TABLE OF CONTENTS

The Parks Canada Participants Manual interior pages were printed on New Life Opaque
• 30% Post-Consumer Fibre • 70% Elemental Chlorine-Free Virgin Fibre

The cover and back cover of the Participants Manual were printed on Cornwall Coated Paper
• Post-Consumer Recycled Fibre • 15% EPA definition • 15% Canadian Standard

30% Post 30% Post

ACKNOWLEDGEMENTS

The Design Team that has coordinated this course is composed of a broad group of dedicated field specialists recognized as leaders, strategic thinkers, and experienced ecosystems managers. They have worked on this project with Innovative Management Solutions Inc., a consulting firm with its head office based in the National Capital Region.

This learning experience is the result of many months of work by Parks Canada staff who believe that the great aim of education is action. They built a consensus around this learning experience and they agreed that within Parks Canada we have a competent workforce that already applies the principles of ecological integrity. This course is a collective opportunity to enrich our organizational capacities to support and foster sustainable practices. Thank you to each of those who took time to read material, provide comments, participate in meetings, and more than anything else accept the risk of being part of this challenging project. From west to east they are: Anna Gajda, Shelley Humphries, Kevin Van Tighem, Doug Clark, Don Wilkes, Darlene Upton, Robin Heron, Jack Ricou, Suzan Dionne, Michel Carrier, Anna Holdaway, and Jeff Anderson.

I cannot complete this section without highlighting the fact that the adventure started March 23, 2000, the same date Minister Copps confirmed the organization's commitment to respond to the Panel's recommendations regarding the implementation of a national orientation program in the coming two years. During this first meeting, we had a very diversified group of park managers who developed the initial proposal and laid the foundation for this exciting education project. Thanks to all of those who believed right from the beginning that this project would be a powerful opportunity to promote ecological integrity learning both on an individual basis as well as a team basis. From east to west they are: Renee Wissink, Yves Bosse, Madeleine Tanguay, Doug Hodgins, Luc Foisy, Suzan Dionne, Darlene Upton, Kevin Van Tighem, Alex Kolesch, Dave Dalman, John Allard, Duane West, and Mike Etches.

I would also like to thank the Ecological Integrity Strategic Directions Committee members for their comments and especially Doug Hodgins for his corporate memory and hard work; the Ontario staff from Georgian Bay Island National Park of Canada, the Trent Severn Waterway National Historic Site of Canada and Bethune House National Historic Site of Canada who accepted to be part of a pilot session. Their comments and feedback were a powerful asset to the course development. They are Kim Marshall, Laurie Thomas, Chuck Wilcox, Kristine Pitkanen, Jessie Wilkes, Wendy McMaster, Patrick Cadeau, Bernie Remmert, Per Lundberg, and Shelley Essaunce-Lamarche. A group of Parks Canada staff also elaborated a national evaluation process for this program. I would like to thank them, from west to east: Eugene Thomlinson, Peggy Smyth and Barbara Bowman. Thank you to Parks Canada Photo Services and all Parks Canada Staff who indirectly contributed to this design, including those of you who provided case studies, pictures, specialized information and time. I also want to thank the Field Unit Superintendents and Field Supervisors who supported the commitment of the Design Team members from the beginning, despite the impact on their own work plan.

Finally, I would like to thank Nik Lopoukhine, Executive Director for Ecological Integrity Branch of National Parks Directorate who from the beginning has been the main advocate and leader of this program design. And now, "on with the show"!

Fernande Surprenant
Project Manager

FOREWORD

Our ability to protect ecological integrity and apply our mandate sustainably is the challenge of the 21st century for Parks Canada. We have a long and powerful history that demonstrates that Parks Canada has a competent workforce with a strong commitment to protect and preserve for future generations. For more than one hundred years, we have taken conscious steps to protect this heritage by establishing National Parks and National Historic Sites. These places inspire us and help us to learn.

This national learning program on ecological integrity has been designed to help all of us individually and collectively to promote, advocate, and apply ecological integrity in our daily work environment. This learning experience is ambitious and exciting, because it will promote individual and team learning. It is about people who, by working together, are able to constantly anticipate, innovate, support, and foster ecological integrity principles through the national parks system in parks themselves, in Service Centers and at National Office.

In Parks Canada we have a competent and dedicated workforce with a strong corporate culture. This learning experience is an opportunity for each of us to explore the concept and its application.

This orientation course is, by definition, a communication tool tailored to our corporate culture to encourage staff at all levels of the organization to embrace change linked to the principles and values of ecological integrity. The program is about awareness, attitudes and skills related to the practice of ecological integrity. This ambitious program will increase the awareness about ecological integrity among all staff members and enable them to be both key players and key advisors in implementing the panel recommendations.

This course has been designed on the principles of adult education and allows for integration of participant experience. The course consists of a set of core and optional learning activities to facilitate delivery in tune with cultural differences. It is designed to respect the existing range of expertise, to be interactive, to encourage participation, to accommodate a broad spectrum of learning styles, and to ensure relevancy at the local level.

You have been selected to be local trainer and to lead the implementation of this course in your Field Unit. This Trainer's Manual includes a series of tools that will lead you through the proposed learning experience.

The program is flexible, respecting your local needs, and will ensure you will have fun. You will learn from your peers and you will develop an appreciation of your own awareness of the concept.

Enjoy!!

TRAINER'S MANUAL OVERVIEW

The Trainer's Manual provides you with the framework for the delivery of 'An Orientation Program on Ecological Integrity – A Call to Action'. This course is designed to provide all learners across Canada with a common understanding of ecological integrity while allowing you to customize the course to reflect the needs of your local site.

ABOUT THE TRAINER'S MANUAL

This manual is divided into four modules that correspond to the four modules in the Participant's Workbook:

- Module 1 – Setting the Context;
- Module 2 – Understanding Ecological Integrity;
- Module 3 – Applying Ecological Integrity; and
- Module 4 – Taking Responsibility for Ecological Integrity.

Each module contains:

- a list of key objectives and key messages;
- a summary sheet of core activities, key messages and learning resources;
- detailed instructions for each activity, including possible variations for each activity, materials required, time required, key messages to deliver and key objectives to be met; and
- optional activities that you can use to reinforce concepts and content discussed in core activities.

In the appendices, you can find:

A. Cheat sheets for activities used in the course;
B. A proposed outline for the three hour summary version of the course; and
C. References.

HOW TO USE THE TRAINER'S MANUAL

In order to ensure that all learners across Canada participate in a standardized fashion, it is necessary that all key messages are delivered and that all key objectives are met in a coordinated manner. This is achieved through the delivery of all core activities for each module. However, various groups of learners across the country will have slightly different needs and learning styles. Likewise, you will have a certain training style. In addition, your site may be facing specific issues that need to be addressed. Therefore, it is important that you tailor the delivery of the activities accordingly.

As you deliver training sessions, your course will mature. Your repertoire of successful techniques that facilitate the learning process and solid examples that reinforce concepts will grow over time. The following features in your Trainer's Manual will allow you to document this additional information:

- The Notes section of the Module Summary Sheets; and
- Wide margins on all pages.

AUDIENCE

In Recommendation 2.4 of the Report on the Panel of Ecological Integrity of Canada's National Parks, the Panel on Ecological Integrity recommended that:

"…Parks Canada develop a detailed and ongoing program for ecological integrity orientation and training with initial delivery to be completed within the 18 months by all current employee (including employees, co-operating associations, partners and co-operators such as commercial operator within Parks). Make this training part of every new employee's orientation package."

Our first organizational priority is to deliver the course to all Parks Canada staff by May, 2002. However, as per the original recommendation, partners are welcome to attend the course. As the feasibility of direct external involvement will vary from site to site, the degree to which partners participate should be determined in consultation with local management.

Trainer Summary for Module 1 – SETTING THE CONTEXT

OBJECTIVES:

- To review the historical evolution of the conservation role of parks and the development of the concept of ecological integrity.
- To gain an understanding of the definition of ecological integrity.
- To recognize the interrelationship between nature and humans in the protection of ecological integrity.
- To reinforce our role as Parks Canada staff in restoring and maintaining ecological integrity.
- To recognize the role and value of Aboriginal Peoples in the protection of ecological integrity.

THE LEARNERS WILL BE ABLE TO:

- Describe the historical evolution of the conservation role of parks in relationship to the development of the concept of ecological integrity.
- Understand the *Canada National Parks Act* definition of ecological integrity.
- Understand the Parks Canada mandate.

Time	Learning Activity and Purpose	Key Points	Learning Resources	Notes
0:00 – 0:10 (10 min.)	**Reconnect with Parks** • To renew pride in working with Parks Canada.	• We have reason to be proud as Parks Canada employees.	**PW pg. 1.2** **Slide Show**	
0:10 – 0:25 (15 min.)	**Introduction** • To introduce purpose of course. • To provide overview of Module 1. • To introduce learners.	• Course purpose and objectives. • Course format. • Module 1 objectives. • Logistics.	**PW pg. 1.1**	
0:25 – 1:20 (55 min.)	**Is Ecological Integrity a New Concept?** • To provide an overview of the evolution of conservation thinking in our national parks system. • To identify milestones in Park Canada history.	• The concept of ecological integrity is not new. It has evolved over time. • Key changes in our conservation philosophy reflect cultural changes. • There are points in the history of Parks Canada that have led us to our understanding of ecological integrity. • Increasing human impacts increases the need to protect ecosystems. • Ecological integrity will be an important part of our future.	**PW pgs. 1.3 – 1.4** **History Cards** **Slide Show**	
1:20 – 1:35 (15 min.)	**Break**			
1:35 – 2:30 (55 min.)	**Comparing Ecosystems to Houses** • To gain an understanding of the term ecological integrity.	• We can understand the components and processes of an ecosystem by comparing it to a house. • Everything in an ecosystem is interconnected • Humans are part of ecosystems. • Everything in an ecosystem has its proper place and proper time. • Our ecosystems are part of the global ecosystem.	**PW pg. 1.5**	

Trainer Summary for Module 1 – SETTING THE CONTEXT (Continued)

Time	Learning Activity and Purpose	Key Points	Learning Resources	Notes
2:30 – 2:50 (20 min.)	**Defining Ecological Integrity** • To have learners create a definition of ecological integrity that is meaningful to them. • To understand the *Canada National Parks Act* definition and compare it to their own definition.	• An understanding of ecological integrity is essential for us to do our jobs. • Ecological integrity is so essential that it has become a part of our law. • The first priority of the Parks Canada mandate is the protection of ecological integrity. • Other conservation agencies around the world have also adopted the principles of ecological integrity.	**PW pgs. 1.6 – 1.8**	
2:50 – 3:00 (10 min.)	**Wrap-Up**	• Summary of Module 1 key messages.	**N/A**	

Module 1 SETTING THE CONTEXT

OBJECTIVES

In this module, learners will:

- renew their pride in working with Parks Canada;
- gain an understanding of ecological integrity;
- understand that ecological integrity is a concept that has developed through the evolution of conservation thinking in our national parks system;
- identify milestones in Parks Canada history;
- create their own definition of ecological integrity and link it to the official *Canada National Parks Act* definition;
- recognize the role and value of Aboriginal People and their contribution to ecological integrity; and
- to recognize the interrelationship between nature and humans in the protection of ecological integrity.

Upon completion, learners will be able to:

- describe the historical evolution of the conservation role of parks in relationship to the development of the concept of ecological integrity;
- understand the *Canada National Parks Act* definition of ecological integrity; and
- understand the Parks Canada mandate.

KEY MESSAGES

The key messages for this module are:

- We have reason to be proud as Parks Canada employees.
- The concept of ecological integrity is not new. It has evolved over time.
- Key changes in our conservation philosophy reflect cultural changes.
- There are points in the history of Parks Canada that have led us to our understanding of ecological integrity.
- Increasing human impacts increases the need to protect ecosystems.
- Ecological integrity will be an important part of our future.
- We can understand the components and processes of an ecosystem by comparing it to a house.
- Everything in an ecosystem is interconnected.
- Humans are part of ecosystems.
- Everything in an ecosystem has its proper place and proper time.
- Our ecosystems are part of the global ecosystem.
- An understanding of ecological integrity is essential for us to do our jobs.
- Parks Canada should develop genuine partnership with Aboriginal Peoples to ensure the protection of the parks.
- Ecological integrity is so essential that is has become formalized in legislation.
- The first priority of the Parks Canada mandate is the protection of ecological integrity.
- Other conservation agencies around the world have adopted the principles of ecological integrity.

Module 1

ACTIVITY: RECONNECT WITH PARKS

NOTES

Purpose

- To have learners renew their pride in working for Parks Canada.

Link to Previous Learning Experience

- This is the first activity in the course. It acts as an icebreaker while setting a positive mood for the course.

Introduction

- N/A

Activity – 8 min.

1. Ten minutes before the course begins, start the slide show and soundtrack.
2. Let the slide show loop repeat itself after the appointed start time for Module 1 to ensure that each learner has a chance to view the loop at least one time. Continue to let it run throughout the exercise.
3. Briefly introduce yourself. Ask learners to answer one of the following questions:

- What was one of your favorite experiences in a national park?
- What was one of your most significant nature experiences?
- What do you like best about working for Parks Canada?

4. Have learners write their thoughts in the workbook.
5. Have learners break into small groups to share their reflections.
6. Have each group share 1-2 themes that they discussed.

Debrief – 2 min.

- We all have reason to be proud as Parks Canada employees. Comments from learners may include:

- Sense of accomplishment in working for Parks Canada.
- Appreciation of natural settings.
- Sense of purpose in working for Parks Canada.

Module 1

Materials

- PW pg. 1.2.
- Computer, projector and screen.
- CD player.
- PowerPoint slides (see CD#1 – Slides/Module – 1A).
- Music (see CD#2 – Music/Track #1).
- Slide show debrief notes (see **Appendix A**).

Variations

1. This activity can be done after the introduction if the trainer feels that the group would benefit from a course overview prior to the initial activity.
2. Augment the slide show by inserting local images. Original slides should not be removed from the slide show as they provide participants with an overview of the diversity of sites that comprise of Parks Canada.

Additional Information

- If participants are interested in following along with the slide show, photocopy and distribute the slide show debrief notes as found in Appendix A.

Learner Objectives		Key Messages
Knowledge	• N/A	• We have reason to be proud as Parks Canada employees
Skills	• N/A	
Attitudes	• To renew their pride working with Parks Canada	

NOTES

Module 1

ACTIVITY: INTRODUCTION

NOTES

Purpose

- To provide course rationale, objectives and outcomes.
- To review the course format.
- To briefly review Module 1 content, structure and agenda.
- To provide logistical information.

Link to Previous Learning Experience

- The course introduction should build upon the sense of pride and accomplishment Parks Canada staff have in working for Parks Canada.
- The principle of ecological integrity is the foundation of our organization.
- The course provides participants with a process for thinking about and addressing ecological integrity issues. Participants learn this process through Modules 1-3, and apply it to a local issue in Module 4.
- The introduction is completed after the Reconnect with Parks activity once a positive mood and an adult learning environment is established.

Introduction – 5 min.

- This course is a national initiative that corresponds with the Parks Canada mandate and the Ecological Integrity Panel report findings. All Parks Canada staff must have a minimum knowledge of ecological integrity in order to incorporate ecological integrity into daily thinking.
- Learners already know much of the material and are encouraged to share experiences and knowledge in a peer-teaching environment.
- Many Parks Canada staff are already contributing positively to the maintenance and enhancement of ecological integrity. The course builds on this action.

Module 1

Activity – 10 min.

- Post a written outline of Module 1.
- Provide course rationale, purpose and objectives.
- Outline course format.
- Explain the workbook and how it will be used.
- Have learners complete pre-course evaluation. See evaluation package for further details.

Debrief

- N/A

Materials

- PW pg. 1.1.
- Flipchart and markers.

Variations

1. The course introduction can be done before the Reconnect with Parks activity.
2. The following ice-breaker may be appropriate if learners do not know each other well.

- Give each learner a piece of paper.
- Ask learners to write down their favorite colour, animal and national park.
- Ask learners to write down three words that describe each element.
- Once everyone has finished, explain that each element tells us something about a person. Colour describes how a person is viewed by others. The animal describes how a person views him/herself. The national park describes what qualities a person values in others.
- Have learners introduce themselves using the descriptions they have created.

Note:
The activity described is only a suggestion. Other ice-breaker activities may be used as an alternative.

Additional Information

- N/A

NOTES

Module 1

Learner Objectives		Key Messages
Knowledge	• N/A	• N/A
Skills	• N/A	
Attitudes	• N/A	

NOTES

Module 1

ACTIVITY: IS ECOLOGICAL INTEGRITY A NEW CONCEPT?

NOTES

Purpose

- To provide an overview of the evolution of conservation thinking in our national parks system.
- To identify milestones in Parks Canada history.

Link to Previous Learning Experience

- As noted in the introduction, this is a mandatory course that corresponds to the Parks Canada mandate and the Ecological Integrity Panel Report Findings. This activity provides learners with an understanding of how we have come to value ecological integrity.

Introduction – 5 min.

- The tradition of protecting natural areas and wildlife has always been an important part of our history.
- As our knowledge of how natural systems work and as pressures on ecosystems increase, we are recognizing the need for a more dynamic concept to guide our approach to managing parks.
- The integration of the principle of ecological integrity has emerged out of the evolution of 'conservation thinking'.

Activity – 40 min.

1. Divide learners into three groups.
2. Instruct learners to close their workbooks.
3. Give each group one set of main history cards, two blank cards photocopied from the template, and the corresponding date cards.
4. Have groups order the cards chronologically and tape them up on the wall. Groups can use the blank cards to insert events specific to their park.
5. As groups finish their timelines, refer them to PW pg. 1.3 to check their timelines and circulate among groups to help re-order timelines that need adjustment.

Activity – 40 min. (continued)

6. Have each group summarize their timeline focusing on the blank cards. Specifically, they should reveal:
   - How conservation thinking has evolved over time.
   - How this evolution influenced their own park.

Debrief – 10 min.

- Use the slide show to identify the periods in Parks Canada history and provide a summary of cultural trends for that period as indicated in the workbook.

Materials

- PW pgs. 1.3 - 1.5.
- History cards.
- Tape for each group.
- Markers for each group.
- Computer, projector and screen.
- PowerPoint slides (see CD#1 – Slides/Module – 1B).
- Slide show debrief notes (see **Appendix A**)

Variations

1. If the group attending the training session is small, divide learners into fewer groups.

Additional Information

- Please see **Appendix A** for the correct ordering of the history cards.
- Please see **Appendix B** in the Participants Workbook for a comprehensive overview of the evolution of conservation thinking.

NOTES

Module 1

Learner Objectives		Key Messages
Knowledge	• To understand that ecological integrity is a concept that has developed the evolution of conservation thinking in our national parks system. • To identify the milestones in Parks Canada history.	• The concept of ecological integrity is not new. It has evolved over time. • Key changes in our conservation philosophy reflect cultural changes. • There are points in the history of Parks Canada that have led us to our understanding of ecological integrity. • Increasing human impacts increases the need to protect ecosystems.
Skills	• N/A	
Attitudes	• N/A	

NOTES

Module 1

ACTIVITY: COMPARING ECOSYSTEMS TO HOUSES

NOTES

Purpose

- To gain an understanding of the term ecological integrity.

Link to Previous Learning Experience

- The previous activity demostrated the evolution of conservation thinking to include ecological integrity. This activity will clarify what the term means.

Introduction – 2 min.

- It is important for everyone to have a common understanding of what ecological integrity means.
- Breaking words down into their root parts can be a useful tool or understanding what the words mean.

Activity – 3 min.

- Use a flipchart to break down ecological integrity into its component parts:
  - eco = house;
  - logical = study/knowledge; and
  - integrity = wholeness.

Introduction – 1 min.

- We can understand what ecological integrity means by comparing an ecosystem to a house.
- Houses and ecosystems are similar in many ways.

Activity – 10 min.

1. Have two flipcharts ready. Use one to draw an outline of a house. Use the other to draw your ecosystem.
2. Have learners brainstorm the similarities between houses and ecosystems and record results on the flipcharts. Points to draw out include:
   - both are open systems that have energy flowing in and out;
   - both depend on energy from the sun;
   - both can exist at different scales; and
   - both are in neighborhoods.

Activity – 10 min. (continued)

3. There are many types of ecosystems, just as there are many types of houses:
   - house: apartment, townhouse, single-family home, igloo, tepee; and
   - ecosystem: wetland, forest, grassland, tundra, marine.
4. There are links between 'neigborhoods':
   - just like what happens in other houses and neighbourhoods affects your house, what happens in other ecosystems affects your ecosystem.
5. Encourage learners to record the discussion in their workbooks.

Introduction – 2 min.

- Both houses and ecosystems are comprised of logical or necessary components and processes.

Activity – 15 min.

1. Using the two flipcharts, have learners brainstorm to reveal the components and systems/processes that are present in houses and ecosystems:
   - Abiotic Components: non-living things in houses and ecosystems;
   - Biodiversity: living things in houses and ecosystems; and
   - Systems/Ecosystem Processes: the things that make houses/ecosystems work.
2. As learners give ideas, draw them on the house or ecosystem flipcharts.
3. Ensure that humans are included in both the ecosystem and house.

Introduction – 2 min.

- In both houses and ecosystems:
  - abiotic components and biodiversity must be in the right place and in the right proportions; and
  - systems and processes must work properly.

NOTES

Activity – 15 min.

1. Have learners brainstorm examples of the dynamics of houses and ecosystems (i.e., place, time and proportion):
- house: need right rooms, furniture needs to be in the right room, systems must work, right number of toilets; and
- ecosystems: plants and animals need to be in right geographic area in the right proportion and natural processes need to occur at the right frequency.
2. Have learners brainstorm what could go wrong if this was not the case:
- house: no toilet – we can not flush wastes, not enough rooms – too crowded; and
- ecosystems: no predators – too many herbivores.

Debrief – 5 min.

- The components of ecological integrity are:
- abiotic components;
- biodiversity; and
- ecosystem processes.

Materials

- PW pg. 1.6.
- Three flipcharts and markers.

Variations

1. Before breaking down ecological integrity into its root parts, demonstrate the process of word breakdown using a common term:
- Perrenial: perrenus – everlasting, annus – year.

Additional Information

- Please see **Appendix A** for House Analogy Cheat Sheets.

NOTES

Module 1

Learner Objectives		Key Messages
Knowledge	• To gain an understanding of ecological integrity.	• We can understand the components and processes of an ecosystem by comparing it to a house. • Everything in an ecosystem is interconnected. • Humans are part of ecosystems. • Everything in an ecosystem has its proper place and proper time. • Our ecosystems are part of the global ecosystem.
Skills	• N/A	
Attitudes	• N/A	

NOTES

Module 1

ACTIVITY: DEFINING ECOLOGICAL INTEGRITY

NOTES

Purpose

- To have learners create a definition of ecological integrity that is meaningful to them.
- To understand the *Canada National Parks Act* definition and compare it to their own definition.

Link to Previous Learning Experience

- The previous activity provided learners with an intuitive understanding of the definition of ecological integrity and useful vocabulary that learners can use to create their own definitions of ecological integrity and to better understand the *Canada National Parks Act* definition.

Introduction – 1 min.

- Learners likely know what ecological integrity means.
- It is important for learners to have a definition of ecological integrity that is meaningful to them in their workplace.

Activity – 3 min.

1. Break learners into small groups.
2. Have each group create a definition of ecological integrity and write it in the workbook.
3. Have each group present their definition of ecological integrity.

Introduction – 2 min.

- The *Canada National Parks Act* includes our official definition of ecological integrity.
- This definition introduces new words for concepts that we discussed in the previous activity. We will discuss them further in Module 2.

Activity – 5 min.

1. Show *Canada National Parks Act* definition using a flipchart.
2. Have groups compare their own definitions with the *Canada National Parks Act* definition.

Module 1

Introduction – 2 min.

- The *Canada National Parks Act* has formalized the principle of ecological integrity and made the maintenance and enhancement of it the primary mandate of Parks Canada.

Activity – 5 min.

1. In small groups, have learners discuss the sections of the Parks Canada mandate:
   - Do the sections conflict with or compliment each other?
   - Ecological integrity means a condition that is characteristic of its natural region and likely to persist.
   - Sections 4. (1), 8. (2) and 12.(1) are complementary since the maintenance or restoration of ecological integrity must be the first priority if national parks are to be maintained "unimpaired for the enjoyment of future generations."
2. Have groups summarize their discussion on a flipchart and share their opinions with the group.
3. Opportunities should be provided, where applicable, for public participation at the national, regional and local level including participation by aboriginal, bodies established under land claims agreements and representative of park communities in the development of park, policy and regulations, the establishment of parks, the formulation of management plans, land use planning and development in relation to park communities and any matter where it is relevant.

Debrief – 2 min.

- The movement to maintain the ecological integrity of parks and protected areas extends beyond Parks Canada.
- Other organizations share a similar commitment to ecological integrity.
- We all have a role to play in maintaining ecological integrity.
- Many of us are already playing a positive role.

NOTES

Debrief – 2 min. (continued)

- The Parks Canada Mandate may be paraphrased as follows:
  National Parks and National Historic Sites serve to protect and commemorate what is significant about Canada, whether it is our natural resources or cultural resources.

Materials

- PW pgs. 1.7 - 1.10.
- Flipcharts and markers for each group.

Variations

1. There are no variations at this time.

Additional Information

- N/A

NOTES

Learner Objectives		Key Messages
Knowledge	• N/A	• An understanding of ecological integrity is essential for us to do our jobs. • Ecological integrity is so essential that it has been formalized in legislation. • The first priority of the Parks Canada mandate is the protection of ecological integrity. • Other conservation agencies around the world have adopted the principles of ecological integrity.
Skills	• To create learner definitions of integrity and link them to the official *Canada National Park Act* definition.	
Attitudes	• N/A	

ACTIVITY: WRAP-UP

NOTES

Purpose

- To review major concepts discussed in Module 1.

Link to Previous Learning Experience

- This summarizes the major points addressed in Module 1.

Introduction – 5 min.

- Conservation thinking has evolved over time.
- The principle of ecological integrity has emerged out of this evolution.
- Ecological integrity is comprised of biodiversity, abiotic components and ecosystem processes.
- The *Canada National Parks Act* made ecological integrity our primary mandate.
- It is essential that Parks Canada develop genuine partnership with Aboriginal Peoples to ensure the protection of the parks. They have an active role to play within their respective traditional lands.

Activity – 5 min.

- Have learners complete Module 1 evaluation. See evaluation package for detailed instructions.

Debrief

- N/A

Materials

- N/A

Variations

- There are no variations at this time.

Additional Information

- N/A

Module 1

Learner Objectives		Key Messages
Knowledge	• N/A	• N/A
Skills	• N/A	
Attitudes	• N/A	

NOTES

Module 1

OPTIONAL ACTIVITY: HISTORY CROSSWORD

NOTES

Purpose	• To review historical material discussed in Module 1.
Link to Previous Learning Experience	• This activity enhances the activity "Is Ecological Integrity a New Concept?" by allowing learners to apply their knowledge of Parks Canada history.
Introduction – 5 min.	• N/A
Activity	1. Have learners complete the crossword puzzle.
Debrief	• N/A
Materials	• PW pg. 1.11.
Variations	1. Have learners complete the crossword puzzle in groups. 2. Have learners complete the crossword puzzle in between Module 1 and Module 2.
Additional Information	• N/A

Module 1

Learner Objectives		Key Messages
Knowledge	• To understand that ecological integrity is a concept that has developed through the evolution of conservation thinking in our national parks system.	• The concept of ecological integrity is not new. It has evolved over time. • Key changes in our conservation philosophy reflect cultural changes. • There are points in the history of Parks Canada that have led us to our understanding of ecological integrity. • Increasing human impacts increases the need for protection. • Over half of the land area now protected in Canada's national parks has been set aside with the direct involvement of Aboriginal Peoples. Aboriginal Peoples have a clear role with all national parks.
Skills	• N/A	
Attitudes	• N/A	

NOTES

Module 1

OPTIONAL ACTIVITY: PARKS CANADA TRIVIA

NOTES

Purpose

- To review historical material discussed in Module 1.

Link to Previous Learning Experience

- This activity enhances the activity "Is Ecological Integrity a New Concept?" by allowing learners to apply their knowledge of Parks Canada history.

Introduction

- N/A

Activity – 10 min

1. Divide learners in two teams.
2. Choose a trivia card and read the question.
3. Have one team identify the correct answer.
4. Repeat with the other team.
5. Award points for each correct answer.

Debrief

- N/A

Materials

- 11 trivia cards.

Variations

- Do not use all 11 cards.

Additional Information

- N/A

Module 1

Learner Objectives		Key Messages
Knowledge	• To understand that ecological integrity is a concept that has developed through the evolution of conservation thinking in our national parks system.	• The concept of ecological integrity is not new. It has evolved over time. • Key changes in our conservation philosophy reflect cultural changes. • There are points in the history of Parks Canada that have led us to our understanding of ecological integrity. • Increasing human impacts increases the need for protection.
Skills	• N/A	
Attitudes	• N/A	

NOTES

Trainer Summary for Module 2 – UNDERSTANDING ECOLOGICAL INTEGRITY

OBJECTIVES:

- To explore the concept of biodiversity and the processes that support it.
- To explore how the processes that support biodiversity relate to human beings and, specifically, to Parks Canada staff members.

THE LEARNERS WILL BE ABLE TO:

- Explain the concepts of biodiversity and ecological processes which are fundamental to ecological integrity.
- Explain the concepts of stressors and cumulative impacts.
- Identify reasons for advocating actions that support ecological integrity.

Time	Learning Activity and Purpose	Key Points	Learning Resources	Notes
0:00 – 0:30 (30 min.)	**Explore Parks Canada's Ecosystems** • To identify living and non-living elements that comprise Parks Canada ecosystems and how ecosystems change.	• An ecosystem is a community of living organisms and their physical environment. • Ecological processes persist in healthy ecosystems. • Modern human cultures have introduced a number of ecosystem stressors.	**PW pg. 2.2** **Slide show**	
0:30 – 0:40 (10 min.)	**Module 2 Overview** • To recap the key messages delivered in Module 1. • To briefly describe the Module 2 content, structure and agenda.	• Module 2 objectives.	**PW pg. 2.1**	
0:40 – 1:20 (40 min.)	**Web of Life Part 1** • To explore the concepts of biodiversity, ecosystem processes, and ecosystem stressors including resilience and cumulative impacts.	• Biodiversity, which is important for ecosystem and human health, is the "composition and abundance of species and communities". • Parks Canada protects biodiversity by protecting representative samples of Canada's landscape and species diversity. • Ecosystem processes are the engines that form and support ecosystems and biodiversity.	**PW pgs. 2.3 - 2.9**	
1:20 – 1:35 (15 min.)	**Break**			
1:35 – 2:15 (40 min.)	**Web of Life Part 2**	• Ecosystem stressors are events and actions that have been introduced by contemporary "consumer" human cultures and that affect biodiversity and ecological integrity directly and indirectly.	**PW pgs. 2.10 - 2.12**	

Trainer Summary for Module 2 – UNDERSTANDING ECOLOGICAL INTEGRITY (Continued)

Time	Learning Activity and Purpose	Key Points	Learning Resources	Notes
2:15 - 2:45 (30 min.)	**Greeting Card/T-Shirt/Bumper Sticker** • To develop simple messages that convey the meaning of ecological integrity.	• There are many ways to define ecological integrity. • It is important to develop a definition that is relevant to you. • The *Canada National Parks Act* defines ecological integrity, with respect to a park, as a condition that is determined to be characteristic of its natural region and likely to persist, including abiotic components and the composition and abundance of native species and biological communities, rates of change and supporting processes.	**PW pg. 2.13**	
2:45 – 3:00 (15 min.)	**Wrap-Up**	• Summary of Module 2 key messages.		

Module 2 UNDERSTANDING ECOLOGICAL INTEGRITY

OBJECTIVES

In this module, the learners will:

- explore the concept of biodiversity and the processes that support it; and
- explore how the processes that support biodiversity relate to human beings including Parks Canada staff members, Aboriginal Peoples and partners.

Upon completion, the learners will be able to:

- explain the concepts of biodiversity and ecosystem processes which are fundamental to ecological integrity;
- explain the concepts of anthropogenic stressors and cumulative impacts;
- explain the role of Parks Canada in protecting biodiversity in Canada; and
- identify reasons for advocating actions that support ecological integrity.

KEY MESSAGES

The key messages for this module are the following.

- An ecosystem is a community of living organisms and their physical environment.
- Ecosystem processes persist in healthy ecosystems.
- Modern human cultures have introduced a number of anthropogenic stressors.
- Biodiversity is the "composition and abundance of species and communities".
- Biodiversity is important for ecosystem and human health.
- Parks Canada protects biodiversity by protecting representative samples of Canada's landscape and species diversity.
- Ecosystem processes are the engines that form and support ecosystems and biodiversity.
- Anthropogenic stressors are events and actions that have been introduced by contemporary "consumer" human cultures and that affect biodiversity and ecological integrity directly and indirectly.
- There are many ways to define ecological integrity.
- It is important to develop a definition that is relevant to you.
- The *Canada National Parks Act* defines ecological integrity, with respect to a park, as a condition that is determined to be characteristic of its natural region and likely to persist, including abiotic components and the composition and abundance of native species and biological communities, rates of change and supporting processes.
- Ecological integrity aims to integrate biological, physical and sociological information, It is seen as a comprehensive way to deal with the host of environmental issues, which seem overwhelming when considered seperately. Ecological integrity is a concept with a broader scope than ecosystems sciences. It has been interpreted to mean a broad consensus-based approach to land mamagement.

Module 2

ACTIVITY: EXPLORE PARKS CANADA'S ECOSYSTEMS

NOTES

Purpose

- To identify living and non-living elements that comprise Parks Canada ecosystems and how ecosystems change.

Link to Previous Learning Experience

- This activity has the same format as the first activity in Module 1. It therefore sets the mood in the same way.
- It introduces the concepts of biodiversity and ecosystem processes that are introduced in the *Canada National Parks Act*, which was introduced in Module 1.

Introduction

- N/A

Activity – 25 min.

1. Ten minutes before Module 2 begins, start the slide show and soundtrack.
2. Let the slide show loop repeat itself after the appointed start time for Module 2 to ensure that each learner has a chance to view the loop at least one time. Continue to let it run throughout the exercise.
3. Indicate that the *Canada National Parks Act* states that healthy ecosystems include biodiversity and ecosystem processes, and that modern human cultures have introduced ecosystem stressors.
4. Indicate that the slide show depicts ecosystems that are present within National Parks, Park Reserves, Marine Conservation Areas, and Historic Sites.
5. Divide the learners into small groups.
6. Ask learners to describe what they saw in the slide show to the other people in their group.

- What plants, animals, and abiotic components did they see?
- Did they see evidence of ecosystem processes?
- Did they see evidence of anthropogenic stressors?

Activity – 25 min. (continued)

7. Ask a representative from each group to describe their group's findings.
8. Encourage the learners to record their results in their workbook.

Debrief – 5 min.

- The *Canada National Parks Act* indicates that healthy ecosystems include biodiversity and ecosystem processes.
- Modern human cultures have introduced anthropogenic stressors.
- These concepts will be explained and discussed in the following module.

Materials

- PW pg. 2.2.
- Computer, projector and screen.
- CD player.
- PowerPoint slides (see CD #1 – Slides/Module – 2).
- Music (see CD #2 – Music/Track #2).
- Slide show debrief notes (see **Appendix A**).

Variations

- Do not divide the participants into small groups.

Additional Information

- N/A

NOTES

Module 2

Learner Objectives		Key Messages
Knowledge	• N/A	• The *Canada National Parks Act* defines ecological integrity, with respect to a park, as a condition that is determined to be characteristic of its natural region and likely to persist, including abiotic components and the composition and abundance of native species and biological communities, rates of change and supporting processes. • An ecosystem is a community of living organisms and their physical environment. • Ecosystem processes persist in healthy ecosystems. • Modern human cultures have introduced a number of anthropogenic stressors. • Parks Canada protects biodiversity by protecting representative samples of Canada's landscape and species diversity.
Skills	• N/A	
Attitudes	• Identify reasons for advocating actions that support ecological integrity.	

NOTES

Module 2

ACTIVITY: INTRODUCTION

NOTES

Purpose

- To recap the key messages delivered in Module 1.
- To briefly describe the Module 2 content, structure and agenda.

Link to Previous Learning Experience

- This overview is required to let the learners know what to expect in this module and to remind them of the key messages in Module 1. It is particularly important if the modules are delivered with a significant period of time between each.

Introduction – 8 min.

- The key messages in Module 1 were:
  - the conservation role of Parks Canada has evolved over time; and
  - the *Canada National Parks Act* reflects the fact that ecological integrity is now Parks Canada's priority.
- The objective of Module 2 is to present the main elements of ecological integrity as per the *Canada National Parks Act:*
  - provide a definition of biodiversity, and discuss the importance of biodiversity and how Parks Canada protects biodiversity;
  - provide a definition of ecosystem processes, and discuss how the processes are altered and how ecosystems respond to changes; and
  - provide a definition of anthropogenic stressors, and discuss the concept of cumulative impacts.

Activity – 2 min.

- Post a written outline of the Module 2 objectives so that the learners can refer to them throughout the module.

Debrief

- N/A

Module 2

Materials
- PW pg. 2.1.
- Flip chart and markers.

Variations
- N/A

Additional Information
- N/A

Learner Objectives		Key Messages
Knowledge	• N/A	• N/A
Skills	• N/A	
Attitudes	• N/A	

NOTES

Module 2

ACTIVITY: WEB OF LIFE PART 1

NOTES

Purpose

- To explore the concepts of biodiversity and ecosystem processes, including resilience.

Link to Previous Learning Experience

- This activity is designed to provide the learners with an opportunity to understand the concepts of biodiversity and ecosystem processes, which are introduced in the *Canada National Parks Act* in Module 1.

Introduction – 20 min.

Biodiversity

- The *Canada National Parks Act* refers to biodiversity in the definition of ecological integrity as the "composition and abundance of species and communities". Biodiversity can be defined on three different levels.
  - Landscape diversity refers to variations in habitat types within a landscape, including abiotic and biotic components.
  - Species diversity refers to variations in the types of species and the number of individuals within each species in a particular ecosystem or landscape.
  - Genetic diversity refers to the different gene combinations that are carried within a species.
- Biodiversity is important, because it provides many humans with emotional, psychological, and spiritual well-being. It is also important for ecosystem and human health. (Refer to the table on page 2.4 in the Participant's Workbook for more details.)

How Does Parks Canada Protect Biodiversity?

- The *Canada National Parks Act* refers to ecological integrity as "a condition that is determined to be characteristic of its natural region".

Introduction – 20 min. (continued)

- Parks Canada has divided the country into 39 natural terrestrial regions and 29 natural marine regions and has committed itself to protecting a representative sample of each natural region.
- Parks Canada considers representative sites for protection when the site:
  - represents the geology, physical features, vegetation, wildlife, and ecosystem characteristics of the natural region; and
  - is in a state that is natural and healthy or has the potential for restoration to a natural and healthy state.
- If we can establish parks and conservation areas in each of these natural regions we are one step closer towards protecting Canada's biotic and abiotic biodiversity.

Protecting Biotic Components

- Native species are species that naturally occur in a local ecosystem. Usually, they have been present within the local ecosystem for many centuries and originally arrived by normal processes of dispersal and colonization.
- However, many of Parks Canada protected areas also include other species. They include the following.
  - Non-native or exotic species are species that did not occur naturally within the local ecosystem until relatively modern times. Usually, their arrival within the ecosystem was helped by modern human activities and development.
  - Invasive species are non-native species that enter an ecosystem and alter it by out-competing native species for food and space.
  - Naturalized species are non-native species that that have been present in an ecosystem for so long that some consider them as natural for the ecosystem.
  - Some consider naturalized species as non-native species that have been present for so long that their removal would be harmful to the ecosystem, others consider them as species that are impossible to eliminate.

NOTES

Introduction – 20 min. (continued)

Protecting Representative Abiotic Diversity

- Parks Canada also seeks to protect representative abiotic components as part of ecological integrity. For example:
- pingos in Ivvavik National Park of Canada; and
- the Niagara Escarpment in Bruce Peninsula National Park of Canada.

Ecosystem Processes

- Ecosystem processes are the engines that form and support ecosystems and biodiversity. They are usually associated with "natural" events that are needed to sustain ecosystems. (Refer to page 2.7 in the Participant's Workbook for a list of some of the abiotic and biotic ecosystem processes that occur in many National Parks and refer to **Appendix B** for definitions of these processes).
- The *Canada National Parks Act* indicates that ecological integrity includes the persistence of ecosystem processes. When considering ecosystem processes, you should also note the following.
- Some processes, like the water and energy cycles, are ongoing and continuous. Other processes, like migration and flooding, are cyclical or sporadic.
- Cyclical processes range in their timing and regularity. They can occur on a daily, seasonal, yearly, or other "regular" basis, or on an irregular basis.
- Although we may perceive some processes as negative, such as fire and flooding, many plants, animals, and ecosystems depend on their occurrence.
- The removal or modification of processes can be detrimental to the ecosystems in which they normally occur.

Keystone Species

- Keystone species are species that, by virtue of their nature or behavior, have an effect on an ecosystem function that is disproportionate to their abundance within the ecosystem.

NOTES

Introduction – 20 min. (continued)

- As humans, we may be considered keystone species because of our ability to affect ecosystem processes by their removal or modification. The extinguishing or starting of fires is one way we have modified ecosystem processes.

Resilience

- Resilience is the ability of an ecosystem or an organism to respond quickly and maintain its integrity after being affected by a change to its natural rhythm or equilibrium.
- The resilience of all ecosystem components and individual organisms may not be equal.
- There may be a threshold beyond which an ecosystem or organism is no longer resilient and cannot re-establish its equilibrium.
- A system may be pushed beyond its resilience by extreme or prolonged changes to natural processes. It may also be pushed by the introduction of events or actions that have been introduced by our contemporary consumer society, like acid rain. These are called stressors.
- Ecosystem processes can be modified by changes to the natural equilibrium caused by humans or other species. They can also be modified by the addition of a stressor, something outside the normal range of variation for the environment.

Activity – 15 min.

1. Divide the learners into small groups.
2. Instruct the groups to use post-it notes to write the names of five animals, five plants, and five non-living elements in an ecosystem that they are familiar with. Use an example to remind the learners about food chain and web structures:
   - The image of a pyramid is often used to depict the links between predators and their prey and the relative number of individuals at each level of the food chain.

NOTES

Activity – 15 min. (continued)

- The image of a web is often used to depict the fact that ecosystems consist of many food chains that are linked together.
- Review similarities between ecosystems and houses.

3. Ask the learners to place the post-it notes on blank flip chart paper in a way that makes sense to them.
4. Ask the participants to write the ecosystem processes that link the plants, animals, and non-living in their ecosystems and to symbolize these links with lines.
5. Encourage the learners to record their results in their workbook.

Debrief – 5 min.

- Briefly describe the types of ecosystems that were generated and indicate that they will be used in Part 2 of the Web of Life activity.

Materials

- PW pgs. 2.3 - 2.9.
- Flip chart and markers for each group.
- Post-it-notes.

Variations

1. Assign the same ecosystem to two different groups in order to compare the results obtained.
2. Use masking tape to symbolize the processes that link the plants, animals, and non-living elements.

Additional Information

- Please see **Appendix A** for Web of Life Cheat Sheet.

NOTES

Module 2

Learner Objectives		Key Messages
Knowledge	• Explain the concepts of biodiversity and ecological processes which are fundamental to ecological integrity.	• An ecosystem is a community of living organisms and their physical environment. • Ecosystem processes persist in healthy ecosystems. • Biodiversity is the "composition and abundance of species and communities". • Biodiversity is important for eco-system and human health. • Parks Canada protects biodiversity by protecting representative samples of Canada's landscape and species diversity. • Ecosystem processes are the engines that form and support ecosystems and biodiversity. • The *Canada National Parks Act* defines ecological integrity, with respect to a park, as a condition that is determined to be characteristic of its natural region and likely to persist, including abiotic components and the composition and abundance of native species and biological communities, rates of change and supporting processes.
Skills	• N/A	
Attitudes	• Identify reasons for advocating actions that support ecological integrity.	

NOTES

Module 2

ACTIVITY: WEB OF LIFE PART 2

NOTES

Purpose

- To explore the concepts of anthropogenic stressors and cumulative impacts.
- To reinforce the concept of resilience.

Link to Previous Learning Experience

- This activity is designed to provide the learners with an opportunity to understand how stressors affect ecosystem biodiversity and ecosystem processes, which are concepts that were addressed in Part 1 of the Web of Life.

Introduction – 10 min.

Anthropogenic Stressors

- Anthropogenic stressors are events and actions that have been introduced by contemporary "consumer" human cultures.
- Some anthropogenic stressors, such as poaching, may have direct effects on biodiversity. Others, such as human induced climate change, affect biodiversity indirectly because they change the ecosystem processes that maintain biodiversity.
- Some stressors, such as the construction of infrastructure within parks are internal to parks. But many anthropogenic stressors originate outside of parks. Some of these stressors might be considered global, like climate change, since they affect an area much greater than any one park or ecosystem.
- Refer to the list of anthropogenic stressors in the Participant's Workbook pg. 2.10.

Cumulative Impacts

- Ecosystems can be resilient to stressors, but in many cases the interaction of stressors causes cumulative impacts. There are two types of cumulative impacts. One is caused by a continual stress, where the effects accumulate on the environment. The second type results from the sum of individual stressors. Cumulative impacts may be difficult to predict because they may appear quite suddenly, or they may only be perceived after a time delay.

Introduction – 10 min. (continued)

- The Parks Canada objective is to identify the potential for negative cumulative impacts and to avoid them whenever possible. This proactive approach requires teamwork. Parks Canada is also committed to repairing the effects of negative cumulative impacts when they have occurred. These initiatives also require teamwork.

Activity – 20 min.

1. Ask the learners to return to their "Web of Life Part 1" groups.
2. Assign one ecosystem stressor to each group and ask them to adjust their ecosystems according to its effects.
3. Repeat step 2 with one more ecosystem stressor and ask the groups to re-adjust their ecosystems.
4. Ask a representative from each group to describe their group's findings.
5. Encourage the learners to record their results in their workbook.

Debrief – 10 min.

- Draw on the results achieved to:
  - review the importance of landscape, species, and genetic biodiversity with respect to resilience including the presence of biotic and abiotic elements in each ecosystem;
  - review the definitions of representative/ native, non-native, invasive, and keystone species;
  - discuss the effects of anthropogenic stressors;
  - discuss the concept of cumulative impacts and the importance of teamwork; and
  - acknowledge that there are gaps in our knowledge and indicate that Module 3 will provide tools for managing ecological integrity despite these knowledge gaps.

Materials

- PW pgs. 2.10 - 2.12.
- Flip chart and markers for each group.
- Post-it-notes.

NOTES

Module 2

Variations

1. Assign the same ecosystems from Part 1 of the Web of Life to two different groups in order to compare results.
2. Assign the same stressors to two different groups in order to compare the results obtained.

Additional Information • N/A

Learner Objectives		Key Messages
Knowledge	• Explain the concepts of stressors and cumulative impacts.	• Anthropogenic stressors are events and actions that have been introduced by contemporary "consumer" human cultures and that affect biodiversity and ecological integrity directly and indirectly.
Skills	• N/A	
Attitudes	• Identify reasons for advocating actions that support ecological integrity.	

NOTES

Module 2

ACTIVITY: GREETING CARD/T-SHIRT/BUMPER STICKER

NOTES

Purpose

- To review the Canada *National Parks Act* definition of ecological integrity.
- To enable the learners to develop concise and relevant definitions of ecological integrity in a humourous manner.

Link to Previous Learning Experience

- This activity provides the learners with an opportunity to reflect on the definition of ecological integrity that was provided in Module 1 and that was referenced throughout all of the Module 2 activities.
- It also enables the learners to synthesize the information provided throughout Module 2 and build on the definition of ecological integrity that they developed in Module 1.

Introduction – 5 min.

- Review the *Canada National Parks Act* and select participant definitions of ecological integrity.

Activity – 20 min.

1. Divide learners into small groups.
2. Distribute materials to groups.
3. Ask each group to create increasingly simple definitions of ecological integrity.
   - The first definition should be appropriate for use on a greeting card. Learners can use up to 25 words and an image to create an ecological integrity greeting card.
   - The second definition should be appropriate for a t-shirt. Learners can use 10-15 words and an image to create a t-shirt message. The learners can draw an image of a t-shirt on a flip chart.
   - The third definition should be appropriate for a bumper sticker. Learners can use up to five words and an image to create an ecological integrity bumper sticker.
4. Ask the groups to display the messages around the room and to present them.

Debrief – 5 min.

- Review the essential parts of the *Canada National Parks Act* definition of ecological integrity and identify these elements within the various learner definitions.
- Discuss the difficulties they had in creating simple definitions of ecological integrity.

Materials

- PW pg. 2.13.
- 8½ x 11" paper.
- Flipchart and markers for each group.
- Adhesive labels.

Variations

1. Have learners complete this activity individually using their workbook or only one of the three media.
2. Have the group award prizes for the best slogans, ideas or picture suggestions.
3. If there is not enough time to complete the whole activity, do not complete the greeting card portion and proceed directly to the t-shirt.

Additional Information

- N/A

NOTES

Module 2

Learner Objectives		Key Messages
Knowledge	• Explain the concepts of biodiversity and ecological processes which are fundamental to ecological integrity. • Explain the concepts of stressors and cumulative impacts.	• There are many ways to define ecological integrity. • It is important to develop a definition that is relevant to you. • The *Canada National Parks Act* defines ecological integrity, with respect to a park, as a condition that is determined to be characteristic of its natural region and likely to persist, including abiotic components and the composition and abundance of native species and biological communities, rates of change and supporting processes.
Skills	• Explain the concepts of biodiversity and ecosystem processes which are fundamental to ecological integrity. • Explain the concepts of stressors and cumulative impacts.	
Attitudes	• Identify reasons for advocating actions that support ecological integrity.	

NOTES

Module 2

ACTIVITY: WRAP-UP

NOTES

Purpose
- To provide a summary of the Module 2 topics.

Link to Previous Learning Experience
- This activity summarizes the key messages that were delivered in Module 2.

Introduction – 10 min.
- Refer to the key messages in the summary table for this module.

Activity – 5 min.
- Have the learners complete the Module 2 evaluation. See the evaluation package for detailed instructions.

Debrief
- N/A

Materials
- N/A

Variations
- If the modules are delivered with a significant period of time in between (more than one day), provide an outline for Module 3.

Additional Information
- N/A

Learner Objectives		Key Messages
Knowledge	• N/A	• Refer to the list of key messages for for Module 2 in the trainer summary table.
Skills	• N/A	
Attitudes	• N/A	

Module 2

OPTIONAL ACTIVITY: CROSSWORD PUZZLE

NOTES

Purpose

- To increase the learner's familiarity with the terminology that was introduced in the Web of Life activity.

Link to Previous Learning Experience

- This activity enables the learners to review the terminology that was introduced in the Web of Life activity.

Introduction

- N/A

Activity – 10 min.

- Ask the learners to complete the crossword puzzle.

Debrief

- N/A

Materials

- PW pg. 2.14.

Variations

1. Ask the learners to complete the crossword puzzle in groups during Module 2 if there is enough time.
2. Encourage the learners to complete the crossword puzzle between Modules 2 and 3 or during breaks.

Additional Information

- N/A

Module 2

Learner Objectives		Key Messages
Knowledge	• Explain the concepts of biodiversity and ecological processes which are fundamental to ecological integrity. • Explain the concepts of stressors and cumulative impacts.	• An ecosystem is a community of living organisms and their physical environment. • Ecosystem processes persist in healthy ecosystems. • Biodiversity is the "composition and abundance of species and communities". • Biodiversity is important for ecosystem and human health. • Ecosystem processes are the engines that form and support ecosystems and biodiversity. • Anthropogenic stressors are events and actions that have been introduced by contemporary "consumer" human cultures and that affect biodiversity and ecological integrity directly and indirectly.
Skills	• N/A	
Attitudes	• Identify reasons for advocating actions that support ecological integrity.	

NOTES

Module 2

OPTIONAL ACTIVITY: BINGO

NOTES

Purpose

- To enable learners to discover some of the biotic and abiotic ecosystem elements, processes, stressors and ecological integrity management tools within a local ecosystem.
- To understand the *Canada National Parks Act* definition of ecological integrity in a humourous manner.

Link to Previous Learning Experience

- This activity enables the learners to better understand the *Canada National Parks Act* definition of ecological integrity and some of the terminology that was introduced in Module 1.
- The activity also introduces some of the terminology that will be discussed in the Web of Life activity in Module 2 and some of the ecological integrity problem management tools that will be discussed in Module 3.

Introduction – 5 min.

- It is sometimes helpful to see things within their context to better understand them.
- The *Canada National Parks Act* indicates that an ecosystem is healthy if it has biodiversity and ecosystem processes that persist.
- The items on the bingo cards are examples of biodiversity, ecosystem processes, anthropogenic stressors, and tools that can be used to manage ecological integrity problems.
- Careful observation and creative thinking may be required to find some of the items on the bingo cards within the local ecosystem.

Activity – 20 min.

1. Provide each learner with a bingo card.
2. Ask the learners to go outside to see how many of the squares they can "dab off" in order to get a blackout i.e. dab off all of the squares.

Debrief – 10 min.

- Ask some of the learners to share their observations.
- Indicate that the learner observations will serve as excellent examples of the concepts that will be discussed in the Web of Life lecture/activity and in Module 3.
- Award a prize to each learner that obtained a blackout.

Materials

- Bingo cards. (Note: use the master bingo card in the trainer kit in order to produce copies for the learners.)
- Prizes.

Variations

1. Ask the learners to complete the activity in groups during Module 2 if there is enough time.
2. Ask the learners to complete the activity between Modules 1 and 2, during breaks, or on their way to the course over the duration of the course.
3. If the items on the bingo cards are difficult to find in the course location or there is not much time available, indicate that only one line (traditional bingo) is required for a winning card and reduce the time allotted to the activity.

Additional Information

- N/A

NOTES

Module 2

Learner Objectives		Key Messages
Knowledge	• N/A	• An ecosystem is a community of living organisms and their physical environment. • Ecosystem processes persist in healthy ecosystems. • Biodiversity is the "composition and abundance of species and communities". • Biodiversity is important for ecosystem and human health. • Ecosystem processes are the engines that form and support ecosystems and biodiversity. • Anthropogenic stressors are events and actions that have been introduced by contemporary "consumer" human cultures and that affect biodiversity and ecological integrity directly and indirectly.
Skills	• Explain the concepts of biodiversity and ecological processes which are fundamental to ecological integrity. • Explain the concepts of stressors and cumulative impacts.	
Attitudes	• Identify reasons for advocating actions that support ecological integrity.	

NOTES

Trainer Summary for Module 3 – APPLYING ECOLOGICAL INTEGRITY

OBJECTIVES:

- To review park issues in general, practice defining ecological integrity problems, explore some of the tools and action options that can help restore and maintain ecological integrity, and consider the ecological benefits or costs of the various options.
- To explore the contribution that partners and Aboriginal Peoples can bring to the challenge of ecological integrity.

THE LEARNERS WILL BE ABLE TO:

- Differentiate between approaches that are consistent with ecological integrity and those that are not.
- Assess the roles we can play in contributing to ecological integrity and better understand the roles of others.
- Further understand the problem-solving approach to ecological integrity and recognize the importance of fully engaging all partners.
- Apply knowledge and concepts from previous modules to evaluate problems and the likely effects of the decisions.

Time	Learning Activity and Purpose	Key Points	Learning Resources	Notes
0:00 – 0:30 (30 min.)	**Parks Canada and Us** • To show the diversity of roles and tasks Parks Canada staff have. • To show Parks Canada staff contributing positively to ecological integrity.	• It is part our role, as Parks Canada staff, to contribute positively to the maintenance or restoration of ecological integrity. • Many of us are already taking action to contribute positively to ecological integrity.	**PW pg. 3.2** **Slide show**	
0:30 – 0:40 (10 min.)	**Module 3 Overview** • To recap the key messages delivered in Modules 1 and 2. • To briefly describe the Module 3 content, structure and agenda.	• Module 3 objectives.	**PW pg. 3.1**	
0:40 – 1:30 (50 min.)	**Build an Issue Tree** • To explore and analyze causes and effects of a Parks Canada case study.	• Ecological integrity problems often have many causes and effects. • The key to effective problem analysis is to examine the problem from all possible angles. • Different people and groups can provide new information, local ecological knowledge, and cultural insights.	**PW pgs. 3.3 - 3.4**	
1:30 – 1:45 (15 min.)	**Break**			

Trainer Summary for Module 3 – APPLYING ECOLOGICAL INTEGRITY (Continued)

Time	Learning Activity and Purpose	Key Points	Learning Resources	Notes
1:45 - 2:45 (60 min.)	**Build a Toolbox** • To introduce some of the tools available within Parks Canada that facilitate the restoration and maintenance of ecological integrity. • To evaluate action strategies for a Parks Canada case study.	• Most ecological integrity problems have a variety of action strategies. • There are tools available to facilitate the restoration or management of ecological integrity. • There are gaps in our knowledge about ecosystems. • The precautionary principle emphasizes the need for care and caution when changes to ecosystems are contemplated. • Adaptive management indicates that learning while doing is a scientifically defensible approach.	**PW pgs. 3.5 - 3.10**	
2:45 – 3:00 (15 min.)	**Wrap-Up**	• Summary of Module 3 key messages.		

Module 3 APPLYING ECOLOGICAL INTEGRITY

OBJECTIVES

In this module, the learners will:

- review general park issues;
- practice defining problems ecologically;
- explore some of the tools and strategies that can help restore and maintain ecological integrity;
- consider the ecological benefits or costs of various strategies; and
- explore the contribution of partners and Aboriginal Peoples can bring to the challenge of maintaining ecological integrity.

Upon completion, the learners will be able to:

- differentiate between approaches that are consistent with ecological integrity and those that are not;
- assess the roles we can play in contributing to ecological integrity and better understand the roles of others;
- further understand the problem-solving approach to ecological integrity;
- recognize the importance of fully engaging all partners; and
- apply knowledge and concepts from previous modules to evaluate problems and the likely effects of the decisions.

KEY MESSAGES

The key messages for this module are the following.

- Each of us, as members of Parks Canada staff and interested parties, play a role in maintaining or restoring the ecological integrity of Canada's national parks.
- Many of us are already taking action in our personal and professional lives to contribute positively to ecological integrity.
- Ecological integrity problems often have many causes and effects.
- The key to effective problem analysis is to examine the problem from all possible angles.
- Different people and groups can provide new information, local ecological knowledge, and cultural insights.
- Most ecological integrity problems have a variety of action strategies.
- There are tools available to facilitate the restoration or management of ecological integrity.
- There are gaps in our knowledge about ecosystems.
- The precautionary principle emphasizes the need for care and caution when changes to ecosystems are contemplated.
- Adaptive management, which is learning while doing, serves the dual goals of achieving management objectives and gaining reliable knowledge.

Module 3

ACTIVITY: PARKS CANADA AND US

NOTES

Purpose

- To show the diversity of our roles within National Parks.
- To show how we contribute positively to ecological integrity.

Link to Previous Learning Experience

- This activity has the same format as the initial activity in Modules 1 and 2. Therefore, it sets the tone for the module in the same way.
- It reinforces the following points which were briefly introduced in Module 1.
  - Each of us, as members of Parks Canada staff, play a role in maintaining or restoring the ecological integrity of Canada's national parks.
  - Many of us are already taking action in our personal and professional lives to contribute positively to ecological integrity.

Introduction

- N/A

Activity – 25 min.

1. Ten minutes before Module 3 begins, start the slide show and soundtrack.
2. Let the slide show loop repeat itself after the appointed start time for Module 3 to ensure that each learner has a chance to view the loop at least one time. Continue to let it run throughout the exercise.
3. Indicate that each of us, as members of the Parks Canada staff and interested parties, play a role in maintaining and restoring the ecological integrity of Canada's national parks; and that many of us are already taking action in our personal and professional lives to contribute positively to ecological integrity.
4. Indicate that the slide show depicts many members of the Parks Canada staff and others performing tasks that have an impact on ecological integrity.

Activity – 25 min.

5. Divide the learners into small groups.
6. Ask learners to describe what they saw in the slide show to the other people in their group.
- Did they see their jobs depicted?
- Did they see jobs that they were not familiar with?
- Can they identify behaviors that affect or contribute to biodiversity, ecosystem processes, stressors and therefore ecological integrity?
7. Ask a representative from each group to describe their group's findings.
8. Encourage the learners to record their results in their workbook.

Debrief – 5 min.

- Everyone has an influence on ecological integrity in some way.
- Everyone has more than one way to contribute – at work, in the community, etc.
- We need to value and learn from many people that have an interest in our parks if we want to be effective.
- We need to value and learn from traditional knowledge, local knowledge and oral history.
- A diversity of people means a diversity of information, insights, ideas and concerns.
- We often see ecological integrity as the primary concern of biologists and other experts.
- We act as though there are glass walls that separate our roles. We look through the walls but do not walk through them. The challenge is to make the walls disappear.

Materials

- PW pg. 3.2.
- Computer, projector and screen.
- CD player.
- PowerPoint slides (see CD #1 – Slides/Module – 3).
- Music (see CD #2 – Music/Track #3).
- Slide show debrief notes (see **Appendix A**).

NOTES

Module 3

Variations

- Do not divide the participants into small groups.

Additional Information

- N/A

Learner Objectives		Key Messages
Knowledge	• Review general park issues.	• Each of us, as members of Parks Canada staff and interested parties, play a role in maintaining or restoring the ecological integrity of Canada's national parks. • Many of us are already taking action in our personal and professional lives to contribute positively to ecological integrity.
Skills	• N/A	
Attitudes	• Explore some of the tools and strategies that can help restore and maintain ecological integrity.	

NOTES

Module 3

ACTIVITY: INTRODUCTION

NOTES

Purpose

- To recap the key messages delivered in Modules 1 and 2.
- To briefly describe the Module 3 content, structure, and agenda.

Link to Previous Learning Experience

- This overview is required to let the learners know what to expect in this module and to remind them of the key messages in Modules 1 and 2. It is particularly important if the modules are delivered with a significant period of time between each.

Introduction – 8 min.

- The key messages in Modules 1 were:
  - the conservation role of Parks Canada has evolved over time; and
  - the *Canada National Parks Act* reflects the fact that ecological integrity is now the Park's Canada priority.
- Module 2 indicated that the key concepts of ecological integrity are:
  - biodiversity: the variety and patterns of plants and animals that are present;
  - ecosystem processes: the engines that make ecosystems work such as fire, predation, and the evolution of human culture; and
  - stresses: challenges to ecosystems.
- The objectives of Module 3 are to:
  - identify the ecological integrity management tools that are available;
  - discuss the ecological integrity management concepts and principles; and
  - use the concepts, principles, and tools to analyze a Parks Canada case study.

Activity – 2 min.

- Post a written summary of Modules 1 and 2 so that the learners can refer to them throughout Module 3.

Module 3

Debrief
- N/A

Materials
- PW pg. 3.1.
- Flip chart and markers.

Variations
- N/A

Additional Information
- N/A

NOTES

Learner Objectives		Key Messages
Knowledge	• N/A	• N/A
Skills	• N/A	
Attitudes	• N/A	

Module 3

ACTIVITY: BUILD AN ISSUE TREE

NOTES

Purpose

- To explore and analyze causes and effects of a Parks Canada case study.

Link to Previous Learning Experience

- This activity is designed to provide the learners with an opportunity to synthesize the information provided in Module 2 in a case study format.
- This format will later be used in Module 4 to analyze the causes and effects of real issues.
- This activity focuses on the problem solving process rather than on the problem and will enable the learners to learn and practice analytical skills. It is therefore important to select case studies from **Appendix B** in the Participant's Manual that are unlike the local case studies that will be used in Module 4.

Introduction – 15 min.

- Most problems have one or more causes and effects. Good problem definition is the first step in finding solutions that will work.
- Defining a problem well means taking time to consider all its possible causes and effects. With a bit of effort, it is possible to define each cause and each effect in ecological terms – relating it to the biological diversity, ecosystem processes and anthropogenic stressors.
- In almost every case, a number of people contribute to the causes, feel the effects, and can provide insight in order to better understand the problem.
- A tree can be a useful metaphor for sorting out the causes and effects of a problem. On an issue tree, the tree trunk represents the problem itself, the roots represent the causes, and the tree branches represent the effects.
- When determining the causes and effects for a particular problem, we need to think broadly and consider the following:
  - what physical elements and living organisms need to be considered;

Introduction – 15 min. (continued)

- what abiotic components are involved and affected;
- what anthropogenic stressors might be involved;
- how different people and groups contribute to the issue and are affected by it; and
- what political, social, and economic issues need to be taken into account in order to develop a solution that will actually work.

• There are some general things to consider when developing an issue tree.

- How is this problem viewed by others since a problem for one person may not be perceived as a problem for others.
- Different people and groups may see different aspects of the problem better than you – they can contribute unique information, local knowledge, and cultural insights into causes and effects.
- Problems have not only direct (primary) causes and effects but also indirect (secondary or tertiary) ones. The problem or its solution may have cumulative causes and effects.
- The issue, causes and effects might look different to you depending on what time or spatial scale you use to examine them. For example: from a satellite orbiting earth, it is hard to see an individual weed patch, but while standing in the weed patch it is hard to see the patterns of roads and disturbance on the larger landscape.

• Select a case study from **Appendix B** in the Participant's Manual to use as an example to demonstrate how to develop an "Issue Tree".

Activity – 30 min.

1. Divide the learners into small groups.
2. Provide each group with a different case study from **Appendix B** in the Participant's Manual.
3. Ask each group to write the problem statement in the tree trunk and to write the problem causes and effects in the roots and branches.
4. Prompt each group to consider information, naturalized ecological knowledge, and cultural insights that different people and groups may provide.

NOTES

Activity – 30 min. (continued)

5. Ask the groups to identify and link the primary, secondary, tertiary, and cumulative causes and effects.
6. Ask the groups to identify the time and spatial scales of the causes and effects.
7. Have groups consider the following questions when working on the case studies:
- Is it an ecological integrity issue?
- What are the ways in which this issue touches on each of these elements of ecological integrity?
- Which partners have a role to play?
8. Ask a representative from each group to present their results.
9. Ask the learners to document their results in their workbook.

Debrief – 5 min.

- Good problem definition is the first step in finding solutions that will work.
- Defining a problem well means taking time to consider all its possible causes and effects, in terms of biological diversity, ecosystem processes and anthropogenic stressors. Were the groups able to do this?
- In almost every case, a number of people contribute to the causes, feel the effects, and can provide insight to better understand the problem. Did the groups consider the views of those that might be interested?
- When determining the causes and effects for a particular problem, we need to think broadly including:
  - the affected political, social, and economic issues;
  - how this problem is viewed by others;
  - the unique information, traditional ecological knowledge, local knowledge, and cultural insights that other people can provide;
  - the primary, secondary, tertiary, and cumulative causes and effects; and
  - the relevant time or spatial scales.
- Humans belong in the ecosystem but must function within its limits to maintain its ecological integrity. Humans rely on, affect, and are affected by ecological integrity.

NOTES

Debrief – 5 min. (continued)

- The learners will use an "Issue Tree" approach for a more local issue in Module 4.
- Introduce the "Build a Toolbox" activity.

Materials

- PW pgs. 3.3 - 3.4.
- Case studies in PW **Appendix B.**
- Flip chart and markers for each group.
- Post-it-notes in two or more colours.
- Case study PowerPoint slides (see CD #1 – Slides/Module)

Variations

1. Provide the same problem to two different groups in order to compare the results obtained.
2. Use brown and green "post-it-notes" to write the problem causes and effects respectively and paste the post-it-notes to the flip chart paper instead of writing them on the flip chart in order to facilitate the classification and linking of the primary, secondary, and tertiary causes and effects.
3. Use other symbols instead of a tree, such as:

- a watershed where the tributaries are the causes and the branches of the delta are the effects; or
- a fire where the wood/fuel is the cause and the smoke is the effects.

Additional Information

- N/A

NOTES

Module 3

Learner Objectives		Key Messages
Knowledge	• Review general park issues.	• Ecological integrity problems often have many causes and effects. • The key to effective problem analysis is to examine the problem from all possible angles. • Different people and groups can provide new information, local knowledge, traditional ecological knowledge, and cultural insights.
Skills	• Practice defining problems ecologically.	
Attitudes	• Explore the contribution that various partners can bring to the challenge of maintaining ecological integrity.	

NOTES

Module 3

ACTIVITY: BUILD A TOOLBOX

NOTES

Purpose

- To evaluate action options for a Parks Canada case study.
- To introduce tools available within Parks Canada that facilitate the restoration or maintenance of ecological integrity.

Link to Previous Learning Experience

- This activity builds directly on the "Issue Tree" activity.
- The learners will continue to use their "Issue Tree" case study and the results obtained in the "Issue Tree" activity to develop action options for managing or solving ecological integrity problems.
- This format will later be used in Module 4 to explore strategy options for real issues.

Introduction – 10 min.

- Once you have worked with others to define the problem and have identified its likely ecological causes and effects, the logical next step is to develop a list of strategies for managing or solving the problem and how to get there.
- The process for developing a toolbox is similar to the process for developing an issue tree. Remember to take into account not only the desired results but also any likely effects with respect to:
  - what animals, plants, and abiotic components will be affected;
  - what ecosystem processes are modified, restored or imitated;
  - what new anthropogenic stressors that might be introduced;
  - how different people and groups will be affected; and
  - what political, social, economic forces are likely to come into play as a result of the chosen option.

Introduction – 10 min. (continued)

- Bear in mind that:
  - different people and groups will generate different strategies, based on their unique information, local knowledge, and cultural insights;
  - each strategy may have both desired and undesired effects;
  - those effects will be felt on different time and spatial scales; and
  - each strategy will likely have primary, secondary, tertiary, and cumulative effects.
- National parks face a great variety of ecological integrity challenges, each with many possible solutions. Problem definition by way of an "issue tree" and the use of naturalized knowledge to develop options are only two possible tools for resolving some of those problems. We have plenty of other tools that can help define and solve problems involving the ecological integrity of national parks and protected areas. The following is only a partial list: (Refer to Participant's Manual pg. 3.6 for more information.)
  - research, consultations, and analysis;
  - legislation;
  - planning;
  - ecological interventions;
  - human use management; and
  - passive management.
- Demonstrate how to develop and study different action options using the results from the "Issue Tree" case study demonstration.

Activity – 30 min.

1. Ask the groups that developed the "Issue Trees" to reconvene.
2. Ask each group to use a flipchart and markers to identify three strategies for managing or solving their "Issue Tree" issue and what is needed to implement each strategy.
3. Ask each group to identify the expected outcomes and likely effects for each strategy.

NOTES

Activity – 30 min. (continued)

4. Ask a representative from each group to describe their results including:
- which tools they used and why;
- the desirable and undesirable results and effects; and
- if the strategy that was preferred initially was preferred at the end.
5. Ask the learners to record their results in their workbook.
6. Ask the groups if they had enough information to complete the "Issue Tree" and "Toolbox" activities and to identify the assumptions that they were required to make.

Debrief – 20 min.

- Most problems have many possible action options – many strategy options should be explored.
- An option analysis can reveal that the strategy that was initially preferred may not yield the best results and effects, especially when secondary, tertiary, and cumulative effects are considered.
- The best strategy usually addresses the root cause of the problem and creates the fewest undesirable results and effects.
- Knowledge gaps are a problem.
- Uncertainty is a fact of life, and never more so than when dealing with questions of ecological integrity and change.
- Ecosystems are complex. It is virtually impossible to know everything about them and especially how they will react to human interventions.
- These inevitable knowledge gaps emphasize the importance of research and monitoring to strengthen Parks Canada's ability to manage protected areas wisely.
- The toolbox contains two important tools: the precautionary principle and the concept of adaptive management.

NOTES

Debrief – 20 min. (continued)

Precautionary Principle

- The precautionary principle is simple common sense: it states that people need to look before they leap.
- The need for care and caution is most pronounced when a human choice might result in change to an ecosystem.
  - Some changes are hard to reverse.
  - If we don't know all the likely consequences, then the precautionary principle suggests we'd be wise to go slowly.
- But the precautionary principle can be hard to implement when human needs or desires seem urgent.
  - It can be tempting to take the approach that says: "Nobody's proven there will be any ecological harm, so why not go ahead with this change."
  - Poor problem definition can make it easy to ignore the precautionary principle, because poor problem definition can make things look more simple than they are.
  - For example: Got weeds? Spray them. Got crowds? Raise the admission fee.
- The precautionary principle is a policy direction, not a legal requirement, and therefore does not legally apply to National Parks and National Park Reserves. However, clause 9.3 of the draft National Marine Conservation Areas Act proposes the precautionary principle as a legal requirement. The draft National Marine Conservation Areas Act states that "In order to protect marine ecosystems and maintain marine biodiversity, the primary considerations in the development and modification of management plans shall be principles of ecosystem management and the precautionary principle".
- It is consistent with our protection mandate and Parks Canada's obligations to future generations.
- It is based on some simple assumptions:
  - Nature has value in itself, not only as something for our use.

NOTES

Debrief – 20 min. (continued)

- It is responsible to act in favour of conservation even when there is no clear proof of negative environmental effects.
- People proposing changes are responsible for demonstrating that the change will not have a negative effect on the environment, as opposed to putting the burden of proof on those who oppose changes.
- Today's actions are tomorrow's legacy.
- All decisions have a cost. Exercising caution may mean that some people will forgo opportunities for recreation or profit today in order to protect the options of future generations.

• The precautionary principle is not an excuse for doing, or allowing nothing.

- In practice, it means that when there are clearly important ecological values at stake, and informed judgment suggest that an action may cause lasting harm to those values, the appropriate decision is the one that creates the least risk until further research or analysis helps create a clearer picture of the responsible choice.
- We can never know everything about what might happen if we make a decision and we will still make decisions.
- The precautionary principle tells us to keep alert for the risk that acting in ignorance may cause lasting damage and, when it is clear that the risks are significant, hold back from making significant decisions until we can find out more.

Adaptive Management

• Is a common sense approach: "learning while doing".

• Since it is often difficult to predict how an ecosystem will respond to a management action, it serves the dual goals of achieving management objectives and gaining reliable knowledge.

• Once a problem has been carefully defined and a solution developed, the next step is to predict what will happen once you take action, and set up a monitoring program to determine if your predictions are valid.

NOTES

Debrief – 20 min. (continued)

- Making changes to the ecosystem or to human activities then becomes a kind of experiment.
- Monitoring tells you if your predictions were correct, and also ensures that you stay on target.
- Through feedback, results of the actions can be used to adapt or change future actions for improved results.
- It is not adaptive management unless managers identify hypotheses (that is, explicitly predict what they think will happen once they take the proposed management action), set up and implement a monitoring program, formally review at the appropriate time what happened, and then make the necessary changes and start all over again with new predictions. Did each group consider a monitoring and feedback program?
- Review the list of tools that were used and add to the list based on the Participant's Workbook. Ask the learners if they could now add to the list of their strategies.
- The learners will use a similar approach for a more local issue in Module 4.

Materials

- PW pgs. 3.5 - 3.10.
- Flip chart and markers.

Variations

1. Two groups are assigned the same "Issue Tree" problem in order to compare results.
2. Each group develops a "Toolbox" for an "Issue Tree" developed by another group.

Additional Information

- N/A

NOTES

Module 3

Learner Objectives		Key Messages
Knowledge	• Review general park issues. • Explore some of the tools and strategies that can help restore and maintain ecological integrity.	• Most ecological integrity problems have a variety of action options. • There are tools available to facilitate the restoration or management of ecological integrity. • There are gaps in our knowledge about ecosystems. • The precautionary principle emphasizes the need for caution when changes to ecosystems are contemplated. • Adaptive management, which is learning while doing, serves the dual goals of achieving management objectives and gaining reliable knowledge.
Skills	• Consider the ecological benefits or costs of various strategies.	
Attitudes	• Explore the contribution that various human partners can bring to the challenge of maintaining ecological integrity.	

NOTES

Module 3

ACTIVITY: WRAP-UP

NOTES

Purpose	• To provide a summary of the Module 3 topics.
Link to Previous Learning Experience	• This activity summarizes the key messages that were delivered in Module 3.
Introduction – 10 min.	• Refer to the key messages in the summary table for this module.
Activity – 5 min.	• Have the learners complete the Module 3 evaluation. See the evaluation package for detailed instructions.
Debrief	• N/A
Materials	• N/A
Variations	• If the modules are delivered with a significant period of time in between (more than one day): - provide an outline for Module 4; and - ask the learners to create a list of their daily tasks and identify how they could modify their tasks to reduce their negative impact and increase their positive impact on ecological integrity.
Additional Information	• N/A

Module 3

Learner Objectives		Key Messages
Knowledge	• N/A	• Refer to the list of key messages for module 3 in the trainer summary table.
Skills	• N/A	
Attitudes	• N/A	

NOTES

Module 3

OPTIONAL ACTIVITY: THINKING OUTSIDE OF THE BOX

NOTES

Purpose

- To encourage learners to think creatively about how they can contribute positively to ecological integrity.

Link to Previous Learning Experience

- This activity reinforces the following points which were discussed in the Parks Canada and Us activity in Module 3.
- It will set the tone for creative thinking in Module 4.

Introduction – 2 min.

- Everyone has an influence on ecological integrity in some way.
- Everyone has more than one way to contribute positively to ecological integrity – at work, in the community, etc.
- We often see ecological integrity as the primary concern of biologists and other experts. We act as though there are glass walls that separate our roles. We look through the walls but do not walk through them. The challenge is to make the walls disappear.
- Puzzles and mind games can help us to think about real issues in a creative way.

Activity – 10 min.

1. Challenge the learners to find the eleven faces that are "hidden" in the picture.

Debrief – 5 min.

- Ask the learners to list/describe the faces that they found.
- Ask the learners to describe the "tricks" that they used to find the faces.
  - Note that different approaches enabled the learners to find different faces.
  - Could these approaches be used to think creatively about ecological integrity?
  - Could other approaches be used to think creatively about ecological integrity?
  - Did learners "think outside the box" when you built the issue tree?

Module 3

Materials

- PW pg. 3.11.

Variations

1. Ask the participants to complete the activity in groups.
2. Award prizes for the correct answers or for more creative answers.
3. Complete the activity during breaks, between Modules 3 and 4, or at the end of Module 3.

Additional Information

- N/A

Learner Objectives		Key Messages
Knowledge	• N/A	• The key to effective problem analysis is to examine the problem from all possible angles.
Skills	• N/A	
Attitudes	• Explore some of the tools and strategies that can help restore and maintain ecological integrity. • Consider the ecological benefits or costs of various strategies.	

NOTES

Module 3

OPTIONAL ACTIVITY: ECOSYSTEM POKER

NOTES

Purpose

- To review the concepts of biodiversity, ecosystem processes, and anthropogenic stressors in a humourous manner.
- To provide the learners with an incentive to participate actively and to reconvene at the appointed times.

Link to Previous Learning Experience

- This activity enables the learners to better understand the concepts of biodiversity, ecosystem processes, and anthropogenic stressors, which were discussed in Module 2.

Introduction – 5 min.

- In Modules 1 and 2, we confirmed that:
  - the *Canada National Parks Act* indicates that ecological integrity means having biodiversity and processes that are likely to persist and that are characteristic of the natural region;
  - anthropogenic stressors have negative effects on biodiversity and ecosystem processes; and
  - our National Parks represent many types of natural regions including terrestrial and marine regions in all parts of Canada from east to west and north to south.
- We will play an "Ecosystem Poker" game that is based on these facts.
- The cards that we will use include three ecosystems:
  - a marine ecosystem;
  - a terrestrial ecosystem that may be found in the southern parts of Canada; and
  - a terrestrial ecosystem that may be found in northern Canada.
- For each ecosystem, there are 6 types of cards:
  - 3 different biodiversity cards with plants and/or animals;
  - 2 different ecosystem process cards; and
  - 1 ecosystem stressor card.

Module 3

Introduction – 5 min. (continued)

- The objective of this "Ecosystem Poker" game is to obtain a "full house with ecological integrity" that contains one of each of the 3 different biodiversity and 2 different ecosystem process cards for the same ecosystem.
- If none of the learners obtain a "full house", the hands will be ranked in the following manner: (write the ranking on a flip chart for reference)
  - 2 different biodiversity and 2 different ecosystem process cards for the same ecosystem with no stressors;
  - 2 different biodiversity and 1 different ecosystem process cards for the same ecosystem with no stressors;
  - 1 different biodiversity and 2 different ecosystem process cards for the same ecosystem with no stressors; and
  - 1 different biodiversity and 1 different ecosystem process cards for the same ecosystem with no stressors.

Activity – 2-3 min. (each time cards are distributed)

1. Distribute one "Ecosystem Poker" card to each participant at the beginning of Module 3 and an extra card each time the participants reconvene at the appointed time, when they provide a helpful example, and/or participate actively in other ways.
2. Once a player has five cards, they may trade one card with the dealer at the time of distribution so that the number of cards in their hand remains at five.
3. Continue distributing cards throughout Modules 3 and 4.

Debrief – 10 min.

- At the end of the day, award a prize to each learner that has a "full house with ecological integrity" or according to the ranking shown in the introduction.

NOTES

Debrief – 10 min. (continued)

- Discuss other ways that the "Ecosystem Poker" non-full-house hands could have been ranked:
  - with the existing cards; and
  - if invasive, naturalized, and/or keystone species cards had been included.

Materials

- Ecosystem Poker cards.
- Flip chart and markers.
- Prizes.

Variations

1. Ask the learners to complete the activity in groups.
2. Award prizes at the end of each day or as soon as someone obtains a "full house".

Additional Information

- N/A

NOTES

Module 3

Learner Objectives[1]		Key Messages
Knowledge	• N/A	• An ecosystem is a community of living organisms and their physical environment. • Ecosystem processes persist in healthy ecosystems. • Biodiversity is the "composition and abundance of species and communities". • Biodiversity is important for ecosystem and human health. • Ecosystem processes are the engines that form and support ecosystems and biodiversity. • The *Canada National Parks Act* defines ecological integrity, with respect to a park, as a condition that is determined to be characteristic of its natural region and likely to persist, including abiotic components and the composition and abundance of native species and biological communities, rates of change and supporting processes. • Anthropogenic stressors are events and actions that have been introduced by contemporary "consumer" human cultures and that affect biodiversity and ecological integrity directly and indirectly.
Skills	• Explain the concepts of biodiversity and ecological processes which are fundamental to ecological integrity. • Explain the concepts of stressors and cumulative impacts.	
Attitudes	• Identify reasons for advocating actions that support ecological integrity.	

1. Although this activity is suggested for implementation in Modules 3 and 4, it is designed to reinforce the learning objectives and key messages from Module 2.

NOTES

Trainer Summary for Module 4 – TAKING RESPONSIBILITY FOR ECOLOGICAL INTEGRITY

OBJECTIVES:

- To identify local ecological integrity issues.
- To determine local ecological integrity actions.
- To recognize that ecological integrity issues are complex, and that all staff can influence the problem solving process

THE LEARNERS WILL BE ABLE TO:

- Determine their role in protecting ecological integrity.
- Commit to steps toward developing and implementing an action plan.

Time	Learning Activity and Purpose	Key Points	Learning Resources	Notes
0:00 - 0:10 (10 min.)	**Module 4 Introduction** • To recap the key messages delivered in Modules 1, 2 and 3. • To review overall goal and objectives of Module 4. • To briefly describe the Module 4 content, structure and agenda.	• Module 1, 2 and 3 key messages. • Module 4 goal and objectives.	**PW pg. 4.1**	
0:10 - 0:30 (20 min.)	**Let's Get Specific** • To review ecological integrity issues specific to the site. • To apply the concepts and process learned in Modules 1-3 to analyze local ecological integrity issues.	• Ecological integrity issues affecting specific sites have been identified in key Parks Canada documents. • All Parks Canada staff are key resources for developing sustainable solutions to ecological integrity problems.	**PW pg. 4.2**	
0:30 - 1:50 (80 min.)	**Build Our Local Issue Tree** • To define and analyze local ecological integrity issues. • Apply the concepts and process learned in Modules 1-3 to analyze local ecological integrity issues.	• Ecological integrity issues are complex and best analyzed comprehensively by a diverse group of people.	**PW pgs. 4.3 – 4.4**	
1:50 - 2:05 (15 min.)	**Break**			

Trainer Summary for Module 4 – TAKING RESPONSIBILITY FOR ECOLOGICAL INTEGRITY (Continued)

Time	Learning Activity and Purpose	Key Points	Learning Resources	Notes
2:05 - 2:25 (20 min.)	**Exploring the Options** • To recognize that ecological integrity issues are complex, and that staff from all functions may have skills or information to contribute to the problem solving process. • To shift their focus from the organization to the place so that their contributions can be on a personal or professional level. • To explore their own personal sphere of influence in which they can affect ecological integrity issues.	• All Parks Canada staff are key resources for developing sustainable solutions to ecological integrity problems. • Restoring, maintaining and enhancing ecological integrity is a collective effort in which everyone has an important role and responsibility.	**PW pg. 4.5**	
2:25 - 2:40 (15 min.)	**Building my Sphere of Influence** • To explore their own personal sphere of influence in which they can affect ecological integrity issues.	• Local action is necessary to resolve local issues. • All Parks Canada staff can make meaningful contributions to the restoration and maintenance of ecological integrity.	**N/A**	
2:40 - 2:45 (5 min.)	**Celebration!** • To provide an overview of the course outcomes. • To reinforce that each Parks Canada staff member is a key asset within our organization.	• Summary of Module 4 key messages. • Brief summary of course. • Group photo	**N/A**	
2:45 - 3:00 (15 min.)	**Evaluation** • Module 4 Evaluation • Course Evaluation • Post-Course Evaluation		**Course evaluation sheets**	

Module 4

TAKING RESPONSIBILITY FOR ECOLOGICAL INTEGRITY

OBJECTIVES

In this module, the learners will:

- review local ecological integrity issues;
- apply the concepts and process learned in Modules 1-3 to analyze local ecological integrity issues;
- recognize that ecological integrity issues are complex, and that staff from all functions may have skills or information to contribute to the problem solving process;
- shift their focus from the organization to the place so that their contribution can be on a professional or personal level; and
- explore their own personal sphere of influence in which they can affect ecological integrity issues.

Upon completion, the learners will be able to:

- apply a process for thinking about problems ecologically that will be reflected in personal and professional actions;
- determine their role in protecting ecological integrity; and
- commit to enhancing the ecological integrity of their site on a professional or personal level.

KEY MESSAGES

The key messages for this module are the following:

- Ecological integrity issues affecting specific sites have been identified in key Parks Canada documents.
- All Parks Canada staff are key resources for developing sustainable solutions to ecological integrity problems.
- Ecological integrity issues are complex and are best analyzed comprehensively by a diverse group of people.
- Restoring and maintaining ecological integrity is a collective effort in which everyone has an important role and responsibility.
- Local action is necessary to resolve local issues.
- All parks Canada staff can make meaningful contributions to the restoration and maintenance of ecological integrity.
- Change is a process that will take time.

PREAMBLE

Module 4 intends to be a catalyst for action at the local level. The overarching goal of this module is to introduce a **process for thinking ecologically** that will hopefully permeate through our organization over time and be reflected in our personal and professional actions. Module 4 is an ambitious module that will have varying paths and endpoints depending upon the support of your local management team, the skills, creativity and comfort zone of the local training teams and the composition of participant groups. However, meeting the core objectives of this module should be achievable in every location, and all participants should have a basic sense of commitment to ecological integrity upon leaving the course. While not possible for all sites, some locations may find themselves in a position to embrace the greatest challenge and take the next step and implement action. Regardless, it is important to remember that change is a process that cannot be expected to occur overnight.

Module 4

NOTE TO TRAINER

The learning path for Module 4 has been revised in response to feedback provided by trainers following Phase 1 of the program implementation. However, if you have attained a comfort level with the original learning path, and the module is being delivered successfully at your site, please feel free to continue to use it.

Again, it is recommended that you consult management to gauge the level of support and set realistic parameters for Module 4. As well course follow-up is essential. It is advisable that you work with management to determine appropriate follow-up measures.

Module 4

ACTIVITY: INTRODUCTION

NOTES

Purpose

- To recap the key messages delivered in Modules 1, 2 and 3.
- To briefly describe Module 4 content, structure and agenda.

Link to Previous Learning Experience

- In this module, learners will apply the concepts and problem solving processes reviewed over Modules 1-3 to analyze a local issue and determine their role in enhancing the ecological integrity of their site.

Introduction – 10 min.

- The key messages in Module 1 were:
  - the conservation role of Parks Canada has evolved over time; and
  - the *Canada National Parks Act* reflects the fact that ecological integrity is now a top priority for Parks Canada.
- Module 2 indicated that the key concepts of ecological integrity are:
  - biodiversity: the variety and patterns of plants and animals that are present;
  - ecosystem processes: the engines that make ecosystems work such as fire, predation, and the evolution of human culture; and
  - stressors: challenges to ecosystems.
- Module 3 indicated that:
  - ecological integrity problems are complex; and
  - different groups have a critical role to play in resolving ecological integrity issues.
- The overarching goal of Module 4 is to introduce a process for thinking ecological. The objectives are to:
  - apply a process for thinking about problems ecologically that will be reflected in personal and professional actions;
  - determine their role in protecting ecological integrity; and
  - commit to enhancing the ecological integrity of their site on a professional or personal level.

Module 4

Activity

1. Post an agenda of Module 4.

Debrief

- N/A

Materials

- PW pg. 4.1.

Variations

- If partners participate in Module 4 without participating in the preceding modules, it will be necessary to provide an overview of the program rationale and an explanation of why they have been invited to participate in the process. As well, it will be necessary to commit some time for group introductions.

Additional Information

- N/A

Learner Objectives		Key Messages
Knowledge	• N/A	• N/A
Skills	• N/A	
Attitudes	• N/A	

NOTES

ACTIVITY: LET'S GET SPECIFIC

NOTES

Purpose

- To review ecological integrity issues specific to each site.

Link to Previous Learning Experience

- This activity provides learners with the local ecological integrity issues that they will use to define local problems.

Introduction – 2 min.

- The following Parks Canada documents have identified ecological integrity issues facing sites within the national parks system:
  - State of the Parks Reports;
  - Ecological Integrity Statements;
  - Site Management Plans; and
  - Ecosystem Conservation Plans.
- These and other documents can help us select local issues.

Activity – 15 min.

1. Choose up to five ecological integrity issues specific to your site and have management approve them for use in the module prior to beginning this activity.
2. Briefly review each issue with the group.
3. Learners may have difficulty understanding the relevance of the issue to their site or their function. In this case, you may want to discuss some of the local issues other sites have tackled. Some examples that have been contributed are:
   - Western Canada Service Centre: managing information to support Field Units in achieving their ecological integrity goals;
   - Prince Albert National Park of Canada: road use through an ecologically sensitive area;
   - Pukaskwa National Park of Canada: development of an aquatic resources inventory, rationalization of a marine operations facility and integration of all General Works operations, actions and all park infrastructure into a comprehensive EMS regime;

Activity – 15 min. (continued)

- Banff National Park of Canada: human-wildlife conflicts and managing the endangered Banff Springs Snail;
- Riding Mountain National Park of Canada: feasibility of recycling in the park area, damming on Whirlpool lake and fencing on the golf course;
- Jasper National Park of Canada: wildlife collisions on the Yellowhead Highway and Canadian National Railway, competing land uses at Old Fort Point and managing use in the Mount Edith Cavell day use area, which is a sensitive alpine environment;
- Mount Revelstoke and Glacier National Parks of Canada: non-native plants in the parks, impacts of forest harvesting and backcountry use on mountain caribou and impacts of the Trans Canada Highway and Canadian Pacific Railway transportation corridor;
- Fort Battleford National Historic Site of Canada: minimize impacts of special events on vegetation at site; and
- Motherwell Homestead National Historic Site of Canada: native species to be planted as a seed source for Grasslands National Park of Canada.

4. Divide learners into small groups and provide each group with a local issue case study. Have each group identify the following elements that are linked to, affecting or impacted by the issue:
   - abiotic components;
   - biodiversity;
   - non-native species;
   - ecosystem processes;
   - anthropogenic stressors;
   - resilience; and
   - cumulative impacts.
5. Encourage learners to review the issue from their functional perspectives and their personal perspectives.

Debrief – 3 min.

- Thinking ecologically is a process whereby we pass through certain steps to better and more completely understand an issue.

NOTES

Debrief – 3 min. (continued)

- This process can also help us understand what our own individual role is in relation to the problem solving process.

Materials

- PW pg. 4.2.
- State of the Parks reports.*
- Ecological Integrity statements.
- Site Management plans.*
- Ecosystem Conservation plans.*

* You will need to access all documents listed above from your site.

Variations

- For training sessions that are specific to non park sites such as service centres, have learners, either as small groups or as a large group, determine a site to which they all are connected in their daily work prior to this module. This will allow you to access the appropriate documents required for this activity. If all groups choose the same park, review the issues facing that park with the entire group. If the groups choose different parks, each group can review the issues for each park.
- Have management present the local issue to the group.
- Take participants on a field trip to see the impacted site or area outlined in the local case study.

Additional Information

- N/A

NOTES

Module 4

Learner Objectives		Key Messages
Knowledge	• Review ecological issues specific to their site.	• Ecological integrity issues affecting specific sites have been identified in key Parks Canada documents. • All Parks Canada staff are key resources for developing sustainable solutions to ecological integrity problems.
Skills	• Apply the concepts and process learned in Modules 1-3 to analyze local ecological integrity issues.	
Attitudes	• Shift their focus from the organization to the place so that their contribution can be on a professional or personal level.	

NOTES

Module 4

ACTIVITY: BUILD OUR LOCAL ISSUE TREE

NOTES

Purpose

- To define and analyze local ecological integrity issues.

Link to Previous Learning Experience

- This activity allows learners to analyze local issues identified in the previous activity using the issue tree format used in Module 3 and concepts introduced in Module 2.

Introduction – 5 min.

1. Building an issue tree allows us to define a problem, and identify its causes and effects.
2. When determining causes and effects, the following should be considered:
   - biodiversity, including biotic and abiotic components;
   - representivity;
   - ecosystem processes;
   - anthropogenic stressors;
   - cumulative impacts and ecosystem resilience;
   - ecosystem values affected;
   - time and space scales;
   - the roles humans have within the ecosystem, and how different groups contribute to the problem, are affected by it, and can contribute to its resolution;
   - the role of Aboriginal Peoples in protecting ecological integrity;
   - political, social, and economic factors; and
   - the importance of providing park visitors with opportunities for quality outdoor experiences and learning opportunities.
3. All Parks Canada staff and partners can provide valuable input into analyzing an ecological integrity issue.
4. All our decisions and activities have impacts, however, those impacts can be either positive or negative. Regardless, they are factors that need to be considered when analyzing an ecological integrity issue.

Activity – 55 min.

- Divide the learners into groups, ensuring that each group includes staff occupying different functions.
- Have each group choose one of the local issues listed in the previous activity.
- Ask each group to use a flipchart to write the problem statement in the tree trunk and to write the causes and effects in the roots and branches.
- Prompt each group to consider information, local ecological knowledge, and cultural insights that different people and groups may provide.
- Ask the groups to identify and link the primary, secondary, tertiary, and cumulative causes and effects.
- Ask the groups to identify the concepts listed in the introduction.
- Ask the learners to document their results in their workbook as they work.
- Ask a representative from each group to present their results.
- Invite other groups to comment and add to each presentation. Capture this information on a flipchart.
- After all groups have presented, ask the whole group to comment on the following questions:

- Are the issues related? If so, how?
- If the issues are related, how could this affect how solutions are developed?

NOTES

Debrief – 5 min.

- It is important to consider as many perspectives as possible when analyzing an issue in order to attain a comprehensive understanding of it, and to best formulate a plan to resolve the issue.

Activity – 10 min.

1. Choose one of the issues that the small groups are working with.

Activity – 10 min. (continued)

2. Write the main Parks Canada staffing functions on a flipchart:
   - manager;
   - clerical;
   - technical/specialist;
   - interpreters;
   - warden; and
   - maintenance, grounds, trades.
3. With the large group, determine how staff in each of these roles contributes to the issues through decision-making and action.
4. Record the discussion on the flipchart.

Debrief – 5 min.

- Decisions and/or actions taken by Parks Canada staff, regardless or their function, do have an impact on ecological integrity.
- This impact may be direct or indirect and positive or negative.
- All staff, therefore, have a role in restoring, maintaining and enhancing the ecological integrity of their site, or if they are not directly associated with a site, the ecological integrity of the sites that they work with.

Materials

- PW pgs. 4.3 – 4.4.
- Case studies (see Participant's Workbook **Appendix B**).
- Flip chart and markers for each group.
- Post-it-notes in two or more colours

Variations

1. Each group will be given an issue by the trainer to decrease time spent by each group choosing their issue.
2. If Parks Canada partners are participating, ensure that each group includes both staff and partners. Before the groups create their own issue tree, use an example to explain how the issue tree can be used to identify a problem, and its causes and effects.

Additional Information

- N/A

NOTES

Module 4

Learner Objectives		Key Messages
Knowledge	• Recognize that ecological integrity issues are complex, and that staff from all functions may have skills or information to contribute to the problem solving process.	• Ecological integrity issues are complex and are best analyzed comprehensively by a diverse group of people.
Skills	• Apply the concepts and process learned in Modules 1-3 to analyze local ecological integrity issues.	
Attitudes	• N/A	

NOTES

Module 4

ACTIVITY: EXPLORING THE OPTIONS

NOTES

Purpose

- To begin to explore the concept of sphere of influence by exploring the options learners have for addressing local ecological integrity issues.

Link to Previous Learning Experience

- This activity provides learners with an opportunity to become individually engaged in addressing the issue they analyzed in the previous activity.

Introduction – 2 min.

- Identifying options to address ecological integrity issues means analyzing our individual decisions and actions to determine where a change can be made that will contribute positively to the situation.
- This includes assessing our decisions and actions that have a direct impact on the issue, as well as those that have indirect impacts.
- All Parks Canada staff members have an opportunity to contribute to restoring, maintaining or enhancing ecological integrity.
- These contributions can also be direct or indirect. Sometimes contributions are easily identifiable while determining other contributions requires us to "think outside the box."
- Options can be determined on a spectrum from individual to organizational:
  - individual: this includes the individual choices Parks staff make, both in as a staff member, and as part of the general park community; and
  - organizational: this includes Parks Canada culture and how the organization operates.
- Key options can include, but are not limited to:
  - making a personal commitment to manage individual decisions and actions more ecologically;
  - implementing functional changes within areas such as greening procurement and revising maintenance practices;

Introduction – 2 min. (continued)

- thinking differently about our roles, functions, skills and knowledge and how we use these to contribute to ecological integrity;
- valuing the potential contributions of others through enhanced and non-traditional team-work; and
- involving partners in decision-making and implementation of actions.

• Options set out a framework within which subsequent planning and implementing phases will take place.

Activity – 15 min.

1. Reconvene learners into the groups used for the previous activity.
2. Have groups determine 10 guiding principles for addressing the ecological integrity issue that they analyzed in the previous activity. These principles should reflect the functional make-up of each group. Depending on the degree of management support, these guiding principles may reflect an individual or organization approach.
   Some examples of guiding principles are as follows:

- consult staff from all functions when addressing ecological integrity issues.
- create multi-functional management teams.
- ensure partners are informed regularly of management decisions.
- dedicate time at every staff meeting to review work undertaken in each section.
- establish periodic forums for discussion of ecological integrity issues.
- highlight and share how staff in different functional positions contribute to the problem solving process.
- reward innovative ideas.
- present options to management for further discussion.
- ensure follow-through on ecological integrity issues by developing an integrated plan.
- create communication programs to inform visitors of ongoing actions to enhance ecological integrity at the site.

NOTES

Activity – 15 min. (continued)

3. Remind learners that complex issues cannot often be addressed in a short period of time.
4. Have learners provide three suggestions for furthering work on the issue once the course is completed.

Debrief – 3 min.

- Restoring, maintaining and enhancing ecological integrity is a collective effort.
- As part of this collective effort, each individual has the responsibility to continually evaluate and exercise their options for contributing to ecological integrity.
- This is clearly stated in the Parks Canada mandate.
- Identifying options for local issues is not an end itself, but rather they set out a framework within which subsequent planning and implementing phases will take place.
- Each individual can make the commitment to act locally. The scope of these options will vary considerably from one site to another, but staff should be responsible for identifying how they can protect ecological integrity.

Materials

- PW pg. 4.5.
- Flip chart and markers for each group.

Variations

- Depending on approval from management, learners can use this activity to formulate the next steps in resolving their issue. This could include convening working groups on the issues to develop potential solutions for management consideration, involving partners if partners have not been included in this process, etc. This would also be a feasible variation if partners have participated in Module 4.

Additional Information

- N/A

NOTES

Module 4

Learner Objectives		Key Messages
Knowledge	• N/A	• All Parks Canada staff are key resources for developing sustainable solutions to ecological integrity problems. • Restoring, maintaining and enhancing ecological integrity is a collective effort in which everyone has an important role and responsibility.
Skills	• Recognize that ecological integrity issues are complex, and that staff from all functions may have skills or information to contribute to the problem solving process	
Attitudes	• Shift their focus from the organization to the place so that their contributions can be on a personal or professional level. • Explore their own personal sphere of influence in which they can affect ecological integrity issues.	

NOTES

Module 4

BUILDING MY SPHERE OF INFLUENCE

NOTES

Purpose

- To have learners explore their own personal sphere of influence in which they can affect ecological integrity issues.

Link to Previous Learning Experience

- This activity builds on the previous activity by giving learners the opportunity to identify potential roles in, and responsibilities for restoring, maintaining and enhancing ecological integrity.

Introduction – 3 min.

- The process of defining local problems and identifying feasible options allows us to understand our own roles and responsibilities. It also gives us insight into our potential.
- By identifying our roles and responsibilities, it becomes clear that we all can play a positive role in implementing our mandate, whether on an individual level (both as a Parks Canada staff member and as a part of the park community), on an organizational, or both.
- All Parks Canada staff have skills and/or information that can be applied in a valuable way to ecological integrity issues. These should be identified and shared.

Activity – 10 min.

Prior to delivering Module 4, choose on of the following options for this activity.

Option 1: My EI Coat of Arms

This activity gives learners the opportunity to describe themselves and learn more about others.

1. Have each learner draw coat of arms or shield with five spaces for inserting images or text.
- In space 1, have learners draw something that characterizes a way that they have contributed to ecological integrity in the past, or how they can contribute in the future.
- In space 2, have learners draw something about themselves that very few people know.

Activity – 10 min. (continued)

- In space 3, have learners draw a symbol of how they spend their free time.
- In space 4, have learners write or draw a personal motto that reflects their commitment to enhancing ecological integrity.

2. Once all learners finish their coat of arms, have learners form into groups to try to identify the meaning of each other's coat of arms.
3. Have each group share what they found out about each other with the large group.

Option 2: Working Together

This activity demonstrates that teamwork gets better results that working alone.

1. Assemble up to 15 portable objects related to the tasks that learners perform, and arrange them on a table. These objects should reflect the diversity of the group.
2. Explain that the objective of this activity is to work together to recognize objects used at work by Parks Canada staff.
3. In groups, have learners approach the table and view the objects in silence for one minute only.
4. Have groups reconvene at their own tables, have individuals take two minutes to write a list of all the objects that they can remember, and describe them.
5. Have each group create a master list of items with descriptions and compare it to the individual lists.

Option 3: The EI Quilt

This activity showcases the diversity and breadth of knowledge, skills, attributes and qualities that the learners, as a group, have.

1. Give each learner a piece of 8.5" x 11" paper.
2. Have each learner write or draw a symbol of a quality, skill or piece of knowledge that they can contribute to the process of addressing ecological integrity issues on the paper.
3. Have learners tape their squares on a wall or blackboard in a patchwork pattern to form a 'quilt'.
4. Once the quilt is assembled, have each learner interpret their quilt block.

NOTES

Debrief – 2 min.

- All Parks Canada staff can make a difference to positively affect ecological integrity.
- Each individual brings something unique and valuable to the process. When we share these among ourselves, we enhance the process.
- Our organizational strength lies in our combined knowledge, skills, and qualities.

Materials

- PW pg. 4.6.
- Scrap sheets of 8” x 11” paper (enough for all learners).

Variations

- N/A

Additional Information

- N/A

Learner Objectives		Key Messages
Knowledge	• N/A	• Local action is necessary to resolve local issues. • All Parks Canada staff can make meaningful contributions to the restoration and maintenance of ecological integrity.
Skills	• N/A	
Attitudes	• Explore their own personal sphere of influence in which they can affect ecological integrity issues.	

NOTES

Module 4

ACTIVITY: CELEBRATION!

NOTES

Purpose

- To provide an overview of the course outcomes.
- To reinforce that each Parks Canada staff member is a key asset within our organization.

Link to Previous Learning Experience

- This activity summarizes the key messages that were delivered in Modules 1, 2, 3 and 4 and closes the course.

Introduction – 5 min.

- Refer to the key messages in the summary table for Modules 1, 2, 3 and 4.
- By participating in this course, we have taken the first steps towards initiating a cultural change within Parks Canada that reflects our commitment to ecological integrity.
- It is important to maintain the momentum that we have initiated over the duration of the course.
- Let's celebrate!

Activity

- Have learners reflect back the statements they made at the start of Module 1.
- Ask the group how this course has changed how they feel about Parks Canada, the Parks Canada system or their park.
- Using a round table forum, have learners share their thoughts with the group.
- Have learners complete the Module 4 evaluation, course evaluation and post-course evaluation. See the evaluation package for detailed instructions.
- Have the group assemble for a group photo. The group can choose to create a banner with a group slogan for this image.
- Advise the learners that the group picture will be displayed in an appropriate location.

Debrief

- N/A

Module 4

Materials • N/A

Variations • N/A

Additional Information • N/A

NOTES

Learner Objectives		Key Messages
Knowledge	• N/A	• N/A
Skills	• N/A	
Attitudes	• N/A	

APPENDIX A: CHEAT SHEETS

SLIDE SHOW CHEAT SHEETS

NOTES

MODULE 1 - Setting the Context
"Reconnect with Parks" Slide Show
Debrief Notes

Slide Number	Source and Description
1	• **Park:** Nahanni National Park of Canada. • **Description:** Ragged Mountain Range. • **Source:** Parks Canada Photo Library 12.120.03.10(26).
2	• **Park:** Gros Morne National Park of Canada. • **Description:** Long Range Mountains. • **Source:** Parks Canada Photo Library 01.11.03.10(39).
3	• **Park:** La Mauricie National Park of Canada. • **Description:** Black spruce. • **Source:** Parks Canada Photo Library 05.51.03.05(350).
4	• **Park:** Cape Breton Highlands National Park of Canada. • **Description:** Ingonish Beach. • **Source:** Parks Canada Photo Library 03.30.03.01(138).
5	• **Park:** Kejimkujik National Park of Canada. • **Description:** Mersy River. • **Source:** Parks Canada Photo Library 03.31.03.12(101).
6	• **Park:** Kouchibouguac National Park of Canada. • **Description:** Kelly's Beach. • **Source:** Parks Canada Photo Library 04.41.03.01(65).
7	• **Park:** Bruce Peninsula National Park of Canada. • **Description:** Bruce Trail. • **Source:** Parks Canada Photo Library 06.64.03.16(03).
8	• **Park:** Riding Mountain National Park of Canada. • **Description:** Clear Lake. • **Source:** Parks Canada Photo Library 07.70.03.08(12).
9	• **Park:** Wapusk National Park of Canada. • **Description:** Blizzard. • **Source:** Parks Canada Photo Library 07.71.03.17(02).

Slide Number	Source and Description
10	• **Park:** Wood Buffalo National Park of Canada. • **Description:** Salt plains. • **Source:** Parks Canada Photo Library 09.90.03.05(05).
11	• **Park:** Jasper National Park of Canada. • **Description:** Athabasca Falls. • **Source:** Parks Canada Photo Library 09.94.03.04(21).
12	• **Park:** Kootenay National Park of Canada. • **Description:** Forest. • **Source:** Parks Canada Photo Library 10.100.03.06(03).
13	• **Park:** Auyuittuq National Park of Canada. • **Description:** Turner Glacier. • **Source:** Parks Canada Photo Library 13.03.03.07(27).
14	• **Park:** Port au Choix National Historic Site of Canada. • **Description:** Gulf of St. Lawrence. • **Source:** Parks Canada Photo Library H.01.12.11.07(15).
15	• **Park:** Gwaii Haanas National Park Reserve of Canada. • **Description:** Sedmond Creek. • **Source:** Parks Canada Photo Library 10.105.03.12(01).
16	• **Park:** Rideau Canal National Historic Site of Canada. • **Description:** Rideau Canal. • **Source:** Parks Canada Photo Library H.06.287.11.14(01).
17	• **Park:** Kluane National Park of Canada. • **Description:** Alpine meadow in Kluane Mountain Range. • **Source:** Parks Canada Photo Library 11.110.03.10(285).
18	• **Park:** Grasslands National Park of Canada. • **Description:** Prairie. • **Source:** Parks Canada Photo Library 08.81.03.05(03).
19	• **Park:** Prince Edward Island National Park of Canada. • **Description:** Cavendish Beach and coastal dunes. • **Source:** Parks Canada Photo Library 02.20.03.20(14).

NOTES

MODULE 1 - Setting the Context
"Is Ecological Integrity a New Concept?" Slide Show
Debrief Notes

NOTES

Slide Number	Source and Description
Pre-1800: **The Changing Relationship of Humans and the Environment**	
1	• **Park:** Spiritual Quest re-enactment at Petroglyphs Provincial Park, Ontario. • **Source:** Parks Canada Photo Library H.06.157.06.09(02).
2	• **Park:** A Metis homestead in Jasper National Park of Canada. During the fur trade, Metis lived in the area. As the fur trade waned, most left the area. The cabin was built in 1898 by one of four Metis families that remained. • **Source:** Kim Forster.
1800-1900: **The Park Concept**	
3	• **Park:** Geyser in Yellowstone National Park. • **Source:** Kim Forster.Ethan Melag.
4	• **Park:** Banff National Park of Canada. • **Source:** Parks Canada Photo Library 09.93.04.19(24).
1900-1930: **Evolution of a System**	
5	• **Park:** Bison in Wood Buffalo National Park of Canada. • **Source:** Parks Canada Photo Library 09.90.10.01(113).
6	• **Park:** Visitors sightseeing Riding Mountain National Park of Canada by vehicle. • **Source:** Parks Canada Photo Library 07.70.04.04(71).

Slide Number	Source and Description
1930-1950: Hard Times Solidify a Nation	
7	• **Park:** Jasper National Park of Canada. • **Description:** Conscientious objectors removing rock during the construction of the Maligne Canyon-Medicine Lake road. • **Source:** Kim Forster.
1950-1979: An Environmental Awakening	
8	• **Park:** Visitors using the Cave and Basin Hot Springs at Banff National Park of Canada. • **Source:** Parks Canada Photo Library 09.93.07.01(03).
1979-2000: An Ecological Approach to Managing Parks	
9	• **Park:** Cross-country skiers at Rivière à la Pêche Visitor Centre at La Mauricie National Park of Canada. • **Source:** Parks Canada Photo Library 05.51.02.03(10).
10	• **Park:** Riding Mountain National Park of Canada surrounded by agricultural development. • **Source:** Jillian Maguet.

NOTES

MODULE 2 – Understanding Ecological Integrity
"Explore Parks Canada's Ecosystems" Slide Show
Debrief Notes

NOTES

Slide Number	Source and Description
1	• **Park:** Mount Revelstoke National Park of Canada. • **Description:** A coniferous forest and sub-alpine trail to Eva Lake. • **Concept:** Biodiversity, stressors. • **Source:** 10.103.03.08(31).
2	• **Park:** Wapusk National Park of Canada. • **Description:** The loss of caribou antlers every year is a natural process. Caribou live in Northern and mountain forest areas and on the Toundra. • **Concept:** Ecosystem processes (growth). • **Source:** 07.71.10.04(01).
3	• **Park:** Pacific Rim National Park of Canada. • **Description:** Northern sea lions and Steller's sea lions sunning on Sealion rock. • **Concept:** Biodiversity, process (inter-species competition). • **Source:** 10.104.10.03(24).
4	• **Park:** Wood Buffalo National Park of Canada. • **Description:** An aerial view of the Peace/Athabasca delta wetlands. • **Concept:** Biodiversity. • **Source:** 09.90.03.23(18).
5	• **Park:** Wood Buffalo National Park of Canada. • **Description:** A herd of bison. • **Concept:** Biodiversity, ecosystem process (intra-species competition). • **Source:** 09.90.10.01(116).
6	• **Park:** Georgian Bay Islands National Park of Canada. • **Description:** A Massassauga rattlesnake. • **Concept:** Biodiversity. • **Source:** Darlene Upton.

Slide Number	Source and Description
7	• **Park:** Mount Revelstoke National Park of Canada • **Description:**Prescribed burns are created in order to emulate the ecosystem processes of fire which create ideal growing conditions for many organisms by providing soil with mineral rich ash, creating openings in the forest cover allowing sunlight to warm the soil, and stimulating new growth from seeds and roots. • **Concept:** Ecosystem process (fire). • **Source:** 10.103.14.01 (04).
8	• **Park:** Glacier National Park of Canada. • **Description:** An avalanche is an ecosystem process that clears trees and swathes of forest in their paths, thereby creating new, early succession habitats which can be highly productive. • **Concept:** Ecosystem process (avalanche). • **Source:** 10.102.14.03 (13).
9	• **Park:** Riding Mountain National Park of Canada. • **Description:** The horned owl is a carnivore/predator. • **Concept:** Biodiversity, ecosystem process (predation). • **Source:** 07.70.10.02(04).
10	• **Park:** Point Pelee National Park of Canada. • **Description:** Point Pelee is a resting point for many of the monarchs travelling south as far away as Mexico. • **Concept:** Biodiversity, ecosystem process (migration). • **Source:** Darlene Upton.
11	• **Park:** Georgian Bay Islands National Park of Canada. • **Description:** An upcoming winter storm. • **Concept:** Ecosystem process (storm). • **Source:** Darlene Upton.
12	• **Park:** Jasper National Park of Canada. • **Description:** American elk fighting during the mating period is a common form of competition. • **Concept:** Biodiversity, ecosystem process (intra-species competition). • **Source:** 09.94.10.01(07).

NOTES

Slide Number	Source and Description
13	• **Park:** Terra Nova National Park of Canada. • **Description:** The orange hawksweed is a non-native species in Terra Nova National Park of Canada. • **Concept:** Non-native species. • **Source:** 01.10.03.05(45).
14	• **Park:** Prince Albert National Park of Canada. Mount Revelstoke National Park of Canada. • **Description:** A black bear crossing the road. Road construction is a stressor within ecosystems. • **Concept:** Stressor. • **Source:** 08.80.10.01(25).
15	• **Park:** Fort George National Historic Site of Canada. • **Description:** A volunteer tends to a garden that likely contains non-native plants. • **Concept:** Non-native species. • **Source:** H.06.61.06.09(61).
16	• **Park:** Bruce Peninsula National Park of Canada. • **Description:** The town of Tobermory includes homes, marinas, and small businesses. • **Concept:** Stressor. • **Source:** 06.64.01.02(13).
17	• **Description:** International trade of animal products such as these bottled snakes is an ecosystem stressor. • **Concept:** Stressor. • **Source:** Amy Lathrop, Royal Ontario Museum.
18	• **Park:** Riding Mountain National Park of Canada. • **Description:** Development around many parks is creating island ecosystems. • **Concept:** Stressor. • **Source:** Jillian Maguet.

NOTES

MODULE 3 – Applying Ecological Integrity
"Parks Canada and Us" Slide Show
Debrief Notes

NOTES

Slide Number	Source and Description
1	• **Park:** La Mauricie National Park of Canada. • **Description:** The black bears of La Mauricie National Park of Canada have been monitored for more than 10 years with the help of radio-collars. The main objectives of this study have been to monitor their seasonal movements, habitat use, and feeding habits at a regional scale. The bear shown here has been taken out of its winter den for collar replacement and to assess its health status. • **Source:** 05.51.10.08(11).
2	• **Park:** Jasper National Park of Canada. • **Description:** Moving compost pits. • **Source:** Kim Forster.
3	• **Park:** Georgian Bay Islands National Park of Canada. • **Description:** Outdoor learning. • **Source:** Darlene Upton.
4	• **Park:** Georgian Bay Islands National Park of Canada. • **Description:** Oversnow rescue practice. • **Source:** Darlene Upton.
5	• **Park:** Pukaskwa National Park of Canada. • **Description:** Employees who perform administrative tasks, such as Mona who is working at an information kiosk, also contribute to ecological integrity. • **Source:** Robin Heron.
6	• **Park:** Fathom Five Marine Park of Canada. • **Description:** The Ecological Integrity Monitoring Plan for Bruce Peninsula Natioanl Park of Canada and Fathom Five National Marine Park of Canada enabled Parks Canada to develop an excellent database full of information. • **Source:** 06.65.07.10(05).

Slide Number	Source and Description
7	• **Park:** Cape Spear National Historic Site of Canada. • **Description:** Restoration of the oldest surviving ligh house in Newfoundland. • **Source:** H.01.13.01.10(04).
8	• **Park:** Gros Morne National Park of Canada. • **Description:** Children's whale interpretation program at Shallow Bay. • **Source:** 01.11.04.04(153).
9	• **Park:** Jasper National Park of Canada. • **Description:** Aquatic research. • **Source:** Kim Forster.
10	• **Park:** Georgian Bay Islands National Park of Canada. • **Description:** Ice testing. • **Source:** Darlene Upton.
11	• **Park:** Georgian Bay Islands National Park of Canada. • **Description:** Archeological crew. • **Source:** Darlene Upton.
12	• **Park:** Georgian Bay Islands National Park of Canada. • **Description:** The Young Canada Works Programme, which runs in many National Parks of Canada, hires highschool students and aims to reach a variety of ethnic groups and provide a national park experience and pride in being Canadian. Each park's programme ideally has 50% kids from out of province and a mix of English and French and Aboriginal representation. • **Source:** Darlene Upton.
13	• **Park:** La Mauricie National Park of Canada. • **Description:** Fire management personnel on prescribed burning exercise. • **Source:** 05.51.14.01(15).
14	• **Park:** Mingan Archipelago National Park Reserve of Canada. • **Description:** Boat tour with interpretation of Ile aux Perroquets (parrot island). • **Source:** 05.52.04.09(41).

NOTES

Slide Number	Source and Description
15	• **Park:** Jasper National Park of Canada. • **Description:** Weed control. • **Source:** Kim Forster.
16	• **Park:** Jasper National Park of Canada. • **Description:** Restoration volunteer. • **Source:** Kim Forster.
17	• **Park:** Jasper National Park of Canada. • **Description:** Wolf telemetry. • **Source:** Kim Forster.
18	• **Park:** Jasper National Park of Canada. • **Description:**Wolf on tracks. • **Source:** Kim Forster.
19	• **Park:** Jasper National Park of Canada. • **Description:** Broken bridge. • **Source:** Kim Forster.
20	• **Park:** Jasper National Park of Canada. • **Description:** Kids and fish. • **Source:** Kim Forster.
21	• **Park:** Georgian Bay Islands National Park of Canada. • **Description:** Snowmobile patrol. • **Source:** Darlene Upton.

NOTES

HISTORY CARDS CHEAT SHEET

Please note that the cultural and environmental events are meant to be hints of the period when the National Parks events took place.

Date	National Parks Event	Cultural/Environmental Event	Date
1885	Canada's first National Park is created.	Canada's transcontinental railway is completed.	**1885**
1904	St. Lawrence Islands National Park is established as the first National Park east of the Rockies.	Canadian Olympic athletes first wear the red maple leaf as an emblem.	**1904**
1906	Elk Island Park is the first federally controlled area in Canada to protect a native mammal, the elk, and the first large mammal sanctuary in Canada.	The aviation era takes off as the first airplanes are developed.	**1903**
1907	Jasper National Park is established. Along with Banff, Yoho and Kootenay (est. 1920), these contiguous parks form one of the world's largest and best-known protected areas.	Natural resources in Canada are thought to be inexhaustible.	**1905-1920**
1910	Banff National Park opens its gates to automobiles for the first time.	Henry Ford's Model "T" makes cars available to the middle class.	**1909-1927**
1911	J.B. Harkin heads the world's first national parks service, the Dominion Parks Branch.	The Titanic is built.	**1909 - 1912**
1919	The Historic Sites and Monuments Board is established to create places of national significance.	Canadian troops come home from Europe after the war ends.	**1919**
1930	Canada's first *National Parks Act:* has phrase, "to leave unimpaired for future generations".	World economies crumble as the Great Depression sets in, leading to "make work" projects in parks.	**1929 - 1939**
1936	Cape Breton Highlands National Park is established as the first national park in the Atlantic provinces.	The beaver on the new nickel is used on the warden badge and thereby becomes our emblem.	**1930s**

Date	National Parks Event	Cultural/Environmental Event	Date
1953	Wolf control is discontinued at Prince Albert National Park.	Post war Canada begins to flock to national parks.	**1950s**
1964	Modern approaches to planning begin as zoning is applied in national parks.	Rachael Carson's book "Silent Spring" spurs on the environmental movement.	**1962**
1970	Forillon National Park extends the national system into Quebec.	Apollo missions allow astronauts to see the blue planet from the moon…and how fragile it really is.	**1968 - 1972**
1971	The first National System Plan is approved for our national parks.	Greenpeace is founded in Vancouver, British Columbia.	**1971**
1978	Nahanni National Park is the first natural site to be declared a UNESCO World Heritage Site.	North America catches disco fever.	**1970s**
1979	Parks Canada introduces the concept of ecological integrity as a principle.	The 'Three Mile Island' nuclear accident occurs in the United States.	**1979**
1987	Fathom Five National Marine Park is established as the first national marine conservation area in Canada.	The Brundtland Report recommends that all nations preserve 12 percent of their wilderness.	**1987**
1988	An amendment to the National Parks Act establishes ecological integrity as the priority.	Recycling emerges as a household practice.	**Mid 1980s**
1993	The Gwaii Haanas Agreement sets the terms of an unprecedented co-management agreement between the Haida Nation and the Government of Canada.	Ontario Parks, the largest parks system in Canada outside of the national parks, celebrates its 100th anniversary.	**1993**
1995	An agreement between the Inuit of the Nunavut Settlement Area and the federal government commits Parks Canada to work with regional Inuit communities.	Climate change becomes a household word as the world experiences its hottest temperatures on record, and more frequent weather catastrophes.	**Mid 1990s**
1996	The Banff-Bow Valley Study sets a new benchmark for ecological management in Canada.	Donovan Bailey wins gold at the Atlanta Olympics.	**1996**

Date	National Parks Event	Cultural/Environmental Event	Date
1998	The Minister of Canadian Heritage appoints a panel of experts to report on ecological integrity in Canada's National Parks.	Eastern Canada is hit by the ice storm of the century.	**1998**
1999	Minister signs the Inuit Impact and Benefits Agreement for Auyuittuq, Quttinerpaaq, and Sirmilik National Parks.	The Nunavut Territory and Government come into existence.	**1999**
2000	An amendment to the Canada National Parks Act is passed which states that ecological integrity must be the first priority in the management of national parks.	The world enters a new millennium.	**2000**

HOUSE ANALOGY CHEAT SHEET

<table>
<tr><th></th><th>Houses</th><th>Ecosystems</th></tr>
<tr><td rowspan="4">Overall Similarities
Eco = House
Comparing our houses to the environment allows us to see some fundamental similarities and to break the environment into components that we can relate to.</td><td>• Apartment, house, mansion, tent, etc.</td><td>• Park, lake, mountain area, wetland, habitat, niche, etc.</td></tr>
<tr><td colspan="2">POINT: You can define a house or ecosystem at different scales depending on how you look at it.</td></tr>
<tr><td>• Exist within neighbourhoods</td><td>• Exist with neighbouring habitats</td></tr>
<tr><td colspan="2">POINT: Nothing exists in isolation. Neighbours and neighbouring habitats have an influence on each other.</td></tr>
<tr><td rowspan="3">Components and Processes
Logical = Knowledge
We build houses with blueprints. We understand fundamentally what belongs in a house to protect ecological integrity we need to know more about nature's blueprint.</td><td colspan="2">POINT: Both ecosystems and houses are open systems. Regardless of what fences you build or boundaries you establish (i.e. park or municipal) there will be movement into and out of the boundaries.</td></tr>
<tr><td>Physical Elements
Walls, furniture, toys, lights, appliances, etc.</td><td>Abiotic Components
Rocks, water, sand, soil, etc.</td></tr>
<tr><td>Living Organisms
Humans, pets, dust mites, house plants, etc.</td><td>Biotic Components
Humans, animals, plants, insects, etc.</td></tr>
<tr><td>Systems
Heating, plumbing, electrical, sewage, etc.</td><td>Ecosystem Processes
Nutrient cycles, fire, wind, water cycles, decomposition, etc.</td></tr>
</table>

	Houses	Ecosystems
Dynamics (place, time and proportion) **Integrity = Wholeness** The wholeness of a system refers to having biota and abiotic components in their proper place, and at proportions that allow the system to work (i.e.: predator/prey ratios). It also refers to having the timing of ecological processes as nature intended.	• You need the right kinds of furniture in the right rooms.	• You need the right plants and animals in the right environment (i.e. native vs. non-native species).
	• Systems need to be functioning properly (i.e. plumbing) in order to maintain comfortable living conditions.	• Ecological processes need to correspond with the environment and need to be functioning (i.e. wind and pollination disperse seeds).

So what does ecological integrity mean?

Regardless of how an ecosystem is defined, there are living and non-living elements and ecological processes present. These elements and processes are optimized in both space and time for the area they exist in naturally. Changes to this natural order have the potential to adversely affect ecological integrity.

ECOSYSTEM VISUAL

NOTES

HOUSE VISUAL

NOTES

A variety of house styles is acceptable. This illustration is an example only.

WEB OF LIFE CHEAT SHEET - Prairie Ecosystem

NOTES

ABIOTIC ELEMENTS

Soil

- Prairie soils can be very fertile but with regular drought they are prone to erosion if grass cover is removed.

Sun

- Sun is important for the growth of rich grasslands. However, in combination with wind it is capable of evaporating more water during the average year as compared to what the clouds bring as rain or snow.

Water

- Prairie areas are often semi-arid. Water is rarely abundant and most species have some kind of mechanism to deal with drought. Plants may grow very deep roots and many animals get all the water they need from their diet.

BIOTIC ELEMENTS

Ferrigunous Hawk

- This species of hawk prefers open prairie, badlands and ranchlands.
- In Alberta, the Ferrigunous Hawk is relatively abundant in the correct habitat but as habitat type is declining as a result of agriculture, there is concern for the long-term stability of this bird.
- The Ferrigunous Hawk feeds on small mammals, birds and reptiles.

Western Prairie Rattlesnake

- The most recognizable feature of this snake is that it can rattle its' tail when it feels threatened.
- Its bite is venomous, but not normally fatal in adults.
- It gathers in large dens or hibernacula for the winter. Dens are often abandoned diggings of badgers or prairie dogs.
- It will eat small mammals (mice, kangaroo rats, baby rabbits, prairie dogs, lizards and birds.

Sage grouse

- The Sage grouse is one of the few species of birds or mammals that can actually eat and digest sage.
- It is famous for its spring mating ritual where males gather in traditional areas called leks, dancing, and displaying puffed up feathers and red expandable patches on their necks.
- The population is declining across their Canadian range.

Mixed grass prairie

- This is the most extensive grassland type on the Great Plains including Grasslands National Park.
- It is composed of a variety of grasses, some short and some medium in height, including Needle-and-thread grass, blue Gramma grass, June grass, and Western wheat grass.

Sagebrush

- This is a drought tolerant plant found in prairies and deserts across North America.
- It contains chemicals that taste unpleasant, protecting them from browsing animals.
- It is an important food source for sage grouse, one of the few species evolved to eat this plant.

Black-tailed prairie dog

- This is a very social mammal that lives in large colonies called "towns".
- They are native to shortgrass prairie and have suffered decline or local extirpation throughout their range.
- It is important to the prairie community because other prairie animals such as burrowing owls quickly take up its abandoned burrows.
- The Black-tailed prairie dog eats grasses, roots, leaves and flowers. They do not need to drink water because they get enough moisture from their diet.

Loggerhead Shrike

- The Loggerhead Shrike is a predatory songbird found in prairies and ranchlands.
- It eats other songbirds, insects, small mammals and reptiles.
- It has a hooked beak that is similar to hawks and other birds of prey.
- This bird has a peculiar habit of displaying prey items on thorns barbs and branches.

Pronghorn Antelope

- The Pronghorn Antelope is the fastest land animal in North America.
- It is a poor jumper but can slip easily under fences if the bottom wire or rail is raised.
- It is very curious and will often investigate anything unusual on the landscape.
- Adults have very few predators.
- The female Pronghorn Antelope stash newborns in the prairie grass and ignore them for most of the day. If a predator comes, the females will often leave the area where their fawns are hidden.
- Newborns are most susceptible to predation and are hunted by golden eagles and coyotes.
- Pronghorn will often 'race' along a vehicle and then suddenly speed up and jump across the path of the vehicle.

NOTES

Prairie Crocus

- This species is one of the first flowers to bloom in the early spring.
- The stems and buds are covered with fuzzy hairs that decrease the movement of cool spring winds.
- Flowers track the movement of the sun each day to maximize warmth. The inside of the flowers can become several degrees warmer than the surrounding air, making a warm and inviting spot for early spring bees and flies that pollinate this plant.

Western Prairie Fringed Orchid

- This is one of many rare orchids that can be found in the short grass prairie particularly in places that have never been broken for cultivation.
- It will not survive without a special fungus it requires around its roots; this makes transplantation almost impossible.

Burrowing Owl

- Unable to dig its own burrows effectively, it relies on abandoned dens and digging of badgers, foxes and coyotes.
- The population is declining across North America.
- It migrates south to Texas, Mexico and other unknown locations.
- It eats grasshoppers and small rodents.

Swift Fox

- This small fox of the prairies has been in serious decline or extirpated across most of its range. Enormous effort to breed and reintroduce this fox has had some success in Alberta and Saskatchewan, including Grasslands National Park.
- Coyotes prey upon this species and also compete with them for food.
- Swift fox will accept an abandoned den of a badger instead of digging its own.

Badger

- Badgers are often hunted and removed from the land by farmers and ranchers because of the prolific holes that they dig and their aggression if they are cornered.
- Female badgers can maintain dozens of active dens at once.
- They hunt for prairie dogs by digging up their "towns".
- Abandoned dens become dens for coyotes, burrowing owls and swift fox.

Eastern Short Horned Lizard

- This species of lizard is only found in the prairies and badlands of the southern parts of central Canada. They are more commonly found in the US.
- The Eastern Short Horned Lizard will eat hundreds of ants each day.
- It maintains small territories.
- To protect itself from predators, this lizard will become very still and rely on camouflage or cryptic coloration to avoid confrontation.

NOTES

ECOLOGICAL PROCESSES

Herbivory

- Prairie ecosystems are adapted to some level of herbivory that was historically provided by large herds of bison.

Competition

- Recent studies have indicated that in Alberta, coyotes and swift fox directly compete with each other for resources. Coyotes will kill foxes if they encounter them.

Fire

- Prairie ecosystems are adapted to periodic fire. Roots deep below the ground are not affected by moderate intensity fire, and burned areas quickly "flush" or regrow.
- The suppression of fire in grassland ecosystems is contributing to the decline in biodiversity.

Mutualism/Symbiosis

- Many species of grass, orchids and other prairie plants rely on the presence of beneficial fungus around their roots in order to obtain required nutrients and remain vigorous.

NOTES

WEB OF LIFE CHEAT SHEET - Northern Arctic Ecosystem

NOTES

ABIOTIC ELEMENTS

Wind

- Winter winds are extremely forceful, creating blizzards and high wind chill factors.
- Cotton grass seeds are carried long distances by the wind to replenish growth of vegetation.

Soil

- Arctic ground is characterized by low, rolling plains covered with soil and rock debris left by glaciers.
- Limestone and sandstone debris is caused by frost.
- Freezing and thawing of soil resulting from temperature changes contributes to mudslides.
- Lichens in barren areas help create soil by injecting enzymes into cracks in rocks that help break down the rocks into smaller particles.

Sun

- Warmer temperatures create favourable conditions for species such as snow geese.
- Winters pass in near darkness and extreme temperatures. The average temperature in winter is -32º C.
- Summers pass in constant daylight. The average temperature in summer is 10º C.

Water

- Moisture is plentiful. The melting of snow and ice, and the thawing of permafrost creates lakes, rivers, ponds and wetlands.
- There is very little annual rainfall.

BIOTIC ELEMENTS

Lichen

- A type of fungus that captures algae, forming a symbiotic relationship between the two species.
- Absorb water quickly and efficiently from the air, allowing their algal partners to make food from the sun's energy.
- A source of food for other creatures such as caribou.
- Raw areas like the barren, rocky land that exists after a glacier retreats will often be colonized first by lichen.

Fungi

- Feeds on trees and decomposes deadfall.
- Consumes the food produced by the algae and wraps its fungal threads around the algae, acting as a house for it.

Algae

- Algae photosynthesize, making food from the sun's energy. Water is made available to the algae because of the fungi's ability to collect rain or moisture in the air.

Arctic Willow

- Low growth willow extends roots to gain moisture below permafrost level, often forming thickets along edges of streams and lakes.
- Arctic willow roots easily, and is found growing along the ground out of the cold wind.
- Inuit call it the tongue plant, because of the shape of its leaves.
- Source of food for musk ox and caribou.
- Provides camouflage for Ptarmigan and low-lying birds.

Willow Ptarmigan

- Resident species of the arctic tundra.
- Hides amongst rocks and willow bushes.
- Brownish in colour, with dark stripes in summer, but completely white in winter allowing them to conceal themselves from predators while eating.

Cotton grass

- A type of sedge resembling course grass growing in wet marshy areas. The spring thaw releases moisture, which stimulates plant growth.
- White tufts cover the fruiting heads in midsummer; these break off and are carried long distances on the wind.
- Underground stem bases of cotton grass are a highly nutritious and digestible plant food for snow geese, musk ox and caribou.

Arctic Fox

- Burrows into the ground or snow for protection from the arctic cold.
- Footpads are densely furred so that it can travel on the snow and ice.
- Creates a store of food over the summer months and freezes it in the permafrost.
- Almost entirely dependent on lemmings throughout the year.
- Only 5 to 10% of the summer diet is composed of birds, eggs, ground squirrels, and berries.
- It is able to sleep in open snow in -80º C temperatures for an hour without its body heat dropping.

Collared Lemming

- Makes simple shallow burrows in summer as permafrost prevents them from digging deeply for shelter.
- Seasonal freezing and thawing creates ridges and depressions that lemmings use for burrows and as travel routes.
- In winter, lemmings make large, globular nests of finely shredded grasses and sedges on the surface of the ground, which provide additional insulation when they are not out foraging.

NOTES

- Snow provides critical insulation.
- Seeks out willows and cranberries as a source of food.
- Key source of food for arctic wolves and arctic fox.
- Populations shrink and swell depending on how many plants and berries are available.

Snow Geese

- Migrate in August/September from Canada after raising their young.
- Seek out areas of wet tundra where there are few other plants besides cotton grass.
- Feed up to 16 hours a day, consuming as much as one third of their body weight.
- Increase their body fat by 400% in only two to three weeks feeding almost entirely on the lower stems and roots of cotton grass.
- Nutrients from cotton grass will supply the geese with energy they need to fly non-stop more than 1,200 miles before they rest and feed again.
- Wolves prey on snow geese during the summer migration.

Caribou

- Variations in snow melt patterns and the timing and location of plant growth on the calving grounds determine where the cows choose to have their calves each year.
- Feed on cotton grass, willow brush and other low growth plants.
- Insect and mosquito harassment interferes with caribou foraging, decreasing survival rates.
- Ice resulting from rain in winter can prevent caribou from getting their food.
- Wolves prey on caribou throughout the year, but most frequently in the winter. Bears prey on caribou during spring, summer and fall.

Mosquitoes

- Appear in early summer, just as the caribou are shedding their long winter hair.
- Easily draw blood from the caribou at this time.
- Caribou try to avoid mosquitoes using a variety of strategies: running, moving to higher, windier or drier ground, seeking out cooler temperatures or moving out into large lakes or shallow salt water, and/or bunching up into very dense groups.
- The running, blood loss, and inability to spend time eating causes caribou to lose weight during a time of year when they need to be getting fat for the coming winter. Mosquitoes are therefore a major influence in the lives of caribou.

Musk ox

- Only large mammals that live year-round on the arctic plains.
- Uniquely adapted to a frigid environment.
- Long, skirt-like guard hairs and thick "qiviut" wool provide insulation, and square, short-legged bodies retain heat.

NOTES

- Less active in winter to conserve energy.
- When threatened, musk oxen typically run together to form a tight circle or line.
- In summer, musk oxen feed along rivers on a wide variety of plants.
- In winter they move to areas with low snow cover to feed on sedges and shrubs.

Wolves
- Highly social animal, preferring to live in packs.
- Hunting in packs enables them to kill large animals such as deer, elk, moose, caribou, bison, and musk ox.
- Opportunistic feeders that will eat small rodents, birds, and ground squirrels.
- Colour variation is a good example of natural selection, which enables those animals best suited to a particular environment to survive.

ECOLOGICAL PROCESSES

Migration
- Weather conditions, such as the first severe storm in the fall, stimulate caribou to migrate toward their winter ranges.
- The 24-hour days near the Arctic Circle produces a brief, but abundant, source of food during the summer.
- Attracts many mammals such as the caribou to the Arctic for breeding purposes.

Symbiosis
- Lichen is a small simple organism that is a combination of an algae and a fungus.
- Fungi break down nutrients that might be in the soil and uses them for food. In return, the algae is able to photosynthesize, also creating food for the organism.
- It is a mutually advantageous symbiotic association because both parts of the organism will benefit.

Predation
- Arctic fox preys on snow geese.
- Arctic caribou herds travel north to avoid wolf predation.
- Lemmings and other small mammals form a key food source for many predators.
- Fluctuating populations cause some predators to adapt to lemming cycles by producing fewer or even no young, or by emigrating. The lemming population then recovers the following year.

Competition
- If a common resource is in short supply competition will occur between or amongst species. When lemming population decreases, arctic fox and arctic wolves will compete for the same food source.
- Competition between musk oxen and caribou for food may affect population size of either species.

NOTES

Adaptation

- Caribou are well equipped to survive in cold, snowy places. In winter, their hair is about three inches long and hollow inside, allowing them to trap air and keep warmth near their bodies. They also have four hoofed "toes" on each foot, when they are in snow, these "toes" spread out, acting like snow-shoes, which help the caribou walk on deep snow.
- Some animals exhibit changes during the winter months. For example, arctic foxes cope with the winter by growing a dense layer of white fur. The fur covers every inch of the body including the bottoms of their paws. This layer of fur is so effective that artic foxes do not have to raise their body heat production until the ambient temperature reaches -40º C.
- Other animals hibernate and still others migrate to warmer regions. For example, almost all the birds in the arctic tundra migrate south before winter starts while most mammals hibernate.

NOTES

WEB OF LIFE CHEAT SHEET - Pacific Marine Ecosystem

NOTES

ABIOTIC ELEMENTS

Wind

- Coastal winds contribute to nutrient upwelling, bringing cooler, nutrient-rich waters up from the depths of the ocean.
- This provides nutrients that enhance plankton populations, which are food for the whole marine species complex, such as seabirds, fish, and marine mammals.

Sun

- Sun is important for the growth of seaweeds and phytoplankton.
- Heating of the ocean water by the sun is the key process that keeps the hydrologic cycle in motion.

Water

- The land barrier imposed by the Alaskan peninsula prevents much of the cold arctic currents from flowing down the west coast, so there is little oceanic water exchanged between the Arctic and Pacific ecozones.
- From south to north within Canada's borders, ocean surface temperatures in the ecozone at any one time vary only about 3° C, while seasonal ocean temperatures vary within a narrow range of about 7° C.

BIOTIC ELEMENTS

Algae

- Phytoplankton are photosynthetic algae that are the anchor of the marine food chain.
- Seaweeds are multicellular but have no true stems, roots, or leaves.
- Giant kelp, which is large, brown seaweed, provides an “anchor” for sea otters as they sleep.
- This seaweed forms “forests” that also provide habitat for many species of fish.

Sea Urchin

- Grinds seaweed with its teeth.
- Source of food for sea otters.
- Live associated with kelp forests.
- The spines are used for locomotion, protection, and for trapping drifting algae for food. Between the spines, are tube feet that are used in food capture, and locomotion.

Gray Whale

- Feeds on shallow, sand or gravel sea bottoms waters that are rich in various invertebrates.
- Travels to lower latitudes to bear their young so that the calves can live in warmer water until they develop a sufficient insulating layer of blubber. Gray whales undertake the longest migrations of all whale species (Baja California, Mexico, to the Bering Sea).

Salmon
- Five species in the Pacific ocean (chum, chinook, coho, pink, sockeye).
- Hatch in fresh water, live most their lives in the ocean, and then return to the exact location where they hatched in order to breed.

Eelgrass
- Along the water's edge, coastal salt marshes and mudflats contain beds of eelgrass, important spawning sites for Pacific Herring and nursery sites for many fish species.

Sea Otters
- A true marine mammal- it eats, sleeps, mates and gives birth at sea.
- Anchors itself in kelp to maintain its position while sleeping or feeding.
- It eats abalone, sea urchins, crabs, mussels and fish, as much as 6 kg a day, using a rock placed on its chest to break the shells.
- It uses tools more than any other mammal except primates.
- Found only along the Pacific coast, the sea otter helps control sea urchin populations that graze kelp forests.

Killer Whales (Orcas)
- There are three distinct races of killer whales off the coast of British Columbia. Transients occur offshore and feed mainly on other marine mammals, including dolphins, sea lions, seals and other whales.
- Residents are common near shores in summer and feed on fish, primarily salmon.
- Little is known about offshore species, but they are believed to feed on fish and squid.
- Killer whales, also called Orcas, live in tight associations called pods, which are matriarchal in nature-the whales remain with their mother for life.

Osprey
- Osprey are fish eaters. Osprey also consume small, terrestrial vertebrates.
- Most migrating osprey arrive in mid April.
- To catch fish, they will hover over a body of water and plunge into the water to catch the fish. Osprey build their nests in trees, atop power poles, and on osprey platforms that humans have constructed near bodies of water.
- The osprey breeds from near sea level to at least 1,070 m elevation in close proximity to permanent water.

NOTES

ECOLOGICAL PROCESSES

Migration

- Migration is probably food and breeding related. There is abundant prey in the northern oceans in the summertime, but in wintertime, the oceans cool, and prey abundance drops off dramatically.

Glaciation

- Affected by extensive glaciation, the coastal areas first "drowned", then “rebounded” as the glaciers melted. First Nations legends describe, and archaeological evidence shows how humans moved their villages with the changing sea levels.

Predation

- Loss of sea otters on Haida Gwaii/Queen Charlotte Islands has resulted in dramatically increased urchin populations. As a result, kelp forests have declined sharply, reducing available habitat for many fish and invertebrates.

Competition

- If human predation of salmon is too high, it can negatively affect other marine predators (orcas) or terrestrial predators and scavengers (bears, marten)

Nutrient Upwelling

- Divergence of water currents or the movement of surface water away from land can lead to a `welling-up' of deeper water; usually richer in nutrients than the surface water.

NOTES

APPENDIX B: PROPOSED COURSE LAYOUT FOR THE SUMMARY VERSION

This Orientation Program is 12 hours long, divided into four modules of three hours each. The learning proposed experience is a set of activities that will invite Parks Canada staff to develop their awareness of the principles of ecological integrity and their application at the field level.

In the Conference press of March 23, 2000, Minister Copps confirmed that all Parks Canada staff will participate in the course. However, during the design, we have elaborated a summary version of this course to ensure more flexibility in the delivery of the course for staff in small National Historic Sites of Canada or National Historic Canals of Canada. The objective is to deliver the complete course to all staff, but in some circumstances, the local trainers may decide to give the summary version instead of the full course to make it more relevant for National Historic Sites of Canada staff.

The following is what we propose for the summary version. Once again, we welcome the trainers to customize the course based on their appreciation of their audience.

1. Reconnect with Parks – Module 1 (30 minutes)
2. Is Ecological Integrity a New Concept? – Module 1 (50 minutes)
3. Comparing Ecosystems to Houses – Module 1 (50 minutes)
4. Greetings Card/T-Shirt/Bumper Sticker – Module 2 (30 minutes)

Please take ten minutes at the beginning of the summary version to have learners complete the Pre-Course Questionnaire, and ten minutes at the end of the course to have learners complete the Post-Course and End-of-Course Questionnaires.

APPENDIX C: REFERENCES

Adult/Continuing Education. www.adulted.about.com/education/adulted/mbody.htm.

Bemowski, Karen and Brad Stratten, eds. **101 Good Ideas: How to Improve Just About Any Process.** Milwaukee, Wisconsin: ASQ Press, 1998.

Canadian Institute for Conflict Resolution. **Facilitation 1: Processes, Techniques and Logistics.** Merrickville, Ontario: RANA Process Technologies Limited, 1994.

Cook, Marshall J. **Effective Coaching.** United States of America: The MaGraw-Hill Companies, 1999.

Gelb, Micheal J. **How to Think Like Leonardo da Vinci.** New York: Delacorte Press, 1998.

Newstrom, John and Edward Scannell. **Games Trainers Play.** United States of America: The MaGraw-Hill Companies, 1980.

Newstrom, John and Edward Scannell. **The Big Book of Team Building Games.** United States of America: The MaGraw-Hill Companies, 1995.

Silberman, Mel. **101 Ways to Make Training Active.** San Francisco: Jossey-Bass Pfeiffer, 1998.

Sugar, Steve. **Games that Teach: Experiential Activities for Reinforcing Training.** San Francisco: Jossey-Bass Pfeiffer, 1998.

Ukens, Lorraine L. **Energize Your Audience!: 75 Quick Activities that Get Them Started… and Keep Them Going.** San Francisco: Jossey-Bass Pfeiffer, 2000.