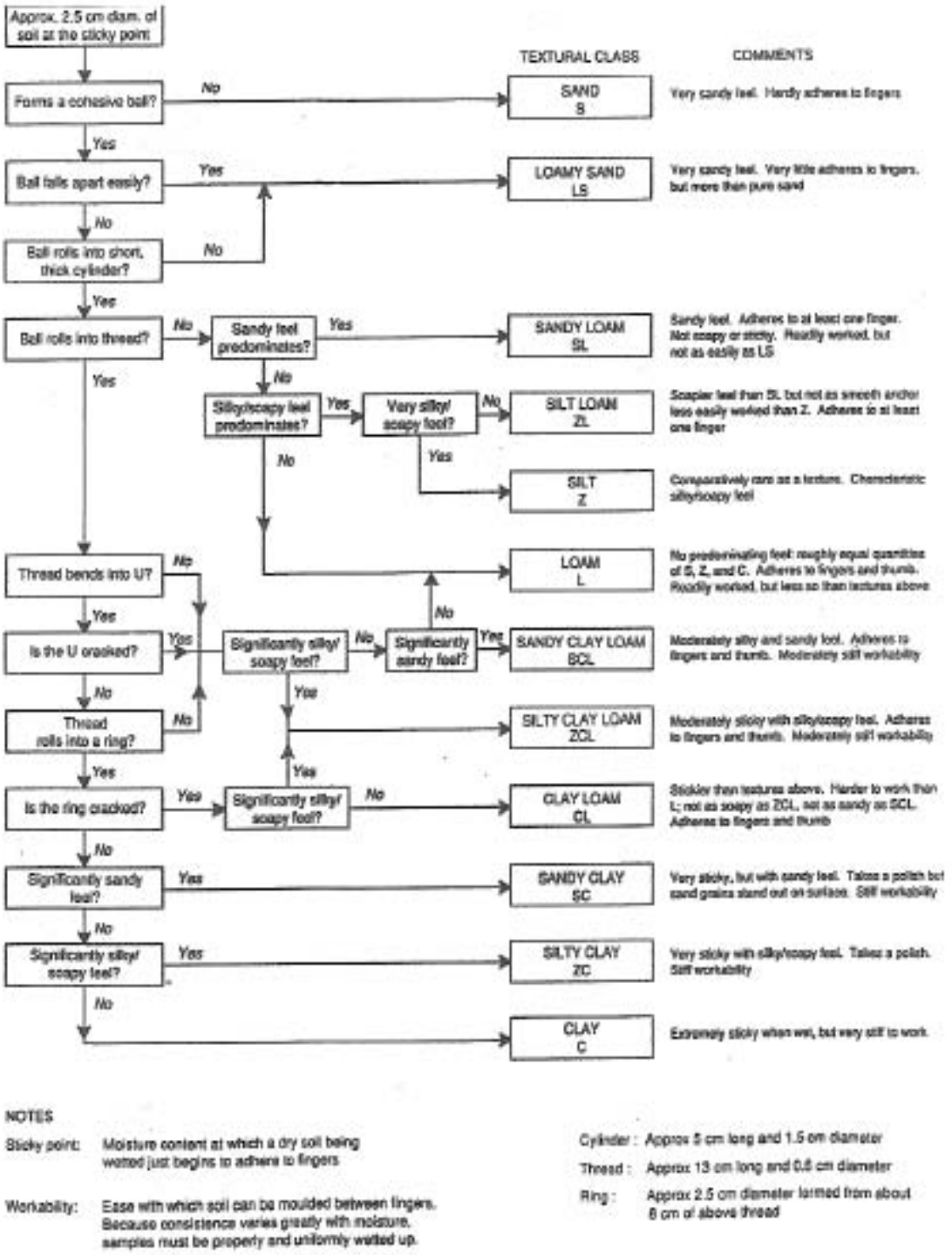


Figure 3. Determination of soil texture by hand texturing.

Post Site Lesson Plan – Cumulating Activity
Improving Ecosystem Habitats and Natural Resources in the Community

Grade: 7
Subject: Science, Geography, Language Arts
Skills: Analysis, application, classification, comparing similarities and differences, computation, description, discussion, drawing, evaluation, interpretation, measuring, observation, prediction
Duration: 4 periods (4th period for presentations)
Group Size: 4 or 5 people per group

CURRICULUM LINKS

Language Arts

- General ideas about more challenging topics and identify those most appropriate for the purpose.
- Gather information to support ideas for writing, using a wide range of print and electronic resources
- Produce pieces of published work to meet identified criteria based on the expectations (i.e. adequacy of information and ideas, logic and effectiveness of organization)
- Demonstrate an understanding of appropriate speaking behaviour in most situations, adapting contributions and responses to suit the purpose and audience.
- Communicate orally in a clear, coherent manner, using a structure and style appropriate to both the topic and the intended audience.
- Use appropriate words, phrases and terminology from the full range of their vocabulary to engage and interest the intended audience
- Use a variety of visual aids to support and enhance oral presentation

Science

- Identify populations of organisms within an ecosystem and the factors that contribute to their survival in that ecosystem
- Formulate questions about and identify the needs of various living things in an ecosystem, and explore the possible answers to these questions
- Use appropriate vocabulary, including correct science terminology, to communicate ideas, procedures and results
- Describe the conditions in an ecosystem that are essential to the growth and reproduction of plants and micro-organisms.

Geography

- Explain how natural vegetation patterns result from the interaction of several factors, including climate, landforms, soil types, and competition for available nutrients
- Explain the concept of sustainable development
- Formulate questions to guide research into problems and points of view regarding management of natural areas.
- Locate relevant information using a variety of primary and secondary sources (i.e. photographs, interviews, field studies, print material)
- Communicate the results of inquiries and analysis for specific purposes using computers, models, written notes, diagrams, maps and graphs.
- Use appropriate vocabulary including correct geographic terminology to describe their inquiries and observations

OBJECTIVES

Students will be able to

1) Apply their knowledge of wildlife by describing essential components of habitat in an arrangement appropriate for the wildlife they identify; and
2) Evaluate compatible and incompatible uses of an area by people and specified kinds of wildlife

METHOD

Students design and accomplish a project to improve a wildlife/plant habitat in their community

BACKGROUND

This activity provides an opportunity for students to evaluate and apply much of what they have learned about wildlife and its needs. The major purpose of this activity is to provide students with experience in looking at their won communities; applying knowledge and skills they have acquired; evaluating and experiencing the possibilities of enhancing their communities as places within which both people and wildlife can live suitably. This is a very effective cumulating activity for a unit.

MATERIALS

- Writing and drawing materials
- Poster or butcher paper
- Or model making materials like clay

PROCEDURE

1. Ask students whether their community could benefit from improved areas for wildlife habitat. If yes, this activity provides a process for helping make such improvements. If a need is identified, the scope of such a project is a major decision. Habitat improvement projects can be large or small. If a project from this activity is actually to be implemented:
   - It should be within the scope and means of the students to experience success with it
   - It should clearly be of benefit to wildlife and the community
2. After general discussion, ask the students to divide into groups of four or five. Give each group the task of beginning a design for a habitat improvement project. The project should involve native plants and animals and make a contribution to the community. Provide time for the students to discuss and make decisions about:
   a. What will be its purpose?
   b. What animals and plants will it serve?
   c. Will people be allowed to visit?
   d. If people can visit, what will they be allowed to do? What won't they be allowed to do?
   e. What positive contributions might this improved wildlife habitat area make to the community?
   f. What possible problems could arise, if any?
   g. What costs will be involved? Who will pay? How?
   h. Where will the area be? How large will it be?
   i. What are the habitat needs of any animals who will live there? What species of animals and plans can live in the size of land area that will be available?
   j. What specific kinds of plans (herbs, shrubs, trees, grasses etc.) are needed and in what arrangement?
   k. What will be the water sources? How will air and water quality be maintained?

l. What kinds of programs, if any, will be necessary to maintain the area once it has been improved?
m. Who must be contacted in order for this project to be undertaken? What permissions will be needed? From whom?

3. Ask each of the groups to prepare the following:
    a. A written description of their habitat improvement project, including its location, characteristics, inhabitants, and purposes.
    b. A map or model to scale of the area. The map or model can include:
        i. Habitat components of various species
        ii. Wildlife living in the area, in their appropriate locations
        iii. Bodies of water, natural or made
        iv. A key to mark major landmarks
        v. Major food sources and types (berry patch for birds, insect community in hedgerows)
        vi. Areas developed for human access
        vii. Etc.
4. Ask each group to display their plans. Have each group set up their project on desks and have students/teachers/parents, walk around and view each project. After all the students have had an opportunity to read the background information and see the map or model of each habitat improvement project, ask the students to talk about what they learned in the process of creating the designs. Finally, ask students to summarize what seemed to be the most important things to remember about designing such an area (e.g. size appropriate to wildlife, diversity, native elements, appropriateness to community.)

EVALUATION

- Evaluate each group according to the achievement chart associated with geography and language arts.

Achievement Levels: Science and Technology, Grades 1-8

Knowledge/Skills	Level 1	Level 2	Level 3	Level 4
Understanding of basic concepts	**The student:**			
	– shows understanding of few of the basic concepts	– shows understanding of some of the basic concepts	– shows understanding of most of the basic concepts	– shows understanding of all of the basic concepts
	– demonstrates significant misconceptions	– demonstrates minor misconceptions	– demonstrates no significant misconceptions	– demonstrates no misconceptions
	– gives explanations showing limited understanding of the concepts	– gives partial explanations	– usually gives complete or nearly complete explanations	– always gives complete explanations
Inquiry and design skills (including skills in the safe use of tools, equipment, and materials)*	**The student:**			
	– applies few of the required skills and strategies	– applies some of the required skills and strategies	– applies most of the required skills and strategies	– applies all (or almost all) of the required skills and strategies
	– shows little awareness of safety procedures	– shows some awareness of safety procedures	– usually shows awareness of safety procedures	– consistently shows awareness of safety procedures
	– uses tools, equipment, and materials correctly only with assistance	– uses tools, equipment, and materials correctly with some assistance	– uses tools, equipment, and materials correctly with only occasional assistance	– uses tools, equipment, and materials correctly with little or no assistance
Communication of required knowledge	**The student:**			
	– communicates with little clarity and precision	– communicates with some clarity and precision	– generally communicates with clarity and precision	– consistently communicates with clarity and precision
	– rarely uses appropriate science and technology terminology and units of measurement	– sometimes uses appropriate science and technology terminology and units of measurement	– usually uses appropriate science and technology terminology and units of measurement	– consistently uses appropriate science and technology terminology and units of measurement
Relating of science and technology to each other and to the world outside the school	**The student:**			
	– shows little understanding of connections between science and technology in familiar contexts	– shows some understanding of connections between science and technology in familiar contexts	– shows understanding of connections between science and technology in familiar contexts	– shows understanding of connections between science and technology in both familiar and unfamiliar contexts
	– shows little understanding of connections between science and technology and the world outside the school	– shows some understanding of connections between science and technology and the world outside the school	– shows understanding of connections between science and technology and the world outside the school	– shows understanding of connections between science and technology and the world outside the school, as well as their implications

Achievement Chart for Social Studies, History, and Geography

Category	Level 1	Level 2	Level 3	Level 4
Knowledge and Understanding *Subject-specific content acquired in each grade (knowledge), and the comprehension of its meaning and significance (understanding)*				
	The student:			
Knowledge of content (e.g., facts, terms, definitions)	– demonstrates limited knowledge of content	– demonstrates some knowledge of content	– demonstrates considerable knowledge of content	– demonstrates thorough knowledge of content
Understanding of content (e.g., concepts, ideas, theories, procedures, processes, methodologies, and/or technologies)	– demonstrates limited understanding of content	– demonstrates some understanding of content	– demonstrates considerable understanding of content	– demonstrates thorough understanding of content
Thinking *The use of critical and creative thinking skills and/or processes*				
	The student:			
Use of planning skills (e.g., focusing research, gathering information, organizing an inquiry, asking questions, setting goals)	– uses planning skills with limited effectiveness	– uses planning skills with some effectiveness	– uses planning skills with considerable effectiveness	– uses planning skills with a high degree of effectiveness
Use of processing skills (e.g., analysing, generating, integrating, synthesizing, evaluating, detecting point of view and bias)	– uses processing skills with limited effectiveness	– uses processing skills with some effectiveness	– uses processing skills with considerable effectiveness	– uses processing skills with a high degree of effectiveness
Use of critical/creative thinking processes (e.g., inquiry process, problem-solving process, decision-making process, research process)	– uses critical/creative thinking processes with limited effectiveness	– uses critical/creative thinking processes with some effectiveness	– uses critical/creative thinking processes with considerable effectiveness	– uses critical/creative thinking processes with a high degree of effectiveness
Communication *The conveying of meaning through various forms*				
	The student:			
Expression and organization of ideas and information (e.g., clear expression, logical organization) in oral, visual, and written forms	– expresses and organizes ideas and information with limited effectiveness	– expresses and organizes ideas and information with some effectiveness	– expresses and organizes ideas and information with considerable effectiveness	– expresses and organizes ideas and information with a high degree of effectiveness

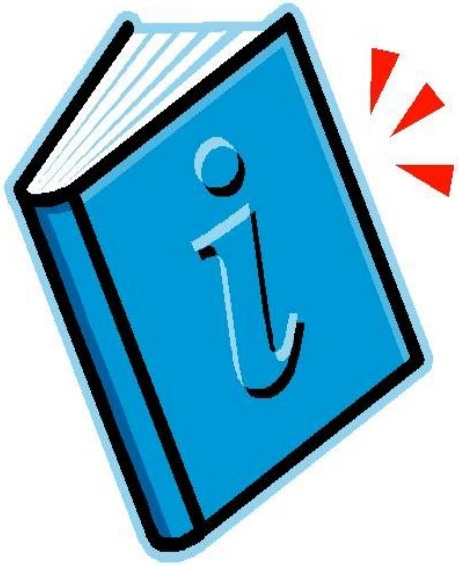
Category	Level 1	Level 2	Level 3	Level 4
Communication (*cont.*)				
	The student:			
Communication for different audiences (e.g., peers, adults) and purposes (e.g., to inform, to persuade) in oral, visual, and written forms	– communicates for different audiences and purposes with limited effectiveness	– communicates for different audiences and purposes with some effectiveness	– communicates for different audiences and purposes with considerable effectiveness	– communicates for different audiences and purposes with a high degree of effectiveness
Use of conventions (e.g., conventions of form, map conventions), vocabulary, and terminology of the discipline in oral, visual, and written forms	– uses conventions, vocabulary, and terminology of the discipline with limited effectiveness	– uses conventions, vocabulary, and terminology of the discipline with some effectiveness	– uses conventions, vocabulary, and terminology of the discipline with considerable effectiveness	– uses conventions, vocabulary, and terminology of the discipline with a high degree of effectiveness
Application *The use of knowledge and skills to make connections within and between various contexts*				
	The student:			
Application of knowledge and skills (e.g., concepts, procedures, processes, and/or technologies) in familiar contexts	– applies knowledge and skills in familiar contexts with limited effectiveness	–applies knowledge and skills in familiar contexts with some effectiveness	– applies knowledge and skills in familiar contexts with considerable effectiveness	– applies knowledge and skills in familiar contexts with a high degree of effectiveness
Transfer of knowledge and skills (e.g., concepts, procedures, methodologies, technologies) to new contexts	– transfers knowledge and skills to new contexts with limited effectiveness	– transfers knowledge and skills to new contexts with some effectiveness	– transfers knowledge and skills to new contexts with considerable effectiveness	– transfers knowledge and skills to new contexts with a high degree of effectiveness
Making connections within and between various contexts (e.g., past, present, and future; environmental; social; cultural; spatial; personal; multidisciplinary)	– makes connections within and between various contexts with limited effectiveness	– makes connections within and between various contexts with some effectiveness	– makes connections within and between various contexts with considerable effectiveness	– makes connections within and between various contexts with a high degree of effectiveness

ACHIEVEMENT CHART – LANGUAGE, GRADES 1–8

Categories	Level 1	Level 2	Level 3	Level 4
Knowledge and Understanding – Subject-specific content acquired in each grade (knowledge), and the comprehension of its meaning and significance (understanding)				
	The student:			
Knowledge of content *(e.g., forms of text; strategies associated with reading, writing, speaking, and listening; elements of style; terminology; conventions)*	demonstrates limited knowledge of content	demonstrates some knowledge of content	demonstrates considerable knowledge of content	demonstrates thorough knowledge of content
Understanding of content *(e.g., concepts; ideas; opinions; relationships among facts, ideas, concepts, themes)*	demonstrates limited understanding of content	demonstrates some understanding of content	demonstrates considerable understanding of content	demonstrates thorough understanding of content
Thinking – The use of critical and creative thinking skills and/or processes				
	The student:			
Use of planning skills *(e.g., generating ideas, gathering information, focusing research, organizing information)*	uses planning skills with limited effectiveness	uses planning skills with some effectiveness	uses planning skills with considerable effectiveness	uses planning skills with a high degree of effectiveness
Use of processing skills *(e.g., making inferences, interpreting, analysing, detecting bias, synthesizing, evaluating, forming conclusions)*	uses processing skills with limited effectiveness	uses processing skills with some effectiveness	uses processing skills with considerable effectiveness	uses processing skills with a high degree of effectiveness
Use of critical/creative thinking processes *(e.g., reading process, writing process, oral discourse, research, critical/creative analysis, critical literacy, metacognition, invention)*	uses critical/creative thinking processes with limited effectiveness	uses critical/creative thinking processes with some effectiveness	uses critical/creative thinking processes with considerable effectiveness	uses critical/creative thinking processes with a high degree of effectiveness

Categories	Level 1	Level 2	Level 3	Level 4
Communication – The conveying of meaning through various forms				
	The student:			
Expression and organization of ideas and information *(e.g., clear expression, logical organization)* **in oral, visual, and written forms, including media forms**	expresses and organizes ideas and information with limited effectiveness	expresses and organizes ideas and information with some effectiveness	expresses and organizes ideas and information with considerable effectiveness	expresses and organizes ideas and information with a high degree of effectiveness
Communication for different audiences and purposes *(e.g., use of appropriate style, voice, point of view, tone)* **in oral, visual, and written forms, including media forms**	communicates for different audiences and purposes with limited effectiveness	communicates for different audiences and purposes with some effectiveness	communicates for different audiences and purposes with considerable effectiveness	communicates for different audiences and purposes with a high degree of effectiveness
Use of conventions *(e.g., grammar, spelling, punctuation, usage)*, **vocabulary, and terminology of the discipline in oral, visual, and written forms, including media forms**	uses conventions, vocabulary, and terminology of the discipline with limited effectiveness	uses conventions, vocabulary, and terminology of the discipline with some effectiveness	uses conventions, vocabulary, and terminology of the discipline with considerable effectiveness	uses conventions, vocabulary, and terminology of the discipline with a high degree of effectiveness
Application – The use of knowledge and skills to make connections within and between various contexts				
	The student:			
Application of knowledge and skills *(e.g., concepts, strategies, processes)* **in familiar contexts**	applies knowledge and skills in familiar contexts with limited effectiveness	applies knowledge and skills in familiar contexts with some effectiveness	applies knowledge and skills in familiar contexts with considerable effectiveness	applies knowledge and skills in familiar contexts with a high degree of effectiveness
Transfer of knowledge and skills *(e.g., concepts, strategies, processes)* **to new contexts**	transfers knowledge and skills to new contexts with limited effectiveness	transfers knowledge and skills to new contexts with some effectiveness	transfers knowledge and skills to new contexts with considerable effectiveness	transfers knowledge and skills to new contexts with a high degree of effectiveness
Making connections within and between various contexts *(e.g., between the text and personal knowledge or experience, other texts, and the world outside the school; between disciplines)*	makes connections within and between various contexts with limited effectiveness	makes connections within and between various contexts with some effectiveness	makes connections within and between various contexts with considerable effectiveness	makes connections within and between various contexts with a high degree of effectiveness

CENTRAL ONTARIO'S RICE LAKE PLAINS TALLGRASS PRAIRIE



ADDITIONAL INFORMATION

Glossary

Animal Community

Animals of various species living within a certain habitat. Each occupying a specific position in its particular environment.

Carrying Capacity

A wildlife management term for an equilibrium expressed as a number indicating the population of any given animal a given area can support

Conservation

The use of natural resources in a way that assures their continuing available to future generations; the wise and intelligent use or protection of natural resources

Controlled Burning

A technique used in forest management, farming or prairie restoration. It stimulates the germination of some desirable forest trees, renewing the forest. The burning of land creates plant and animal habitat; many ecosystems would not exist in the absence of fire

Dominant Species

Plant or animal species, which exert major controlling influence on the community.

Ecology

The study of all the interaction that occur within the biosphere

Ecological niche

The role played by an organism in a biological community; its food preferences requirements for shelter, special behaviors and the timing of its activities.

Ecosystem

A system formed by the interaction of a community of organisms

A collection of living things and the environment in which they live. For example, a prairie ecosystem includes coyotes, the rabbits on which they feed, and the grasses that feed the rabbits.

Endangered

A wildlife species facing imminent extirpation or extinction.

Environment

A total of all the surroundings that has influence on you and your existence including physical, biological and all other factors.

Extinction

The condition of having been removed from existence. An animal or plant facing extinction is one in danger of vanishing from our world

Field Trips

A trip taken by students to a museum, factory, geological area, or environment of certain plants and animals, with the purpose of gaining firsthand knowledge outside of the classroom

Field Trip Curriculum Kit

Curriculum kits specify how a field trip can be incorporated into the classroom by directly relating to curriculum documents. It contains a composition of documents that specify what is involved in the activity and how to implement it. They include information on the regulations of field trips, field trip forms (including parental permission slips for students and volunteer forms).

Food Chain

The transfer of food energy from the source and plants through a series of animals with repeated eating and being eaten.

Food Web

A network of feeding relationships in an ecosystem that develops because few organisms confine themselves to a single source of food.

Grasslands

A vegetative community in which grasses are the most conspicuous members

Habitat

The arrangement of food, water, shelter or cover and space suitable to animals needs. It is the life range which must include food and water as well as escape.

Management

In general terms related to wildlife, the intentional manipulation or non-manipulation of habitat and/or the organisms within the habitat

Multiple Use

A term referring to a system of land management in which the land is used for a variety of purposes.

Non-renewable resource

Nonliving resources such as rocks and minerals; resources which do not regenerate themselves

Outdoor Education

The use of the outdoors to facilitate and enrich learning, in relation to school curriculum and involves extending classroom learning to the outdoor environment

Plant communities

An association of plants each occupying a certain position or ecological niche inhabiting a common environment and interacting with each other

Preservation

To keep alive or in existence, to keep safe from harm or injury, and to maintain.

Savanna

A park like grassland with scattered trees or clumps of trees.

Species

A population of individuals that are more or less alike, and that are able to breed and produce fertile offspring under natural conditions.

Succession

The slow, orderly progressive replacement of one community by another during the development of vegetation in an area

Sustainability

An attempt to provide the best outcomes for the human and natural environments both now and into the indefinite future. To meet the needs of the present without compromising the ability of future generations to meet their own needs.

Tall grass Prairie

Tall grass aptly refers to the height of native grasses Prairie" is a French word for meadow which refers to a community of grasses and wildflower

Wetland

Any land area that tends to be regularly wet or flooded

Teacher Resources

Rice Lake Plains Tallgrass Prairie; The Rainbow Restoration Site
http://www.rainbowcottagesresort.com/tallgrass.html

This site offers information on the actual Tallgrass Prairie Lands location. It has a variety of links detailing its history, partners, frequently asked questions and answers, their home page etc. It also offers contact information of the owners of the site if there are further questions or concerns about the site.

Tall Grass Ontario
www.tallgrassontario.org

- Tall Grass Ontario provides information on the conservation of Tall Grass prairie and savanna lands in Ontario. This site provides information on managing the prairie, fire in the prairie, as well as the extent, and historical extent of these lands in Ontario. This site provides several links which could help with research.

Pollishuke Mindy, Schwartz Susan. *Creating the Dynamic Classroom: A Handbook for Teachers.* Irwin Publishing Ltd Toronto/Vancouver 2002.

- A comprehensive teacher resource guide to assist teachers in all aspects of teaching including a chapter on field trips. It offers a detailed chapter on how to prepare for the best field tip possible.

NCTE – Teaching Resources
www.ncte.org

- Teaching resources and articles dealing with field trips. Offers ideas about how to plan field trips and make them the most useful in the classroom.

All Birds Habitat
www.wetlandfund.com

- Financial and Technical Assistance for Private Landowners. An information site in how to maintain and protect wetlands. Native Plant Resource Guide

Ecological Restoration Ontario
www.serontario.org/publica.htm

- The Site for Ecological Restoration; Ontario Chapter. It is an information site on the native plants in Ontario.

Ontario Land Trust Alliance
www.ontariolandtrustalliance.org

- The Ontario Land Trust Alliance is a non-profit organization with a mandate to encourage the land trust movement throughout Ontario. Provide administrative and professional support to a province-wide network of members who adhere to an acceptable set of standards and practices regarding the broad spectrum of land trust activities. This site offers information about the Trust Alliance and how to get involved.

Alderville First Nation. *To Know This Place: The Black Oak Savanna/Tallgrass Prairie of Alderville First Nation*. Sweetgrass Studios, 2003.

- This book is an overview of The Black Oaks Savanna Tallgrass Prairie land. It explains where it is located and the different species that can be found within its perimeters.

Carroll Kathleen. *A Guide to Great Field Trips.* Zephyr Press Toronto 2007.

Davis Julie (1998). *Young Children, Environmental Education and the Future.* Early Childhood Education Journal 26 (2). Human Science Press.
English Barbara Lipton-Doidge Karen (1997). *Creating Successful Field Trips.* Irwin Publishing Toronto Canada.

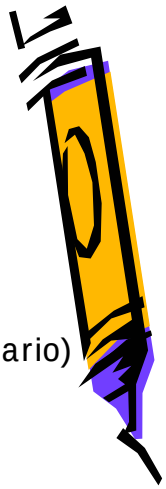
Environment Canada – Tallgrass Prairie
www.mb.ec.gc.ca/nature/whp/prgrass/df03s32.en.html

Falk, J.H. & Dierking, L.D. (1997) *School Field Trips: Assessing their Long Term Impact*. Curator, 40 (3), 211-218

Kisiel, J. (2005). *Understanding Elementary Teacher Motivations for Science Field Trips*. Science Education, 89, 936-955.

Kisiel, J. (2006a). *Making Field Trips Work – Strategies for Creating an Effective Learning Experience.* The Science Teacher, 73(1), 46-48.

Fun Facts



- There are three main types of prairies in North America:
  - Tallgrass Prairies (only tallgrass prairie exists in Ontario)
  - Mixed Grass Prairies
  - Shortgrass Prairies
- The name "Tallgrass" aptly refers to the height of native grasses, which in the case of Big Bluestem, may reach heights of eight feet (2.4m) or more
- Tallgrass prairies contain a wide variety of unique plant and animal species, many of which are considered rare, threatened or extirpated (no longer present within their local range)
- The site is still in the process of restoration Some of the benefits of restoring are:
  - The site will be used by Sir Sandford Fleming College to teach students and firefighters how to conduct a prescribed burn and us the latest rural/agricultural fire control and suppression techniques
  - Restoration of abandoned farm fields will result in the elimination of erosion and the infiltration of pesticides, herbicides and nutrients which are degrading the provincially significant wetland complex. This wetland provides important spawning habitat for Muskies and other game fish as well as important nesting and rearing habitat for a wide array of migratory birds
- The Rainbow Restoration Site features a passive recreation trail and an interpretive garden where each species is showcased
- Ojibway people have been at Rice Lake since about 1700. They named the area, Pemedashdakota and Pemedashcoutayang meaning, “Lake of the Burning Plains”.

  Intentional and natural fires have been used as a tool to keep encroaching tress and shrubs at bay, preserving the open tallgrass prairie lands.

1. Secondary Stream Introduction

This study explores the feasibility of a field trip to the Tallgrass Prairie Restoration Site located on Rice Lake in Bailieboro, Ontario. This study has focused on the grade nine high school geography curriculums from the 2005 Ontario Ministry of Education. Both the academic and applied geography curriculum will be investigated for possible relevant connections to the Tallgrass Prairie Restoration Site.

The first part of this research project, will report on interviews with grade nine high school geography teachers to determine the feasibility of taking students on a field trip to this site. The second part of this research project is a curriculum kit for grade nine geography field trips to this site. The interviews serve the purpose of identifying relevant curriculum connections, between the grade nine geography curriculum and the Tallgrass Prairie Restoration Site. Also, the interviews will provide information as to what high school geography teachers expect to be included in a curriculum kit.

This study will incorporate a discussion of the results from the interviews conducted. It will also draw conclusions and suggest recommendations to the host based on the interviews. A reflection on the overall process of the research project will also be included at the end of the report.

2. Methodology

A feasibility study was selected to determine if the Tallgrass Prairie Restoration Site would be a beneficial learning opportunity for grade nine geography students. Curriculum documents were consulted when deciding which grade and subject were suitable for a field trip to the site. The grade nine geography curriculum, both applied and academic, contained suitable material for connections to be made between the curriculum and the Tallgrass Prairie Restoration Site. The Kawartha Pine Ridge District School Board was chosen as the boundary for the feasibility study. This was due to the close location of the Tallgrass Prairie Restoration Site to this school board.

Interview questions were formulated from themes found within the literature review. The interview questions aimed to make connections between the results of the literature review and current field trip patterns of high school geography teachers. All of the interview questions were open-ended, allowing the interviewees to provide as much or as little detail as they wished. The questions were formulated to flow from one to another in their content. Questions were also formulated to obtain information about the use of curriculum kits as well as the possibility of field trips to this site.

Once interview questions were finalized, an ethics proposal was drafted and submitted to the Research Ethics Committee within the Trent University Research Ethics Board. This contained the interview questions, consent forms as well as the student application to undertake human research. The ethics proposal had minor mistakes which were easily corrected and approval was granted. Once approval was granted, an introductory letter was drafted outlining the purpose of the research project.

Letters were dropped off at various schools within the Kawartha Pine Ridge District School Board. These letters were not responded to in the week's time that was requested. The schools were then contacted in person to follow up the letters. Contact was then made with the geography departments. E-mail and telephone contact were used to arrange time and place for interviews. The interviews were conducted over a three week time period in which each interview ranged from fifteen to forty-five minutes. In total, four interviews were required and conducted. While other geography teachers within the Kawartha Pine Ridge District School Board were contacted, some declined due to busy schedules, while one declined because they did not take their students on field trips.

3. Results

The following are the questions and compiled results from the four interviews conducted within the Kawartha Pine Ridge District School Board. All four participants were geography teachers' currently teaching grade nine academic or applied geography. The results were tape recorded as well as hand scribed for accuracy. These results are analyzed in the following discussion section.

How long have you been a high school teacher?

All teachers who participated in the interviews had been teaching for over five years. Two of the teachers taught for over 17 years.

What subjects do you teach?

All teachers have taught geography as well as a variety of other courses. These courses included history, parenting and family studies, math, co-op, law, guidance, careers, science, computers, outdoor education and leadership.

How long have you taught geography?

All participants had taught geography for at least 4 years and as long as 21 years. All teachers had also taught both academic and applied geography.

How many field trips do you take your students on per semester?

The general consensus among the interviewed high school geography teachers was that they were able to take their students on one field trip per semester. However, there were

some exceptions, which allowed teachers to take their students on two or three field trips per semester.

Would you like to take them on more field trips?

Three out of the four teachers interviewed stated that ‘Yes’ they would like to take their classes on more field trips. Only one teacher stated that ‘No’ they would not like to take their classes on more field trips and that one was enough.

Why would you like to take your class(es) on more field trips?

Teachers wanted to take their students on more field trips so that they could participate in more experiential learning through hands-on activities that field trips provided.

Why would you not like to take your class(es) on more field trips?

In all cases teachers were crunched by the curriculum and therefore had to make sure that what they were going to be doing on the field trip had strong connections to the curriculum. Depending on the group of students, trust was a noted issue that could hinder a teacher from taking their class on more field trips. Other issues that were mentioned by the interviewees included budget, class coverage and administrative reasons.

After briefly looking over the Central Ontario Rice Lake Plains Tallgrass Prairie information booklet, which can be found in the appendix, the interviewees were asked to answer the following questions:

Would this fit into the curriculum you teach and where?

The majority of teachers agreed that a field trip to the Tallgrass Prairie Restoration Site would strongly connect to the curriculum that they teach. However, one teacher disagreed because they believed that this field trip would only fit into a small portion of the grade nine curriculum they covered.

The areas of curriculum in which the teachers stated that this field trip would cover included the following: sustainability and world issues, management of resources in the area, ecozones, vegetation and soils, climate, ecosystems and citizenship.

Would you take your students to this ecologically significant restoration site on a field trip?

Three out of the four teachers said that they would definitely consider taking their students on a field trip to this ecologically significant restoration site. One teacher would probably not choose to do so.

Why?

Three out of the four teacher interviewed felt that this site was deeply related to curriculum. They also thought that the site would be very interesting to their students and provided an opportunity to experience nature in a hands-on fashion. The location of the site was also a noted benefit because it was close to the Peterborough area.

Why not?

One teacher would not take their geography students to this site for a field trip because they felt that it does make enough connections to the geography curriculum. However, they believe that the site is indeed an amazing educational site, which students in other subjects, such as a horticulture class would be able to benefit from.

If it was able to connect to more of the curriculum then it would be beneficial?

If the students were able to educate themselves about the Tallgrass Prairie in conjunction with geocashing, while using GPS units to find stations, then this would be more beneficial as it would connect further to the curriculum.

When do you generally schedule your field trips?

All four teachers said that they usually take their students on field trips in October during first semester and April or May in the second semester. These months were said to be the best because the teachers have had enough time to get to know their class. They have had a chance to develop the class enough where the field trip would be useful to them. October, April and May are also the best months weather wise. Additionally, teachers can not take their classes on field trips during the last months of first and second semester, January and June.

Would there be more incentive to take a field trip here if there were a curriculum kit available to you?

All of the interviewed teachers agreed that a curriculum kit would be a valuable resource for this field trip. Although two teachers said that they would still consider visiting the site if there was not a curriculum kit available. However, a few of the teachers would only use the curriculum kit if they felt that what it included was relevant or useful for their class. These teachers also said that they could always adapt the lessons included in the kit to best fit their individual class needs and what they were covering in the class.

What would you look for in a curriculum kit for this type of field trip?

All teachers agreed that a curriculum kit for this type of field trip needed to have strong connections to the geography curriculum. Specific references to the Ministry of Education documents as well as clearly outlined objectives that this field trip would meet in the curriculum, were strongly recommended. The teachers also suggested that the curriculum kit include background information on the site and pre-site activities to prepare the students for the field trip to the site. This would aid them with a prior understanding of what they would be learning about while there, as well as some of the on-site activities. The teachers placed an emphasis on the benefits of hands-on activities in which students could participate. The teachers also suggested follow-up activities be included in the kit, so that the students could use the knowledge that they gained after the field trip is over. Also, the teachers indicated that the curriculum kit must be easy to use. The kit must be easy for the students to understand, as well as contain clear instructions for the teacher to follow.

Do you use curriculum kits in your classroom?

All teachers, except one use curriculum kits in their classrooms.

Would you use the lessons in a curriculum kit or make your own?

The three teachers who said that they use curriculum kits also use kits as a base for their own lesson plans. These three teachers agreed that curriculum kits are valuable resources that provide teachers with options for lessons plans. They also pointed out that that most teachers alter and adapt curriculum kit materials according to their different teaching styles and students learning needs.

Do you ever go to the field trip site before going with the class?

Two of the teachers who participated in the interviews said that they would definitely check out the field trip site before taking their class there. The other two teachers who were interviewed were unsure or stated that they would most likely not visit the field trip site prior to attending with their class.

Would cost be an issue?

Three of the interviewed teacher said that cost would not be an issue because it is a rather inexpensive field trip. However, one teacher said that cost would be an issue because it is an issue for all field trips at this individual high school.

4. Discussion

Throughout the interviews with four teachers within the Kawartha Pine Ridge District School Board, this feasibility study uncovered several common and important themes within the responses provided. These teachers were interviewed in order to gain an understanding of high school teachers willingness to take students on a field trip to the Tallgrass Prairie Restoration Site. The key themes that were discovered are discussed below.

4.1. Literature Review Connections

After completing interviews with the four high school teachers, many connections were drawn between their responses and themes that were identified in the literature review. These themes included: the benefits of hands-on learning and students experiencing nature; budget and field trip cost concerns; and trust and liability issues in regards to taking students off school property. Throughout the four interviews themes were revealed which connected to the literature review which can be seen as either positive or negative issues within the schools.

Experiencing nature and hands-on learning were two positive themes identified in the literature review. Experiencing nature through hands-on activities was confirmed by the interviewees to be a very beneficial teaching strategy that aided in students learning. The literature review defined outdoor education as the use of the outdoors to facilitate and enrich learning, in relation to school curriculums (Hammerman et al., 1968). Outdoor education is the type of learning, which can be done individually but most often involves students working in teams and gaining knowledge through hands-on learning, which is associated with experiencing nature (Donaldson et al., 1972).

Trust and liability were of concern for both the teachers that were interviewed and the educators mentioned in the literature review. The literature review stated that critics of field trips believe that they are unnecessary because liability increases when students are taken off school property. This statement was confirmed after the completion of the interviews with the four high school teachers. Although the liability issue examples mentioned in the literature review are different from the examples mentioned by the interviewees, they all present the same concern. Teachers are generally concerned about the possible tribulations and consequences of a field trip. Therefore, many teachers believe that it is often not worth the risk to take certain groups of students on a field trip (Education Week, 2006). A few teachers even shared personal examples of negative incidents that had occurred to themselves or fellow colleagues. These examples supported their caution in taking certain classes of students off school property on field trips.

The third negative issue addressed in the literature review and confirmed by the interviewed teachers, was the allotted budget for field trips. The literature review indicated that as a result of liability issues, several school boards discouraged the use of field trips as part of the school curriculum. One measure mentioned in the literature review that has been taken by the Toronto District School Board is budget cuts. Although a budget to help cover the cost of field trips was a concern outlined by some of the teachers interviewed, some also disagreed. All four teachers interviewed indicated that the number of field trips they could take their students on was limited because of cost issues. Two of the teachers interviewed stated that they were limited because of cost and budget issues. These teachers were not limited by budget cuts because their schools did not have a budget that included field trip funding. Three of the teachers interviewed

indicated that there was help to cover the cost of a field trip for needy students available through their schools. One teacher mentioned that funds did exist but were very inaccessible.

4.2. Budget

Budget was one of the most mentioned themes in all of the interviews. However, not all of the teachers had a problem with budget constraints. Only one teacher had no problem at all with a budget. This teacher found any means possible to get students funding for outdoor educational excursions. The main resource used by this teacher to obtain any money needed for field trips was through a fund called Teacher's for Kids. Each teacher who agrees to donate twenty-five dollars for the year to this fund can wear jeans on Fridays. This fund can be drawn upon to assist a needy student as a last resort. Another source of funding this teacher uses is the Principals Trust Fund. Although the two funds exist they are used as a last resort by the teacher. This teacher does everything possible to find money in order take their students on educational field trips before accessing these funds.

The three other teachers interviewed did not feel the same way about budget constraints. These three teachers felt that due to budget reasons they could only take their students on one field trip per semester. There is not a budget allotted for field trips, therefore the cost lies entirely on the shoulders of the students. However, part of the cost can be covered if the head of the geography department allots a portion of the departments' budget towards outdoor excursions. These teachers did not feel comfortable accessing the Teacher's for Kids or Principals Trust Funds in order to take students on extra field trips. They felt that this money should not be used for these opportunities.

These teachers took their students on one extremely meaningful field trip per semester. This means that it was a field trip which covered as many connections to the curriculum as possible, in order to get the most out of the money being spent. If there was an extremely needy student, and the field trip was a necessary part of the course, then money could be obtained through the Teacher's For Kids Fund. However, there is no money in the budget for field trips within the Kawartha Pine Ridge District School Board, it all has to be paid for by the students.

4.3. Class Coverage (Supply Teachers)

Class coverage was one of the least mentioned themes in the interviews, however it is an important aspect of taking students out of the classroom. Two interviewees identified class coverage as a hidden issue and addressed it as a hindrance to taking students on more field trips. Class coverage involves the hiring of a supply teacher to cover the classes which the teacher on the field trip would teach that day. This is where the hidden element of class coverage emerges because the supply teacher needs to be paid for their days coverage, which adds to the costs of a field trip. Only one teacher mentioned class coverage as a hindrance, however it would be an even larger issue if teachers were to take their students on more than one field trip per semester.

4.4. Trust Issues

Two of the teachers interviewed strongly noted that trust was a problem when taking students on field trips. One teacher said that trust was better at the end of the semester. This same teacher also noted instances in their career where trust had just not

been present. The second teacher, who also commented on this issue of trust, stated that they saw it as the top hindrance to taking students on field trips. This second teacher uses field trips as a reward for good behaviour. Unfortunately, this teacher has cancelled field trips due to lack of good behaviour, as well as not being able to trust their students. Trust for these two teachers was a negative issue when given the opportunity to take their students on curriculum based field trips.

On the theme of trust, liability was also an issue. If a teacher cannot trust their students, then they become a potential liability. This statement connects to a hindering issue of clientele liability. When certain students are taken on field trips and cannot be trusted, they become a further liability. This creates added concern for the host of the field trip, as well as additional responsibility for the supervising teacher(s).

4.5. Curriculum Connections

Interviewees noted several curriculum connections that could be made to the Tallgrass Prairie Restoration Site, which they saw through the pamphlet provided in the interview. The interviewed teachers all stated that as many curriculum connections as possible must be made in order to make a field trip to this site worthwhile. These teachers stated that a pre-site, on-site as well as post-site lesson plans be included in the development of any curriculum kit. Curriculum connections would be the major deciding factor as to whether or not teachers would take their students on a field trip to the Tallgrass Prairie Restoration Site.

The teachers agreed that both academic and applied geography classes could find this site beneficial. Also, there are many aspects of the curriculum that could be met on

this field trip. However, the Tallgrass Prairie Restoration Site would predominately meet the objectives and expectations of the physical geography unit of the grade 9 academic and applied geography curriculum.

The teachers agreed that curriculum connections could be made between the site and the physical unit of the geography curriculums. They explained that this unit covers topics of vegetation and soils, climate issues and the management of resources within an area. They also all highlighted the sections of ecozones and ecosystems with the utmost importance. Other areas such as soils and vegetation were not as important to the curriculum, and therefore not as much time was spent on those areas of the unit. However, they also mentioned that links could be made to sustainability, world issues, mapping, and traditional ecological knowledge of Aboriginal peoples as well as general citizenship enhancement for students.

These teachers also said that the curriculum is extremely full. Therefore, it is crucial that teachers choose field trips that make as many connections as possible to curriculum documents. By doing so, this would make the field trip worthwhile. The themes stated above by the teachers make the most relevant curriculum connections. Other connections than those stated by the teachers interviewed can also be made. The interviewees were using their memory to recall the most obvious connections, in comparison to someone who has thoroughly reviewed the Ontario Ministry of Education Grade Nine Geography Curriculums.

4.6. Connections between Interviews and Curriculum Documents

The connections that the interviewed teachers made between the Ontario Ministry of Education curriculum documents and the Tallgrass Prairie Restoration Site, were

important to understand the connections with classroom learning. These teachers made connections to several different strands in which the Geography of Canada course is organized. The teachers stated that ecozones and ecosystems would be a match from the Tallgrass Prairie Restoration Site to the curriculum. This occurs under the Geographic Foundations: Space and Systems strand of the curriculum. While the natural or physical systems, which incorporate soils, natural vegetation and climate are included in the Human-Environment Interactions strand. Another expectation under the Human-Environment Interactions strand, suggested by one of the teachers, was the management of resources in an area. This expectation can be met through the identification of government roles and responsibilities. Another expectation that the Tallgrass Prairie Restoration Site would meet, as identified by the interviewed teachers, is a mapping component. Mapping was addressed by several teachers as an important aspect to the curriculum, which falls under the Methods of Geographic Inquiry and Communication strand. Other connections to the curriculum can also be made within these strands as well as others, if the curriculum documents are reviewed.

After reviewing curriculum documents from the Ontario Ministry of Education, several connections, besides those outlined by the interviewed teachers, can be highlighted. Through the Geographic Foundations: Space and Systems strand, a connection can be drawn between the Tallgrass Prairie Restoration Site and the expectation that students be able to describe characteristics of natural systems. Within this expectation the complex interconnectedness of tallgrass prairies could be analyzed.

Within the Human-Environment Interactions strand several other connections can be made. Students could be expected to explain how human activities affect, or are

affected by the environment, which could be learned through experiencing the Tallgrass Prairie Restoration Site. Also, an assessment of how the effects of urban growth have altered the natural environment could be learned. This site provides an example of a way to improve the balance between human and natural systems.

Under the Methods of Geographic Inquiry and Communication strand, the interviewees highlighted the expectation of mapping. However, it is important to note that several other connections can be made between a field trip to the Tallgrass Prairie Restoration Site and the curriculum. Students can gather geographic information from field research using the site as a primary source, as well as a secondary source. Students can not only identify and describe but also use the technologies of geographic inquiry such as Geographic Information Systems (GIS) and Global Positioning Systems (GPS). By doing so students would be able to collect and synthesize information about the local ecozone of the tallgrass prairies. These are all curriculum connections that could be made before a visit to the Tallgrass Prairie Restoration Site, as well as during or after a visit has occurred.

4.7. Other Curriculum Subject Connections

Two of the teachers interviewed also suggested that this would be a good field trip for students in other subjects to experience. One school in Peterborough was mentioned to have an environmental studies class, which could possibly be interested in a field trip to this site. Another school was mentioned to have a horticulture program, which could find this site useful for the specific plants and hands-on educational opportunities that it has to offer. One teacher provided several other additional classes that might be better suited for a field trip to this site. These suggested classes included a travel and tourism

class, grade eleven biology or grade nine or ten science. The grade eleven biology course covers a unit on plants and their cellular structures and diversity, which could possibly be integrated into this site. The grade nine or ten science may also have curriculum connections that could be incorporated into the site. However, each subject still has specific strand expectations that need to be covered. For example, grade nine and ten science each have three strands and twenty days for each strand. Therefore a field trip would need to be extremely worthwhile and cover as many curriculum connections as possible.

5. Overall Secondary Stream Concluding Connections

After interviewing the four high school teachers on their field trip preferences and concerns, a number of positive and negative concluding connections were drawn. One of the main concerns identified by the interviewed teachers as well as in the literature review was liability in regards to trust. Teachers stated that taking their classes on a field trip closer to the end of a semester was the most suitable time because they have built up enough trust. This coincides with fact that October and May would be the most opportune times for teachers to bring their students to the site because it is most ecologically active. Students, teachers, and the community will be able to benefit from the site during these times because this is when the site can provide the most ideal and well rounded outdoor education experience.

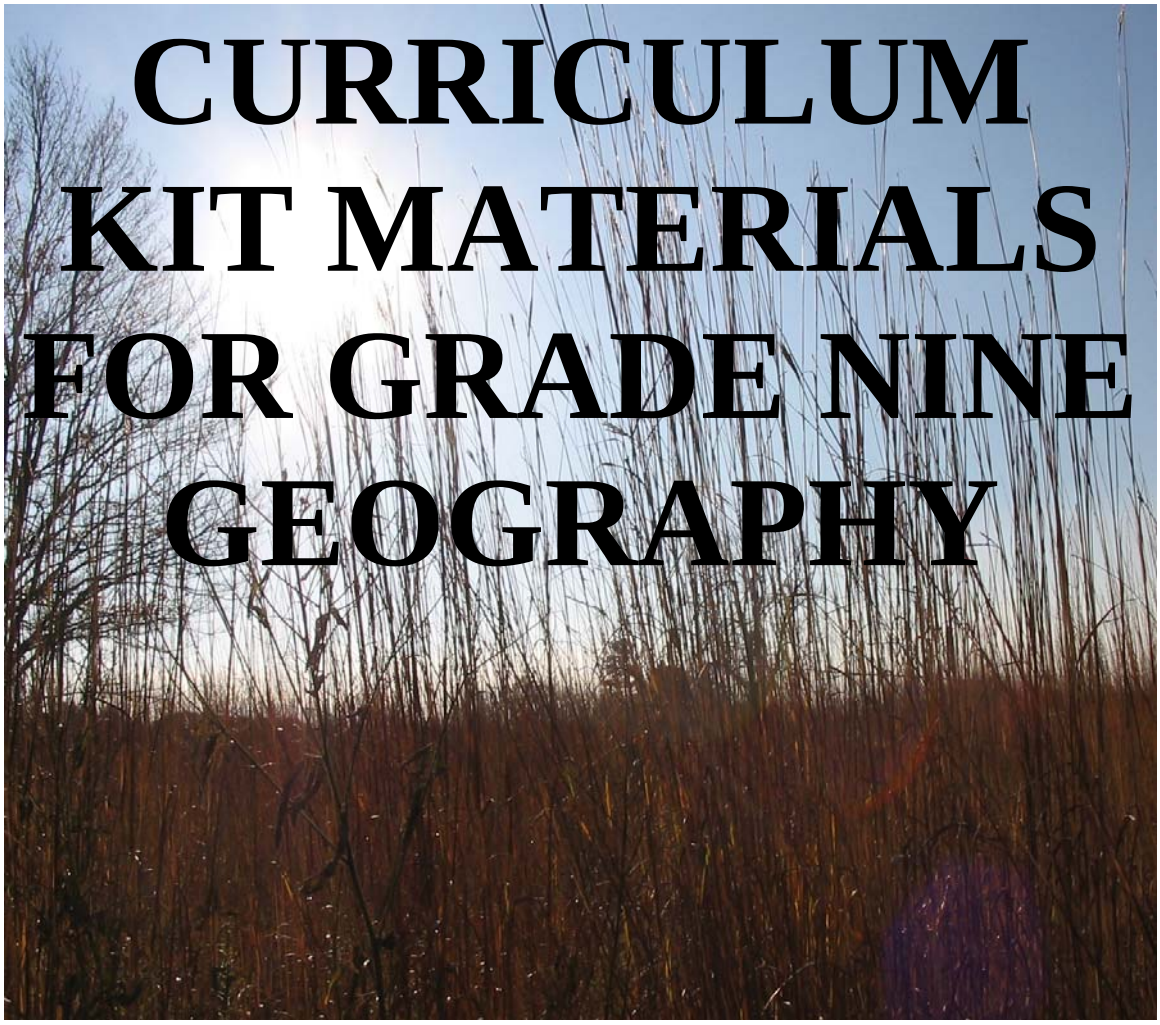
Another strong theme presented in the literature review and throughout the interviews was budget. This is a hindrance to teachers taking their students on field trips because many cannot afford to pay significant amounts of money to experience one lesson. However, if a field trip connected strongly to the curriculum, as well as had a low cost associated with it, this field trip would be educationally worthwhile and feasible for students.

Location is another positive element about the Tallgrass Prairie Restoration Site. Since it is located only twenty minutes away from downtown Peterborough it is a very accessible excursion. Having such a close location to the schools is beneficial because it reduces travel time, allowing students to spend more time in the outdoors rather than on a school bus. Some of the interviewed teachers also mentioned that they saw it as

beneficial to teach their students about efforts to preserve and restore the environment in their local community.

Through this research project, the aims set out in the overall introduction, have been met. Significant interest in a field trip to the Tallgrass Prairie Restoration Site was shown by grade nine geography teachers. During the interviews each teacher emphasized the importance of making many strong connections to the classroom curriculum, both academic and applied, when considering a field trip. These curriculum connections will further promote possible interest of a field trip to the site. In the interviews teachers stipulated strong curriculum connections were required before further interest in a field trip to this site would be worthwhile.

Based on the interviews many expectations and suggestions were outlined that must be included for the teachers to find the curriculum kit useful in the classroom. These teachers also suggested possible lessons with an emphasis on hands-on and group participation. This information was very beneficial to the creation of the curriculum kit. Some of the teachers' suggestions were adapted to fit the agenda of the site and included in the curriculum kit, which follows the report. Overall, this study has produced successful results as well as an easy to understand, useable curriculum kit with strong connections to the grade nine academic and applied geography curriculums.


CURRICULUM
KIT MATERIALS
FOR GRADE NINE
GEOGRAPHY

6. Secondary Curriculum Kit
6.1. Background

6.1.1. Field Trip Permission Form

Dear Parents or Guardian,

I _____ give permission for my son/daughter _____ to attend the following field trip with the grade nine geography class to the Central Ontario Rice Lake Tallgrass Prairie Site on _____. It is located twenty minutes south of Peterborough, and we will be traveling by school bus. This is an all day trip, with your child returning to school in time for regular school dismissal. We will be eating on site, so a packed lunch in advised. Students are expected to dress appropriately for the outdoor weather, as no time will be spent indoors. This field trip as a _____ cost associated. Please ensure that your son/daughter returns this signed form and money to their teacher prior to _____.

_____
Parent Signature

Thank you,
Geography Department

www.rainbowcottagesresort.com/map.html

6.1.2. Field Trip Itinerary

Ideal Field Trip Itinerary for School Start of 8:15am

8:15-8:30am	Load buses, take attendance and departure
9:00am	Arrival at the Tallgrass Prairie Restoration Site
9:00-9:15am	Greetings and outline of the day
9:15-9:30am	Split into groups, walk to prairies and separate into stations
9:30-10:30pm	Soil Coring Station
10:30-11:30	Global Positioning System Activity Station
11:30-12:00pm	Lunch
12:00-12:30pm	Tallgrass Prairie Nature Walk Station
12:30-1:00pm	Mapping Activity Station
1:00- 1:30pm	Possible Seed Harvesting/Seed Planting Station
1:30-2:00pm	Departure from Tallgrass Prairie Restoration Site

LESSON PLANS

6.2. Lesson Plans
6.2.1. Pre-Site Lesson Ideas

6.2.1.1. Academic Pre-Site Lesson Ideas
Lesson Topics: Soils, Climate, Landforms, Vegetation and Wildlife

Curriculum Strand:
Geographic Foundations: Space and Systems, Human-Environment Interactions, Understanding and Managing Change and Methods of Geographic Inquiry and Communication

Geographic Foundations: Space and Systems Expectations:
- Describe the components and patterns of Canada's spatial organization;
- Demonstrate an understanding of the regional diversity of Canada's natural and human systems;
- Analyse local and regional factors that affect Canada's natural and human systems.

Human-Environment Interactions Expectations:
- Analyse the ways in which natural systems interaction with the human systems and make predictions about the outcomes of these interactions;
- Evaluate various ways of ensuring resource sustainability in Canada

Understanding and Managing Change Expectations:
- Explain how natural and human systems change over time and form place to place;
- Predict how current or anticipated changes in the geography of Canada will affect the country's future economic, social and environmental well-being (with specific emphasis on environmental well-being).

Methods of Geographic Inquiry and Communication Expectations:
- Communicate the results of geographic inquires, using appropriate terms and concepts and a variety of forms and techniques.

Specific Curriculum Expectation Links for Geographic Foundations: Space and Systems:
Building Knowledge and Understanding
- Explain terms and concepts associated with regions (e.g., bioregion, ecozone, "ecological footprint", boundaries, transition zone, ecumene);
- Describe the characteristics (e.g., complex, interconnected, life supporting, driven by solar energy) of natural systems (e.g., climate, biomes, the lithosphere, the hydrosphere);
- Outline the criteria used to define selected Canadian ecozones and describe the processes and interactions that shape those ecozones.

Specific Curriculum Expectation Links for Human-Environment Interactions:
Building Knowledge and Understanding

- explain how human activities (e.g. agricultural and urban development, waste management, parks development, forest harvesting, land reclamation) affect, or are affected by he environment;
- Describe how natural systems (e.g., climate, soils, landforms, natural vegetation, wildlife) influence cultural and economic activities (e.g. recreation, transportation, employment opportunities);
- Identify the role of government in managing resources and protecting the environment.

Developing and Practising Skills

- Assess the value of Canada's key natural resources, including agricultural lands and wilderness;
- Assess how the effects of urban growth (e.g., development of former farm lands, destruction of wildlife habitats, draining of marshes) alter the natural environment;
- Present findings from research on ways of improving he balance between human and natural systems (e.g., recycling, river clean-ups, ecological restoration of local woodlots or schoolyards, industrial initiatives to reduce pollution).

Learning Through Application

- Evaluate solutions to environmental problems proposed by various groups (e.g., by government, industry, environmentalists, community members) and make recommendations for sustainable resource use;
- Recommend ways in which individuals can contribute to the quality of life in their home, local ecozone, province, nation, and the world.

Specific Curriculum Expectation Links for Understanding and Managing Change

Developing and Practising Skills

- Predict the consequences of human activities (e.g., agriculture, recreation) on natural systems (e.g., soil depletion, climate change).

Specific Curriculum Expectation Links for Methods of Geographic Inquiry and Communication

Interpretation and Analysis

- Identify and describe the technologies used in geographic inquiry (e.g., geographic information systems (GIS), global positioning system (GPS), Hypermedia);
- Use different types of maps (e.g., road, topographical, thematic) to interpret geographic relationships, including changes over time in a specific location.

Description:

Many of these curriculum connections should be made prior to visiting the site. These are standard lesson topics within grade nine geography. Soil horizons, landforms, climatic diversity, climate graphs, vegetation changes within climatic regions, Canadian vegetation regions, as well as Canadian ecozones should be lessons covered before partaking in this field trip. A lesson on maps should have been covered in earlier classes, and a review of this material may be necessary before this strand begins. Climate and soils can be discussed in relation to agricultural purposes and the consequences of human interactions, which have altered the accessibility and use of agricultural land. Ecozones and ecosystems would also be touched upon in this strand. A brief lesson to identify and

describe different types of technologies that can be used with geography should be incorporated. Geographical Information Systems (GIS), Global Positioning Systems (GPS) and geocashing should be discussed in relation to what they are, and how they are used so students can become enthusiastic about using a GPS system on the field trip. Prior to going to the restoration site, it would also be beneficial to touch upon the governmental role in managing resources and protecting the environment. A glossary of some relevant definitions to this field trip are located following the post-site activity of this kit. These are all lessons that should exist with or without this field trip for classroom learning. These lessons will be left to the teachers' discretion as each school uses a different geography textbook.

It has been recommended to the host that a promotional video be created for the site. This video could be shown to students the day before, in preparation for a field trip to the Tallgrass Prairie Restoration Site. The host has agreed this would be valuable and they will consider editing already made advertising. This is the hosts responsibility, and has not been included in this kit.

6.2.1.2. Applied Pre-Site Lesson Ideas

Lesson Topics: Soils, Climate, Landforms, Vegetation and Wildlife

Curriculum Strand:
Geographic Foundations: Space and Systems, and Methods of Geographic Inquiry and Communication

Geographic Foundations: Space and Systems Expectations:

- Identify patterns and diversity in Canada's natural and human systems;
- Illustrate regional differences using the concept of ecozone;
- Describe issues that affect natural and human systems in Canada.

Specific Curriculum Expectation Links for Geographic Foundations: Space and Systems:

Building Knowledge and Understanding

- Use the terms and concepts associated with regions (e.g., single-and multi-factor, boundaries, transition zone, ecozone);
- Describe selected characteristics of natural systems (e.g., climate, landforms, natural vegetation);
- Describe how natural and human systems interact within selected Canadian ecozones.

Methods of Geographic Inquiry and Communication Expectations:

- Communicate the results of geographic inquires, using appropriate terms and concepts and a variety of forms and techniques.

Specific Curriculum Expectation Links for Geographic Foundations: Space and Systems:

Building Knowledge and Understanding

- Explain terms and concepts associated with regions (e.g., bioregion, ecozone, "ecological footprint", boundaries, transition zone, ecumene);
- Describe the characteristics (e.g., complex, interconnected, life supporting, driven by solar energy) of natural systems (e.g., climate, biomes, the lithosphere, the hydrosphere);
- Outline the criteria used to define selected Canadian ecozones and describe the processes and interactions that shape those ecozones.

Specific Curriculum Expectation Links for Methods of Geographic Inquiry and Communication

Interpretation and Analysis

- Identify and describe the technologies used in geographic inquiry (e.g., geographic information systems (GIS), global positioning system (GPS), Hypermedia);
- Use different types of maps (e.g., road, topographical, thematic) to interpret geographic relationships, including changes over time in a specific location.

Description: Many of these curriculum connections should be made prior to visiting the site. These are standard lesson topics within grade nine geography. Soil horizons, landforms, climatic diversity, climate graphs, vegetation changes within climatic regions, Canadian vegetation regions, as well as Canadian ecozones should be lessons covered before partaking in this field trip. A lesson on maps should have been covered in earlier classes, and a review of this material may be necessary before this strand begins. Climate and soils can be discussed in relation to agricultural purposes and the consequences of human interactions, which have altered the accessibility and use of agricultural land. Ecozones and ecosystems would also be touched upon in this strand. A brief lesson to identify and describe different types of technologies that can be used with geography should be incorporated. Geographical Information Systems (GIS), Global Positioning Systems (GPS) and geocashing should be discussed in relation to what they are, and how they are used so students can become enthusiastic about using a GPS system on the field trip. Prior to going to the restoration site, it would also be beneficial to touch upon the governmental role in managing resources and protecting the environment. A glossary of some relevant definitions to this field trip are located following the post-site activity of this kit. These are all lessons that should exist with or without this field trip for classroom learning. These lessons will be left to the teachers' discretion as each school uses a different geography textbook.

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6.2.2. On-Site Lesson # 1: Soil Coring

6.2.2.1. Academic Lesson Plan

Lesson Topic: Soils
Duration: Sixty minutes. Three soil cores will be conducted. Twenty minutes per core.

Curriculum Strand:
Human-Environment Interactions, Understanding and Managing Change and Methods of Geographic Inquiry and Communication

Human-Environment Interactions Expectations:
- Analyse the ways in which natural systems interaction with the human systems and make predictions about the outcomes of these interactions.

Understanding and Managing Change Expectations:
- Explain how natural and human systems change over time and form place to place

Methods of Geographic Inquiry and Communication Expectations:
- Use the methods and tools of geographic inquiry to locate, gather, evaluate, and organize information about Canada's natural and human systems

Specific Curriculum Expectation Links for Human-Environment Interactions:
Developing and Practising Skills
- Assess the value of Canada's key natural resources, including agricultural lands and wilderness

Specific Curriculum Expectation Links for Understanding and Managing Change
Developing and Practising Skills
- Predict the consequences of human activities (e.g., agriculture, recreation) on natural systems (e.g., soil depletion, climate change)

Specific Curriculum Expectation Links for Methods of Geographic Inquiry and Communication
Research
- Gather geographic information from primary sources (e.g., field research, survey's, interviews) and secondary sources (e.g., reference books, mainstream and alternative media, CD-ROMs, the Internet) to research geographic issue

Soil Core Activity Description:
Students will be in groups while conducting these soil cores. Each group will conduct three soil cores in order to differentiate between the different areas where they are conducted. One will be completed in a Maple forest, one in the Tallgrass Prairie, and one on the pathways around the Tallgrass or near the water. The groups will be able to see the differences in the layers of soil in each of the locations. They will be expected to draw the approximate depth of each horizon on a diagram. They will be expected to include a brief description of why each area is different, such as why the O horizon would be deeper in the Tallgrass Prairies location. These groups should also discuss the differences of these

locations in respect to human interactions. For example, Tallgrass Prairies were located in this area before Maple forests. They should also discuss which location they think would be the most suitable for agriculture as a key resource in Canada. While talking about this, the consequences of human activities on lands such as the Tallgrass Prairie can be discussed.

Learning Materials: Soil core, pen or pencil, activity sheet

Checks for Understanding:
Once back in the classroom, understanding can be checked by questioning students on what they learned from this activity. The different discussion points can be brought up to allow students to talk about the ideas which each group came up with.

Teacher Reflection:

6.2.2.2. Applied Lesson Plan
Lesson Topic: Soils
Duration: Sixty minutes. Three soil cores will be conducted. Twenty minutes per core.

Curriculum Strand:
Methods for Geographic Inquiry and Communication

Methods of Geographic Inquiry and Communication Expectations:
- Use the methods and tools of geographic inquiry to locate, gather, evaluate, and organize information about Canada's Natural and human systems

Specific Curriculum Expectation Links for Methods of Geographic Inquiry and Communication
Research
- Gather geographic information from primary sources (e.g., field research, survey's, interviews) and secondary sources (e.g., reference books, mainstream and alternative media, CD-ROMs, the Internet) to research geographic issue

Soil Core Activity Description:
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Learning Materials: Soil core, pen or pencil, activity sheet

Checks for Understanding:
Once back in the classroom, understanding can be checked by questioning students on what they learned from this activity. The different discussion points can be brought up to allow students to talk about the ideas which each group came up with.

Teacher Reflection:

Name:_____
Date:_____

Soil Core Activity – Learning About Soil Horizons

Soil Core #1
Location: _____
Description of area: _____
_____
_____
_____
_____
Diagram of Soil Horizons (do not forget to label each horizon and estimated depth):

Soil Core #2
Location: _____
Description of area: _____
_____
_____
_____
_____
Diagram of Soil Horizons (do not forget to label each horizon and estimated depth):

Soil Core #3
Location: _____
Description of area: _____
_____
_____
_____
_____
Diagram of Soil Horizons (do not forget to label each horizon and estimated depth):

Differences in each area: _____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Human Interactions:
Explain the consequences of human activities on Tallgrass Prairies with an emphasis on what soil types would be most suitable for agriculture, and why: _____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

6.2.3. On-Site Lesson #2: Global Positioning System Scavenger Hunt

6.2.3.1. Academic Lesson Plan

Lesson Topic: GPS
Duration: Sixty minute scavenger hunt through pathways in tallgrass.

Curriculum Strand:
Methods of Geographic Inquiry and Communication

Methods of Geographic Inquiry and Communication Expectations:

- Use the methods and tools of geographic inquiry to locate, gather, evaluate, and organize information about Canada's natural and human systems;
- Analyse and interpret data gathered in inquiries into the geography of Canada, using a variety of methods and geotechnologies;
- Communicate the results of geographic inquires, using appropriate terms and concepts and a variety of forms and techniques.

Specific Curriculum Expectation Links for Methods of Geographic Inquiry and Communication:

Research

- Gather geographic information from primary sources (e.g., field research, surveys, interviews) and secondary sources (e.g., reference books, mainstream and alternative media, CD-ROMS, the Internet) to research a geographic issue.

Interpretation and Analysis

- Identify and describe the technologies used in geographic inquiry (e.g., geographic information systems [GIS], global positioning system [GPS], hypermedia);
- Use different types of maps (e.g., road, topographical, thematic) to interpret geographic relationships, including changes over time in a specific location;
- Collect and synthesize information about the local ecozone.

GPS Activity: Groups of students will be provided with a GPS unit and instructed on how to use the unit. The students will then be provided with a set of pre-set coordinates that they will be required to follow. At each point there will be a specific plant with a piece of a puzzle. Once all of the coordinates have been properly read and the plants with coinciding puzzle piece have been found, the students will be required to uncover the meaning of the puzzle. There will be a different colour puzzle piece located at each coordinate in the case of a large group of students that needs to be broken down into numerous smaller groups. There will also be a letter associated with each plant which needs to be written down on the activity sheet.

Learning Materials: GPS unit, list of pre-set coordinates, pen/pencil

Checks for Understanding:
Students can be questioned in the classroom after the field trip. These discussions can include what the experience of learning the GPS units was like, any difficulties, any interesting plants they encountered, what the puzzle they had turned out to be etc.

Teacher Reflection:

6.2.3.2. Applied Lesson Plan
Lesson Topic: GPS
Duration: Sixty minute scavenger hunt through pathways in Tallgrass.

Curriculum Strand:
Methods of Geographic Inquiry and Communication

Methods of Geographic Inquiry and Communication Expectations:
- Use the methods and tools of geographic inquiry to locate, gather, evaluate, and organize information about Canada's natural and human systems;
- Analyse and interpret data gathered in inquiries into the geography of Canada, using a variety of methods and geotechnologies;
- Communicate the results of geographic inquires, using appropriate terms and concepts and a variety of forms and techniques.

Specific Curriculum Expectation Links for Methods of Geographic Inquiry and Communication:
Research
- Gather geographic information from primary sources (e.g., field research, surveys, interviews) and secondary sources (e.g., reference books, mainstream and alternative media, CD-ROMS, the Internet) to research a geographic issue.

Interpretation and Analysis
- Identify and describe the technologies used in geographic inquiry (e.g., geographic information systems [GIS], global positioning system [GPS], hypermedia);
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- Collect and synthesize information about the local ecozone.

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Learning Materials: GPS unit, list of pre-set coordinates, pen/pencil

Checks for Understanding:
Students can be questioned in the classroom after the field trip. These discussions can include what the experience of learning to use the GPS units was like, any difficulties, any interesting plants they encountered, what the puzzle they had turned out to be etc.

Teacher Reflection:

Name:_____
Date:_____
Group Colour:_____

Global Positioning System Scavenger Hunt Activity

Instructions: You will be working in a group in order to find "geocaches". Geocaches use Global Positioning Systems (GPS) to discover cashes, which are generally a form of reward. Working in groups, with a GPS unit, you will uncover each cache hidden at each of the coordinates below. Each of the coordinates also corresponds to a plant species found in the prairies. In order to find these plants you may need to go within the Tallgrass Prairie. Only take the item which corresponds with the colour of your group and record the letter posted at each plant to solve the question at the end of the activity. You will have to uncover the solutions to the puzzles once you have uncovered each geocache.

Coordinate #1:

Letter for the word puzzle: _____

Coordinate #2:

Letter for the word puzzle: _____

Coordinate #3:

Letter for the word puzzle: _____

Coordinate #4:

Letter for the word puzzle: _____

Coordinate #5:

Letter for the word puzzle: _____

Coordinate #6:

Letter for the word puzzle: _____

Coordinate #7:

Letter for the word puzzle: _____

Coordinate #8”

Letter for the word puzzle: _____

Coordinate #9:

Letter for the word puzzle: _____

Coordinate #10:

Letter for the word puzzle: _____

Coordinate #11:

Letter for the word puzzle: _____

Coordinate #12:

Letter for the word puzzle: _____

Coordinate #13:

Letter for the word puzzle: _____

Coordinate #14:

Letter for the word puzzle: _____

Hint: What helps Tallgrass Prairies grow?

Word Puzzle Solution: ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

Global Positioning System Scavenger Hunt Answer Sheet

Instructions: You will be working in a group in order to find “geocaches”. Geocaches use Global Positioning Systems (GPS) to discover cashes, which are generally a form of reward. Working in groups, with a GPS unit, you will uncover each cache hidden at each of the coordinates below. Each of the coordinates also corresponds to a plant species found in the prairies. In order to find these plants you may need to go within the Tallgrass Prairie. Only take the item which corresponds with the colour of your group and record the letter posted at each plant to solve the question at the end of the activity. You will have to uncover the solutions to the puzzles once you have uncovered each geocache.

Coordinate #1:

Letter for the word puzzle: _____

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Coordinate #5:

Letter for the word puzzle: _____

Coordinate #6:

Letter for the word puzzle: _____

Coordinate #7:

Letter for the word puzzle: _____

Coordinate #8”

Letter for the word puzzle: _____

Coordinate #9:

Letter for the word puzzle: _____

Coordinate #10:

Letter for the word puzzle: _____

Coordinate #11:

Letter for the word puzzle: _____

Coordinate #12:

Letter for the word puzzle: _____

Coordinate #13:

Letter for the word puzzle: _____

Coordinate #14:

Letter for the word puzzle: _____

Hint: What helps Tallgrass Prairies grow?

Word Puzzle Solution: C O N T R O L L E D B U R N

6.2.4. On-Site Lesson #3: Tallgrass Prairie Nature Walk

6.2.4.1. Academic Lesson Plan

Lesson Topic: Plants and Aboriginal Traditional Ecological Knowledge

Duration: Thirty minutes. Twenty minutes for a walk around the site while listening to a lecture about plants. Ten minutes to ask questions and clarify answers.

Curriculum Strand:
Human-Environment Interactions

Human-Environment Interactions Expectations:

- Analyse the ways in which natural systems interaction with the human systems and make predictions about the outcomes of these interactions.

Specific Curriculum Expectation Links for Human-Environment Interactions:
Building Knowledge and Understanding

- Describe how natural systems (e.g., climate, soils, landforms, natural vegetation, wildlife) influence cultural and economic activities (e.g. recreation, transportation, employment opportunities).
- Explain the ways in which the traditional ecological knowledge of Aboriginal peoples, including their concepts of place, wilderness, and boundaries, influences how they interact with their environment.

Plant Lecture Description and Activity:
Students will be engaged in a talk describing specific plants, which have interesting Aboriginal uses or purposes in today's economy. Students will have a worksheet which they will have to fill out while listening to the talk. They will be able to learn how certain plants have found their way into everyday products, as well as into the economy. Students will also learn about the traditional ecological knowledge of Aboriginal peoples and their uses of specific plants. Through this students will hopefully grasp the balance of Aboriginals and their environment, and the interaction between the two. The worksheet will help the students to pay attention to what is being said while learning about the plants as well as Aboriginal interactions with the environment. The worksheet will include pictures of the plant as well as a space to include their answers.

Learning Materials: Pen or pencil and activity sheet

Checks for Understanding:
The understanding of this activity will be noted through student listening skills. If the students do not have the correct answer then they were not paying attention to the talk. It will be a straight forward and short talk in order to capture attention spans.

Teacher Reflection:

6.2.4.2. Applied Lesson Plan

Lesson Topic: Plants and Aboriginal Traditional Ecological Knowledge

Duration: Thirty minutes. Twenty minutes for a walk around the site while listening to a lecture about plants. Ten minutes to ask questions and clarify answers

Curriculum Strand:

Human-Environment Interactions

Human-Environment Interactions Expectations:

- Relate current lifestyle choices of Canadians to the prospects for sustaining Canada's economic and environmental well-being

Specific Curriculum Expectation Links for Human-Environment Interactions:

Building Knowledge and Understanding

- Identify the ways in which the traditional ecological knowledge and perspectives of Aboriginal peoples influence how they interact with their environments today (e.g., Aboriginal view on hot springs as traditional sacred sites, not tourist attractions)

Plant Lecture Description and Activity:

Students will be engaged in a talk describing specific plants, which have interesting Aboriginal uses or purposes in today's economy. Students will have a worksheet which they will have to fill out while listening to the talk. They will be able to learn how certain plants have found their way into everyday products, as well as into the economy. Students will also learn about the traditional ecological knowledge of Aboriginal peoples and their uses of specific plants. Through this students will hopefully grasp the balance of Aboriginals and their environment, and the interaction between the two. The worksheet will help the students to pay attention to what is being said while learning about the plants as well as Aboriginal interactions with the environment. The worksheet will include pictures of the plant as well as a space to include their answers.

Learning Materials: Pen or pencil and activity sheet

Checks for Understanding:

The understanding of this activity will be noted through student listening skills. If the students do not have the correct answer then they were not paying attention to the talk. It will be a straight forward and short talk in order to capture attention spans.

Teacher Reflection:

Tallgrass Prairie Nature Walk Information Chart

Plant	Other Names	Habitat	Brief physical description (colour, form etc.)	Wildlife Value	Human Value	Interesting Fact
Big Bluestem 						
Switchgrass 						
Canada Wild Rye 						

Plant	Other Names	Habitat	Brief physical description (colour, form etc.)	Wildlife Value	Human Value	Interesting Fact
Blue-eyed Grass 						
Smooth Beard Tongue 						
Canada Anemone 						

Plant	Other Names	Habitat	Brief physical description (colour, form etc.)	Wildlife Value	Human Value	Interesting Fact
Black-eyed Susan 						
New England Aster 						
Butterfly Milkweed 						

Plant	Other Names	Habitat	Brief physical description (colour, form etc.)	Wildlife Value	Human Value	Interesting Fact
Prairie Smoke 						
Wild Lupine 						
Prairie Buttercup 						

Plant	Other Names	Habitat	Brief physical description (colour, form etc.)	Wildlife Value	Human Value	Interesting Fact
Cylindrical Blazingstar 						
Wild Bergamot 						
Canada Tick-trefoil 						

Plant	Other Names	Habitat	Brief physical description (colour, form etc.)	Wildlife Value	Human Value	Interesting Fact
Heath Aster 						

Tallgrass Prairie Nature Walk Information Chart

Information Provided by Heather and Tony Kenny

Plant	Other Names	Habitat	Brief physical description (colour, form etc.)	Wildlife Value	Human Value	Interesting Fact
Big Bluestem 	Turkey Foot or Beard Grass	- Tallgrass prairies - Savannah - Occasionally along roadsides	- Slender re-purple spikelet clusters radiating from top of stem - Divided into three or more parts (resembles a turkey foot) - Turns a distinct bronze in Fall	Deer like to eat it	Aboriginal people set fire to the prairie to stimulate the growth of the Big Bluestem and other species of would grasses which in turn attracted deer, a main food source	- Signature grass of the tallgrass prairie - Capable of sending roots down in excess of 3m
Switchgrass 		- Tallgrass prairies - Savannahs	- Grows in big, leafy clumps to 1.5 m tall -Long blades, up to 1cm wide - Flower born singly at the ends of the branches – head is initially purple, turning tan later in season	Excellent forage species	Recently shown promise in Ontario for use in ethanol fuel, animal bedding, and pulp/paper production	- Root system extends nine to eleven feet into the soil - Does very well on drought-prone sites - Only has to be planted once every ten years - Requires no fertilizers or chemical weed control
Canada Wild Rye 	Nodding Wild Rye	- Dry prairies - Sand dunes - Beaches	- Bunchgrass - Grows to 1.3 m tall - Single bushy flower that grows above leaves – usually straight sometimes nodding - Leaves clasp stem at base and are flat or curled inward near the tip	- Several species of grubs congregate in the root system - Skunks dig in search of grubs around these grasses causing many pants to fall over and sometimes die.	Natives used seeds as a food source	-One of only a handful of “cool season” prairie grasses- grows quicker during spring and fall conditions

Plant	Other Names	Habitat	Brief physical description (colour, form etc.)	Wildlife Value	Human Value	Interesting Fact
Blue-eyed Grass 	Common blue-eyed grass	-Tallgrass prairie - Meadows - Old fields and alvars	-Up to a dozen stems that row up to 30cm tall - Deep blue flowers surrounding a yellow eye; occurring in cluster of two to four near the tip of the stem		Natives made a tea from the root and used it to treat diarrhea and stomach aliments	- Flower only blooms for one day, and only in the morning providing it is sunny. - Flower closes upon being picked
Smooth Beard Tongue 	Foxglove beardtongue	- Moist and dry sites in prairie - Oak savannah - Marsh edges	- Smooth, shiny appearance - Grows to 120cm tall - White, tubular flowers that are penciled inside with purple - Leaves are wide at base and taper to a pointed tip	Benefits bees, butterflies & hummingbirds	The heart stimulant, Digitalis, is a derivative of this plant	- Contains a powerful chemical called “cardiac glycoside” – a defense compound that aids in protecting the plant from herbivores. - - Also the chemical from which the heart stimulant “Digitalis” is derived.
Canada Anemone 	Meadow Anemone	- Meadows - Moist prairies - Open woods	- Hairy stemmed plants to 60 cm tall - Each stalk bears a single, white flower with a yellows center - Leaves are deeply divided into three narrow segments which are themselves toothed and sometimes lobed	Animals rarely browse on this plant	- Natives used roots and leaves to make an astringent styptic - Used to treat wounds and nosebleeds - root was often chewed to clear the throat before singing	- Member of the Buttercup family - All anemones contain a toxic compound (caustic irritant) that may irritate the skin of some people

Plant	Other Names	Habitat	Brief physical description (colour, form etc.)	Wildlife Value	Human Value	Interesting Fact
Black-eyed Susan 		Variety of habitats	- 40 to 50cm tall - purple-green, hairy stem - Dark brown, button-like central disc surrounded by 8-20 yellow petal-like flowers	Nectar attracts bees and butterflies	Tea made from the leaves or roots used by natives to treat sores, snake bites, worms, colds and ear aches - Yellow dye was also made from the petals	Black eyed Susan was originally a prairie species, but is now common in many different habitats throughout the province
New England Aster 		- Thickets - Meadows	- Grows to 1.7 m - Numerous deep violet flower rays (florets) surrounding an orange disc - Many long, narrow leaves with smooth margins - Leaves clasp at stem	Attracts butterflies and bees	Historically used as a cure for fainting spells and loss of consciousness – this was done by burning the plant and forcing the smoke up the patients nostrils with the aid of a paper cone	- Largest and showiest of the wild asters - When in bloom, the deep violet flowers attract swarms of butterflies and bees
Butterfly Milkweed 	Butterflyweed or pleurisy	- Well-drained sandy sites	- Bushy in appearance - Stems are hairy - Up to 90 cm tall - Flower - begins lime green, shifts to bright yellow and finally matures to a brilliant orange - Star-like appearance	The nectar is very attractive to insects and butterflies	- The roots and seeds were used by Aboriginal people for food and to produce sugar - Early settlers and Aboriginal people also used the plant to treat pleurisy	- Has a clear sap unlike other milkweeds which have white, milky sap - Medicinal properties of roots are caused by a powerful chemical which acts as a natural protection (insecticide) against insect damage - The generic name, *Asclepias*, suggests that the plant was dedicated to the ancient Greek doctor, Aesclepius

Plant	Other Names	Habitat	Brief physical description (colour, form etc.)	Wildlife Value	Human Value	Interesting Fact
Prairie Smoke 	- Old man's whiskers - Three-flowered avens	- Dry prairie - Alvars	- Hairy stemmed plants, grows to 30 cm - Composed of five triangular red-purple sepals alternating with thread-like bracts and five smaller creamy white to pink or purple petals - Up to 15cm long and divided into as many as nineteen toothed segments leaves occur on lower part of plant		Historically, the roots were used to make a medicinal tea	The flowers of prairie smoke only open up enough to admit insects (especially bees) for pollination
Wild Lupine 	Lupin	- Tallgrass prairie - Savannas (sandy open woodlands) - Meadows	- Several hairy stems rise between 30-80cm from fan-like basal leaves - Deep blue, pea like flowers surround the stem from its midpoint and taper inwards towards the tip	Lupins are the only larval host for the endangered, Karner Blue Butterfly	- Natives made a cold leaf tea to treat nausea and internal hemorrhaging - Settlers used to feed Lupins to their horses to fatten them up and make then "more spirited"	- Lupins, like other members of the pea family, are legumes - Warning – some lupins are toxic
Prairie Buttercup 		- Tallgrass prairie - Savannahs - Rock barrens	- Less than a foot tall - Leaves and stem are covered with fine silky hairs - Flowers are ¾ an inch wide with five small, hairy sepals and five yellow petals surrounding many yellow stamens	This plant contains a powerful stomach irritant therefore it is of little value to wildlife	- American Indians poulticed roots for use on abscesses - The leaves were also used to ease symptoms of arthritis and reheumatism	Some buttercups contain an acrid compound that can cause severe mouth, skin, stomach and intestinal irritation

Plant	Other Names	Habitat	Brief physical description (colour, form etc.)	Wildlife Value	Human Value	Interesting Fact
Cylindrical Blazingstar 	Blazingstar	- Dry prairies - Sand dunes - Alvars - Often associated with limestone or calcium rich soils	- Smooth, unbranched plants, up to 60 cm - Grass-like; longest leaves on stem are up to 25 cm long with the leaves getting smaller upward along the stem - flower heads are alternate and each flower bract has 10-35 small purple dislike flowers	Attracts butterflies, hummingbirds, and bees	Historically, a tea was made from the roots and used to treat aliments such as kidney and bladder infections, sore throats, and colic	- Several species of Dense Blazing Star are among the most popular perennials sold in North Americans nurseries - This is attributed to their unique form, long lasting flowers and ability to attract wildlife
Wild Bergamot 		- Prairies - Old fields - Roadsides	- Grows from creeping underground stems 30-100 cm tall - Pink flowers that resemble pom-poms - Oval to lance shaped leaves - Leaves have minty aroma	Very attractive to bees and butterflies	- Historically the leaves were used to make mint tea and as a seasoning - The leaves are also recognized as having medicinal properties (the tea is said to soothe sore throats) - Aboriginal people also used Bergamot as a hair pomade	- The leaves of wild bergamot are what gives Earl Grey tea its distinct flavour
Canada Tick-trefoil 		- Tallgrass prairies - Meadows - Open woods	- Upright, slender, hairy stems giving the plant a bushy appearance - Grows to 1.5 metres tall - Rosy purple flowers arranged in a dense cluster - Compound leaves with 3-5 leaflets per leaf	Tick-trefoils are a favorite food source of deer, wild turkeys and ruffled grouse	Tick-trefoils are legumes or nitrogen fixing plants	- Also known as stick-tights, because the rough, flattened seeds cling tenaciously to clothing, shoelaces, and hair

Plant	Other Names	Habitat	Brief physical description (colour, form etc.)	Wildlife Value	Human Value	Interesting Fact
Heath Aster 	Frost-weed Aster or White Aster	- Upland prairies - Pastures - Old fields	- Slender, erect, and open-branched - Smooth stem - Grows up to 90 cm tall - Miniature white to pink daisy-like flowers with yellow centers - Alternate leaves that are small, narrow and pointed	Provides nectar and pollen for bees, butterflies, and other insects	Used for ornamental purposes	Is the last native plant to flower in Ontario

6.2.5. On-Site Lesson #4: Mapping

6.2.5.1. Academic Lesson Plan

Lesson Topic: Mapping

Duration: Thirty minutes on site. Students will be able to add to their map through the day, however there will one thirty minute station in which students will be provided with time to complete their map with the required elements.

Curriculum Strand:
Methods of Geographic Inquiry and Communication

Methods of Geographic Inquiry and Communication Expectations:

- use the methods and tools of geographic inquiry to locate, gather, evaluate, and organize information about Canada's natural and human systems.
- communicate the results of geographic inquires, using appropriate terms and concepts and a variety of forms and techniques.

Specific Curriculum Expectation Links for Methods of Geographic Inquiry and Communication:

Research

- gather geographic information from primary sources (e.g., field research, surveys, interviews) and secondary sources (e.g., reference books, mainstream and alternative media, CD-ROMS, the Internet) to research a geographic issue.

Interpretation and Analysis

- use different types of maps (e.g., road, topographical, thematic) to interpret geographic relationships, including changes over time in a specific location.
- collect and synthesize information about the local ecozone.

Mapping Activity: Students will have to draw a map of the Tallgrass Prairie Restoration Site (hint, they can use the sign on site). Students will be required to complete the map by illustrating where they have been, what they have seen and what they have done. This activity allows students to comprehend all of the ecological interactions of a specific ecosystem.

Suggested elements to include on map for mapping activity:

- Title
- Boundaries of restoration site
- Specific land marks (e.g., Oak Tree)
- Maple Forest
- Pathways
- Stations (including the three soil core locations)
- Legend
- Directional arrow
- River
- Entrance to Tallgrass Prairie
- Animal sighting(s) or interesting feature(s)

Learning Materials: Map of Tallgrass Restoration Site, pencil or pen

Checks for Understanding:
Students can be questioned in the classroom after the field trip. These discussions can include what they learned, any interesting facts, animals spotted, what their favorite moment or activity was etc.

Teacher Reflection:

6.2.5.2. Applied Lesson Plan
Lesson Topic: Mapping
Duration: Thirty minutes on site. Students will be able to add to their map through the day, however there will one thirty minute station in which students will be provided with time to complete their map with the required elements.

Curriculum Strand:
Methods of Geographic Inquiry and Communication

Methods of Geographic Inquiry and Communication Expectations:
- use the methods and tools of geographic inquiry to locate, gather, evaluate, and organize information about Canada's natural and human systems.
- communicate the results of geographic inquires, using appropriate terms and concepts and a variety of forms and techniques.

Specific Curriculum Expectation Links for Methods of Geographic Inquiry and Communication:
Research
- gather geographic information from primary sources (e.g., field research, surveys, interviews) and secondary sources (e.g., reference books, mainstream and alternative media, CD-ROMS, the Internet) to research a geographic issue.

Interpretation and Analysis
- use different types of maps (e.g., road, topographical, thematic) to interpret geographic relationships.
- collect and synthesize information about the local ecozone.

Mapping Activity: Students will have to draw a map of the Tallgrass Prairie Restoration Site (hint, they can use the sign on site). Students will be required to complete the map by illustrating where they have been, what they have seen and what they have done. This activity allows students to comprehend all of the ecological interactions of a specific ecosystem.

Suggested elements to include on map for mapping activity:
- Title
- Boundaries of restoration site
- Specific land marks (e.g., Oak Tree)
- Maple Forest
- Pathways
- Stations (including the three soil core locations)
- Legend
- Directional arrow
- River
- Entrance to Tallgrass Prairie
- Animal sighting(s) or interesting feature(s)

Learning Materials: Map of Tallgrass Restoration Site, pencil or pen

Checks for Understanding:
Students can be questioned in the classroom after the field trip. These discussions can include what they learned, any interesting facts, animals spotted, what their favorite moment or activity was etc.

Teacher Reflection:

6.2.6. On-Site Lesson #5: Seed Harvesting

6.2.6.1. Academic/Applied Lesson Plan

Lesson Topic: Creation of a restoration site

Duration: Thirty minutes in total. A ten minute introduction to seed harvesting will be followed by a twenty minute hands-on seed harvesting activity.

Seed Harvesting Activity: Students will be engaged in the opportunity to experience the creation of a restoration site. This will be experienced by participating first hand in the seed collecting process.

Learning Materials:

Checks for Understanding: Students will be questioned on the benefits of collecting seeds, seed banks, and what would happen to the restoration site if harvesting seeds or seed banks did not exist during the introduction to the activity.

Teacher Reflection:

6.2.7. On-Site Lesson #6: Seed Planting

6.2.7.1. Academic/Applied Lesson Plan

Lesson Topic: Creation of a restoration site

Duration: Thirty minutes in total. A ten minute introduction to seed planting will be followed by a twenty minute hands-on seed planting activity.

Seed Planting Activity: Students will be engaged in the opportunity to experience the creation of a restoration site. This will be experienced by participating first hand in the seed planting process.

Learning Materials:

Checks for Understanding: The student will be questioned as to why they are planting these seeds, how it going to help the site, the ecozone and the different interactions within the ecosystem during the introduction to the activity. Additionally, students will also be educated on the benefits of controlled burns contrasting them to natural burns which historically occurred.

Teacher Reflection:

6.2.8. Post-Site Lesson #1: Ecozone Poster Project

6.2.8.1. Academic Lesson Plan

Lesson Topic: Ecozones

Duration: One classroom period (for group work). Ideally, this activity would be given to students on a Thursday, while giving then the Friday as a work period for group members. The project would be due on a Tuesday to maximize weekend work time as well as allowing students to work at lunch on Monday.

Curriculum Strand:

Geographic Foundations: Space and Systems and Human-Environment Interactions

Geographic Foundations: Space and Systems Expectations:

- Describing the components and patterns of Canada's spatial organization;
- Demonstrate an understanding of the regional diversity of Canada's natural and human systems;
- Analyse local and regional factors that affect Canada's natural and human systems.

Human-Environment Interactions Expectations:

- Analyse the ways in which natural systems interaction with the human systems and make predictions about the outcomes of these interactions;
- Evaluate various ways to ensuring resource sustainability in Canada.

Specific Curriculum Expectation Links for Geographic Foundations: Space and Systems:

Building Knowledge and Understanding

- Explain terms and concepts associated with regions (e.g., bioregion, ecozone, "ecological footprint", boundaries, transition zone, ecumene);
- Describe the characteristics (e.g., complex, interconnected, life supporting, driven by solar energy) of natural systems (e.g., climate, biomes, the lithosphere, the hydrosphere);
- Distinguish between the characteristics of urban and rural environments (e.g., differences in population density, land use, forms of settlement, development patterns, types of employment.

Developing and Practicing Skills

- Illustrate and explain the regional distribution patterns of various peoples across Canada (e.g., Aboriginal peoples, Francophones, immigrant groups).

Specific Curriculum Expectation Links for Human-Environment Interactions:

Building Knowledge and Understanding

- Describe how natural systems (e.g., climate, soils, landforms, natural vegetation, wildlife) influence cultural and economic activities (e.g. recreation, transportation, employment opportunities).

Learning Through Application

- Evaluate solutions to environmental problems proposed by various groups (e.g., by government, industry, environmentalists, community members) and make recommendations for sustainable resource use.

Poster Project Description:
Students will choose different ecozones in Canada and give a brief description of the ecosystem. Students will include visuals of each ecozone. A map of Canada will be located in the middle of the poster board. Surroundng the map of Canada students will attach pictures in a creative way with different colours for easy identification link to an ecozone. Students should colour the map according to the ecozones they are choosing to research.
Each picture will need a caption of what is in the picture and what part of the ecozone it is found in. Each ecozone also needs a full description, including endangered species as well as examples of resource sustainability and deterioration. The post should include how sustainability is occurring or how destruction is deteriorating in ecosystems within each ecozone. A write up for each of these should be attached to the back of the poster. At the end of this write up there should be a description of what each student learned from doing the project. They should include something they did not know before researching the ecozones and ecosystems, in order to provide a personal reflection or connection to the project. Each reflection must be at least half a page. Groups should include two or three members and each person must do two ecozones.

They can be posted around the classroom once marked.

Suggested topics to include in picture selection and informational write up:
- Climate of area
- Soil types
- Land formations
- Land use
- Natural vegetation
- Wildlife
- Indigenous groups found within the ecosystem area.

Learning Materials: Map of Canada, poster board, old magazines, access to Internet for pictures, glue, pencil crayons

Checks for Understanding:
A quick brainstorming activity can be done after the poster project has been handed in to evaluate students understanding of the material which they researched. This could be a verbal thirty minute brainstorming session about the various ecozones and what environmental problems they are encountering. It could include issues of sustainability and solutions to environmental degradation. This will allows students to gain an understand of ecozones their group perhaps did not cover.

Teacher Reflection:

6.2.8.2. Applied Lesson Plan

Lesson Topic: Ecozones

Duration: One classroom period (for group work). Ideally, this activity would be given to students on a Thursday, while giving then the Friday as a work period for group members. The project would be due on a Tuesday to maximize weekend work time as well as allowing students to work at lunch on Monday.

Curriculum Strand:

Geographic Foundations: Space and Systems and Human-Environment Interactions

Geographic Foundations: Space and Systems Expectations:

- Identify patterns and diversity in Canada's natural and human systems;
- Illustrate regional differences using the concept of ecozone;
- Describe issues that affect natural and human systems in Canada.

Specific Curriculum Expectation Links for Geographic Foundations: Space and Systems:

Building Knowledge and Understanding

- Use the terms and concepts associated with regions (e.g., single-and multi-factor, boundaries, transition zone, ecozone);
- Describe selected characteristics of natural systems (e.g., climate, landforms, natural vegetation);
- Describe how natural and human systems interact within selected Canadian ecozones.

Developing and Practicing Skills

- Compare and contrast two ecozones to illustrate physical and cultural diversity;
- Propose criteria (e.g. public support accessibility, uniqueness of physical features) for determining the most appropriate location for a new provincial or national park;
- Identify and explain the regional patterns of population distribution of Aboriginal and non-Aboriginal people across Canada (e.g., where various groups are located and why they settled there).

Poster Project Description:

Students will choose different ecozones in Canada and give a brief description of the ecosystem. Students will include visuals of each ecozone. A map of Canada will be located in the middle of the poster board. Surroundng the map of Canada students will attach pictures in a creative way with different colours for easy identification link to an ecozone. Students should colour the map according to the ecozones they are choosing to research.

Each picture will need a caption of what is in the picture and what part of the ecozone it is found in. Each ecozone also needs a full description, including endangered species as well as examples of resource sustainability and deterioration. The post should include how sustainability is occurring or how destruction is deteriorating in ecosystems within each ecozone. A write up for each of these should be attached to the back of the poster. At the end of this write up there should be a description of what each student learned from doing the project. They should include something they did not know before

researching the ecozones and ecosystems, in order to provide a personal reflection or connection to the project. Each reflection must be at least half a page. Groups should include two or three members and each person must do two ecozones.

They can be posted around the classroom once marked.

Suggested topics to include in picture selection and informational write up:
- Climate of area
- Soil types
- Land formations
- Land use
- Natural vegetation
- Wildlife
- Indigenous groups found within the ecosystem area.

Learning Materials: Map of Canada, poster board, old magazines, access to Internet for pictures, glue, pencil crayons

Checks for Understanding:
A quick brainstorming activity can be done after the poster project has been handed in to evaluate students understanding of the material which they researched. This could be a verbal thirty minute brainstorming session about the various ecozones and what environmental problems they are encountering. It could include issues of sustainability and solutions to environmental degradation. This will allows students to gain an understand of ecozones their group perhaps did not cover.

Teacher Reflection:

6.2.8.3. Map of Canada

6.2.8.4. Poster Rubric

Mark ____/100

Name:_____

Date: _____

Neatness and Organization	Creativity	Quality of Pictures	Labeling of Pictures	Use of Bristol Board	Your Input
Exceptionally well-organized, neatly presented, title, and names 25	Presented all info in an unusual but informative way 15	Pictures, sharp, clear; unique pictures for each area, all in colour 15	High quality printing and all lines and labels exceptionally well done 15	Complete use with no overlap unless due to creativity 10	Reflection fully completed and well answered 20
Very well-organized, neatly presented, title, and names 21	Some evidence of creativity 11	Pictures, some not unique, all in colour 12	Very good quality printing, neat well-drawn lines 12	Some overlap but full use 8	Reflection fully completed and some questions not fully answered 16
Acceptable organization and neatness 18	Basic presentation 9	Pictures, some not unique, some not in colour 10	Good quality printing, lines well drawn 10	Some gaps on the board 7	Some questions attempted but reflection not completed 13
Lacks organization but is neat 14	Lacks any creativity 5	Some pictures missing, mixture of b/w & colour 8	Inconsistent printing, labeling acceptable 8	Major areas left blank 5	Reflection less than half completed 8
Is neat but lacks organization 14		More than half pictures missing 5	Consistent printing, problems with labeling 8	Too many areas left unused 3	
Lacks organization and lacks neatness 7			Printing and labeling poor 5		

6.2.9. Glossary

Biome: A kind of plant and animal community that covers large geographic areas. Climate is a major determiner of the biome found in a particular area. (Enger & Smith, 2000).

Bioregion: a part of the Earth's surface, large or small, identified by its combination of natural and human characteristics. Example: Tundra, wetlands, and woodlots are three examples of the many different types of bioregions (DesRivieres, 2003).

Boundary: An imaginary line on the Earth's surface, or on a map, that divides one area from another. Example: The line o latitude numbered 49°N marks the boundary between western Canada and the United States (DesRivieres, 2003).

Curriculum Documents: Curriculum documents define what children are taught in Ontario public schools. They detail the knowledge and skills that students are expected to develop in each subject at each grade level. By developing and publishing curriculum documents for use by all Ontario teachers, the Ministry of Education sets standards for the entire province. (Ontario Ministry of Education, 2006)

Ecological Footprint: The total impact, including the resources used and waste produced, of human use on the surrounding environment, often measured in hectares (Wallace, 2006).

Ecological Niche: The role an organism plays within the structure and functions of an ecosystem, and the way it interacts with other living things and with its physical environment (Enger & Smith, 2000).

Ecology: The science of the study of the relationship between living things and their environment (Botkin & Keller, 2005).

Ecosystem: A system that is formed by the interactions of the living and non-living components of the physical environment. (Wallace, 2006).

Ecumene: The settled portion of a country (Wallace, 2006).

Ecozone: A region that is distinct due to its pattern of humans and natural geography (Wallace, 2006).

Endangered Species: A species that faces threats that might lead to its extinction in a short time (Botkin & Keller, 2005).

Environment: All factors (living and nonliving) that actually affect an individual organism or population at any point in the life cycle. Environment is also sometimes used to denote a certain set of circumstances surrounding a particular occurrence (environments of deposition, for example) (Botkin & Keller, 2005).

Geographical Information System (GIS): Technology capable of storing, retrieving, transferring, and displaying environmental data (Botkin & Keller. 2005)

Global Positioning System (GPS): a method of determining a location on the Earth based on signals form three or more satellites. Example Back-country skiers and hikers use GPS unities to check their locations (DesRivieres, 2003). This is also used for a recreational hobby of geocaching.

Habitat Management: The process of changing the natural community to encourage the increase in populations of certain desirable species (Enger & Smith, 2000).

Prairies/Grasslands: Areas receiving between 25 and 75 centimeters of precipitation per year. Grasses are the dominant vegetation, and trees are rare (Wallace, 2006).

Preservation: To keep from harm or damage; to maintain its original condition (Enger & Smith, 2000).

Restoration Ecology: The field within the science of ecology with the goal to return damaged ecosystems to ones that are functional, sustainable, and more natural (Botkin & Keller, 2005).

Soil Core: A tool used which cores down into the soil, retrieving a cylindrical soil sample. This allows the differentiation of soil horizons to be seen using a soil profile.

Soil Profile: A side view, or cross-section, of soil layers, from the surface down to the rock or gravel material below. Example: Trees that have large, deep root system are found only where the soil profile is at least a meter or two deep (DesRivieres, 2003).

Stewardship: The concept that mankind has an ethical responsibility to care for the plants, animals, and the environment as a whole, due to our superior intellect and power to change the natural world (Enger & Smith, 2000).

Strands: The Geography of Canada course is organized into five strands (Ministry of Education, 2005)

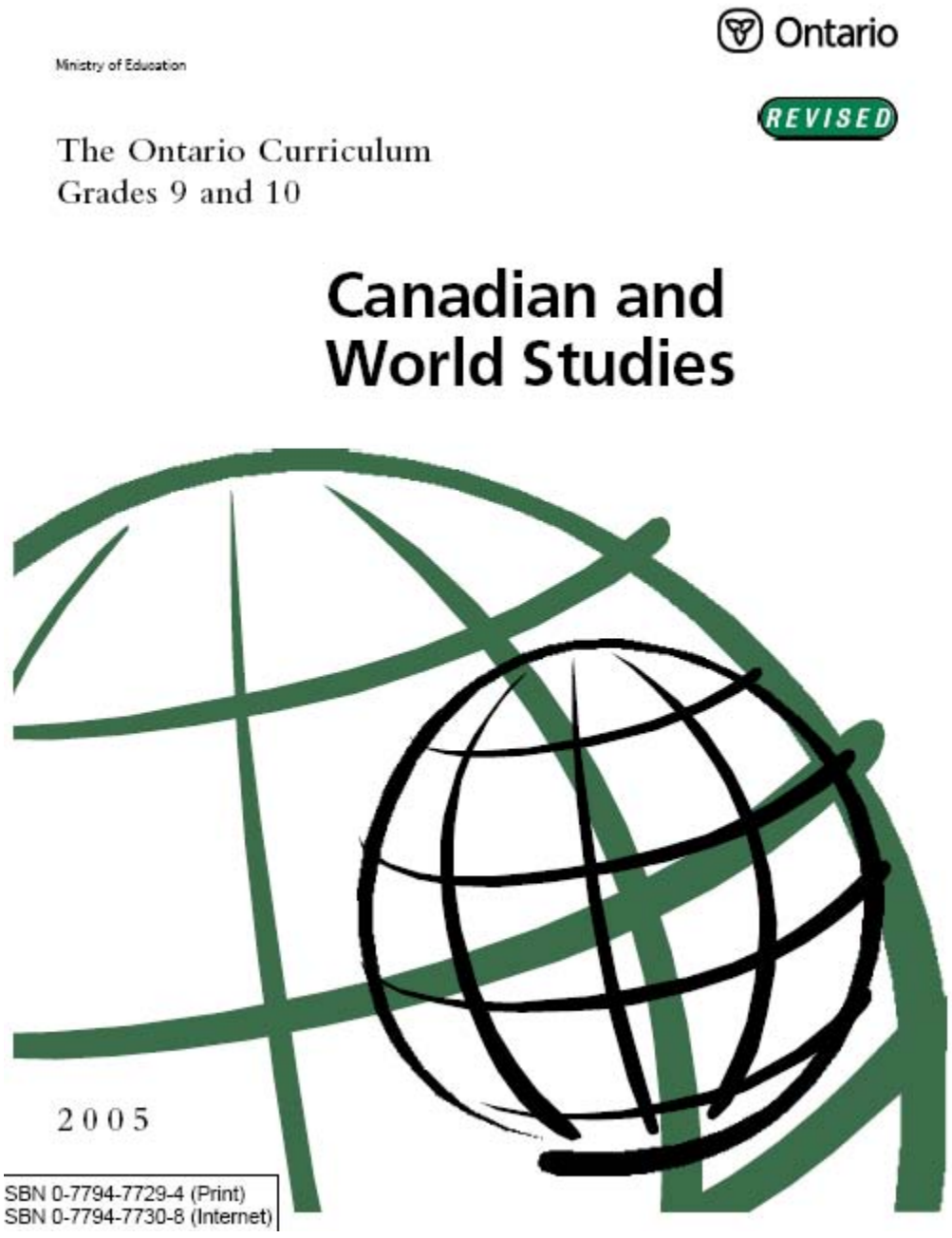
Sustainability: Management of natural resources and the environment with the goals of allowing the harvest of resources to remain at or above some specified level, and the ecosystem to retain its functions and structure (Botkin & Keller, 2005).

Transition Zone: An area between two different regions, in which the characteristics of one region gradually blend into those of the other. Example: The taiga region of the Northwest Territories is a transition zone between the coniferous forests to the south and the tundra to the north (DesRivieres, 2003).

APPENDIX

7.1. Brochure

7.6. Curriculum Documents



Geography

Overview

Geography is an integrative subject that brings a variety of perspectives, both social and physical, to the study of people, places, and environments around the world. Knowing where physical, social, or political events or processes occur helps students gain a spatial perspective on them. Understanding the processes that shape the earth and knowing how life forms interact with the environment allow them to view events from an ecological perspective. Historical and economic perspectives help students understand the relationship between people and their environments, as well as interactions that occur among groups of people. Studying geography, students receive practical guidance for decision making and problem solving in geographic planning, economic development, and environmental and resource management.

As the world's economies become increasingly interdependent, as pressures on the world's resources mount, and as concerns about issues such as global warming, urbanization, and population growth escalate, people need to become geographically literate and able to make informed judgements about environmental and social issues. The Grade 9 Geography of Canada course provides students with a foundation in this essential area of learning.

Strands

The following are the five strands into which the Geography of Canada course is organized.

Geographic Foundations: Space and Systems. When geographers study the earth's surface, they work with spatial measurements such as elevation, distance, area, direction, and scale, as well as with complex ideas such as place, region, distribution, and pattern. Geography also includes the study of physical, economic, cultural, and political systems. By learning about the structure, evolution, and interaction of these systems, students gain insight into the interconnectedness of the physical and human worlds.

Human-Environment Interactions. People are an integral part of the natural environment. The natural environment affects people's lives in many fundamental ways, and people in turn affect the environment through their policies and activities. A similar relationship exists between people and their urban, cultural, and economic environments. Students need to understand these relationships in order to analyse the human consequences of natural events and the effects of human decisions on the environment.

Global Connections. Geography requires that students assume a global perspective on events and processes in any part of the world. Geographers study the special characteristics of different parts of the world and the connections between them. They consider issues that affect local communities and those that affect the whole world. Since the world's economies are becoming increasingly interconnected, and the flow of people, products, money, information, and ideas around the world is accelerating, a global perspective is particularly important for today's students.

Understanding and Managing Change. As the world undergoes continual change, students need many different kinds of knowledge and skills to be successful. Geographers use both local and global perspectives to identify trends, analyse the factors that cause change, and forecast the effects of change in the relationships between the earth's natural and human systems. These kinds of knowledge and skills are invaluable in problem solving and planning.

Methods of Geographic Inquiry and Communication. Geographers use a wide array of approaches and tools in their work. Some of these, such as fieldwork and computer analysis, are used in various disciplines; others are specific to geographic studies. The latter include mapping, interpretation of aerial photographs, remote sensing, and image analysis using the global positioning system (GPS) and geographic information systems (GIS). The study of geography is especially relevant to contemporary students because, in addition to teaching them to view the world from both spatial and ecological perspectives, it familiarizes them with this broad range of new and traditional techniques and approaches.

Geography of Canada, Grade 9, Academic (CGC1D)

This course explores Canada's distinct and changing character and the geographic systems and relationships that shape it. Students will investigate the interactions of natural and human systems within Canada, as well as Canada's economic, cultural, and environmental connections to other countries. Students will use a variety of geotechnologies and inquiry and communication methods to analyse and evaluate geographic issues and present their findings.

Geographic Foundations: Space and Systems

Overall Expectations

By the end of this course, students will:

- describe the components and patterns of Canada's spatial organization;
- demonstrate an understanding of the regional diversity of Canada's natural and human systems;
- analyse local and regional factors that affect Canada's natural and human systems.

Specific Expectations

Building Knowledge and Understanding

By the end of this course, students will:

- explain the terms and concepts associated with regions (e.g., *bioregion*, *ecozone*, *"ecological footprint"*, *boundaries*, *transition zone*, *ecumene*);
- describe the characteristics (e.g., complex, interconnected, life supporting, driven by solar energy) of natural systems (e.g., climate, biomes, the lithosphere, the hydrosphere);
- describe the characteristics (e.g., complex, interconnected, affecting natural systems) of human systems (e.g., transportation, communication, infrastructure, energy networks, economic systems);
- outline the criteria used to define selected Canadian ecozones and describe the processes and interactions that shape those ecozones;
- distinguish between the characteristics of urban and rural environments (e.g., differences in population density, land use, forms of settlement, development patterns, types of employment);
- explain the geographical requirements that determine the location of businesses, industries, and transportation systems.

Developing and Practising Skills

By the end of this course, students will:

- analyse variations in population density and use their findings to explain overall population patterns;
- illustrate and explain the regional distribution patterns of various peoples across Canada (e.g., Aboriginal peoples, Francophones, immigrant groups);
- analyse the location pattern of recent First Nation land claims in Canada.

Learning Through Application

By the end of this course, students will:

- identify criteria with which to evaluate the effect of government land use policy on planning in the local community;
- compare different ways of providing human systems (e.g., transportation, social services, resource management, political structures) for a territory (e.g., Nunavut) and areas in southern Canada;
- use a reasoned argument to identify the best place to live in Canada and justify their choice;
- predict future locations of businesses, industries, and transportation systems in Canada;
- identify and describe examples of Canadian art (e.g., in dance, drama, literature, music, visual arts) that reflect natural or cultural landscapes.

Human-Environment Interactions

Overall Expectations

By the end of this course, students will:

- explain the relationship of Canada's renewable and non-renewable resources to the Canadian economy;
- analyse the ways in which natural systems interact with human systems and make predictions about the outcomes of these interactions;
- evaluate various ways of ensuring resource sustainability in Canada.

Specific Expectations

Building Knowledge and Understanding

By the end of this course, students will:

- explain how human activities (e.g., agricultural and urban development, waste management, parks development, forest harvesting, land reclamation) affect, or are affected by, the environment;
- describe how natural systems (e.g., climate, soils, landforms, natural vegetation, wildlife) influence cultural and economic activities (e.g., recreation, transportation, employment opportunities);
- describe the regional distribution of Canada's energy sources and the relative importance of each source;
- identify the role of government in managing resources and protecting the environment;
- explain the ways in which the traditional ecological knowledge of Aboriginal peoples, including their concepts of place, wilderness, and boundaries, influences how they interact with their environment.

Developing and Practising Skills

By the end of this course, students will:

- assess the value of Canada's key natural resources, including agricultural lands and wilderness;
- assess the feasibility of using selected renewable and alternative energy sources (e.g., solar, wind, tidal, hydrogen fuel cell) to implement conservation strategies;
- evaluate differing viewpoints on the benefits and disadvantages of selected resource megaprojects (e.g., James Bay hydro complex, Hibernia offshore oilfields, Athabasca oil sands, diamond mines in the Northwest Territories, Mackenzie Valley oil/gas pipeline);
- assess how the effects of urban growth (e.g., development on former farm lands, destruction of wildlife habitats, draining of marshes) alter the natural environment;
- present findings from research on ways of improving the balance between human and natural systems (e.g., recycling, river clean-ups, ecological restoration of local woodlots or schoolyards, industrial initiatives to reduce pollution).

Learning Through Application

By the end of this course, students will:

- analyse and evaluate the success, in environmental and economic terms, of local waste management methods;
- evaluate solutions to environmental problems proposed by various groups (e.g., by government, industry, environmentalists, community members) and make recommendations for sustainable resource use;
- recommend ways in which individuals can contribute to the quality of life in their home, local ecozone, province, nation, and the world.

Global Connections

Overall Expectations

By the end of this course, students will:

- describe how Canada's diverse geography affects its economic, cultural, and environmental links to other countries;
- analyse connections between Canada and other countries;
- report on global issues that affect Canadians.

Specific Expectations

Building Knowledge and Understanding

By the end of this course, students will:

- explain the role of selected international organizations and agreements and why Canada participates in them (e.g., United Nations, Commonwealth of Nations, World Health Organization, North Atlantic Treaty Organization, World Trade Organization, Asia-Pacific Economic Cooperation, Sommet de la Francophonie, International Olympic Committee, Inuit Circumpolar Games; North American Free Trade Agreement, Kyoto Protocol);
- summarize significant contributions Canada makes to the world (e.g., in peacekeeping, telecommunications technology, humanitarian aid, sports, arts);
- explain how Canada's natural systems form part of global natural systems (e.g., Pacific Ring of Fire, continental shelves, global biomes).

Developing and Practising Skills

By the end of this course, students will:

- compare Canada's approaches to specific concerns (e.g., species loss, deforestation, pesticide use, cross-border pollution, movement of people, trade) with the approaches of other nations;
- evaluate Canada's participation in organizations that deal with global issues (e.g., global warming, biodiversity, human rights);
- analyse the global distribution of selected commodities and determine Canada's share of each (e.g., minerals, fuels, forest and agricultural products, manufactured goods and services);
- summarize ways in which the economies of Canada and the rest of the world are interdependent;
- evaluate the importance of tourism to Canada's economic development.

Learning Through Application

By the end of this course, students will:

- compare, in terms of resource use and consumption, the "ecological footprint" of an average Canadian with that of an average citizen in a developing country;
- produce a set of guidelines for developing a solution to a global geographic or environmental issue.

Understanding and Managing Change

Overall Expectations

By the end of this course, students will:

- explain how natural and human systems change over time and from place to place;
- predict how current or anticipated changes in the geography of Canada will affect the country's future economic, social, and environmental well-being;
- explain how global economic and environmental factors affect individual choices.

Specific Expectations

Building Knowledge and Understanding

By the end of this course, students will:

- recognize the similarities among cultures and the need to respect cultural differences;
- explain how selected factors cause change in human and natural systems (e.g., technological developments, corporate and government policies, zoning by-laws, natural hazards, global warming);
- identify and explain the factors influencing demographics and migration in Canada.

Developing and Practising Skills

By the end of this course, students will:

- analyse different perspectives on a geographic issue (e.g., clear-cutting, waste disposal, urban sprawl) and present arguments supporting a point of view;
- predict the consequences of human activities (e.g., agriculture, recreation) on natural systems (e.g., soil depletion, climate change);
- analyse the positive and negative effects of people and the environment of the manufacture, transportation to market, and consumption of selected products (e.g., cars, clothing, tropical food products).

Learning Through Application

By the end of this course, students will:

- evaluate the impact of change (e.g., new technologies) on a selected planning project (e.g., residential or resort development, urban renewal, installation of water and sewage systems);
- predict various global environmental changes (e.g., global warming) and the impact they may have in the future on the occupations of Canadians (e.g., wheat farming in the Arctic) in various sectors of the economy (e.g., primary, secondary, tertiary, quaternary).

Methods of Geographic Inquiry and Communication

Overall Expectations

By the end of this course, students will:

- use the methods and tools of geographic inquiry to locate, gather, evaluate, and organize information about Canada's natural and human systems;
- analyse and interpret data gathered in inquiries into the geography of Canada, using a variety of methods and geotechnologies;
- communicate the results of geographic inquiries, using appropriate terms and concepts and a variety of forms and techniques.

Specific Expectations

Research

By the end of this course, students will:

- develop and use appropriate questions to define a topic, problem, or issue and to focus a geographic inquiry;
- gather geographic information from primary sources (e.g., field research, surveys, interviews) and secondary sources (e.g., reference books, mainstream and alternative media, CD-ROMs, the Internet) to research a geographic issue;
- evaluate the credibility of sources (e.g., authority, impartiality, expertise) and the reliability and usefulness of information (e.g., accuracy and relevance, absence of bias or prejudice, arguments substantiated by evidence);
- identify various career opportunities in the field of geography, and the educational requirements associated with them.

Interpretation and Analysis

By the end of this course, students will:

- distinguish among opinion, argument, and fact in research sources;
- identify and describe the technologies used in geographic inquiry (e.g., geographic information systems [GIS], global positioning system [GPS], hypermedia);
- use graphic organizers (e.g., semantic webs, timelines, future wheels, analogy charts, Venn diagrams) to clarify and interpret geographic information;
- use different types of maps (e.g., road, topographical, thematic) to interpret geographic relationships, including changes over time in a specific location;
- use appropriate statistical methods (e.g., calculate averages, medians, correlations) and categories of data (e.g., population distribution, density, migration rates) in geographic analysis, observing accepted conventions;
- provide appropriate and sufficient geographic evidence and well-reasoned arguments, to support opinions and conclusions;
- collect and synthesize information about the local ecozone;
- analyse a regional or national geographic issue on the basis of information gathered through research (e.g., designate a World Heritage Site; select the best site for a particular manufacturing industry);
- make planning decisions concerning a regional community after studying its existing natural and human systems (e.g., transportation, communication, energy networks, ecozones).

Communication

By the end of this course, students will:

- communicate the results of geographic inquiries, for different audiences and purposes, using a variety of forms (e.g., reports, role plays, presentations, essays) and including geographic visual supports, both conventional (e.g., photographs, charts, graphs, models, organizers, diagrams, maps) and geotechnological (e.g., computer-generated maps and graphs, aerial photographs, satellite images);
- use an accepted form of academic documentation (e.g., footnotes, endnotes, or author-date citations; bibliographies or reference lists) to acknowledge all information sources, including electronic sources;
- use appropriate terminology (e.g., *location*, *place*, *region*, *pattern*, *urban*, *suburban*, *rural*, *wilderness*) to communicate results of geographic inquiries.

Geography of Canada, Grade 9, Applied (CGC1P)

This course focuses on geographic issues that affect Canadians today. Students will draw on personal and everyday experiences as they learn about Canada's distinct and changing character and the natural and human systems and global influences that shape the country. Students will use a variety of geotechnologies and inquiry and communication methods to examine practical geographic questions and communicate their findings.

Geographic Foundations: Space and Systems

Overall Expectations

By the end of this course, students will:

- identify patterns and diversity in Canada's natural and human systems;
- illustrate regional differences using the concept of ecozone;
- describe issues that affect natural and human systems in Canada.

Specific Expectations

Building Knowledge and Understanding

By the end of this course, students will:

– use the terms and concepts associated with regions (e.g., *single-* and *multi-factor*, *boundaries*, *transition zone*, *ecozone*);

– describe selected characteristics of natural systems (e.g., climate, landforms, natural vegetation);

– describe selected characteristics of human systems (e.g., transportation networks, population, industry);

– describe how natural and human systems interact within selected Canadian ecozones;

– identify characteristics of urban, suburban, fringe, and rural environments (e.g., population density, land use).

Developing and Practising Skills

By the end of this course, students will:

– compare and contrast two ecozones to illustrate physical and cultural diversity;

– determine the best place (e.g., ecozone, region, city) to locate an industry in Canada, using a decision-making process;

– propose criteria (e.g., public support, accessibility, uniqueness of physical features) for determining the most appropriate location for a new provincial or national park;

– identify and explain the regional patterns of population distribution of Aboriginal and non-Aboriginal people across Canada (e.g., where various groups are located and why they settled there).

Learning Through Application

By the end of this course, students will:

– explain the challenges of developing human systems (e.g., transportation, social services, resource management, political structures) in a territory (e.g., Nunavut);

– evaluate how well Canadian natural systems are protected (e.g., by means of conservation areas, provincial parks, national parks, World Heritage Sites).

Human-Environment Interactions

Overall Expectations

By the end of this course, students will:

- assess the impact of human systems and/or resource extraction on the natural environment;
- describe ways in which renewable, non-renewable, and flow resources are used in Canada;
- relate current lifestyle choices of Canadians to the prospects for sustaining Canada's economic and environmental well-being.

Specific Expectations

Building Knowledge and Understanding

By the end of this course, students will:

- describe the role of key stakeholders (e.g., governments, non-governmental organizations [NGOs], the private sector, cultural and community groups, individuals) in protecting the environment (e.g., through emissions testing, air-quality regulations, environmental assessments, water-quality testing);
- describe the techniques used in various forms of resource extraction (e.g., strip and shaft mining, clear-cutting and selective cutting, intensive and extensive agriculture, inshore/offshore fishing and aquaculture);
- identify the ways in which the traditional ecological knowledge and perspective of Aboriginal peoples influence how they interact with their environments today (e.g., Aboriginal view of hot springs as traditional sacred sites, not tourist attractions);
- identify the locations and determine the relative importance of Canada's major energy sources.

Developing and Practising Skills

By the end of this course, students will:

- use selected criteria (e.g., costs, capacity, availability, sustainability, application, local attitudes) to evaluate alternative energy sources (e.g., solar, wind, tidal, hydrogen fuel cell) and conservation strategies;
- compare the benefits and costs (e.g., social, economic, environmental) of selected resource megaprojects (e.g., James Bay hydro complex, Athabasca oil sands, Hibernia offshore oilfields, diamond mines in the Northwest Territories, Mackenzie Valley pipeline);
- describe the views of key stakeholders on a local environmental issue (e.g., urban sprawl, highway expansion, waste management, resource extraction, recreational development, changing land use, residential infilling).

Learning Through Application

By the end of this course, students will:

- describe the collective and individual/personal methods used in the community to reduce waste and conserve energy and water;
- create a visual (e.g., poster, cartoon, multimedia presentation) to address an environmental sustainability issue or promote environmental awareness;
- compare Canada's quality of life with that of other countries (e.g., by constructing a rating scale, by studying the United Nations Human Development Index).

Global Connections

Overall Expectations

By the end of this course, students will:

- identify the economic, cultural, and environmental connections between Canada and other countries;
- report on how Canada influences and is influenced by its economic, cultural, and environmental connections with other countries;
- explain how current global issues affect Canadians.

Specific Expectations

Building Knowledge and Understanding

By the end of this course, students will:

– describe Canada's participation in major international organizations (e.g., United Nations, World Health Organization, Asia-Pacific Economic Co-operation) and agreements (e.g., North American Free Trade Agreement, Kyoto Protocol);

– identify significant contributions Canada makes to the world (e.g., peacekeeping, technology, humanitarian aid);

– compare Canadian and global trends in resource consumption and pollution (e.g., level of development versus rate of resource use, GDP versus pollution levels).

Developing and Practising Skills

By the end of this course, students will:

– evaluate Canada's effectiveness and commitment in responding to global challenges (e.g., climate change, depletion of ocean resources, terrorism) and promoting international well-being (e.g., humanitarian aid, human rights advocacy, peacekeeping);

– analyse the potential impact on the global community of their personal choices (e.g., in music, clothes, food, work, recreation);

– describe the effect on Canadian society of the cultural influences of the "global village" (e.g., in music, dance, fashion, food, media).

Learning Through Application

By the end of this course, students will:

– produce an oral, visual, or written report on a current international trade, cultural, or sporting event involving Canada (e.g., a trade mission, Sommet de la Francophonie, Commonwealth Conference, Olympic Games, Inuit Circumpolar Games, Commonwealth Games, Pan-American Games);

– compare the "ecological footprint" of a typical Canadian with those of people from other countries.

Understanding and Managing Change

Overall Expectations

By the end of this course, students will:

- explain the relationship between sustainability, stewardship, and an "ecological footprint";
- identify current or anticipated physical, social, or economic changes and explain how they could affect the lives of Canadians;
- apply the concepts of stewardship and sustainability to analyse a current national or international issue.

Specific Expectations

Building Knowledge and Understanding

By the end of this course, students will:

- describe the calculations and criteria used to determine their "ecological footprint";
- explain the relationship between stewardship, sustainability, and change in Canada's consumption of energy (e.g., use of conventional versus alternative sources) and other resource-use practices (e.g., "consume and discard" versus "reduce, reuse, recycle");
- describe how regional disparities (e.g., in resource accessibility) affect the economic sustainability of communities.

Developing and Practising Skills

By the end of this course, students will:

- evaluate different perspectives on a geographic issue (e.g., clear-cutting, waste disposal, urban sprawl) and present arguments supporting a point of view;
- identify the costs and benefits (e.g., income, resource protection, cultural self-determination) to selected groups in Canada of recent Aboriginal land claims;
- assess Canada's environmental stewardship and sustainability based on the average Canadian's "ecological footprint".

Learning Through Application

By the end of this course, students will:

- report on how current national or international trends or events (e.g., immigration, rural-urban migration, changing demographics, natural or human disasters) affect the sustainability of Canada's human systems;
- predict the impact of selected technological changes (e.g., in communications and information technology, renewable energy technology) on the future quality of life for Canadians (e.g., working conditions, air and water quality, education,transportation).

Methods of Geographic Inquiry and Communication

Overall Expectations

By the end of this course, students will:

- use the methods and tools of geographic inquiry to locate, gather, evaluate, and organize information about Canada's natural and human systems;
- analyse and interpret data gathered in inquiries into the geography of Canada, using a variety of methods and geotechnologies;
- communicate the results of geographic inquiries, using appropriate terms and concepts and a variety of forms and techniques.

Specific Expectations

Research

By the end of this course, students will:

- develop and use appropriate questions to define a topic, problem, or issue and to focus a geographic inquiry;
- gather geographic information from primary sources (e.g., field research, surveys, interviews) and secondary sources (e.g., reference books, mainstream and alternative media, CD-ROMs, the Internet) to research a geographic issue;
- evaluate the credibility of sources (e.g., authority, impartiality, expertise) and the reliability and usefulness of information (e.g., accuracy and relevance, absence of bias or prejudice, arguments substantiated by evidence);
- identify some job, career, or volunteer opportunities requiring geographic knowledge and skills.

Interpretation and Analysis

By the end of this course, students will:

- distinguish among opinion, argument, and fact in research sources;
- identify and describe the technologies used in geographic inquiry (e.g., geographic information systems [GIS], global positioning system [GPS], hypermedia);
- use graphic organizers (e.g., mind maps, semantic webs, timelines, Venn diagrams, cross-classification charts) to clarify and interpret geographic information;
- use different types of maps (e.g., road, topographical, thematic) to interpret geographic relationships;
- use appropriate statistical methods (e.g., calculate averages, ranges, percentages) and categories of data (e.g., population distribution, density, migration rates) in geographic analysis, observing accepted conventions;
- provide appropriate and sufficient geographic evidence and well-reasoned arguments to support opinions and conclusions;
- collect and synthesize information about the local ecozone;
- conduct an inquiry, using a variety of appropriate tools, into a current Canadian geographic issue (e.g., loss of farm land, declining fish stocks, petroleum industry in the Arctic).

Communication

By the end of this course, students will:

- communicate the results of geographic inquiries, for different audiences and purposes, using a variety of forms (e.g., reports, role plays, presentations, essays) and including geographic visual supports, both conventional (e.g., photographs, charts, graphs, models, organizers, diagrams, maps) and geotechnological (e.g., computer-generated maps and graphs, aerial photographs, satellite images);
- use an accepted form of academic documentation (e.g., footnotes, endnotes, or author-date citations; bibliographies or reference lists) to acknowledge all information sources, including electronic sources;
- use appropriate terminology (e.g., *location*, *place*, *region*, *pattern*, *urban*, *suburban*, *rural*, *wilderness*) to communicate results of geographic inquiries.

Overall Conclusion

The feasibility studies for both elementary and secondary levels were successful in understanding the feasibility of a field trip to the Tallgrass Prairie Restoration Site. Additionally, key points were uncovered that were required to be included when creating a curriculum kit. We feel that we have successfully accomplished our goals for the research project. We also believe that this study is a preliminary basis for expanding the Tallgrass Prairie Restoration Site to further educational opportunities.

There are several implications of this study for the owners of the Tallgrass Prairie Restoration Site, the Kawartha Pine Ridge District School Board as well as the Peterborough community. The hosts believe that there is value attached to something that is paid for, and the environment has value. Keeping their beliefs in mind, a small cost should be charged for visiting the site. However, based on our research, our hosts need to consider that these costs have to keep at a minimum. This is based on school budget restraints of the Kawartha Pine Ridge District School Board.

An overall implication of this research study is that there is a lack of motivation and support for studies looking into enhancing the curriculum through outdoor education experiences. Although this was not found to be the opinion of all teachers, there were some that, for their own reasons, showed a lack of interest in this type of teaching. If more teachers showed an interest and support for studies of this nature, we feel that students would benefit from outdoor educational alternatives.

It is suggested that the host of the Tallgrass Prairie Restoration Site allocate funds and resources to furthering educating the public about the availability and importance of the site. The host should widen the variability of research participants to adult learning,

outdoor education based groups (for example; Boy/Girl Scouts) and the Catholic School Board. On a further note, it is recommended that the host try to make this site more accessible to the elderly population, as well as individuals with mobility issues.

In conclusion, field trips to the Tallgrass Prairie Restoration Site are feasible if strong curriculum connections are made. We found that there were strong curriculum connections in grade seven geography and science as well as grade nine geography. However, this site can also be expanded to include other grades and subjects. Also, curriculum kits are very beneficial as long as strong curriculum connections are established and the kit is easy to use. Overall, the Tallgrass Prairie Restoration Site has potential to become a significant educational opportunity for the Peterborough community and surrounding areas.

Reflection

As an overall reflection of the project, we learned about working with community members. We did this through interacting with our host, as well as with several teachers within the Kawartha Pine Ridge District School Board. We also learned to work effectively as a team of two as well as a larger team of four. We found this research project interesting as well as demanding in regards to analyzing and integrating the curriculum into a curriculum kit for this site.

We also found differences when attempting to access schools in order to locate interview participants. In the elementary section, we found it difficult to gain access. Although we provided proof of I.D., criminal record checks and signed in as visitors, schools were still hesitant to allow us entrance. Due to this setback, we found it extremely difficult to speak directly to teachers, principles or vice principles. However, after we spoke directly to the principals, they were very helpful in providing interview participants.

It was not as difficult to find interview participants in the secondary level. However, it was a challenge to schedule interview times and contact these teachers. We failed to incorporate the high school exam schedule in January, into our interview timeline. Teachers did not respond to the letter which was sent out as they were preparing for exams. However, we further contacted the schools and these teachers apologized and did not purposefully mean to ignore the first contact attempt. This set us back a few weeks, but these teachers were more than willing to help us once we considered their schedules. Thankfully, most of the interview responses were positive towards a field trip, if this had not occurred, this project would have been in jeopardy.

The hosts of this restoration site are very enthusiastic about opening their site up to schools so that students can benefit from their efforts. Teachers are often presented with numerous field trips. Therefore it has been a challenge to make a trip to this restoration site the most educationally attractive choice through curriculum connections. Throughout this project it has been a challenge to make lesson plans that draw as many connections to the classroom curriculum as possible, so teachers will find the lesson plans useful. Hopefully we have provided a good base for the host, so they can build upon these materials and the information provided to fully integrate the site within the Kawartha Pine Ridge District School Board elementary and high schools.

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